

The Influence of Digital Information and Communications Technology on Industry Evolution

Submitted for The Degree of PhD

2020

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DECLARATION

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SUMMARY

There is a requirement for research engaging with the structural evolution of whole industries. This research focuses on exploring how digital information and communications technology (ICT) has influenced industry evolution in the Irish advertising and retail grocery industries. The application of ICT has become endemic across industries and has had significant impact. Engaging with ICT, has become a necessity and a key strategic consideration for firms. As a general purpose technology ICT offers a particularly interesting lens to explore industry evolution. In the information systems (IS) literature industry level research is rare, and most research focuses on a specific ICT solution. This research engages with the full structural evolution of industries, augments industry level research in IS, and addresses ICT as a class of technology.

The research was conducted through the creation of comparative longitudinal case studies, following a contextualist methodology developed in the Warwick Business School, Centre for Corporate Strategy and Change. Data was collated from secondary and primary sources, and cycles of inductive and deductive analysis occurred throughout the research process. A multi-modal framework encompassing five theories was applied to provide a more holistic multi-level explanation of ICT influenced industry evolution.

The research concludes that the routinizability of industry processes mediates the influence of ICT on evolving industry structure. The routinization of processes through ICT is reliant on the specifiability of information for successful process outcomes, and the degree of social complexity of industry processes influences this potential. The characteristics of industry product/service in regard to social complexity effected the adoption and influence of ICT in the industries.

ICT is deployed at the process level and social technology adaptations are required to leverage ICT. When processes can be routinized through ICT great advances in efficiency and capabilities can occur. ICT-related process changes enabled and drove wider and multi-level industry change, through influencing capabilities which in turn influenced firm and industry boundaries, relationships, and business models.

While ICT solutions became ubiquitous, firm's social technology capabilities determined the utility and advantages they achieved through its application. The application of ICT resulted in information asymmetries and power shifted in line with information advantages along the supply chain.

ICT itself has been an important contextual factor in driving its adoption and influence in the industries, and there has been coevolution of ICT and industry capabilities. The establishment of standards to facilitate the application of ICT were enabled by and enhanced routinizability opportunities, and augmented ICT's effectiveness and influence in retail grocery. There was no

equivalent in the advertising industry. Context matters, and ICT's influence on external context has been a key influence in driving industry evolution in the advertising industry, but is less evident in the retail grocery industry.

The research makes an empirical contribution through the creation of the two Irish service industry case studies, particularly as the majority of prior research has focused on manufacturing and American industries. The cases provide evidence of the social technology developments required to leverage ICT, including the emergence of new institutions in the industries. A conceptual contribution is provided through the recognition of the role of routinizability in the influence of ICT. The assessment of the explanatory power of five different theoretical perspectives revealed that key drivers of the adoption of ICT included the pursuit of efficiency and competitive capabilities. Firm's ICT adoption was also influenced by their resources, capabilities and culture. Whilst a varying combination of efficiency, power (both resource and institutional) and capabilities were prevalent in the ICT-influenced industry outcomes. Highlighting the requirement to routinize processes coupled with adaptation in social technologies to enable the effective application of ICT makes a contribution to practice.

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ABBREVIATIONS AND ACRONYMS

3G Third Generation (of wireless mobile)

3PL Third Party Logistics

AAI Association of Advertisers in Ireland

ABF Associated British Foods

ADM Allied Dublin Merchants Limited

AI Artificial Intelligence

AMS Associated Marketing Services (a European buying group for grocery retailers)

AMSI Association of Media Specialists in Ireland

ANAI Article Numbering Association of Ireland

AND Associated National Distributors Ltd.

API Application Programming Interface

ASN Advance Shipping Notice

ATL Above The Line

AWL Amalgamated Wholesalers Ltd.

BARB Broadcasters Audience Research Board

Bn Billion

BOE Bought, Owned, Earned

BOGOFs Buy one get one free

BTL Below the Line

BWG Brooks Watson Group

B2B Business to Business

B2C Business to Consumer

CAD Computer Aided Design

CCSC Centre for Corporate Strategy and Change

CD Central Distribution

CEO Chief Executive Officer

CPA Cost Per Action/Acquisition

CPC Cost Per Click

CPM Cost Per Mille (1,000 impressions)

CPT Cost Per Thousand Homes

CRM Customer Relationship Management

CSO Central Statistics Office

DIT Dublin Institute of Technology

DMP Data Management Platforms

DSD Direct to Store Delivery

DSP Demand-Side Platform

DSS Decision Support Systems

EAN European Article Number
ECR Efficient Consumer Response
EDI Electronic Data Interchange
EDL Efficient Distribution Limited
EDP Electronic Data Processing
EEC European Economic Community
EFTS Electronic Funds Transfer System
EPC Electronic Product Code
EPOS Electronic Point of Sale
ERP Enterprise Resource Planning
EU European Union
FMCG Fast Moving Consumer Goods
FORFÁS An agency of the Department of Enterprise, Trade and Employment
FTC Fair Trade Commission
FTP File Transfer Protocol
GPT General Purpose Technology
GS1 Global Standards 1
IAB Interactive Advertising Bureau
IADT Irish Association of Distributive Trades
IAPI Institute of Advertising Practitioners in Ireland
ICT Digital Information and Communications Technology
IFAA International Federation of Advertising Agencies
IE Industry Evolution
ILC Industry Life Cycle Model
IMD Irish Modern Distributors
IoT The Internet of Things
IS Information Systems
IT Information technology
JIT Just in Time
JNMR Joint National Media Research
K Thousand
KPI Key Performance Indicators
LCM Life Cycle Model
M Million
M&A Mergers and acquisitions
Marcoms Marketing communications
MIS Management Information Systems
MNC Merchants National Co-operative Ltd

MRC The Media Rating Council
MUM Munster United Merchants
NIT New Institutional Theory
N.R.M.A National Retail Merchant's association (US)
NWGA National Wholesale Grocers' Alliance
OECD Organisation for Economic Co-Operation and Development
PE Population Ecology
PLOF Price List Order Form
POE Paid Owned Earned
PR Public Relations
RBT Resource-Based Theory
RBV Resource-Based View
RDT Resource Dependence Theory
RFID Radio Frequency Identification
RGDATA Retail Grocery, Dairy and Allied Trades' Association
ROI Return on Investment
RPC Restrictive Practices Commission
RPM Resale Price Maintenance
RTB Real-time Bidding
RTÉ Raidió Teilifís Éireann
SEO Search Engine Optimization
SKU Stock Keeping Unit
SSP Supply Side Platform
TAM Television Audience Measurement
TCE Transaction Cost Economics
TPS Transaction Processing Systems
TQM Total Quality Management
TSN Tobacconist Stationer Newsagent
TV Television
UPC Universal Product Code
USP Unique Selling Proposition
UTV Ulster Television
VAT Value Added Tax
VAN Value Added Network
VMI Vendor Managed Inventory
VRIN Valuable, Rare, Imperfectly imitable and Non-substitutable
WAP Wireless Application Protocol

CHAPTER 1 INTRODUCTION TO THE STUDY

'[B]y learning more about history we may do a better job in the future' (Greiner, 1998:67)

1.1 INTRODUCTION

This introductory chapter provides a rationale for the research, and presents the research question, the goals, and potential contributions of the research. The last section of this chapter outlines the structure of the thesis.

The research is situated in the strategy domain and is focused on contributing to increasing knowledge of industry evolution (IE), through exploring the influence of digital information and communications technology (ICT) on the evolution of the Irish advertising and retail grocery industries.

1.2 RATIONALE FOR THE RESEARCH

Understanding the evolution of industries is of strategic importance (Lenox, Rockart, & Lewin, 2006; Porter, 1980/2004), but *'..industry evolution is largely a black box.. there is still much to learn.. about industry evolution'* (Buenstorf, 2016:833-834) echoing Malerba & Orsenigo (1996:82) *'not much is known about the structural evolution of industries'*. There has been a lack of empirical research focused on the structural evolution of industries (Malerba & Orsenigo, 1996; Quinn & Leavy, 2002), particularly in regard to non-manufacturing industries (Quinn & Sparks, 2007; Williams, 2009).

ICT has been hailed as the harbinger of a new industrial revolution: an 'information revolution' (Atkeson & Kehoe, 2007; Castaldi & Dosi, 2008; Dalum, Freeman, Simonetti, von Tunzelmann, & Verspagen, 1999). It is suggested that the influence of ICT is so significant that the 'digital hand' is worthy of consideration alongside the 'invisible hand' (Smith, 1776) of markets, and the 'visible hand' (Chandler, 1977) of managers (Cortada, 2004). ICT has brought significant industry change (Cortada, 2006a; Crowston & Myers, 2004; Dalum et al., 1999; Evans & Wurster, 1997; Porter, 2001; Porter & Millar, 1985; Segars & Grover, 1995), and its use has become so endemic in industry processes, that industries could no longer function without it (Chatfield, 2011; Cortada, 2006a; Dalum et al., 1999).

There is a requirement for research concentrating on the structural evolution of whole industries, and ICT has been identified as a technology of particular import in industry change. Additionally, a review of the information systems (IS) literature identified a lack of industry level research (Allen & Kim, 2005; Chiasson & Davidson, 2005; Crowston & Myers, 2004; Segars & Grover, 1995), along with the suggestion that *'the industry level is the right place to look for, and understand, the*

true implications of IT' (Allen & Kim, 2005:243). These points provide a rationale for research exploring the influence of ICT on IE.

1.3 RESEARCH QUESTION

The previous section provided justification for seeking an answer to the question: 'How has digital ICT influenced industry evolution?' This question provides the outline of the arena for the research. The researcher endeavours to contribute to answering the question by refining the focus of it, to: 'How has digital ICT influenced the evolution of the Irish advertising and retail grocery industries¹?'. Addressing this question will contribute to answering the wider question, particularly as any correspondence in patterns that emerge between these contrasting industries would suggest potential relevance to a wider selection of industries.

1.4 RESEARCH GOALS AND CONTRIBUTIONS

Maxwell (2009) delineates three types of research goals: personal; practical and intellectual. Goals serve the purpose of guiding research decisions, and hence increase the likelihood that the research process has 'worthwhile' output, and goals also provide justification for the research (Maxwell, 2009).

1.4.1 Personal Goals

Completing a PhD thesis is a personal challenge. The researcher has always gained satisfaction in the pursuit of knowledge, as an end in itself, and completing a PhD enables her to develop a proficiency in research and actually contribute to existing knowledge.

There was an opportunity for funded research in the predefined area of ICT. The researcher worked in investment management for more than twenty years, including spending a number of years working as an IT business analyst. She cares passionately about managing Information Technology (IT) to support and enable business. However, her experiences suggest that:

- The integral importance of ICT is frequently overlooked and certainly undervalued in firms.
- The challenges and complexities of successful ICT implementations are vastly underestimated.
- Despite exhortations that ICT is a key strategic resource, many business managers are uncomfortable with ICT, and many IT managers do not understand business challenges. There is still a disconnect between business and IT management.

¹ Justification for the selection of these industries is provided in Chapter 3.

The situation is not aided by articles in the popular business press focused on individual ICT solutions and individual companies which can give the impression that ICT solutions are ‘plug and play’ to provide unlimited business flexibility, whilst in parallel there are suggestions that the pace of change is relentless and entirely new rules are required to compete in the digital age. Unrealistic expectations and unrealistic fears can be created. Business managers and indeed IT managers can feel overwhelmed by the relentless opportunities, and requirements for business flexibility that ICT appears to present and require.

In a somewhat frenetic atmosphere, it can be useful to draw breath and take stock, and this is what taking an IE perspective on the influence of ICT offers. Research focused on providing an account of how industries have been influenced by ICT can help to make sense of the journey so far. It helps to see beyond individual technologies and individual firms, to broader considerations and impacts. It can provide a more holistic understanding of where we are now. Additionally, perhaps managers can see how far they have already come on their digital journey.

1.4.2 Practical Goals and Contribution

Ogilvy & Mather Ireland sponsored this research, and a prerequisite for the funding was that the subject matter should address the advertising industry and digital information and communications technology. Over recent years ICT has had the advertising industry under siege: *‘technology has advertising in its teeth, keeps shaking it, and won't let go’* (Neff, 2014). There is a great deal of uncertainty, and the industry faces many challenges. The researcher is grateful to JP Donnelly in Ogilvy for sponsoring the research, and would like the output of the research to be useful to Ogilvy and the advertising industry.

The production of comprehensive case studies, reflecting the influence of ICT on the Irish advertising and retail grocery industries should prove valuable to industry participants: such narratives can enhance understanding (Mjøset, 2009). The analysis of the research data and the research conclusions may be useful through presenting previously unconsidered perspectives.

The creation of two IE case studies provides an opportunity to compare the patterns that emerge across the industries. Commonalities that are identified potentially have more widespread relevance, while contrasts may reveal important industry-specific differences. There is cross pollination of knowledge and best practices amongst different industries (indeed this contributes to explaining the widespread diffusion of ICT (Cortada, 2004; Kelly, 2010)) and therefore the industry case studies and research findings can be of interest to business managers in any industry.

1.4.3 Intellectual Goals and Contribution

Intellectual goals relate to increasing understanding or revealing insights, and contribute to achieving practical goals (Maxwell, 2009). The research is focused on exploring the influence of ICT on the evolution of industries, and through this seeks to increase our understanding of the process of IE. The research will explore contextual factors (in addition to ICT) as drivers of the adoption and diffusion of ICT in the industries and in industry outcomes, and in this way may contribute to both IE and IS knowledge.

There is a requirement for more empirical evidence to develop '*generalizations, taxonomies or theories about how industries evolve over time in terms of structure*' (Malerba & Orsenigo, 1996:54). This research will augment the pool of empirical evidence, by creating two longitudinal IE case studies. In particular there is a need for evidence from non-manufacturing industries, and two service industries have been selected to contribute to addressing this requirement.

The research will make a potential theoretical contribution through assessing five organization theories² which span economic and sociological domains in regard to their explanatory power concerning IE. Rather than viewing the various theories as competing, the researcher views them as having the potential to illuminate different aspects of IE. Thus through taking a multi-modal perspective the researcher seeks to provide a more holistic explanation of the process of IE. Additionally there is an opportunity to augment existing empirical support for the theories, and/or potentially extend their application.

1.5 OUTLINE STRUCTURE OF THE THESIS

This introduction chapter, is followed by Chapter 2, which provides a review of pertinent literature that informs the research, and the development of a conceptual framework to guide it. Chapter 3 presents the methodology and methods employed in doing the research. Chapters 4 and 5 present the case narratives. Chapter 6 contains the within case and comparative analysis of the case studies. Lastly Chapter 7 presents the conclusions of the research and suggests opportunities for future research.

Chapter 2 provides an appraisal of the literature that is judged to be most central to the research. It considers how the domains of strategy, IE and IS are connected. Then IE is explained, an overview of IE literature is provided, which evaluates what is known, and this identifies a need for empirical research that is both longitudinal and processual in approach, focused on the structural evolution of industries. Different perspectives on IE from the literature are explored along with the potential for evolution theory to aid in understanding the process of IE. A need for multi-modal and multi-level research for exploring IE is identified.

² Listed in the overview of Chapter 2 below.

Then the term technology is defined, and technology is recognized as a key driver of IE. A distinction is made between physical and social technologies, and the uneven advance of technologies is acknowledged along with the need for adaptation in social technologies for the adoption of physical technologies. Technological regimes and the diffusion of technology is then discussed, before ICT is defined and considered as a general purpose technology (GPT). This is followed by a review of IS literature focused on the industry level, which shows that industry level IS research is rare, and identifies calls for research focused on the influence of ICT at industry level, along with a need for longitudinal research to uncover this.

Based on the reviewed literature five theoretical perspectives are assessed for their potential to aid in understanding the process of IE as influenced by ICT. These theories are the Resource-Based View (RBV), Transaction Cost Economics (TCE), Resource Dependency Theory (RDT), Neo-Institutional Theory (NIT), and Population Ecology (PE). The last section of Chapter 2 builds from the literature review and the goals of the research presented in Chapter 1, and develops sub-questions from the research question and presents the conceptual framework that guides the research.

Chapter 3 completes the research design. Having previously covered research goals, research questions and the conceptual framework, this chapter presents the research methodology and methods, and considers validity challenges. The chapter discusses paradigms in social science research. This provides a context for the researcher's critical realist perspective. Then the contextualist methodology and its appropriateness for the research is discussed. Longitudinal comparative case studies are the chosen research method, and the fitness of this selection for this research is explained. Key decisions such as the selection of the specific industries and the time period studied are justified. The strengths and challenges associated with qualitative data and the case study method are considered. Then the actual execution of the research is delineated.

Chapter 4 and Chapter 5 present a synopsis of the empirical evidence in the form of case study narratives of the Irish advertising and retail grocery industries respectively. An ICT contextual overview is provided for the industries. Each case begins by providing an overview of the current industry structure, and a summary of the major changes that have occurred across the researched periods. Then the longitudinal cases are presented in chronological time periods, defined by diffusions of key ICT for the industries. The sections capture the adoption of key ICT, and key industry events linked to the influence of ICT, essential contextual factors are also captured, and the story unfolds through narrating the cumulative strategic activities of key firms.

Chapter 6 presents the within case and cross case analysis. The analysis chapter is presented in line with the conceptual framework. The influence of contextual factors in the adoption of ICT and the patterns of ICT diffusion are assessed across both industries, then ICT influenced industry

outcomes are identified and compared. Chapter 6 ends with a summary of the key corresponding and divergent features from the cases, identified by the analysis.

Chapter 7 discusses the research findings in light of the reviewed literature, and presents the empirical and theoretical conclusions and contributions of the research. The ‘why’ of ICT adoption and diffusion is explored. The patterns in the outcomes of ICT-influenced IE are presented, and are linked to, and build on, the literature. Multi-level empirical and conceptual drivers are identified in the adoption of ICT and outcomes influenced by ICT. The cases provide evidence of the requirement for process adaptation (social technology developments) for the successful leveraging of ICT. In this regard a firm’s social technology capabilities determine the benefits they achieve through ICT. Processes emerge as fundamental in ICT adoption and ICT influenced industry outcomes. The application of ICT in processes, changed firm’s capabilities, and this led to widespread industry change.

The research proposes that the degree of social complexity and hence routinizability of processes in the creation of industry products, mediates the influence of ICT in IE. Additionally, the provision of supplementary empirical support for key theoretical perspectives by case data is recognised, (including support for Pfeffer’s (1978) suggestions that RDT has relevance intra-firm, not just inter-firm). Finally there is a review of the contributions made by the research, along with suggestions for future research. Appendices provide additional supporting data for the thesis.

1.6 CONCLUSION

This chapter introduced the research topic: ‘the influence of ICT on industry evolution’ and provided a brief rationale for it. Then the goals and potential contributions of the research were reviewed. This was followed by an overview of the structure of the thesis. The next chapter provides a literature review and building from this presents refined research questions and a conceptual framework that guides the research.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides an overview and appraisal of pertinent material and debates from the literature that are most central to the research. The research is located within the strategic management domain, with industry evolution (IE) being its central subject. The research seeks to contribute to existing IE knowledge by exploring the influence of ICT on industry structure. The literature informing the research is located at the intersections between the strategic management, IE and information systems (IS) literatures. These three literature streams form the arena for developing the conceptual model and the research question.

The literature review reveals firstly that there is still much that is unknown about IE and secondly that ‘industry’ has been neglected in IS research, thus establishing knowledge gaps that the research contributes to addressing.

The chapter is structured as follows. The first section (2.2) links strategy, IE and IS. Following this the concept of IE is explored along with what is known about this domain (Section 2.3). This includes a discussion of the empirical drivers of IE, with consideration of the coevolution of drivers, (including the coevolution of ICT and industries). Then the concept of technology is explored including social technologies, and the diffusion of technology (Section 2.4). In Section 2.5, ICT are delineated and positioned as a GPT, followed by an overview and assessment of the IS literature relating to industry change.

Next a section (2.6) on theoretical drivers briefly explains the premise of five theories and their relevance to ICT-influenced IE. This is followed by a brief reflection on the literature (2.7). The chapter ends with Section 2.8 presenting a conceptual model which has been informed by the literature.

2.2 LINKING THE THREE LITERATURE STREAMS: STRATEGY, INDUSTRY EVOLUTION, AND INFORMATION SYSTEMS

The literature streams are conjoined through the recognition that: ICT is strategically important; is purported to be a significant driver of industry change; and that understanding IE is valuable in informing strategic knowledge.

2.2.1 What is Strategy?

Strategy aids managers in decision making and taking action by providing a toolbox to enable them to assess their firm in relation to the environment they operate in and therefore make sense out of chaos (Porter, 1983; Ronda-Pupo & Guerras-Martin, 2012). It is defined as

'the dynamics of the firm's relation with its environment for which the necessary actions are taken to achieve its goals and/or to increase performance by means of rational use of resources' (Ronda-Pupo & Guerras-Martin, 2012:180)

In the literature 'strategy' has tended to coalesce in to three streams:

- Doing something new
- Building on what you already do
- Reacting opportunistically to emerging possibilities

Rather than there being two stark choices for firms between cost leadership³ or a differentiation⁴ strategy (as ascribed in Porter (1980/2004)⁵), there is *'a broad expanse of opportunity'* for firms *'to ...nudge Adam Smith's invisible hand toward truly productive and profitable enterprises'* (Ovans, 2015:5). Activities are at the core of strategic advantage: firm's decisions in regard to how and which activities are done, and *'fit among activities'* matters, as strategic advantage is the output of the totality of a firm's activities⁶ (Porter, 1996:77).

Firms need an holistic consideration of the environment they operate in (Ovans, 2015). It is proposed *'that the essence of successful strategy lies in ...dynamic strategic fit'*, requiring the confluence of the content of strategy and both the internal environment of the firm and the external environment that the firm operates in (Mintzberg, Ahlstrand, & Lampel, 1998:217). Successful strategies emerge from ongoing cohesion between a firm's activities, resources and the wider environment.

2.2.2 Strategy, Industry Evolution and Information Systems

2.2.2.1 Industry Evolution and Strategy

'Industry evolution takes on critical importance for formulation of strategy' (Porter, 1980/2004:156)

Understanding how industries evolve is of value, both in regard to guiding government policy (Audretsch, 1997; Jacobides, 2005; O'Mahony & Ark, 2003) and to industry participants (McGahan, 2000; Afuah & Utterback, 1997). The industry a firm operates in is a significant factor in determining its profitability (Hawawini, Subramanian, & Verdin, 2003; Lenox et al, 2006; McGahan, 2000; McGahan & Porter, 1997; Porter, 1980/2004; Porter & Kramer, 2011). *'Industry structure strongly influences the competitive rules of the game as well as the strategies potentially*

³ Do what everyone else is doing but more efficiently

⁴ Do what no one else is doing

⁵ Who also ascribes a third generic strategic option 'Focus'

⁶ Fitting with the evolutionary perspective of routines as genes per Nelson & Winter (1982). It also provides an explanation for the persistent heterogeneity of firms

available to firms' (Teece, Pisano, & Shuen, 1997:511).

An understanding of the drivers and processes of IE are required to determine why certain firms in an industry thrive, whilst others fail (Lenox et al., 2006). Effective strategies of firms can alter industry structure and changing industry structure alters which strategies are effective (Lenox et al., 2006; Porter, 2001)⁷, which is why *'[a] fundamental understanding of industry evolution is critical to strategy research'* (Lenox et al., 2006:613).

2.2.2.2 *Linking Information Systems and Strategy*

Literature from strategic management⁸ has frequently been adopted in IS research (Crowston & Myers, 2004; Segars & Grover, 1995). Distinctions have been made between IS support of operational, managerial, and strategic management activities (Gorry & Scott Morton, 1971; Müller, Fay & vom Brocke, 2018). The IS literature recognizes that ICT has developed beyond the role of supporting infrastructure, to enabling and inspiring business strategies (Dempsey, 2014; Earl & Feeny, 2000; Shin & Edington, 2007), such as *'cost leadership, product differentiation, strategic alliance strategies, diversification strategies, and vertical integration strategies'* (Mata, Fuerst, & Barney, 1995: 496). ICT creates opportunities for strategic differentiation (Sambamurthy, Bharadwaj & Grover, 2003; Seely- Brown & Hagel III, 2003).

It has been proposed that the application of ICT has the potential to *'create substantial and sustainable competitive advantages'* for a firm (Porter & Millar, 1985:149) reaffirmed in Barney (1991) and Mata et al. (1995). Further development of this argument suggests that it is not ICT in itself that can create strategic advantage for firms, but the persistent innovative management of ICT (Ross, Beath, & Goodhue, 1996; Sambamurthy et al., 2003).

ICT represents a new techno-economic paradigm (Castaldi & Dosi, 2008; Perez, 2009). It has become increasingly intrinsic in organizations, and needs to be included in marshaling a firm's strategic arsenal (Dempsey, 2014; Drnevich & Croson, 2013; Porter, 2001; Porter & Millar, 1985). It has become *'integral to a firm's business-level strategy'* (Drnevich & Croson, 2013:483). ICT have become the engine of several industries including banking, insurance, advertising, computing, and broadcasting etc. (Teece, 2018b).

2.2.2.3 *Information Systems and Industry Evolution*

According to the literature the application of ICT has changed industry structures. ICT is *'transforming the nature of products, processes, companies, industries and even competition itself'* (Porter & Millar, 1985:149), reiterated in Cortada, (2006a), Dalum et al. (1999), Porter (2001) and

⁷ *'industry structure is not fixed but rather is shaped to a considerable degree by the choices made by competitors'* (Porter, 2001:9)

⁸ and the industrial economics literature

Daft, Murphy, & Willmott, (2014). It has changed how things are done in firms and reconfigured industry value and supply chains (Cortada, 2006a; Porter & Millar, 1985). Industries are dependent on ICT (Chatfield, 2011; Cortada, 2006a), it *'has affected every function within each industry'* (Dalum et al., 1999:107). ICT is having a profound impact on IE (Cortada, 2004). Within the IS field industry level research is rare (Allen & Kim, 2005; Chiasson & Davidson, 2005; Crowston & Myers, 2004; Segars & Grover, 1995), despite the recognition that IS influence on industries is significant.

The review revealed evident overlap between the IE and strategy literature and between the IS and strategy literature and a more limited engagement between IS and IE literature. This literature review focuses primarily on IE and IS literature and their intersection.

2.3 INDUSTRY EVOLUTION

2.3.1 What is an Industry?

Industries matter, they are the drivers of economic growth (Chandler, 1990; Malerba & Orsenigo, 1996) and globally governments regulate industries (Cortada, 2004; Porter, 1990). Industries are constructs, and can be viewed as having different boundaries dependent on the perspective taken, e.g. government, versus trade associations, versus a firm's view of its competitors (Stokes & Banken, 2015).

The literature acknowledges challenges in defining industry boundaries. Industries and their boundaries are not static, they are porous and protean (Jacobsson et al., 2017; Porter, 1980/2004; Stokes & Banken, 2015). For example, influenced by ICT the *'television, telephone and internet provision industries'* have converged resulting in the creation of *'what is essentially a new industry'* (Stokes & Banken, 2015:702). Another issue in empirically defining industries and the relationship between firms and industries is that the range of activities carried out by firms within industries varies (Gadiesh & Gilbert, 1998) and firms may be participants in more than one industry (Buensdorf 2016; Segars & Grover, 1995; Stokes & Banken, 2015). Despite these challenges *'grouping firms by industry is useful as it provides markets, sources of resources, rules of the game, identities and worldviews'* (Cortada, 2004:64).

As a unit of analysis there is debate in the literature regarding the scope of industry boundaries. Porter (1990:33) reflecting an economics perspective defined an industry as *'a group of competitors producing products or services that compete directly with one another'*⁹. In value chain terms, in economic based research, the industry boundary is limited to the process of converting inputs to outputs (Crowston & Myers, 2004).

⁹ Porter advises paying attention to buying and supplying industries when considering industry evolution

Scott (2005) identified three pillars of institutional thinking regulative, normative and cultural-cognitive. Consideration of industry boundaries could encompass these institutional perspectives. Viewing an industry as an ‘organizational field’ (DiMaggio & Powell, 1983) includes the totality of relevant actors along the supply chain: *‘key suppliers, resources and product consumers, regulatory agencies, and other organizations that produce similar services or products’* (Powell and DiMaggio, 1991:64-65). This captures a material¹⁰ and an institutional¹¹ dimension in examination of an industry (Chiasson & Davidson, 2005; Scott, 2001) and market and non-market organizations. Other terms of close equivalence to an industry value chain have emerged including ‘industry systems’ (Hirsch, 1972, 2000) and ‘societal sectors’ (Meyer & Scott, 1983), ‘community ecology’ (Quinn & Murray, 2009) and ‘sectors¹²’ (Quinn, 2015). Research has also occurred on strategic groups. Strategic groups reflect distinctive strategic positioning within industries representing an intermediate level of aggregation between firms and industry (Ghemawat, 2002; Porac, Thomas, & Baden-Fuller, 1989).

An interpretation of industry boundaries that can enrich IE research is a cognitive community perspective i.e. a firm’s management’s perspective of who their competitors, suppliers and customers are (Porac et. al, 1989; Porac & Thomas, 2002). Also reflected in industries’ ‘social networks’, this view captures aspects of power, status, industry elites and identity within industries (Shearman & Burrell, 1987).

A broad conception of boundaries is recommended when undertaking IE research (Malerba & Orsenigo, 1996; Quinn & Sparks, 2007). Similarly Santos and Eisenhardt (2005:491) called for wider consideration of organizational boundaries in order to *‘fuel a deeper understanding of organizations’*. They suggested consideration of four organizational boundaries, represented conceptually as:

- Efficiency: reflective of a legal ownership activities boundary, and a cost focus.
- Power: a permeable boundary reflective of sphere of influence, and pursuit of autonomy.
- Competence: a dynamic boundary represented by a firm’s portfolio of resources, driven by their pursuit of growth.
- Identity: the organizational view of ‘who we are’, focuses on coherence.

Marks (2015) innovatively conceived Santos & Eisenhardt’s (2005) four organizational boundaries from an industry perspective in her study of the influence of brand in IE.

¹⁰ Demand-side and supply-side factors, technologies and market structure

¹¹ Institutional logics, institutional actors and governance systems – spanning normative, cultural-cognitive and regulative

¹² E.g. Davide Consoli (2008:579) *‘longitudinal study on the evolution of the retail banking sector in the UK’*

2.3.1.1 Industry Architecture

Industry architecture represents a new conceptual layer underlying industry organization, which engages with the division of labour and value appropriation along an industry value chain. Industry architecture comprises two frameworks, which delineate:

- the creation of value and the division of labour between organizations i.e. *'who can do what'*
- *'value appropriation and the division of surplus, or revenue, i.e. who gets what'* (Jacobides, Knudsen, & Augier, 2006:1205)

Industry architecture comprises industry characteristics such as *'the degree of vertical integration, the division of labour between firms and the 'rules and roles' that determine how firms interact and the business models, available to them'* (Jacobides, 2016). Competition to appropriate value occurs along the value chain, not just horizontally. Some activities capture higher proportions of an industry's profits than others (Gadiesh & Gilbert, 1998). Industry architecture is manifest in this distribution of profits along an industry value chain.

IE can emerge from activities which seek to increase firm's/or a sector's architectural advantage: such as political lobbying by industry associations (Jacobides, 2016). Opportunities for architectural shifts can emerge through the introduction of new technologies and subsequent process changes and/or new sectors (Jacobides et al., 2006). ICT can disrupt industry architecture.

2.3.2 What is Industry Evolution?

Industry evolution (IE) deals with the dynamic changes in the features and structures of industries, their changing nature and importance over time (Malerba & Orsenigo, 1996). Industries evolve, they change in regard to their populations, boundaries, technologies, relationships, profitability, and economic importance (Malerba & Orsenigo, 1996). IE studies strive to understand the why, what, when, where and how of industry change.

In their seminal paper on the status of IE research, the evolutionary economists Malerba and Orsenigo (1996:53-54) identified three levels of IE inquiry:

- I. *'Industry Dynamics;*
- II. *Structural Dynamics;*
- III. *Structural Evolution'.*

More recently, Quinn (2015:656) observed that *'the work on industry evolution, to date, can still be broadly placed within the[se] three categories'*. Most IE research has focused on the first two categories (Malerba & Orsenigo, 1996) and has not attempted to explore the 'structural evolution'

of industries (Howard, 2005; Malerba & Orsenigo, 1996; Quinn & Leavy, 2004, 2005). Structural evolution encapsulates and extends beyond industry dynamics and structural dynamics levels.

Structural evolution analysis includes recognizing the interconnecting changes of: population of industries, e.g. firm entry and exit; scope of industries e.g. new products, product developments and extensions; firm and industry boundaries e.g. vertical integration, or disintegration, firm horizontal boundaries, industry concentration; capabilities and competencies of industry participants, and the macro environment (Malerba & Orsenigo, 1996) (See [Appendix A](#) for a table capturing these variables). Structural Evolution research is required to progress the field (Malerba & Orsenigo, 1996).

2.3.3 ‘Stylised Facts’ – What Do We Know?

‘[T]he evolution of industry evolution is largely a black box’ (Buensdorf, 2016:833)

Malerba & Orsenigo (1996:82) observed ‘*not much is known about the structural evolution of industries*’. This was reiterated in Dosi (2005), Dosi et al., (2008), and Quinn & Leavy, (2005). Yet certain ‘stylized’ facts have emerged from IE research: there is persistence of firm heterogeneity; firms pursue different strategies; and there is variation in firms’ sizes within industries (Dosi et al., 2008; Malerba & Orsenigo, 1996). Some industries display high turbulence with firms constantly entering and exiting (Audretsch, 1997). The turbulence in industries appears to most frequently represent ‘churning’, reflecting a revolving door analogy, with new firms quickly exiting industries, rather than a forest analogy where new firms replace older firms (Barron, 2003; Dosi & Marengo, 2007). Regularities are observed between growth, age and survival (Audretsch et al., 1997; Malerba & Orsenigo, 1996) and it appears that ‘barriers to entry’ (Porter, 1979) act more as barriers to survival than entry (Audretsch, 1997).

Despite these observed regularities industries differ in the pattern of their evolution (Audretsch, 1997; Cortada, 2006a; Lenox et al., 2006; Malerba & Orsenigo, 1996; Porter, 1980/2004). The development of industries varies by country (Lorenzen, 2005; Malerba & Orsenigo, 1996; Malerba, Nelson, Orsenigo, & Winter, 1999; Nelson, 2005) as do effective strategies within those industries (Crowston & Myers, 2004).

In addition to the limited amount of ‘facts’ that have emerged from the research there is concern that most of what is known about IE is based on research of manufacturing industries, and therefore may not be reflective of other types of industries (Audretsch, Klomp, & Thurik, 1997; Klepper, 1997; Quinn & Sparks, 2007; Williams, 2009), such as service industries (Audretsch et al., 1997; Barras, 1986). *‘[T]he suggestion that the dynamics of industrial organization in services mirrors that in manufacturing appears naive and is not supported by the evidence’ (Audretsch et al., 1997:18).*

There are few empirical studies that capture the whole industry perspective or structural change over time (Howard, 2005; Malerba & Orsenigo, 1996; Quinn & Leavy, 2004, 2005). This makes it difficult to establish '*generalizations, taxonomies or theories*' about long-term structural IE (Malerba & Orsenigo, 1996:54). Therefore there is a requirement for more research on the full structural evolution of industries (Malerba & Orsenigo, 1996; Quinn & Leavy, 2004, 2005).

2.3.3.1 *Technological Regimes*

Technology influences industry structure (Afuah & Utterback, 1997), as the technology evolves, so does the industry (Porter, 1980/2004), and the evolution of industry structure represents the evolution of a social technology¹³. Stressing the importance of technology to industry structural evolution, it is proposed that industries are characterized by different 'Technological Regimes', either 'Entrepreneurial' (competence-destroying) or 'Routinized', ('competence-enhancing') (Audretsch, 1997; Breschi, Malerba & Luigi, 2000; Malerba & Orsenigo, 1996; Scott & Davis, 2007). The dominant technological regime impacts both how the technology and the industry evolve, influencing the type of innovation activities, and the industries' population characteristics (Audretsch, 1997; Breschi et al., 2000).

Technological regimes are a manifestation of institutional forces in industries. The type of technological regime dominant in an industry (akin to the type of Schumpeterian innovation either Mark I & II occurring in an industry) is reflected in:

- the concentration of innovative firms,
- the relative importance of new firms versus incumbent firms,
- and the hierarchy of innovative firms in the industry over time (Breschi et al., 2000).

For example, in industries characterized by Entrepreneurial Regimes it is new firms who are more likely to develop or adopt the disruptive technologies rather than incumbent firms within an industry (Audretsch, 1997; Breschi et al., 2000; Malerba & Orsenigo, 1996).

Technological regimes suggest that incumbent firms are more focused on incremental and process rather than radical innovations, and in general less innovative than new entrants. Buensdorf, (2016) suggests that innovative activities are influenced by the intensity of competition in an industry. He cites the automobile industry where in addition to new entrants (e.g. Tesla) incumbents (e.g. Toyota and GM) are highly active in the development of hybrid and/or electric vehicles i.e. '*radical innovations*' (Buensdorf, 2016:827). He proposes a wider consideration of incumbents' role (direct and indirect, including their acquisition of innovative start-up firms) in innovation in industries and hence IE.

¹³ Social technology is defined in Section 2.4

2.3.4 Differing Perspectives on Industry Evolution

Differing perspectives on evolution and how variations emerge are apparent in the IE literature (Barron, 2003). These include the Evolutionary Economics perspective, championed by Nelson and Winter (1982, 2002), and the Population Ecology perspective championed by Hannan and Freeman (1977, 1984) and Hannan and Carroll (1995).

The Evolutionary Economics perspective, *'build[s] a theory of industry and technological change'* (Dosi & Marengo, 2007:491). It is based on the abduction of the metaphor of biological evolution (Hodgson, 1999) with *'routines as genes'* (Nelson & Winter: 2002:30). It views firms as comprising of bundles of routines, with variations emerging from changing routines, triggered by perceived requirements to improve performance (Barron, 2003; Hannan & Freeman, 1984; Malerba & Orsenigo, 2015). Routines

'are the fundamental units of selection and boundedly rational search is the fundamental variation mechanism that generates the variety of organizational behaviors on which market selection operates' (Dosi & Marengo, 2007:491).

Red Queen theories conceive that through the process of competitive rivalry between firms in an industry, firms may feel akin to Alice¹⁴ running as fast as they can to stay in the same place (Barnett & Burgelman, 1996; Barnett & Hansen, 1996). This is a coevolutionary process (Barnett & Pontikes, 2008). IE occurs as variations arise from firms' responses to competitors' actions (including buyers and suppliers competing for profits along the industry supply chain). In line with an evolutionary economists' view *'firms are prompted to search, undertake new actions, and learn in an effort to improve performance'* (Derfus, Maggitti, Grimm, & Smith, 2008:62).

The Population Ecology perspective views firms as relatively inertial, with variations primarily occurring through industry population changes, such as firm entry or exit (Carroll & Hannan, 1995; Hannan & Freeman, 1977)¹⁵. Mc Pherson's Niche Overlap model which is concerned with the differential use of resources, fits with a population ecology perspective (Barron, 2003). Organization niches expand and contract with intensity of competition, with firms potentially becoming more specialized as the intensity of competition increases (Barron, 2003). Population ecologists seek to understand *'the mechanisms and processes'* underlying population (organizational ecosystems) members growth and decline (Abatecola, 2014:435).

Institutional theory¹⁶ (Meyer & Rowan, 1977) has become linked to the population ecology perspective through 'legitimacy' concerns (Barron, 2003). Legitimacy is viewed as enhancing an organization's survival prospects (Meyer & Rowan, 1977). Institutional theory notes an increase in

¹⁴ Lewis Carroll's Alice stories

¹⁵ Population ecology is expanded on in the section on theoretical drivers

¹⁶ Institutional theory is discussed in more detail in the section on theoretical drivers

the homogeneity of organizational forms as an organizational field matures over time (DiMaggio & Powell, 1983), i.e. decreased variation of organizational forms occurs as firms compete for institutional legitimacy. Isomorphism of organizations occurs within industries as firms *'respond to an environment that consists of other organizations responding to their environment, which consists of organizations responding to an environment of organizations' responses'* (DiMaggio & Powell, 1983:149).

The evolution of firms and industries is largely characterized by path dependence (Malerba & Orsenigo, 2015). Past decisions and existing context limit future variations (Aldrich & Ruef, 2006). One proposed reason for the persistence of firm heterogeneity within industries, and why the pattern of IE differs between industries, is partly due to potential differing levels of interdependencies in productive activities utilized by firms in the industries (Lenox et al., 2006). The complexity of interdependencies and potential complementarities limits the managers' choices in reorganizing internal processes (Lenox et al., 2006) thereby limiting the variations that emerge and firm's selection criteria. Cusumano (2009:28) suggests that there is a balance between firms' ability for adaptation, and environment selection (fit): *'The companies that survive for the very long term are likely to be the smartest as well as the financially fittest: managers must be able to anticipate as well as exploit change in difficult economic times'*.

2.3.4.1 Evolutionary Processes and Porter's Five Forces Framework

Porter (1980/2004) identified several 'Evolutionary Processes', which are drivers of changes in the 'Five Forces' (Porter, 1979) which represent key indicators of industry structure. Factors that affect the Five Forces are strategically significant (Porter, 1980/2004). Changes in these 'Evolutionary Processes' drive IE, and create momentum for industry change. Change in any area of the industry structure is likely to trigger further changes (Porter, 1980/2004). The Five Forces framework has been criticized as being static; however, Porter (2004:184) has responded that it was not intended as such, and that firms need to assess the environment regularly as *'industry evolution is always occurring'*. The Five Forces framework provides firms with an external environment analysis of opportunities and threats, thus providing only a partial view of strategy. According to Barney (1991) it lacks consideration of firm's internal characteristics and Porter (1980/2004), in his chapter on IE, acknowledges that firm's actions can influence the path of IE.

Porter's Five Forces (1979, 1980) has frequently been used as a framework in the IS literature for assessing the impact of ICT (Crowston & Myers, 2004; Segars & Grover, 1995). Evans & Wurster in their article 'Strategy and the New Economics of Information' (1997) portray how ICT (specifically broadband capabilities (the Internet, extranet, intranet)) can and have resulted in changes in barriers to entry, bargaining power (of buyers and suppliers), the emergence of unexpected substitutes for industry products, and the levels of competitive rivalry for industries.

Porter's Five Forces model (1979) draws from and/or encompasses several theoretical perspectives. For example, a Network Theory (Powell, 1990) perspective is evident at an individual force analysis (e.g. competitive rivalry, what does the competitive network look like and therefore how intense is industry competition), and in analysis of the interaction of the Five Forces. A Resource Dependency Theory (RDT) perspective is evident in the analysis of the power of buyers and suppliers (Quinn & Leavy, 2005). Institutional factors are seen at play in barriers to entry. Transaction cost economics (TCE) is also seen at play in consideration of forward and backward integration with regard to power of suppliers and buyers.

A combination of perspectives of IE might create greater insight into the evolution process, as drivers of IE emerge from different levels, including routines within firms, strategies pursued by firms, competition between firms, industry population changes, industry level change and fluctuations in the macro environment etc.

2.3.5 Explaining the Process of Industry Evolution

Process Theory	Evolution	Dialectic	Life Cycle	Teleology
Unit of Change	Multiple Entity	Multiple Entity	Single Entity	Single Entity
Mode of Change	Prescribed	Constructive	Prescribed	Constructive
Process Sequence Elements	Variation, Selection, Retention	Thesis, Antithesis, Conflict, Synthesis	1. Start-up, 2. Grow, 3. Harvest, 4. Terminate	Dissatisfaction, Search/Interact, Set/Envision Goals, Implement Goals
Event Progression	Recurrent, cumulative probabilistic sequence	Recurrent discontinuous sequence	Linear and irreversible stages	Recurrent discontinuous sequence
Key metaphor	Competitive survival	Opposition, conflict	Organic growth	Purposeful co-operation

Adapted from Van de Ven & Poole, 1995

Table 2-1: Four Process Motors

In this section a number of process theories are evaluated to inform how the process of IE might be explored/explained. A process has been defined as '*a sequence of individual and collective events, actions and activities unfolding over time in context*' and process studies are concerned with examining not only the 'how' but also the 'what' and 'why' of a sequence (Pettigrew, 1997:338). Van de Ven & Poole (1995) identified four distinct foundational process theories for explaining organizational development and change: life-cycle, teleology, dialectics, and evolution. They categorized the theories across two key dimensions, the unit of change (single or multiple entities)

and the mode of change (prescribed or constructive) (See Table 2-1, for their key characteristics). Each theory is incomplete as the ‘trigger’ for each process is exogenous to the motor. The theories are depicted as primary motors, which singly or through interaction (either sequentially or concurrently) can enrich the understanding of the progression of events. For example, Greiner’s (1972/1998) ‘The Five Phases of Growth’ model for organizations, encapsulates life-cycle and dialectical motors in repeated sequences (Van de Ven & Poole, 1995).

- Teleological processes are goal driven, with actors and actions working towards an envisioned outcome, which may be adjusted.
- Dialectical processes emerge from conflict, between thesis and antithesis where interaction/compromise may result in synthesis.
- Evolution theory is derived from biology, and is driven by competition for scarce resources.
- A life-cycle model is a linear sequence where an entity progresses towards a natural unfolding of inherent potential.

The life cycle model (LCM) and evolution are discussed in more detail in sections below.

Whilst Van de Ven & Poole (1995) focused on the motors of change, Meyer, Brooks & Goes, (1990) classified the consequences of change by degree and entity (see Figure 2-1 below). Prescribed mode processes tend to result in ‘first-order’ incremental change, whilst a constructive mode can generate ‘second-order’ radical change.

Firm Level	Adaptation	Metamorphosis
	Focus: Incremental change within organizations	Focus: Frame-breaking change within organizations
Industry Level	Evolution	Revolution
	Focus: Incremental change within established industries	Focus: Emergence, transformation, and decline of industries

First-Order Change Second-Order Change

Adapted from Meyer, Brooks & Goes 1990:96

Figure 2-1: Broad Classifications of Change

2.3.6 The Life Cycle Model of Industry Evolution

The industry life cycle model (ILC) approximates an integration of technological, firm and IE based on empirical studies (Klepper, 1997; Giachetti & Marchi, 2010). The ILC proposed four phases: emergence, development, maturity and decline (Klepper, 1997). It remains the IE model with the most empirical support (Beere, 2015; Marks, 2015). However, the ILC, has received significant criticism. It's not feasible to predict when an industry will move from one phase to another (a limitation to the usefulness of the model), some industries skip phases, others appear to remain indefinitely within a particular phase (often maturity), and life cycle regeneration occurs in some industries (Cusumano, 2009; Porter, 1980/2004).

The ILC appears to be more accurate when industries are defined by narrow product definitions (Malerba & Orsenigo, 1996; McGahan, 2000). McGahan (2004:93) proposes that the ILC while relevant for phases of 'progressive' or 'creative' change, *'does not apply to industries that are experiencing radical or intermediating change'*. The ILC may not be representative of service industries (Barras, 1986; Beere, 2015). Malerba & Orsenigo (1996) comment that even when the ILC accurately reflects an industries evolution it leaves many questions unanswered with regard to the structural evolution of industries. The ILC has been criticized for defining only 'one' model of IE, but the evolution of industries can take many different paths (Malerba & Orsenigo, 1996; Porter, 1980/2004). Indeed Klepper never proposed that there was only one model of IE (Agarwal, Buenstorf, Cohen & Malerba, 2015; Klepper, 1997).

McGahan (2000) proposes a framework comprising four potential models of IE. The models Receptive, Blockbuster, Radical Organic and Intermediary she categorizes¹⁷ as either architectural or non-architectural and recommends strategies for the differing change scenarios. McGahan (2000, 2004) proposes that industries can migrate from one model of change to another. Other patterns of IE have been observed such as Quinn's (2002) 'Phase Pattern' which consists of: Structural Reinforcement, Structural Tension, Structural Fracture, Structural Reconfiguration, Structural Consolidation and is more reflective of *'punctuated equilibrium than a gradualist perspective'* and does not conform to the ILC (Quinn, 2002:267).

The patterns observed in IE research are dependent on the time period studied and the proliferation of alternative industry models reminds us of industry differences. Models are simplified representations of the true complexity of real life phenomena (Geroski, 2000). It is inadvisable for firms to assume a predetermined common path of IE (Grant, 2005; Quinn, 2012). IE models are considered in this research as an aid to sensitizing the researcher to recognizing potential industry changes.

¹⁷ McGahan relabeled the Trajectories she identified from Receptive, Blockbuster, Radical Organic and Intermediary, to Radical, Progressive, Creative, and Intermediating between 2000 and 2004

2.3.7 Evolution Theory

'...variety is the evolutionary fuel' (Hodgson, 1999:13)

Evolution implies change (Barron, 2003) but not necessarily progress (Barnett & Burgelman, 1996; Hodgson, 1999). Evolutionary theories seek to understand why and how things come to be as they are and can be used as a way of comprehending the dynamic processes involved in industry change (Barron, 2003). Path dependency is acknowledged in evolutionary processes (Witt, 2008).

Variation, selection, and retention (VSR) are the mechanisms underlying evolution (Barron, 2003; Sminia, 2009). Struggle is a proposed fourth mechanism (Aldrich & Ruef, 2006). This equates with 'competition' for scarce resources identified as a generative mechanism for evolution in Van de Ven & Poole (1995). The evolutionary processes are co-dependent, feeding into one another and from each other in continuous cycles (Aldrich & Ruef, 2006; Van de Ven & Poole, 1995).

Variation, selection and retention need to be explored to investigate the evolution of '*complex population systems*' (Hodgson, 2013:978), such as an industry.

Variation is the creation of the opportunity to change, providing the 'raw material' for selection (e.g. the emergence of a new technology that is useful for firms or a new start-up firm in an industry). Variation may be intentional or blind, with selection acting on effect rather than intentions (Aldrich & Ruef, 2006; Hodgson, 2013). Selection is the process that eliminates certain variations and promotes others (e.g. the diffusion of a technology throughout an industry, the growing market share of a firm in an industry). The selection criteria applied by organizations may be ill-aligned with the external environment (Aldrich & Ruef, 2006; Malerba & Orsenigo, 2015). Selection criteria may be driven by many forces including the pressures of conformity, competition, the market etc. (Aldrich & Ruef, 2006). Selected variations are preserved through retention. Retention embeds the variation, enables its repetition, and its spread. Retention is persistence.

Struggle is the contest for scarce resources, without sufficient resources firms and industries will not survive. Struggle represents the continuous effort required by firms to survive in competitive environments. They must constantly obtain and manage scarce resources, and need sufficient capital, supplies, employees and customers. Struggle underlies and drives the other phases (Van de Ven & Poole, 1995). It is a driver of variation, an influence on selection criteria and effective in retention mechanisms (Aldrich & Ruef, 2006).

'Evolution takes place within open systems involving both exogenous and endogenous change' (Hodgson, 1999:144). It is a multilevel process (Pettigrew, 1985b), occurring at macro, micro and intervening levels, with interdependencies/interactions existing in both directions between levels (Barron, 2003). Context matters for evolutionary processes as selection and retention are influenced by environment, and there may be two-way interaction between elements and context (Hodgson,

1999, 2013). It enables recognition that history matters i.e. decisions are not always reversible, the system is in flux it is not static, mistakes are made, and evolutionary outcomes may not be ideal, and it facilitates taking a long term view (Barron, 2003, Hodgson, 1999). Evolution theory can be used to stimulate a new way of viewing social phenomena (Hodgson, 1999).

'[A]n evolutionary perspective may allow the synthesize of many disparate theories...Base mechanisms for theories such as 'efficiency, power, market position, distinctive capabilities' etc., can be understood through an evolutionary lens (Barnett & Burgelman, 1996:17). This is reiterated by Aldrich & Ruef (2006:34) who suggest that using evolutionary theory as an overarching framework or meta-theory enables adopting multiple theoretical perspectives (evolution theory does not explain causality, it is a process mechanism) and can enable 'integrated understanding'. Thus an evolutionary perspective provides an appropriate framework for exposing and analyzing the multi-level interactions and forces driving a process of change (Aldrich & Ruef, 2006) such as IE. The application of an evolution framework can inform the selection versus adaptation debate, and supply 'the conceptual structure for the development of detailed theories of organizational and industrial evolution' (Hodgson, 2013:985).

2.3.7.1 Evolution Theory and Theoretical Perspectives

Theoretical drivers are evident in the evolution process; driving the creation of variations, underlying selection criteria, retention mechanisms and struggle. Reviewing the struggle mechanism the relevance of certain theoretical drivers can be observed such as:

- Resource-based view (Barney, 1991): Struggle for superior and/or superior use of resources
- Transaction cost economics (Williamson, 1981): Striving for the most efficient use of resources
- Resource dependence theory (Pfeffer & Salancik, 1978): Power over required resources
- Neo-institutional theory (DiMaggio & Powell, 1983): Rules and routines for the use of resources
- Population ecology (Hannan & Freeman, 1977): Exogenous driven changes impacting resources or the value of resources.

The Table 2.2. explores perspectives of VSR through five theoretical lenses. Each theory is discussed later in Section 2.6.

Theory	Variation	Selection	Retention
Resource-Based View (RBV)	Firm activities/response to competition and opportunities.	Competitive advantage	Sustained competitive advantage through resource VRIN characteristics.
Transaction Cost Economics (TCE)	Variations emerge through firms taking ‘rational’ action, seeking efficiencies. Outsource/insource decisions	Efficiency motives drive selection criteria	Retention via transaction-specific investments
Resource Dependency Theory (RDT)	Variations emerge through actions seeking to reduce dependencies	Selection through efforts to influence power/power shifts	Retention via emerging/transitory balance of power
Neo-Institutional Theory (NIT)	External changes cause adaptations by organizations e.g. Regulatory changes, new technologies. Uncertainty increases imitation and can create further variations.	Conformity – legitimacy views	Norms and accepted ways of doing things, legitimized actions, structures etc.
Population Ecology (PE)	Entry and exit of firms. New niches in an industry. Firm transformation – mergers, takeovers, joint ventures.	Surviving firms - Selection through environmental fit. New competitive niches emerged/disappeared.	Shaped by exogenous forces and organization inertia.

Adapted from Aldrich & Ruef, 2006

Table 2-2: Theoretical Perspectives Interpreted Through VSR

2.3.8 Evolution: A Multi-level Process

Evolution is a multilevel, path dependent process with co-evolution occurring between levels, with properties of each level constraining and influencing other levels across time (Aldrich & Ruef, 2006; Dosi & Marengo, 2007).

‘The relation of the higher-level regularities manifested in institutions, rules, and organizational forms to lower-level evolutionary processes is a complex one of coevolution across levels of analysis and timescales. Although the former are emergent phenomena of the latter, they may be considered as relatively invariant structures that constrain and shape the

latter on short timescales' (Dosi & Marengo, 2007:492).

Industry structure is a product of its past evolution, '*driven by underlying patterns of technological and organizational learning and competitive interactions*' (Dosi, Gambardella, Grazzi, & Orsenigo, 2007:6). Research that bridges micro and macro environments and recognizes their coevolution is recommended (Dosi & Marengo, 2007).

2.3.8.1 Coevolution

There has been much debate in the literature regarding whether firm evolution mainly emerges from external (determinism) or internal drivers (voluntarism) (Abatecola, 2014). Coevolution provides a perspective that potentially reconciles the adaptation-selection debate (firm level adaptation and strategic choice versus environmental selection and population ecology) in the literature (Lewin & Volberda, 1999; McKelvey, 1997; Murmann, 2013). Rather than either/or, a co-evolutionary lens acknowledges mutual adaptation (McKelvey, 1997; Volberda & Lewin, 2003) and proposes that firms, industries, technology and institutions coevolve (Murmann, 2013; Nelson, 1995). Causal arrows are bidirectional (Nelson, 1995) and coevolution is a multilevel process occurring within and between micro and macro environments (McKelvey, 1997).

2.3.9 Industry Evolution: Drivers

2.3.9.1 Empirical Drivers

Long-run changes in growth	Changes in buyer segments served	Product innovation
Buyers' learning	Diffusion of proprietary knowledge	Process innovation
Accumulation of experience	Expansion (or contraction) in scale	Marketing innovation
Reduction of uncertainty	Changes in input and currency costs	Entries and exits
Government policy change	Structural change in adjacent industries	
From Porter 2004:164		

Table 2-3: Evolutionary Empirical Processes

At the root of evolutionary processes are industry drivers (Porter, 1980/2004). Just as there is no one pattern of IE (Malerba & Orsenigo, 1996; Porter, 1980/2004) and no one theory that suffices to explain it, there are multiple empirical drivers of industry change. Technology is a key driver of IE (Afuah & Utterback, 1997; Consoli, 2008; Dosi, 2005; Dosi & Marengo, 2007; Malerba, 2005; White & Bruton, 2007). Other drivers frequently mentioned are government action (Quinn & Leavy, 2004; Xi, Lei, & Guisheng, 2009), regulation (Cortada, 2006a; Jacobides, 2005), competition (Barnett & Hansen, 1996; Perez, 2009; Porter, 1980/2004), social change (Castaldi & Dosi, 2008; Perez, 2009) and demand (Dosi, 2005; Malerba, 2005; Malerba et al., 1999). Drivers can have differing impacts on different industries for example Quinn (2002:191) found that '*the impact of technology differed across the industries*' he studied. Drivers can emerge from multi-levels as evidenced in the Table 2-3 which lists the evolutionary processes identified by Porter

(1980/2004).

2.3.9.2 *Multiple Drivers and the Co-evolution of Drivers*

Drivers of change interact, overlap and impact each other (Consoli, 2008; Jacobides, 2005; Porter, 1980/2004; Xi et al., 2009). In the literature there is evidence of, and exploration of, the co-evolution of empirical drivers such as: the coevolution of government actions, competition and technology found by Consoli, (2008) in the UK Banking industry and Xi et al. (2009) in the Chinese Automobile industry. In their review of the evolution of the computer industry Malerba et al. (1999), explore the interaction of government action, technology development, competition and demand. Disruptive technologies are associated with the coevolution of technology and demand (Christensen, 1997; Malerba, 2005). Cusumano (2009) acknowledges competition, technology and the economic environment as drivers of industry change. It is proposed that there is a symbiotic relationship between technology and the institutional structure of an industry, i.e. institutional forms influence how technology impacts an industry and vice versa (Lorenzen, 2005, 2007; Nelson, 2005).

Multiple empirical drivers acting at various levels are evident in the literature, *'industrial evolution emerges from the joint interaction of technical advances, historical events and social forces'* (Consoli, 2005:473), reiterating Nelson & Winter (1982) and Perez (1983). The interaction of contextual factors/drivers matters, this is illustrated in Dore, Lazonick & O'Sullivan (1999) who compare and acknowledge the impact of war, economic crises, governments and prevailing social systems on the differential evolution of industries in America, Great Britain, Germany and Japan. Cortada (2004), who conducted multiple IE studies focused on how ICT changed the US economy, indicated that 'single cause arguments' are insufficient. ICT was significant but *'its importance was relative to other factors simultaneously at work'* in the evolution of the industries (Cortada, 2004:73).

2.4 TECHNOLOGY

2.4.1 Technology Introduction

'What technology brings is only increasing opportunities' (Kelly, 1999:429)

This section delineates the term 'technology' and conveys its importance in IE. Technology is *'more than machinery/artifacts'* (Orlikowski, 2000), it has been defined as *'any means to an end'* (Arthur, 2009), and *'the application of knowledge'* (White & Bruton, 2007). These broad definitions of technology include both 'physical' and 'social technologies'.

Technology is recognized as a key driver of economic growth (Bresnahan & Trajtenberg, 1995; Nelson, 2005, 2008b; Schumpeter, 1911, 1939 cited by Perez, 2009; Zhouying, 2003), and also as

being central to the evolution of industries (Afuah & Utterback, 1997; Cortada, 2006; Dosi, 2005; Dosi & Marengo, 2007; Malerba, 2005). Technology is a critical factor in a firm's environment (Boström, Zackariasson, & Wilson, 2003; Kotler, Wong, Saunders, & Armstrong, 2005; Zackariasson, Boström, & Wilson, 2009).

2.4.1.1 Social Technologies

The term social technology is ambiguous (Marks, 2015). Varying terms and definitions have been applied to it: Quinn (2002) used the term organizational technologies, Burgess & Gules (1998), and Zhouying (2003, 2004, 2005) used the term soft technology¹⁸, whilst in the work of Mokyr (2003) and North (1990) the use of the term institutions is representative of social technologies.

Social technologies are perceived in this research as per Nelson & Sampat (2001:40) to *'involve patterned human interaction'*. They are *'systems of thought, practice and action'* applied with specific intentions, and are *'lived rather than acquired'* (Bessant & Francis, 2005:98-99). Examples of social technologies include, *'forms of business organization, management practices [such as TQM and JIT (Burgess & Gules, 1998), Continuous Improvement (Bessant & Francis, 2005)], market mechanisms and structures, public policies, legal and regulatory structures'* (Nelson, 2005:198). They encompass *'the way work is divided and coordinated'* (Nelson, 2008b:3). If we accept that all means to an end/ways of organizing are technologies, then all organizational routines, business models, and organizations represent technologies.

Many activities comprise both physical and social technologies (Nelson 2005). Leveraging physical technologies requires developing social technologies (Nelson, 2005, 2012; Zhouying, 2003, 2005). There must be 'social' (soft/institutional) adaptations to enable physical technologies (Burgess & Gules, 1998; Mokyr, 2003; Nelson, 2005; Nelson, 2008b; North & Wallis, 1994) i.e. changes in behaviour (Bessant & Francis, 2005). It is proposed that physical and social technologies coevolve, and that it is this coevolution that drives development (Mokyr, 2003; Nelson, 2005; Nelson & Sampat, 2001). The challenges and importance of social technology development is indicated by Zhouying's (2003:37) assertion that *'underdeveloped'* social technology prevents developing countries from absorbing and benefitting from *'technology transfer'* and is *'a principal barrier to improving industrial competitiveness'*, (also recognised in North (1990) and Mokyr (2003) but discussed using the term institutions).

Institutional theory can provide valuable insights in the study of technology driven change. Institutions can enable or stymie technology development and utility (Mokyr, 2003; Nelson,

¹⁸ Soft technology is also an ambiguous term (Burgess & Gules, 1998). Since the arrival of the Internet and in particular social media, 'social technology' has been used to refer to social interaction enabled through ICT e.g. in Gartners' IT Glossary and the Salem Press Encyclopedia.

2008b). Institutions are *'the factors and forces that mold and hold in place social technologies'* (Nelson, 2008b:2). Much institutional theorizing relates to social technologies; institutions and institutional norms represent social technologies (Nelson, 2005; Nelson & Sampat, 2001). However, not all social technologies are institutions, only those that have become standard and expected in specific contexts (Nelson & Sampat, 2001; Siddiqui & Ahmed, 2018). The role of social technology in industry evolution has been relatively unexplored (Marks, 2015), and there is a requirement for *'further study of the role of soft technology in industry'* Zhouying (2004:140).

2.4.1.2 Uneven Advance of Technologies

'Institutions and the human behavior that gives rise to them are far more difficult to refine and perfect than human control over the natural environment.' (Mokyr, 2003:60)

Technology drives progress, and Nelson (2005) citing the variation in progress across the fields of agriculture versus manufacturing versus services, posulates that a key cause in explaining this uneven advance of technology is differences between physical and social technologies. Progress in developing effective social technology (institutions) has been far more uneven than for physical technologies (Mokyr, 2003; Nelson, 2008b). Interestingly Zhouying (2004) appears to blame lack of attention, errors in approach and a cultural aversion of social scientists to 'technology' for lack of progress in social technology (social science) in comparison to physical technology (the natural sciences). However, Nelson (2008a, 2012) argues that lack of investment or attention is not the cause. Domains that are *'hardest to advance very often have a large element of the social, and a limited role of the physical'* (Nelson, 2005:207), and it is more difficult to improve/advance social technologies than physical technologies (Mokyr, 2003; Nelson, 2005, 2008a, 2008b).

Nelson (2005, 2008a, 2012) identified characteristics that enable improvements in activities/domains including, an ability to:

- establish criteria for *'good and better performance'*
- learn from experience (perceiving what worked and what did not and why)
- learn from simple models (Nelson, 2012)

These are needed in order to design/establish routines that build in the formula required for good performance and safeguard against the influence of factors that detract from good outcomes (Nelson, 2008a). *'[F]or progress to be made the practices involved must have a certain amount of the "routine" about them'* (Nelson, 2008a:488).

Physical technologies tend to evolve faster than social technologies. Nelson (2005, 2008a, 2012) posits that ease of experimentation enables learning, and the ability to sharply define 'good' performance criteria makes the process of their evolutionary 'progress' simpler. Standardization also aids the evolution of technologies (Nelson, 2005; Nelson 2012). Using 'Continuous

Innovation' as a sample social technology, Bessant & Francis (2005) identified characteristics that make it challenging to develop and to transfer. These included: the requirement for behavioral change; being characterized by having uncertain outcomes; and lacking an apparent best approach for implementation.

Routines and competencies are embedded in technologies (Aldrich & Ruef, 2006). Routinization of processes enables greater efficiencies, i.e. substituting artifacts for '*aspects of the social*', has achieved '*significant advances*' (Nelson, 2005:208). However, in certain fields '*tight routinization often hinder good performance*' i.e. certain complex social processes may be unsuitable for routinization (Nelson, 2012). The literature suggests that it is less difficult to apply a social technology to improving a product with a higher degree of physical content than one with a greater degree of social content: Consider the challenge of applying 'Continuous Improvement' to 'aircraft maintenance' versus 'participative leadership' (Bessant and Francis, 2005). The intertwining of physical and social technologies, and the differences in the process of their development requires further attention and holds promise for informing our understanding of economic progress (Nelson, 2008b).

Technology evolution creates variations and affects selection mechanisms operating within and for industries (Malerba & Orsenigo, 1996; Porter, 1980/2004). Technology both influences and is influenced by industry (Afuah & Utterback, 1997; Cortada, 2006; MacKenzie & Wajcman, 1999; O'Mahony & Ark, 2003). Industries are characterized by their technologies and technology evolution significantly impacts the process of industry change.

2.4.2 The Evolution of Technology

Technology is built on itself, i.e. each more advanced technology is enabled by earlier technologies (Arthur, 2009; Kelly, 2010). Technologies harness/leverage natural phenomena, and evolve through combination and recursiveness (Arthur, 2009). Technology develops through an evolutionary process, its advance is influenced by exogenous environmental factors (Dosi & Nelson, 2009; Nelson, 2005). The Dynamic Model of Innovation Phases (fluid, transitional, specific and discontinuity) refers to a model of technology evolution with each phase of technological development changing the competitive structure of an industry (Afuah & Utterback, 1997). These phases can be likened to the evolutionary phases of variation, selection and retention, with discontinuity representing where a new variation has been selected. Innovations represent variances, whether they are changes in procedures and/or the introduction of new physical technologies.

There are differences between evolution for biological organisms versus evolution as it occurs for technologies (Kelly, 2010) which has relevance to the influence of technology on industries. Unlike biological evolution, revolutionary jumps in technology are possible e.g. vacuum tubes to

transistors (Kelly, 2010). Evolution for technologies can be horizontal¹⁹. Exaptations²⁰ are routine in relation to technology (Arthur, 2009; Kelly, 2010). Industries influence each other, practices or technology solutions from one industry may be effectively applied in other related or non-related industries (Cortada, 2004).

Difficulty persists in predicting the process and outcome of technological evolution (Hodgson, 1999; Nelson, 2005; Zhouying, 2003).

'[V]irtually all detailed empirical studies of major technological advances have highlighted the inability of the actors involved early in the game to foresee the path of development, even in broad outline, and the major surprises that often occurred along the path' (Nelson, 2005:11).

Technology is *'both socially shaped and society-shaping'* (MacKenzie & Wajcman, 1999:xv). Critics of technological determinism posit that such a view undervalues how the users of technology influence its development and application (Allen & Kim, 2005; Orlikowski, 2000). Users drive variations in technology by changing technology goals; they select variations through deciding which technologies are appropriated; and they embed the selected variations through *'creating new industry practices'* (Allen & Kim, 2005:234-235). Cortada (2004) also rejects technological determinism, finding conjunctions of action and context at play such as *'managerial and business practices and economic circumstances'* in driving adoption and outcomes of ICT (Cortada, 2004:38).

2.5 DIGITAL INFORMATION AND COMMUNICATIONS TECHNOLOGY

2.5.1 What is it?

In the literature, terms relating to digital technology are frequently used loosely and interchangeably e.g. Information Technology (IT), Information and Communications Technology (ICT) and Information Systems (IS). After this section the term ICT is used to represent digital information and communications technologies throughout this work.

The term 'digital' represents data in discrete values symbolized through combinations of ones and zeros (Chatfield, 2011). Digital data can be easily combined and used to form building blocks that can be used again and again for different purposes. Digital data represents discontinuous data, and this enables the characteristic of media integrity²¹. Digital technology supports information, communication and computing: text, sound, data and images can be represented digitally.

¹⁹ Biological evolution is vertical –hereditary only (Kelly, 2010)

²⁰ I.e. *'a trait advantageous for one problem will turn out to be advantageous for a second unanticipated problem'* (Kelly, 2010:50)

²¹ copies of data are as perfect as the original.

Digital technologies represent a 'domain' (Arthur, 2009; Brynjolfsson & Kahin, 2000; Chatfield, 2011), or a 'class' (Cortada, 2006). They are a cluster of technologies including: the World Wide Web; the Internet; computers; email; microprocessors; switches; routers; videos (Arthur, 2009; Brynjolfsson & Kahin, 2000; Chatfield, 2011); and anything the digital world can manipulate and reduce to numerical symbols (Arthur, 2009).

2.5.2 Digital ICT: A General Purpose Technology

Technologies differ in their importance. General-purpose technologies (GPTs), such as the steam engine, the electric motor and semi-conductors, are of momentous economic significance (Basu & Fernald, 2007; Bresnahan & Trajtenberg, 1995). GPTs *'open up new opportunities, are pervasive in use, create innovation complementarities, and necessitate reorganization'* by firms using them (Majumdar & Chang, 2010:101). GPTs decrease in price, improve in their performance and enable new products, processes and business models (Tilson, Lyytinen, & Sorensen, 2010).

It is proposed that ICT is a GPT (Atkinson & McKay, 2007; Basu & Fernald, 2007; Castaldi & Dosi, 2008; Cortada, 2012; David, 1999), driving the 'information revolution' (Castaldi & Dosi, 2008; Dalum et al., 1999). Individual ICTs have also been labelled as GPTs (Consoli, 2005; Majumdar, Carare, & Chang, 2009; Majumdar & Chang, 2010; Teece, 2018a) e.g. the Internet. GPTs have applicability in multiple industries, requiring innovations in their adaptations in different sectors, therefore promoting continuous change (Basu & Fernald, 2007; Bresnahan & Trajtenberg, 1995; Pilat, 2004). The phenomenon of how ICT have been so widely adopted in administrative functions in all industries (Dalum et al., 1999; Cortada, 2004) provides evidence of its adaptability and ubiquity.

ICTs' economic importance is indicated by the OECD estimates of worldwide spend *'on various forms of IT and related services'* accounting for nearly *'8 percent of the global economy'* (Cortada, 2013:234). Dalum et al. (1999) found a clear relationship between the level of ICT diffusion and the economic prosperity of countries, a link also proposed by Atkinson & McKay, (2007) and by the consultants Booz & Company (e.g. see EL-Darwiche & Singh, (2012); Sabbagh, Friedrich, EL-Darwiche, & Singh, (2012)). Additionally ICT is recognized as a key enabler of globalization (Perez, 2009). Time is required to reveal the *'widespread applicability'* and the *'cumulative effects'* of a GPT (Teece, 2018b:1369).

ICT is pervasive in organizational life (Friedrich, Merle, Peterson, & Koster, 2011). The *'higher the frequency of variations, whatever their source, the greater the opportunities for change'* (Aldrich & Ruef, 2006:18). The continuing development and range of ICT adopted in industries would suggest that it has provided significant opportunity for industry change.

2.5.3 Digital ICT Literature

'Ultimately, it seems that we have "everything" yet to study about the history of IT, humankind's latest collection of fundamental tools' (Cortada, 2013:252).

IS research acknowledges the co-evolution of technology and institutions (Orlikowski & Barley, 2001).

'IT research focuses on information systems in organizations, understanding how organizational phenomena affect the development and use of technologies and how technologies shape organizations are central to the field's agenda' (Orlikowski & Barley, 2001:146).

There are several studies exploring the link between ICT and economic prosperity and/or evidence of a third industrial revolution (e.g. Atkinson & McKay, (2007), Castaldi & Dosi (2008), Dalum et al., (1999), David (1999), EL-Darwiche & Singh (2012), O'Mahony & Ark (2003), Schmoch, Laville, Patel, & Frietsch (2003)). According to Dalum et al., (1999:112) the number of patents lodged in the US in the area of ICT in comparison to traditional technologies is indicative of and *'confirms the technological dynamism that is associated with the idea of ICT as a technological revolution'*. Some research disputes a 'revolution' but note evidence of incremental changes driven by ICT (e.g. Dosi et al. (2007)).

A number of studies trace the emergence and development of ICT industries (i.e. manufacturing industries) including: the computer industry (Malerba et al., 1999; Malerba, Nelson, Orsenigo, & Winter, 2008); disk drives (Christensen, 1997); the development of the Swedish IT industry (the study illustrates the path dependent nature of IE and posits institutional forces as imperative in the industry development) (Zaring & Eriksson, 2009). However, the IS literature notes a lack of research engaging with the influence of ICT on industries. Additionally, most studies focus on a specific ICT rather than the totality of ICT (Mooney, Gurbaxani, & Kraemer, 1996).

2.5.3.1 Industry Level Research is Required

'[I]t could be that the industry level is the right place to look for, and understand, the true implications of IT' (Allen & Kim, 2005:243).

Within the IS literature there appears to be consensus that ICT is the driver of significant industry change (Crowston & Myers, 2004; Evans & Wurster, 1997; Segars & Grover, 1995). However, industry level research within the IS field is rare (Allen & Kim, 2005; Chiasson & Davidson, 2005; Crowston & Myers, 2004; Jacobsson et al., 2017; Segars & Grover, 1995). The IS literature principally focuses on the interaction of ICT with individuals and firms (Iacono & Wigand, 2005; Orlikowski & Barley, 2001).

Crowston & Myers (2004) speculate that a reason for the dearth of industry level research in the IS field is that it is more challenging than organizational level research. Particular challenges of industry studies include: their scale; multi-levels need to be embraced ('inter, intra, meta'); and they deal with a complex sociotechnical environment (Howard, 2005). Cortada (2006:763) postulated that the comprehensiveness and type of industry studies he completed might not be possible outside the US due to lack of data '*archives and contemporaneous publications*'.

Despite the challenges involved, there is advocacy for the value of and the requirement for research at the industry level (see Allen & Kim (2005), Cortada (2004), Crowston & Myers (2004), Jacobsson et al. (2017), Segars & Grover (1995) and Steinfield, Markus, & Wigand (2005)). The aggregation from numerous studies at organizational levels cannot reveal the extent of industry wide effects of ICT, nor provide a holistic picture, and can lead to incorrect assumptions (Crowston & Myers, 2004). In the case of industries, the whole is more than the sum of its parts: '*Industrial phenomena are not reducible to organizational phenomena, just as organizational phenomena are not reducible to individual phenomena*' (Crowston & Myers, 2004:3).

Industry level research offers opportunities to see impacts that would not be revealed at an organizational level of research (Steinfield et al., 2005). For example, the outsourcing phenomenon enabled by ICT revealed at an industry level suggests that this trend has the potential to hollow out economies (Iacano & Wigand, 2005). Building on from Orlikowski & Barley (2001), Crowston & Myers (2004) stress that context matters, the rules, regulations and norms of an industry influences how technology impacts it, and therefore requires industry level research. It is also suggested that industry level research is required to reveal the influence that industries have on the development of ICT, thus allowing the exploration of the co-evolution of industries and ICT (Crowston & Myers, 2004).

2.5.3.2 *Digital ICT Influence Varies by Industry*

'..it seems unlikely that the impacts of IT could be identical across the ... diverse range of industries that make up our modern world economy' (Allen & Kim, 2005:243).

Although '*common technology strategies*' are frequently evident within industries (Chiasson & Davidson, 2005:591), the pace and penetration of digital change differs between industries (Cortada, 2004; Scott & Davis, 2007) as does the extent of ICT adoption and its use and impact (Cortada, 2004). In the business literature Phillips & Wright (2009:1079) call for longitudinal, in-depth case study research to '*enrich industry specific patterns of behavior*'. Chiasson and Davidson (2005) opine that IS research appears to assume that the application of ICT is industry neutral and perceive this as a gap in the research. Similarly, a reason that Cortada (2004) advocates an industry centric view is because although the same technologies may be deployed across different industries, it's been found that they are used in different ways and with differing results. Indeed,

Yip (2000) proposed that the influence of the Internet would vary by industry. Industry studies revealed that banking used ICT differently than airlines (Cortada, 2004). Cortada (2004:24) found that *'the rate of deployment of computing technologies varied across all industries and within firms in an industry'* which influences the level of ICT embeddedness in industries and how ICT changed firms and industries.

The industry context matters, for instance, industry regulations and government interventions in industries affect adoption (Chiasson & Davidson, 2005; Cortada, 2004; Segars & Grover, 1995). For example, US airplane manufacturers adopted CAD software tools because it was a government requirement, automotive manufacturers adopted it much later (Cortada, 2004). Even in technical industries it has been found that there are delays in adoption of new ICT. Allen and Kim (2005) observed very different patterns of technology adoption, innovation, competition and markets between the PC and the video game industry. They postulate that the observed variances between two high tech and presumably similar industries suggest it will be difficult to find a general pattern of ICT impact that applies across industries (Allen & Kim, 2005).

Key factors that explain the variances in ICT influences in different industries are: *'how IT was used in the industry; industry expectations for the technology; and the role of technology in causing the work of specific organizations to change'* (Cortada, 2004:5, reiterated by Allen & Kim, 2005). Further research comparing dissimilar industries is recommended (Allen & Kim 2005).

More recent IS industry level research has emerged focused on understanding the industry specific characteristics that influence the adoption, use and impact of ICT. This research emerged from qualitative (e.g. Jacobsson et al., 2017) and quantitative (e.g. Müller et al., 2018) approaches. Müller et al. (2018) found that industry characteristics of information intensity and level of competition influenced productivity improvements achieved through the application of big data and analytics solutions i.e. differential influence of ICT solutions between industries. They suggest a research agenda to reveal the effect of a wider array of industry characteristics (e.g. such as product or service) on the influence of ICT on industries (Müller et al., 2018).

2.5.3.3 Requirement for Longitudinal Research of ICT Influence on Industries

It is noted that both the embedding of ICT in industry processes and its influence on industries (including *'unintended consequences'*) is a process that has taken time (*'decades'*) to evolve (Cortada, 2004:xi). The influences of ICT implementation take longer to be revealed than expected (Howard, 2005; Christensen, 1997). Therefore longitudinal studies of sufficient length are required for the process and outcomes to be revealed (Howard, 2005; Segars & Grover 1995).

McKesson's experience in the drug wholesaling industry provides a good example. Their adoption of order entry technology initially delivered a significant strategic advantage to the company²² but other firms in the industry swiftly copied them. Widespread ICT adoption in the industry ultimately resulted in increased competition between firms, and benefits accrued to suppliers and customers through better services and lower costs rather than to the adopting firms (Segars & Grover, 1995). Although McKesson were cited as an exemplar of achieving strategic advantage through the adoption of ICT it took time and an industry perspective to reveal this strategic advantage was very short-lived.

Advantages of using longitudinal industry level research include that it allows time for processes to unfold, and provides insights which may be different than those revealed through a firm level study. Longitudinal industry level exploration is required to create greater understanding of the consequences (many unforeseen) of the adoption of ICT within industries, and such studies will be useful for regulatory bodies and industry participants (Segars & Grover, 1995).

2.5.4 Diffusion of Digital ICT

Diffusion is '*[t]he acceptance and spread of new technology*' (Loch & Huberman, 1999:161). In evolutionary terms, the process of diffusion represents selection, and retention of selected variations. However, technologies continue to be developed throughout the process of diffusion and new variations emerge i.e. '*Diffusion is as much a process by which new technologies are developed as it is a process by which usage spreads*' (Geroski, 2000:623).

2.5.4.1 Diffusion Models

Various models of diffusion, which consider a selection of influencing factors, seek to explain the common S-curve shape reflecting the rate of the diffusion process for new technologies (Geroski, 2000; 2001). These include the epidemic, the probit, the density dependence and the information cascade models. These models are neither mutually exclusive nor comprehensive (Geroski, 2000). (See [Appendix B](#) for an outline of these models.)

Technology diffusion rates are considered to be dependent on a number of factors which reflect a firm's context: relative advantage (perceived gains); complexity (risk increases with complexity); compatibility (fit with current social and technical structure); trialability (reduces risk if feasible to trial prior to adoption); and observability (can process and outcome of adoption elsewhere be observed) (O'Callaghan & Wilcox, 2000; Rogers, 1995). In adopting technology, firms consider the feasibility of adoption, the durability of the technology investment, the sufficiency of technology support available, and potential demand and legitimacy consequences (Geroski, 2000). Status seeking has also been proposed as a driver of technology adoption (O'Callaghan & Wilcox, 2000). Technologies tend to diffuse across a pattern representative of innovators, early adopters, the early

²² Greater efficiency and lower costs.

and late majority, and laggards (Rogers, 1995). Bessant & Francis (2005) draw attention to non-users and to under utilization of technologies, and that sociocultural tendencies influence this adoption positioning. Consideration of a broad range of factors can improve insight into the diffusion process (Geroski, 2000) and industry change.

2.5.4.2 Diffusion, Digital ICT and Industry Evolution

Diffusion of technology represents technological change which '*can change the structure of an industry*', including competition and industry profitability (Czepiel, 1992: 220). Technology can enable firms to achieve lower cost structures, and/or to differentiate their products. It can change the relative competitive advantages of firms in an industry through the relative timing of a firm's adoption (Czepiel, 1992; Zachariasson et. al, 2009). Social and institutional change are required and result from the diffusion of innovations/new technology (Dalum et al., 1999). Diffusion of technology in an industry requires adaptations by adopting firms and this is a driver of industry change. For example the supermarket format (a social technology i.e. a business model innovation) caused considerable transformation in the retail arena (McGahan, 2000; Quinn & Murray, 2005).

The structures of firms differ, and these structures promote certain learning but hinders other directions (Dosi & Marengo, 2007). Firms differ in their ability to adopt and adapt to technologies (Geroski, 2000; O'Callaghan & Wilcox, 2000). This appears to hold true for industries. '*[D]iffusion speed is highly industry-specific*' (Loch & Huberman, 1999:161). The importance and power of differing diffusion factors and their interaction will change depending on the technology and industry context. In their study of the adoption of big data and analytics across US quoted companies, Müller et al., (2018) found differential adoption rates by industry and Cortada (2004; 2006) found the adoption rates of generic computing differed across industries.

Despite differences in ICT adoption and impact in differing industries, cross industry pollination of experience and utility occurs. Industries influence and learn from each other (Cortada, 2004; Kelly, 2010). The diffusion of technology occurs across different industries in part because of potential multiple uses of the same technologies (Kelly, 2010). ICT '*innovations can be easily borrowed across lines of origin or moved across time and repurposed*' (Kelly, 2010:50). For example, the use of CAD in airplane design spread to general manufacturing design (Cortada, 2004), and from engineering to architecture (Zackariasson et al., 2009).

'[T]he transfer of experience from one application to another and from one firm or industry to another played an important role in the proliferation of digital technologies throughout the American economy, also accounting in large part for the speed of diffusion' (Cortada, 2004:25).

The diffusion of ICT was found to be influenced by political events, economic cycles, infrastructure, the management of firms, and societal features such as education levels, demand factors and technology. In turn the diffusion of ICT has had political, economic and social impact (Cortada, 2012). The development and diffusion of ICT has been unpredictable but path dependent (Cortada, 2012). The diffusion process takes time. Christensen (1997) found the impacts of new technologies to be overestimated in the short-term and underestimated in the long-term.

2.5.4.3 General Diffusion Pattern of Digital ICT

Generalizations of the diffusion of ICT in business use depicts ICT as first being applied to operational tasks encompassing the use of Transaction Processing Systems (TPS) and Databases. This period evolved into ICTs application to inform decision making and controlling of the business through monitoring key performance indicators, through the use of Management Information Systems (MIS), and Decision Support Systems (DSS) (Daft, 2004; Daft et al., 2014). The application of ICT has become increasingly strategic as ICT and its application have evolved. Thus, as ICT has been increasingly used in improving both internal and external co-ordination of processes, Enterprise Resource Planning (ERP) systems emerged and not only Intranets but Extranets and electronic data interchange (EDI) (Daft, 2004; Quilliam, 2015). The Internet and cloud-based solutions are changing firms' perspective on ICT costs, from 'capital' to 'operating' (Quilliam, 2015), and have made ICT solutions far more accessible.

Three general eras of ICT diffusion have been identified from a firm level perspective (Dempsey, 2014; Ross & Feeny, 2000):

- *the mainframe era* (1960's-early 1980's)
- *the distributed era* (late 1970's – mid 1990's)
- *the web-based era* (mid 1990's – today)

In Cortada's (2012) study of the diffusion of ICT across several countries he highlights the overlap between waves of ICT diffusion. He noted that earlier technologies continued to be developed and diffuse throughout, and that components of technologies that diffused later were present to some extent in earlier waves. A timeline reflecting what are considered to be some of the major developments in ICT is included in [Appendix C](#) to provide context. Cortada suggests that '*understanding the patterns of diffusion [of ICT] deserves greater attention from scholars*' (Cortada, 2013:252).

2.5.4.4 Reasons for the Adoption of Digital ICT

'Information Technology (IT) has moved from the role of organizational support to become an integrated part of core business processes and a driver of business strategy' (Shin & Edington, 2007:21)

In his studies of US industries Cortada found that ICT solutions were adopted to *'improve internal business operations and to lower operating costs'* and that the adoption of ICT which resulted in increased revenue opportunities were *'welcome, but [seen as] non essential benefits, that were not required to justify the cost of projects'* (Cortada, 2006a:760) (see also Cortada, 2004, 2006b). Managers were always concerned with return on investments in the adoption of ICT²³ (Cortada, 2004). Although ICT was frequently adopted for the purposes of efficiency it delivered more than efficiency, enabling new business models, and is considered as a strategic enabler, and as a potential strategic driver²⁴, by organizations (McNurlin, Sprague & Bui, 2009).

Cortada (2004) cites difficulties with unions, inflexibility of the workforce and relatively high labour costs as drivers of ICT adoption by US firms. The prospect of reducing costs was found to be a driver of investment by manufacturing firms in inventory applicable ICT (Cortada, 2004). In Cortada's (2004) review it is evident that the theoretical drivers of efficiency, power and institutional forces play an important role.

In the three industry studies (airlines – reservation system, wholesale drugs – order entry system, industrial chemicals – process and logistics) carried out by Segars & Grover (1995) competition was seen as a primary driver of the initial and imitative adoption of ICT, and the application of strategic ICT systems significantly changed the competitive landscape in each industry. In one instance (the airline industry), the prospect of deregulation was identified as a driver for the deployment of internal systems beyond the organization boundary, ultimately leading to a change in the basis of competition within the industry (Segars & Grover, 1995).

The literature refers to unanticipated consequences of the implementation of ICT on businesses and industries (e.g. McKesson case by Segars & Grover, 1995), reflective of the blind variation process of evolution. Selection and retention are revealed in changed competitive status of firms within the industry, for instance in the Segars & Grover study (1995) a new strategic group is identified within two industries.

The adoption of ICT has developed beyond notions of a purely *'competitive weapon, towards ICT as a collaborative'* tool (Howard, 2005:54). Howard (2005) cites the automotive industry supply chain structure, suggesting that enabled by ICT the industry also competes on the basis of 'supply

²³ Although this did not mean that this was always measured after implementation

²⁴ ICT capabilities could inspire strategies

chain versus supply chain'. Meyer, (2013) predicted that current uncertainties and challenges facing firms would drive collaboration (enabled by ICT) in industries. Players would work together to *'discover a value-creating solution for all than find an advantage in a zero sum game'* (Meyer, 2013:36)²⁵. Adoption of ICT has been an ongoing and relentless process as firms seek to stay ahead, and apply ICT to further enhance their capabilities and *'this pattern is evident in all industries'* (Cortada, 2004:31-32).

Many organizations struggle to use ICT effectively (Howard, 2005). Successful adoption by one firm within an industry does not necessarily mean other firms can successfully adopt or adapt to a technology. Success in a firm's adoption of ICT is impacted by process, structure and culture (Howard, 2005; Segars & Grover, 1995)²⁶. Internal hierarchical and centralization/decentralization of organizational structures were postulated as influencing successful ICT adoption (Howard, 2005; Segars & Grover, 1995).

According to Jacobsson et al. (2017:611) *'little is known about the role that industry plays in the adoption and use of ICT'*, and they ponder what industry characteristics influence the fast versus delayed/protracted diffusion of variable ICT solutions? In seeking to address this they developed a framework²⁷ spanning attributes from the institutional and material environment, including: institutional actors²⁸ and the socio-cognitive environment²⁹; demand and supply side features; market governance; and product characteristics. Their framework, which builds on Chiasson & Davidson (2005), is proposed to help determine the degree of alignment between ICT applications and the industry and hence be indicative of the level of inertia and extent of adaptation required to adopt the ICT (Jacobsson et al., 2017).

2.5.5 Industry Influence of Digital ICT

'How does information technology (IT) change an industry? ... important questions about the role of IT in industry change are relatively unexplored in the information systems research literature (Allen & Kim, 2005:234).

In quantitative based industry level studies (focused on the economic impact of the ICT revolution) O'Mahony & van Ark, (2003) found a relationship between the intensity of use of ICT in industries and industry productivity. Higher intensity is associated generally with higher increases in productivity. Müller et al., (2018) concur and also found that the productivity impact from ICT implementation was higher in industries with intense competition.

²⁵ There is overlap here with industry architecture and value capture considerations in Jacobides et al. (2006)

²⁶ Examples from the car industry and the airlines industry were cited respectively

²⁷ Developed based on a study of the architecture, engineering and construction industry

²⁸ The term 'actors' is intended to include both individuals and organizations

²⁹ Representative of interpretative frameworks

Proponents of the need for more qualitative research of the impact of ICT suggest that the *'structural change and diffusion of a new techno-economic paradigm are very hard to capture in the statistics'* (Dalum et al., 1999:108). This is reiterated by Consoli (2005) who suggests that relying on quantitative measurements could understate the impact of ICT on industry structure. Crowston & Myers (2004) suggest that in addition to quantitative research preventing investigation into the detail of the ICT impacts in industries, subjectivity emerges regarding what is measured i.e. use of economically available data, including with relation to industry boundaries (Crowston & Myers, 2004).

The 'digital revolution' has created new industries and significantly impacted existing industries, changing their structures and their operations (Cortada, 2004; Daft et al., 2014; Dosi et al., 2007; Teece, 2018b). ICT has strategic significance and can impact the *'fundamentals of business'* in industries (Evans & Wurster, 1997:71). For example, the emergence of internet-based advertising is cited as a *'gale of creative destruction'* for the advertising industry (Evans, 2009:37), whilst Daft et al. (2014) cite the insurance industry as being transformed by ICT.

Evans & Wurster (1997) propose that every business is an information business, that the economics of information has been disrupted by ICT, and therefore every industry will reflect ICT driven changes, albeit at different paces and to different degrees. ICT can change the rules of the game and has the potential to change the competitive basis and the value propositions of industries (Evans & Wurster, 1997; Teece, 2018b). The impact of ICT extends along the entire industry value chain/business system, enabling new products, services, business models, processes and structures (Evans & Wurster, 1997; Kotler et al., 2005; McNurlin et al., 2009; Scott & Davis, 2007).

Themes explored in the IS literature include changes in industry boundaries and changes in the basis of competition: intermediation and re-intermediation; the enablement of outsourcing; increased efficiencies enabling lower costs and/or increased services; and the changed nature of the product or service provided by the industry (Crowston & Myers, 2004). These result in changes in industry structure manifested through changing the players and/or the positions of players in an industry, changing the structure of the industry business system, value configurations and industry architecture.

The reconfiguration of value chains rather than their destruction is predicted (Evans & Wurster, 1997). Existing functions will still be performed, but some new ones may also appear, and the business definitions/value propositions of businesses and industries will potentially change. The travel industry provides an example of value chain reconstruction through the somewhat simultaneous disintermediation and re-intermediation that occurred in the industry i.e. the demise of many traditional travel agencies and their replacement by cybermediaries like Expedia etc. (Crowston & Myers, 2004).

The impact of ICT is evident throughout industry supply chains (Howard, 2005). ICT has significantly increased the feasibility and greatly reduced the cost of outsourcing and has enabled a greater variety of organizational forms. Indeed, the integration of ICT systems has spread beyond firm boundaries to create networks linking suppliers, partnering firms and customers (Shin & Edington, 2007).

'[T]he most effective uses of computers often came when industry-specific forms of digital technology were used. ...ATMs in Banking, point of sale terminals in Retail' (Cortada, 2004:38). Thus, an industry view *'gets one past applications used in all industries, such as accounting and e-mail, to industry-specific uses that often fundamentally changed the nature of the work there'* (Cortada, 2004:23). Workers have had to continually adapt and learn new skills, it has also changed the type and number of jobs available in industries (Cortada, 2004). ICT application led to dramatic changes in processes (Evan & Wurster 1997). Quinn (2002:193), in his study of IE in three Irish wholesale industries, observed that ICT implementation *'altered work practices'*³⁰. Sawyer, Crowston, & Wigand (2014) focus on how ICT impacted work in the US real estate industry, and suggest a requirement for similar research particularly in information-intensive industries.

Mooney et al. (1996) in their research of the impact of ICT implementation on firm performance, highlight that ICT is 'deployed' at process level. They define three key categories of effects of ICT application to processes: 'automational, informational and transformational' (Jacobsson et al., 2017; Mooney et al., 1996). These align with improved efficiency and control, improved decision-making, monitoring and information sharing, and product/service innovations and scope changes. ICT can be deployed intra and inter-firm (Mooney et al., 1996), spanning processes along an industry value chain. ICT related process changes not only impact firm level output and performance, but can also directly and indirectly have influence at an industry level.

Technologies adopted by an industry can embody industry codes of conduct, institutionalizing practices, and selecting new industry norms (Crowston & Myers, 2004). Crowston & Myers (2004) contrast the regulatory influences of the US versus New Zealand on effective competitive practices, and hence use of ICT in the real estate industries. This example highlights the advantages of research based on two different contexts, in this case country differences.

Consideration of an institutional perspective, (extending beyond economic concerns of costs and benefits) has been recommended and applied in the IS literature (Chiasson & Davidson, 2005; Crowston & Myers, 2004)³¹. Technology and industry standards are a social technology and a form of institutional behavior. The adoption of standards in relation to ICT can promote/facilitate their development, adoption and effectiveness and hence lead to significant industry change (Cortada,

³⁰ Additionally it improved the efficiency of processes in all of the studied industries, and shifted the balance of power in the supply chain in one of them

³¹ Neo-Institutional Theory (NIT) (DiMaggio & Powell, 1983) is discussed in the Theoretical Drivers section

2004). Consoli (2005) cites the eventual industry cooperation that emerged with regard to ATMs in banking as significant in the move of the focus of bank competition away from bricks and mortar. However, whilst standards frequently promote developments, they can also constrain them (Nelson, 2018).

The institutional perspective can recognize the interdependent impact of the regulatory environment on the uses and impact of ICT (Crowston and Myers, 2004; Orlikowski and Barley, 2001). Moyon & Lecocq's (2010) study of the music recording and distribution industry reveals that ICT enabled distribution, challenged copyright laws, and resulted in the eventual capitulation of leading companies to a new distribution structure (iTunes), illustrating the emergence of industry norms. It also exposes the reactions and actions of the incumbent industry firms who initially sought to prevent these industry changes.

The literature calls for more industry level research, wider research boundaries (to capture changes throughout the business system in the material resource and the institutional environment) (Crowston & Myers, 2004; Chiasson & Davidson, 2005), longitudinal research (Crowston, Sawyer Wigand, 2001; Howard, 2005. Segars & Grover 1995) and more studies outside the US (Cortada, 2006a).

2.5.5.1 The Co-Evolution of Digital ICT and Industries

Co-evolution occurs between industries and technology (Nelson, 1995). ICT has significantly impacted industries, and industries have influenced ICTs' development (Cortada, 2004). It is not a story of technological determinism, industry users and customers have influenced the emergence and evolution of digital solutions, driving variations, selecting variations, and embedding the variations through adapting activities/processes/routines and hence changing industry practices (Allen & Kim, 2005). It is indicated that the diffusion and use of ICT varies by country (Cortada, 2012; Dalum et al., 1999). Dalum et. al (1999) propose that ICT develops in response to demand, and that the existence of large markets promotes swifter ICT development. A synergy between ICT production skill and the existence of significant demand has been noted (Dalum et al., 1999; Mowery & Nelson, 1999). Mowery & Nelson (1999) identified the role of the US Government departments as a customer as an important driver of innovation in the US IT domain.

Nelson (2005) found institutional factors played a significant role in the development of US ICT related competencies and its global competitiveness. The emergence of standards appears to provide an impetus for accelerated innovation and diffusion of ICT (Dalum et. al 1999; Nelson 2005). Nelson (2005) suggests that regulatory factors impact the development of ICT. These relationships identified between institutional factors, markets and ICT support the coevolution perspective of a symbiotic development of industries and ICT proposed by Crowston & Myers (2004), and indicate the importance and the interaction of contextual factors in influencing ICT

development, diffusion and industry outcomes.

The perceived needs of industries and indeed increasing use of ICT appears to drive further development and use of ICT. ICT have proved to have strong ‘exaptative’ (Kelly, 2010) potential and in part this explains their pervasiveness. Shin & Edington (2007) draw attention to the complexity of organizational environments and hence the interaction of factors in influencing the implementation of ICT, and that the presence of differing contextual factors can strengthen or weaken the effect of ICT.

2.6 THEORETICAL DRIVERS – WHY INDUSTRIES EVOLVE

Theory	Origins	Primary Level of Analysis	Driver of Change	Informative Works
Resource-Based View (RBV)	Economics/Strategic Management	Firm, (vis-à-vis competitors and potential competitors)	Competition	Barney, 1991; Penrose, 1959; Teece, et al., 1997; Wernerfelt, 1984
Transaction Cost Economics (TCE)	Economics	Inter-organizational and various organizational forms (Market – Hierarchical). Firms actions re boundaries result in changes in industry structure – the business system/value chain	Efficiency	Coase, 1937; Simon, 1957; Williamson, 1981
Resource Dependency Theory (RDT)	Sociology/political Science	Inter-organizational with potential for intra-organizational. Firm & Industry power balances and shifts	Exchange Power	Pfeffer, 1982; Pfeffer & Salancik, 1978
Neo-Institutional Theory (NIT)	Sociology	Population level. Industry norms. Industry structure. e.g. The role of institutional forces in technology diffusion.	Isomorphic forces: Normative, Cultural and Regulatory	DiMaggio & Powell, 1983; Meyer & Rowan, 1977.
Population Ecology (PE)	Sociology/Biology	Population level. The organization within populations/organizational field - A focus on industry dynamics	Critical events Environment changes	Carroll & Hannan, 1989; Hannan & Freeman, 1977

Table 2-4: Summary of Theoretical Perspectives

Theoretical drivers underlie the empirical drivers of IE (Quinn & Leavy, 2005). A multi-theoretical perspective provides greater explanatory power of the processes of IE. Quinn (2002), Marks (2015), and Beere (2015) in their studies of IE adopted a multi-modal perspective, which enriched their research. According to Marks (2015:281) the multi-theoretical approach was *'essential as no one theory explained the change processes that emerged'*. Jacobides & Winter (2005) posited a dynamic interaction between transaction cost economics and resource-based view perspectives to explain the structural evolution outcomes in the US mortgage banking and the Swiss watch-manufacturing industries. Whilst it is recognised that institutions impact transaction costs (Siddiqui & Ahmed, 2018). These bodies of work highlight the inadequacy of single perspectives.

In the IS literature criticism emerged of a bias towards the use of economics perspectives³² in industry level research. The adoption of multiple perspectives is advised to provide a more holistic rendering of ICT related industry change (Crowston & Meyers, 2004; Segars & Grover, 1995).

Five theoretical perspectives are discussed below: the Resource-based View (RBV), Transaction Cost Economics (TCE), Resource Dependency Theory (RDT), Neo-Institutional Theory (NIT) and Population Ecology. Exploring the process of ICT influenced IE requires multi-level research, and the assortment of theories chosen encompass multi-level explanatory power. Table 2-4 provides a brief synopsis of the theories.

2.6.1 Resource-Based View

There can be significant differences in profitability levels of firms within an industry (Rumelt, 1991; Teece et al., 1997), and the RBV proposes that a firm's capabilities³³ are a key factor in explaining this (Barney, 1991; Barney, 2001). I.e. firm-specific capabilities and resources matter within industries. The resource-based view (RBV) of strategy

'is the notion that heterogeneity in individual firm resources and capabilities may lead to performance differences among firms and that these advantages are not 'competed away' because of the inability of competitors to perfectly imitate one another' (Lenox et al., 2006:602).

In the RBV, resources that enable a firm to achieve a sustained competitive advantage must have the concurrent qualities of being valuable, rare, imperfectly imitable and non-substitutable (VRIN) (Barney, 1991). A firm's resources may be inimitable due to historical conditions, causal ambiguity and/or social complexity (Barney, 1991; Mata et al., 1995). The RBV is relevant to understanding the boundaries of firms, as the strategic importance³⁴ of and efficiency in access to capabilities is a

³² And quantitative data

³³ Capabilities are defined *'as the ability of firms to use their resources to generate competitive advantages'* (Barney, 2001:647)

³⁴ E.g. if related to core competence (Prahalad & Hamel, 1990)

key consideration in boundary decisions, (Barney, 1999; Teece et al., 1997). *‘Capabilities are ... seen as fundamental determinants of both the horizontal boundaries and of the vertical scope of firms’* (Malerba & Orsenigo, 2015:666), this indicates the RBV’s relevance to understanding industry structure.

An organization’s resources include their ability to exploit ICT (Barney, 1991; Mata et al., 1995) and the information and knowledge a firm controls (Barney, Wright, & Ketchen, 2001). ICT can enable a firm to reduce costs and/or differentiate its product offering and thereby increase revenues (Mata et al., 1995). As ICT applications diffuse across industries it is unlikely to qualify as a VRIN resource for a firm. However, superior capabilities in the management and leveraging of ICT might do so and hence may deliver sustained competitive advantages (Barney, 1991; Mata et al., 1995; Ross, Beath, & Goodhue, 1996). Crucially, as much if not more investment/effort in people is required to enable an organization to realize the potential advantages of ICT applications (Dempsey, 2014; Phillips & Wright, 2009). The RBV has been criticized in regard to the indeterminate nature of a valuable resource (Kraaijenbrink, Spender, & Groen, 2010).

The RBV acknowledges path dependency. Changes in industry environment can impact the ‘value’ of a firm’s capabilities (Barney, 1991; Barney, 2001; Eisenhardt & Martin, 2000). Dynamic capabilities enable a firm to be responsive and adapt its resources to achieve congruency with changing market conditions (Teece et al., 1997; Eisenhardt & Martin, 2000). Dynamic capabilities are defined as *‘the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments’* (Leonard-Barton, 1992:516). ICT capabilities are cited as a key resource in enabling firms to adapt in dynamic market environments (Phillips & Wright, 2009; Rockart, Earl, & Ross, 1996).

Eisenhardt & Martin (2000) propose that dynamic capabilities by themselves do not qualify as VRIN. They argue that many firms develop dynamic capabilities such as capabilities in new product creation and that these capabilities are ‘equifinal’ and overtime represent ‘best practice’ within industries. *‘[T]he reality is that competitive advantage is often short-term’* (Eisenhardt & Martin, 2000:931), but a firm’s continued response to market opportunities, cumulatively can enable it to achieve long term competitive advantages. Thus industry players need to view achieving competitive advantage as a journey not a destination.

The RBV has a less pessimistic outlook than the Population Ecology perspective in regard to management’s abilities to enable a firm to adapt in the face of environmental changes. However, *‘RBV encounters a boundary condition in high velocity markets...where dynamic capabilities themselves are unstable’* and strategic logic moves from *‘leverage to change’* (Eisenhardt & Martin, 2000:1118-1119). There is a frontier reached as a function of the increasing dynamism of markets (degree of change from moderate to extreme) the adaptation needs of firms shifts from

‘learning before doing’ (reasoned from existing knowledge) to ‘learning by doing’ (creating new knowledge) (Eisenhardt & Martin, 2000) where existing knowledge and structures can be a disadvantage.

2.6.2 Transaction Cost Economics

Transaction Cost Economics (TCE) was proposed to explain the ‘make or buy’ decisions of firms, manifesting in the vertical structures of industries (Williamson, 1999, 2005). TCE offers an explanation of firm boundaries based on the selection criteria of efficiency³⁵ of exchange activities (transactions) along a continuum of governance, from hierarchical to market (Williamson, 1981, 1999). The determinants of transaction costs are: frequency, specificity, uncertainty, limited rationality, and opportunistic behavior (Barney, 1999; Williamson, 1999, 2005). The transaction is the unit of analysis, and its characteristics inform boundary decisions for organizations (Williamson, 1981, 1999). Bounded rationality and ‘satisficing’ are assumed (Simon, 1957) due to search costs and limits in management’s abilities to handle complexity (Williamson, 1981).

Environmental factors such as technological development impact transaction costs. TCE has been used in industry level ICT related research to explore the themes of intermediation and re-intermediation (potentially the emergence of cybermediaries), and the enablement of outsourcing (Crowston & Myers, 2004). The communication efficiencies enabled by ICT are credited with enabling extensive outsourcing, thus changing the architecture of industries (Scott & Davis, 2007). This is a reversal of the integration trend facilitated by the telephone that had made it economically feasible for firms to control a geographically extended owned supply network (Scott & Davis, 2007). These examples illustrate a TCE perspective as a driver of industry change. However, most TCE studies have been cross-sectional, and neglect the potential impact of external changes to transaction costs (David & Han, 2004). Additionally, empirical findings relating to uncertainty are inconclusive (David & Han, 2004) and it is posited that there is a need to distinguish between behavioral and technological uncertainty (Santos & Eisenhardt, 2005).

In uncertain environments, firm’s may pursue alliance strategies, where strategic flexibility concerns trump transaction cost considerations (Delmas, 1999; Dosi & Marengo 2007). Barney (1999) criticized TCE for neglecting consideration of company capabilities in their boundary decisions. *‘[W]e cannot fully understand choices of scope without assessing the resource bases of firms’* noted Jacobides & Winter (2005:396) in agreement with (Williamson, 1999). The theory has also been criticized for having too pessimistic a view of human nature (Aldrich & Ruef, 2006).

³⁵ Companies are assumed to make decisions on the basis of maximizing efficiency (Williamson, 1981).

2.6.3 Resource Dependency Theory

Resource Dependency Theory (RDT) posits power as the theoretical mechanism determining organizations actions (Nienhüser, 2008). RDT emerged to address the questions of '*organizational responses to external pressures and how organizations attempted to manage those constraints*' (Pfeffer, 2005:441). Organizations are dependent on an environment for scarce resources, populated by other organizations '*with diverse agendas and interests*' (Wry, Cobb, & Aldrich, 2013:442). Managers seek to reduce their organization's '*external dependencies*' (Pfeffer, 1982:193).

The resource dependency perspective recognizes organizations as representing political/power as well as economic systems (Wry et al., 2013). Manager's actions may be driven by dependencies in relationships inter or intra-firms (Aldrich & Ruef, 2006). Managers seek to increase their organizations' control of the external environment and over resources, potentially improving the organization's profitability (Aldrich & Ruef, 2006). Pfeffer and Salanik (1978) postulated RDTs relevance between subunits of organisations. Astley and Zajac's (1990) research in this area did not strongly support this hypothesis³⁶. However, population ecologists Hannan & Freeman (1984) recognise internal politics as a cause of structural inertia and posit that a firm's ability to adapt can be limited by internal power balances among players in an organisation.

Power considerations can provide insight into the structure of industry business systems; choke points in value chains are manifestations of power, representing an ability to control profits (Evans & Wurster, 1997; Howard, 2005). Porter's Five Forces Framework (Porter, 1979) is indicative of the importance of exchange power (e.g. power of Buyers and Suppliers) for firms (Quinn & Leavy, 2005).

RDT perceives organizations as having the ability to react and adapt and change the environment they operate in (Aldrich & Ruef, 2006). The resource dependency perspective lacks empirical evidence (Hillman, Withers, & Collins, 2009; Pfeffer, 2005) and results from empirical research have been inconsistent (Drees & Heugens, 2013). RDT has been criticized conceptually for conflating competitive dependence³⁷ and mutual dependence (Casciaro & Piskorski 2005; Drees & Heugens, 2013).

2.6.4 Neo-Institutional Theory in Sociology

'An institution is a set of routines or practices that are being reproduced over time and that acts as a cognitive framework structuring the organizational field' (Moyon & Lecocq, 2010:37). Neo-Institutional theory (NIT) deals with the influence of institutions on organizational structural and

³⁶ They found activity flow (*'functional interdependence'*) was more influential than resource dependence

³⁷ An imbalance of power between two organizations versus interdependencies between two organizations

behavioral characteristics (DiMaggio & Powell, 1983; Moyon & Lecocq, 2010). NIT in Sociology relates to legitimacy, accepted norms and where changes in institutional behavior emerge (DiMaggio & Powell, 1983; Scott, 2005). Institutional processes influence organizational change (Oliver, 1991). A potential dichotomy is posited between firms pursuing both legitimacy and efficiency. Institutional norms may be ill-aligned with technical production efficiencies (Meyer & Rowan, 1977; Scott, 2005).

Isomorphism is the phenomenon of organizations in an industry becoming increasingly similar to each other *'in structure, culture and output'* (DiMaggio & Powell, 1983:147). The three key mechanisms of institutional isomorphism of industries are: imitative, coercive and normative forces (DiMaggio & Powell, 1983; Scott, 2005). Most related literature engages with imitative isomorphism (Aldrich & Ruef, 2006). *'Uncertainty is... a powerful force that encourages imitation'* (DiMaggio & Powell, 1983:151). Uncertainty caused in industries in relation to ICT adoption can increase the likelihood of imitative institutionalization³⁸.

An industry level institutional perspective extends the industry boundaries beyond the value chain to include the regulatory context (Crowston & Myers, 2004). This would include industry trade associations and professional associations in addition to government related regulatory bodies and laws. Institutional perspectives highlight the individual differences between different industries and countries, driven by the regulatory context an industry operates within. It also recognizes the importance of the history of industries.

Institutional theory often views variation as emerging from outside, or from responses from organizations to changes in the external environment e.g. changed regulations, changes in population and demand environments (Aldrich & Ruef, 2006). NIT has been criticized for neglecting agency and firms' strategic responses to institutional pressures (Moyon & Lecocq, 2010; Oliver, 1991). However, some organizational strategic responses to institutional processes have been identified, ranging from compliance to defiance i.e. Acquiesce, Compromise, Avoid, Defy, Manipulate (Moyon & Lecocq, 2010; Oliver, 1991). Moyon & Lecocq, (2010) posit a co-evolutionary relationship between organizational and institutional change. Nelson (2005) proposes that the co-evolution of institutions and technologies are key processes driving industry change.

The institutional view is representative of: the way of doing things and the forces that shape these patterns (Nelson, 2005). Institutions are manifestations of institutional theory and also represent social technologies. The adoption of industry standards (institutional norms/social technologies) in relation to ICT can lead to significant industry change (Cortada, 2004; Consoli, 2005). Supportive

³⁸ Imperfect imitative adoption can result in innovation (new variations), which itself is copied (selection) and diffused (retention) (DiMaggio & Powell, 1983)

institutional environments promote rapid progress in technological developments and in building capabilities (Dalum et al, 1999; Mowery & Nelson, 1999; Nelson, 2005).

Within the IS literature a separate socio-cognitive³⁹/socio-cultural perspective has occasionally been applied (e.g. Crowston & Myers (2004) and Jacobsson et al., (2017)) although in most research it has been subsumed within an institutional perspective (Crowston & Myers, 2004).

2.6.5 Population Ecology

It is proposed that a population level perspective can reveal drivers that could be concealed at other levels of analysis (Aldrich & Ruef, 2006; Hannan & Carroll, 1995). Population ecologists privilege selection over adaptation perspectives (Hannan & Freeman, 1977, 1984). Their view *'is that most companies are unable to adapt to major change and that successful companies are mainly those whose structural characteristics happen to match well with demands of the new environment'* (Cusumano, 2009:27). Population ecologists postulate that firms are subject to strong forces of inertia, both internal (e.g. internal politics) and external (e.g. legitimacy concerns) that may limit their adaptive capacity (Hannan & Freeman, 1977, 1984).

The fit between the firm and the environment (including technological, market and regulatory features), acts as a selection mechanism (Aldrich & Ruef, 2006) and is therefore a determinant of industry structure. The population ecology view has been criticized for denigrating the potential effectiveness of management for instigating change (Cusumano, 2009).

2.6.6 Theoretical Framework

'The causes of any particular event are always multiple....also conjunctural - they combine and affect each other as well as the "effects"' (Miles & Huberman, 1994:146)

The theoretical framework for the research is drawn from RBV, TCE, RDT, NIT and PE, thus providing analysis from a selection of levels. The reviewed perspectives are not treated as competing theories but as having potential collectively to contribute to a more holistic understanding of industry change. Prior research on continuity and change (which an IE study represents) warns to *'...beware of the singular theory of choice and change'* (Pettigrew, 1985a:41). The review of theoretical understanding and its application in IE and IS literature supports the view that a multi-theoretical perspective can provide richer understanding and insight into the process of IE than a single perspective.

³⁹ The socio-cognitive environment, is defined as *'a broader belief system that shapes the beliefs and ideas of individual actors'* and influences their actions (Jacobsson et al., 2017:612)

2.7 REFLECTIONS ON THE LITERATURE

The review of the literature illustrates that our understanding of industry evolution (IE) is incomplete. It identifies a need for empirical evidence and research that is designed to address the structural evolution of industries. Most of what is known about IE is based on research of manufacturing industries and there are concerns that it may not apply to other industries such as service industries. Research shows that there is more than one pattern of IE. Longitudinal research is required to allow patterns of industry continuity and change to be revealed.

IE is a multi-level process and requires multi-level and contextual research as variation and selection can emerge, interact and occur across any level: routines, firms, competitors, across the supply and value chain, industry and from the external environment. Multi-level empirical and theoretical drivers of IE have been identified. Several theoretical perspectives, representative of various levels, are viewed as having the potential to be useful in contributing to our understanding of the drivers, process and outcomes of IE. The theoretical perspectives are seen as potentially complementary aiding a more holistic understanding of IE. Also, the usefulness of framing theories through evolutionary processes of VSR is proposed.

Technology is recognised as a key driver of IE. It is proposed that ICT is a GPT i.e. a technology of great consequence and impact. ICT use has become endemic in industries, and the application of ICT requires adaptation i.e. developments in social technologies. Therefore, exploring the influence of ICT (a GPT) on IE is likely to provide a particularly interesting lens for research purposes.

The IS literature indicates that industry level research has been neglected but has the potential to be valuable to the field (Allen & Kim, 2005; Chiasson & Davidson, 2005; Crowston & Myers, 2004; Phillips & Wright, 2009; Segars & Grover, 1995). A socio-technical perspective of technology recognizes that the impact and development of ICT is not predetermined but is path dependent and influenced by contextual factors including technology users. The diffusion process influences the development of ICT. The IS literature show that it takes time for ICT to diffuse and for the influence of its application to emerge. Hence the IS literature draws attention to the need for longitudinal and contextual research (Chiasson & Davidson, 2005; Cortada, 2004; Kling & Lamb, 2000; Segars & Grover, 1995). The IS literature has been criticized for an over focus on economic perspectives with calls for consideration of wider perspectives. The limited number of industry studies in the IS domain reveal that the influence of ICT varies by industry and so a wider selection of industries need to be studied.

ICT has been recognized as a valuable strategic resource and a driver of firm strategy and IE. IE is a key strategic issue for firms. An exploration of the influence of ICT on IE has the potential to inform the IE and IS literatures.

2.8 CONCEPTUAL FRAMEWORK

This section draws from the goals of the research and the literature review to inform the research questions, the focus of the research and the conceptual framework which guides the research.

Maxwell (2009) suggests that comprehensive qualitative research studies require five interrelated components:

- Goals
- Conceptual framework
- Research questions
- Methods
- Validity

The overall research design needs to be inherently consistent, with each component having congruency with the others. The research design does not emerge in one iteration, it should be reconsidered and potentially be adjusted throughout the research journey. The elements in the research design are overlapping processes and indeed may be progressing simultaneously (Maxwell, 2009).

In Chapter 1 the research questions were introduced and the goals of the research were presented. Methods and validity concerns are dealt with in the next chapter. Informed by the literature this chapter revisits and expands upon the research questions and presents the conceptual framework that guides the research. The research questions are at the core of the research design and are directly informed by and inform the other elements of the research design (Maxwell, 2009).

2.8.1 Research Questions

The literature identifies:

- a gap in IE knowledge and a need for more research that addresses the structural evolution of industries
- the importance of technology as a driver of IE and that ICT is a particularly significant technology
- a scarcity of industry level research in the IS literature

The research gaps and the significance of ICT as a general purpose technology (GPT) provide justification for the research topic: The influence of digital information and communications technology on industry evolution. The research is designed to contribute to answering the question:

- How does ICT influence the process of industry evolution?

The researcher focused on exploring the influence of ICT in two contrasting industries: the Irish advertising and the Irish retail grocery industries⁴⁰. Insights that emerge from this exploration can inform the body of IE knowledge and IS industry level research.

To more comprehensively address the research question, sub-questions were identified:

- Why was ICT adopted in the industries?

We cannot understand the influence of ICT on IE unless we have insight into why ICT is adopted in industries. The literature suggests that firms adopt ICT to improve operations and enable strategies. These firm initiatives emerge from context: the industry environment that the firm operates in and the wider macro environment. The literature mentions competitive rivalry, regulatory factors, demand etc. as influencing ICT adoption. Opportunities and threats emerging from either variations in the industry environment and/or the macro environment are recognized as drivers of the adoption of ICT.

Diffusion patterns are the enactment of sufficiency of drivers for ICT adoption i.e. the why of ICT adoption and diffusion are intertwined. The literature suggests that ICT diffusion might be industry specific. However, technologies are generally adopted by firms, not industries. The literature reflects that firms (and possibly industries) have varying capacities for the adoption of technologies, and diffusion is influenced by internal and external factors such as: knowledge of and support available for the technology; a firm's goals and resources; legitimacy and competitive considerations; and network effects. Therefore the adoption of ICT is driven by multilevels of context: macro, industry and firm.

- What were the outcomes of the adoption of ICT in the industries?

Industries have become dependent on ICT and it has become embedded in industry processes. The IS literature speculates that the outcome of the cumulative adoption of ICT across an industry may potentially vary from what might be anticipated from individual firm outcomes. It is proposed that:

- The use of ICT has required significant adaptations, resulting in changes in industry processes and changing work in industries, including the number of jobs and type of jobs and required skillsets.
- That ICT potentially: changes the competitive basis in industries; enables the emergence of new products, services, sectors and industries; changes industry boundaries; alters the

⁴⁰ The justification for the selection of these industries is dealt with in the methodology chapter.

structure of the industry supply and value chain (firms, types of firms and distribution of profits, relationships).

ICT influences industry structure and industry architecture. Variances in the influence of ICT on different industries have been noted with regard to degree, timing and actual effects; however, simultaneously there have been common patterns in diffusion and application of ICT across industries.

2.8.2 Exploratory Conceptual Framework

A conceptual framework *'explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables—and the presumed relationships among them'* (Miles & Huberman, 1994:18). A conceptual framework guides the research, it reflects what the researcher *'thinks is going on'*, informing the research questions and the research design, and a researcher should be open to adjusting the framework as the research progresses (Maxwell, 2009:222).

Why was Digital ICT Adopted?

What Influence did Digital ICT have on Evolving Industry Structure?

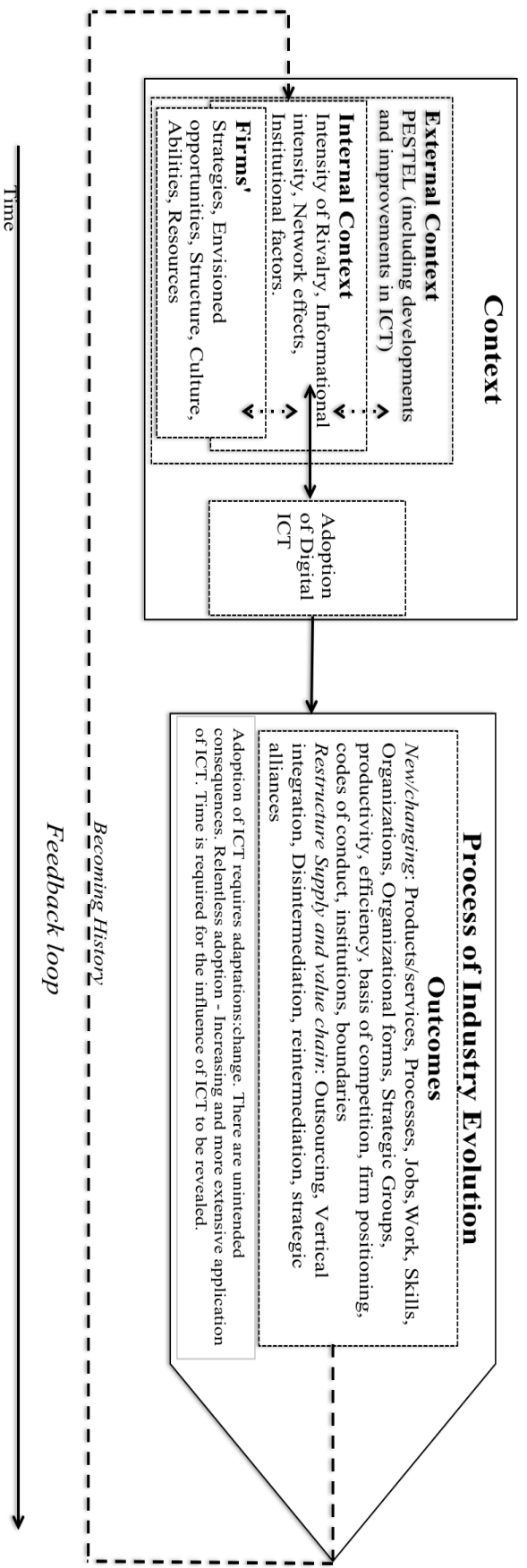


Figure 2-2: Framework Reflecting Array of Factors from Literature

Figure 2-2 captures a summary of factors from the literature review, structured to address the proposed research questions. In consideration of ‘Why’ ICT was adopted, factors emerge from multilevels as portrayed in the diagram. The literature recognises that the adoption of technology including ICT is influenced by macro environmental factors represented as PESTEL in the diagram. For example Cortada (2004, 2012, 2013) recognised a combination of government directives, infrastructure, societal features, developments of technology and the establishment of technology standards as influencing the adoption of ICT in industries.

Internal context represents the industry environment. There is sparse knowledge of the influence of industry on ‘*the adoption and use of ICT*’ (Jacobsson et al., 2017:611). Factors that have been suggested include: information and competitive intensity (Müller et al., 2018), and network effects (Cortada, 2013). Jacobsson et al. (2017) recommended consideration of demand, supply and product characteristics, skills required to transform inputs into outputs, the potential for dominant industry players to drive industry standards, and industry institutions including organizations, routines and culture.

Firm’s resources and capabilities including management are determinants of their adoption of ICT. Firms adopted ICT to enable strategies (McNurlin et al., 2009), including reducing costs and increasing productivity and efficiency (Cortada 2004, 2006a/b). Firm characteristics influencing ICT adoption include institutional factors such as culture and firm structure (Howard, 2005; Segars & Grover, 1995).

Contextual factors are drivers for the adoption of ICT and can influence each other. Contextual boundaries are porous. A firm’s capabilities and resources coupled with the environmental context influence whether and when they adopt ICT. The use of ICT drives its development and changes context. The development of ICT is influenced by context and action. The literature shows that governments, industries, firms and users may drive developments of ICT, and ICT continues to develop across the diffusion process, and these developments drive wider diffusion.

The process of IE (Malerba & Orsenigo, 1996, 2015) and the diffusion and influence of ICT takes time (Chiasson, 2005; Christensen, 1997; Cortada, 2004; Kling & Lamb, 2000; Segars & Grover, 1995). Rather than being linear and sequential as the diagram appears to represent, the actual process is far more complex and entangled, and is more reflective of overlapping and intertwining loops across vertical and horizontal (time) dimensions. Hence the adoption of evolution theory aids in envisioning this complexity. History matters in the process of industry evolution. The context at any time is a product of the past, representing cumulative interactions of context and action.

Adopting ICT necessitates change⁴¹ and this is a driver of IE. The literature review suggested numerous potential industry outcomes as influenced by ICT, spanning structural and architectural change. Outcomes suggested in the literature (see Cortada 2004, 2006a/b; Daft et al., 2014; Dosi et al., 2007; Evans & Wurster, 1997; McNurlin et al., 2009; Segars & Grover, 1995; Teece, 2018b etc.) include changes: in the basis of competition; in industry population; in firms competitive positioning in an industry; products and services; jobs, skills, processes; industry supply and value chain; and boundaries.

A simplified model has been adopted as the conceptual framework (see Figure 2-3). It provides an overarching structure for the exploratory research, but is not overspecified. This allows unanticipated insights to emerge from the research. Change ‘*may emerge and occur across many levels of context*’ (Pettigrew, 1997:340), drivers emerge from multi-levels both empirically and theoretically, and the framework endeavors to recognize that the emergence of variations and the process and outcomes of change are multi-layered/multi-level. Multi-level contexts are represented by external, internal and firm levels. The numerous potential industry outcomes influenced by ICT are represented as structural and architectural changes. History matters in the process of industry evolution (Malerba & Orsenigo, 2015). Outcomes are both ingredients and products in the process of industry evolution. In the research model there is a feedback loop from the outcome of the process of industry evolution to context. The context at any time is a product of the past, representing cumulative interactions of context and action.

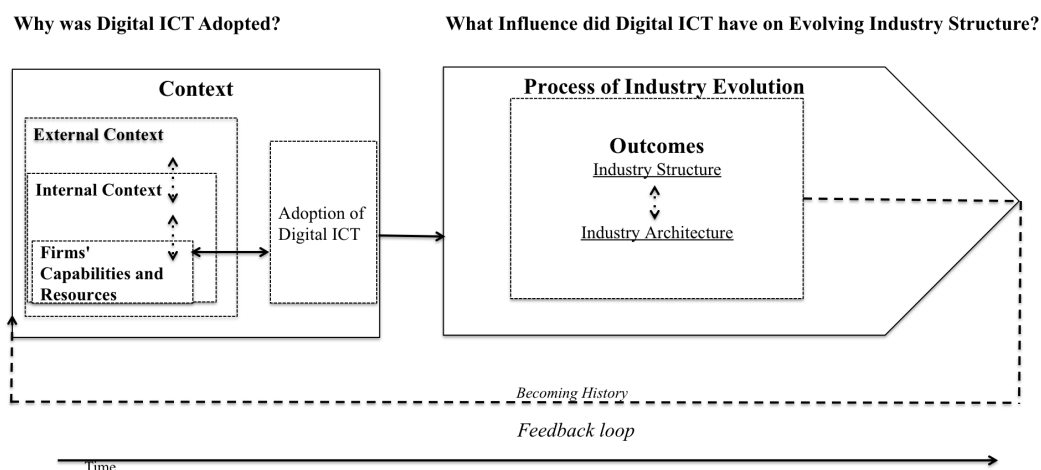


Figure 2-3: Conceptual Framework

⁴¹ Social technology adaptations are required.

2.9 CONCLUSION

This chapter identified the relevance of ICT to the IE domain and reviewed and analyzed IE and related IS literature, identifying gaps and challenges within IE and industry level research. The most relevant selection of theoretical perspectives from the literature were reviewed and compiled to form a theoretical framework for interpreting the research. The chapter ends with a presentation of the research questions and conceptual model as informed by the literature review. The next chapter discusses the methodology and research methods utilized in addressing the research question.

CHAPTER 3 RESEARCH METHODOLOGY AND METHODS

3.1 INTRODUCTION

This chapter explains and justifies the researcher's chosen methodology, methods employed, and details the execution of the research.

Methodologies provide guidance for the researcher, outlining 'how to pursue knowledge' (Guba & Lincoln, 1994; Mjøset, 2009). The chosen methodological framework should align with the researcher's philosophical perspective (Holden & Lynch, 2004), and be appropriate for addressing the goals of the research (Edmondson & McManus, 2007). A contextualist methodology, as developed in the Centre for Corporate Strategy and Change (CCSC), at Warwick University, (Pettigrew, 1997) was adopted for this research. Industry evolution (IE) is a process and contextualism has been identified as one of the three dominant practices for process research⁴² (Sminia, 2009). The literature identified the need for multi-level, multi-modal and longitudinal research to explore the structural evolution of industries (Malerba & Orsenigo, 1996), which a contextualist methodology facilitates. Contextualism recognises multiple levels of context and process intertwining across time, and multilevel and longitudinal research is required for causes and relationships to be revealed: according to Pettigrew (2012:1316) '*[e]mbeddedness and temporality are reciprocal and need one another in analytical investigation*'. Prior research is also relevant as it informs the researcher in regard to previously acceptable approaches in the research domain, and contextualism has been proven in use for IE research, e.g. Beere (2015), Hanchar (2011), Marks (2015), and Quinn, (2002).

This chapter also deals with methods and with validity issues, thus addressing the remaining components that Maxwell (2009) delineated as required for comprehensive qualitative research⁴³. Comparative case studies are the chosen method for this research. The research questions form the hub of the research design, as the methods employed must enable the researcher to adequately address the questions (Maxwell, 2009). The questions and methods are determinants of threats to validity that need to be addressed in the research (Maxwell, 2009). It is essential to achieve overall congruity between all the elements of the research design: the research goals; the conceptual framework; the research questions; methods; and validity considerations. The methods employed by the researcher must support and fit with the researcher's chosen methodology (Guba & Lincoln, 1994; Mjøset, 2009). A contextualist methodology comprising longitudinal comparative case studies was employed to engage with the research questions.

⁴² The others being 'Tracking Strategy', key author Mintzberg, and 'Minnesota Studies' key author Van de Ven.

⁴³ Chapter 1 explained the goals of the research, and the previous chapter provided a review of the literature, and presented the research questions and conceptual framework.

The next section provides an overview of paradigms in social science, before critical realism, the researcher's chosen perspective, is introduced. Then contextualism as a methodology is explained, and justification is provided for its selection as an appropriate methodology for addressing the research questions. Following this, the appropriateness of the case study method for this research is established. Then good practice in qualitative and case study research, and related validity considerations are discussed. The final section of the chapter sets out the actual execution of the research.

3.2 SOCIAL SCIENCE PARADIGMS

'People differ markedly in the beliefs they form about the very same things they each clearly see'
(Audi, 1998:17)

Social science research falls within a continuum from Subjectivist to Objectivist⁴⁴ (Burrell & Morgan, 1992; Morgan & Smircich, 1980), (see Figure 3-1, below for characterisation of a selection of paradigms along the subjectivist - objectivist continuum). Objectivism adopts a natural science approach to social science, seeking laws and causal explanations (Holden & Lynch, 2004). Subjectivism emerged as a rejection of the natural science approach, deeming it inappropriate for social science (Holden & Lynch, 2004).

Ontological assumptions refer to the nature of reality, and opposing perspectives span from nominalism to realism (Burrell & Morgan, 1992). Realism assumes that there exists out there a reality that is independent of human perception (Audi, 1998), reality preceded human existence. The nominalist stance perceives reality as a construction of the mind, with the extreme position labeled as solipsism where the world is a product of our imagination, and therefore all knowledge is relative (Morgan & Smircich, 1980).

In regard to assumptions about human nature, the subjectivists subscribe to voluntarism, seeing man as the creator of his reality/environment, whilst the objectivist perspective takes a deterministic view, seeing man as a responder to reality/environment.

Epistemology is concerned with the nature of knowledge, 'how can we know about what is out there to be known' (Burrell & Morgan, 1992; Holden & Lynch, 2004). An inquirer's ontological and human nature assumptions inform their epistemological stance, as they impact their judgment of what can be known. The extremes on the epistemological continuum are subjectivist⁴⁵ and objectivist⁴⁶. The subjectivist position rejects that research can be completely objective and value-free, but sees the researcher as value-laden with inherent biases. Objectivism assumes that

⁴⁴ Also, frequently labeled as Constructivism and Positivism respectively

⁴⁵ Anti-positivist (phenomenological)

⁴⁶ Positivist (positivism)

Both of these extreme positions have received effective criticism, and currently social science research frequently occurs along the continuum rather than at the extremes. However, objectivist approaches have long dominated the social science field (Morgan & Smircich, 1980). According to Mintzberg (1979), the positivist approach with its reliance on the hypothetico-deductive method has resulted in an over concern with method, deflecting the focus from the significance of the research i.e. an over focus on quantitative rather than qualitative research evidence and deductive rather than inductive methods. In regard to quantitative versus qualitative research evidence, it should not be a question of which is the better approach, researchers should apply a methodology that suits the purpose of the research (Edmondson & McManus, 2007).

Ontological, epistemological and methodological beliefs which represent the inquirers world-view must be aligned as this dictates the boundaries of legitimate inquiry for the researcher (Burrell & Morgan, 1992; Guba & Lincoln, 1994). There also should be fit between the world-view⁴⁷, methodology and the research problem (Holden & Lynch, 2004; Morgan & Smircich, 1980), and the methods employed by the researcher (Guba & Lincoln, 1994; Mjøset, 2009). There must be overall congruence between all the elements of the research design.

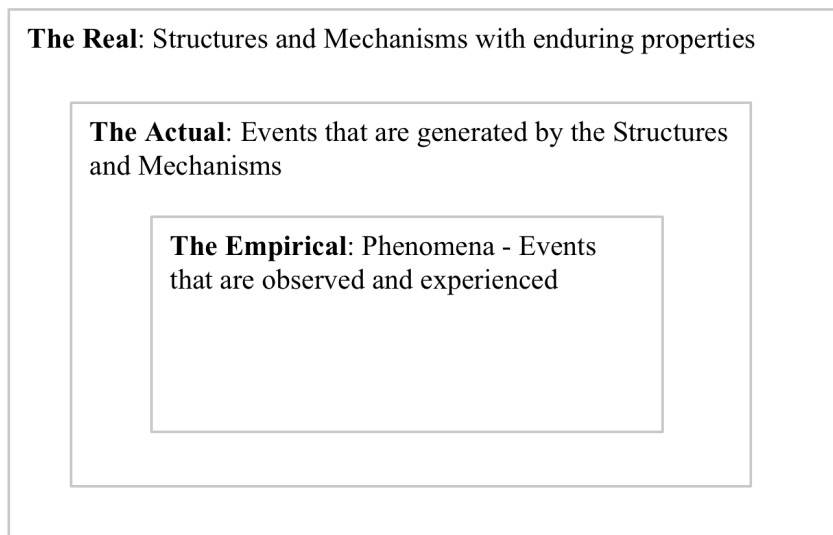
3.2.1 Critical Realism

This research adopts a critical realist stance. Critical realism (CR) originated with Roy Bhaskar (1975, 1998), who viewed reality as structured, differentiated and changing (Bhaskar, 2014a). Ontologically CR proposes that there is a reality independent of human knowledge or our ability to perceive it (Bhaskar, 1998; Wynn & Williams, 2012). CR avoids the epistemic fallacy of reducing the whole of reality (ontology) to the domain of our knowledge of reality (epistemology) (Mingers, Mutch, & Willcocks, 2013). CR considers that we are limited in our perception and comprehension of reality and rejects the potential of truly objective research. Bhaskar (2014b) defined CR as reflecting a realist ontology and a relativist epistemology, thus CR has been described as bold in ontology and cautious in epistemology (Sminia, 2009; Wynn & Williams, 2012). CR is ‘critical’ in that it recognises that our knowledge is limited and fallible, and it does not accept all perspectives as being equally valid (Wynn & Williams, 2012).

Collier (1994) refers to CR as ‘depth realism’. A CR perspective views reality as stratified across the domains of the Real, the Actual and the Empirical (Mingers et al., 2013), (see Figure 3-2). The Real domain is ‘the whole of reality’ and it comprises structures (physical and non physical) with inherent causal powers, it contains mechanisms, events and experiences (Mingers et al., 2013; Zachariadis et al., 2013). The Actual is a subset of the Real and contains actual events and experiences, generated through mechanisms in the Real (Mingers et al., 2013). The Empirical is reflective of those events we experience mainly through our sensory perceptions, and represent only

⁴⁷ Or research philosophy

a subset of the Actual events (Wynn & Williams. 2012). Structures such as physical objects or social processes, possess emergent powers. When triggered these ‘powers’ act as generative mechanisms, which may (or may not) be empirically observable as an event (Zachariadis, Scott, & Barrett, 2013). Critical realists see social structure as preceding human agency, but that human agency is required to reproduce and transform social structure⁴⁸ (Bhaskar, 2014a).



The Stratified Ontology of Critical Realism (Adapted from Zachariadis, Scott, & Barrett, 2013)

Figure 3-2: Critical Realism Stratified Ontology

Our ‘knowledge’ of a mechanism may emerge from observing it or its effects (Bhaskar, 1975/2008; Wynn & Williams, 2012). What we know of ‘events’ is limited to what we can conceptualize from the effects that we have observed (Wynn & Williams, 2012). CR requires retroductive analysis: the hypothesizing of generative mechanisms that explain events (Mingers et al., 2013). CR seeks to explain rather than predict, it looks to provide an explanation of the mechanisms that generated an event, to identify the causes of a particular phenomenon (Wynn & Williams, 2012). CR seeks to answer the question: ‘*What must reality be like in order for this event to have occurred?*’ (Wynn & Williams, 2012:794).

3.3 CHOSEN METHODOLOGY

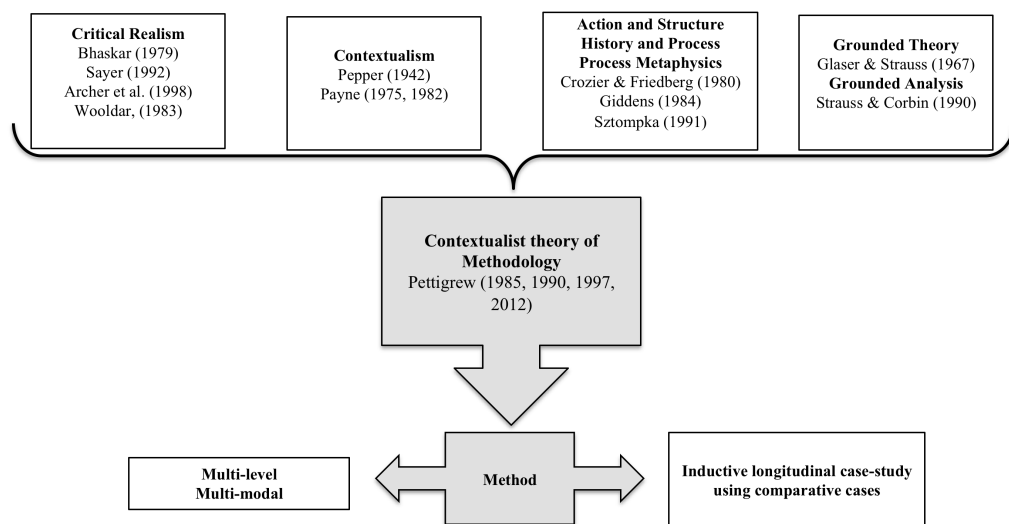
3.3.1 Contextualism

Contextualism is the chosen methodological framework for this research. A contextualist methodology fits with the researcher’s philosophical position and is appropriate for addressing the aims of the research. Contextualism is both a philosophy of research and a theory of method. It has

⁴⁸ This aligns with structuration theory.

roots in critical realism, contextualism, structuration and grounded theory (Quinn, 2008), as shown in Figure 3-3.

Pettigrew’s theory of method was informed by Pepper’s (1942) ‘contextualist’ world-view (Pettigrew, 1990). Pepper (1942), *[d]istinguishes amongst the various kinds of evidence about the world which can be used to corroborate claims to knowledge*’ (Pettigrew, 1985b:58), proposing four ‘relatively adequate’ world-views formism, mechanism, contextualism and organicism (Pepper, 1942). *‘Contextualism is concerned with the event in its setting; the truth theory has to be qualitative confirmation since the context will change and knowledge will need to change also, and the root metaphor is the historic event’* (Pettigrew, 1985b:58).



Based on Quinn (2019)

Figure 3-3: The Roots of Contextualism

Sminia (2009) identifies the research orientation of Pettigrew’s contextualism as most closely aligning with critical realism. Pettigrew characterized himself as a ‘mediativist’, seeing social circumstances as mediating between reality and accounts of reality, but not eliminating the effects of reality (Sminia, 2009).

Contextualist research is referred to as *‘an example of the utilization of structuration theory’* (Sminia & de Rond, 2012:1331). Structuration theory is evident in the reflexive relationship between structure (context) and action (process) that is exhibited in Pettigrew’s work (Pettigrew, 1985b, 2012; Sminia & de Rond, 2012). It reflects a theory of social action that is neither voluntaristic nor deterministic (although Bhaskar (2014c) viewed Giddens’ (1984) structuration theory as being overly voluntaristic).

Influence from Grounded Theory is also evident in contextualism. Theory as grounded in data as per Glaser and Strauss's (1967) systematic process '*refers to qualitative data emerging as researchers exercise sensitivity to cases*' (Mjøset, 2009:54). In contextualism, theory is grounded in the case data, e.g. generalizations through the recognition of patterns across cases (Mjøset, 2009). A grounded analysis approach (Strauss & Corbin, 1998) is reflected in the overlapping cycles of induction and deduction. This is evident in the predominantly qualitative nature of the evidence and the suggested iterative process of data gathering and analysis to identify themes before pursuing further data and content analysis and pattern recognition (e.g. see Pettigrew 1997). As certain grounded theorists have also advocated (e.g. Charmaz, 2006 and Strauss & Corbin, 1998) Pettigrew recommends becoming sensitized to the relevant literature for the domain of the research, to shape the research question: '*Few process scholars enter the field with an empty head waiting to be filled with evidence*' (Pettigrew, 1997:339).

3.3.1.1 Features of the Contextualist Methodology

As touched on above in the linkage to grounded theory, contextualism is not a highly specified technique, but provides broad principles for the researcher, there is no one best way of doing contextualist research (Pettigrew, 1985b). However, there are recognizable traits of the research. Contextualist research is processual research, it aims to '*catch reality in flight*' (Pettigrew, 2012:1305). '*The irreducible purpose of a processual analysis remains to account for and explain the what, why and how of the links between context, processes and outcomes*' (Pettigrew, 1997:340). Contextualism as developed by the CCSC is case based research, specifically '*longitudinal comparative cases*' (Mjøset, 2009; Pettigrew, 1990, 1997, 2012).

Pettigrew (1997:340) delineated five guiding assumptions for implementing a contextualist methodology:

1. '*embeddedness, studying processes across a number of levels of analysis*'. Multilevel analysis is required to reveal connections between context, process and outcomes;
2. '*temporal interconnectedness, studying processes in past, present and future time*'. Longitudinal research allows patterns in both change and continuity to be revealed;
3. '*a role in explanation for context and action*'. There is the recognition of the entwined relationship between context and action. Action and future contexts are path dependent, the current context provides the opportunities for current action and creates the future contexts and hence the range of future opportunities;
4. '*a search for holistic rather than linear explanations of process*'. An anti-reductionist stance is also reflected, singular explanations of change are unlikely, causation is complex and change may

emerge and occur across many levels of context. A multi-modal approach is recommended. Contextualist research is not carried out in the pursuit of grand theory, but of substantive theory; and

5. 'a need to link process analysis to the location and explanation of outcomes'. Pettigrew recommends having a clear outcome to explain to alleviate the complexity of the research.

3.3.1.2 Justification for Selecting Contextualist Methodology

The research is concerned with industry evolution (IE), and evolution is a path dependent, multilevel process, requiring an holistic assessment (Aldrich & Ruef, 2006), thus matching well with features of a contextualist methodology. Attention has been drawn to the need for IE research to be grounded in historical context, as processes and resulting outcomes are guided/directed by context (Quinn, 2015; Winter in Murmann, Aldrich, Levinthal, & Winter, 2003). Vertical (multilevel), horizontal (longitudinal) and multimodal research are characteristics of contextual research (Pettigrew, 1985b).

- IE is a multilevel process. Contextualism is used for exploring the what, how and why of process and enables multi-level analysis (Pettigrew, 1987, 1990, 1997; Pettigrew, Woodman, & Cameron, 2001).
- Longitudinal studies are required for IE research (Barron, 2003; Malerba & Orsenigo, 1996). Longitudinal research is a requirement of contextualism which advocates allowing a sufficiently long time period that allows the *'processual dynamics of changing, the relationship between forces of continuity and change, and therefore the inextricable link between structure and process'* to be revealed (Pettigrew, 1985b:61).
- Evolution is path dependent (Aldrich & Ruef, 2006), and contextualism recognises that past conditions are inherent in the present and the future (Pettigrew, 1987, 1990, 1997; Pettigrew et al., 2001).
- Contextualism is concerned with providing holistic understanding (Pettigrew, 1985a, 1987, 1990, 1997; Pettigrew et al., 2001), which is a requirement for the exploration of the structural evolution of an industry.

3.4 RESEARCH METHOD

This section discusses quality criteria in research and presents the chosen research method and related key research decisions.

3.4.1 Quality in Research

The quality criteria applied to judging research needs to align with the researcher's ontological, epistemological and methodological position (Guba & Lincoln, 1994). Thus the criteria for judging

objectivist research include: internal validity, external validity (generalizability), reliability and objectivity (Guba & Lincoln, 1994), while trustworthiness, transferability, dependability, confirmability, and the authenticity of fairness have been deemed more suitable for subjectivist research (Guba & Lincoln, 1994). Objectivist and subjectivist quality criteria have come to be considered as generally applying to quantitative and qualitative based research respectively. This is discussed below along with consideration of quality indicators appropriate for critical realist research and contextualist methodologies.

3.4.1.1 Quantitative and Qualitative Research

Qualitative and quantitative research refer to types of evidence rather than research methods (Yin, 1981). Quantitative evidence is numeric based, whilst qualitative evidence is largely word based⁴⁹. Quantitative evidence is strongly associated with hypo-thetico deductive research, and objectivist research.

In quantitative based research ‘reliability’ means that the research would have the same outcome if carried out by a different researcher. However, in the application of qualitative based methodologies the personality and history of the researcher can influence what they ‘see’ in the research and the path they follow through it. The researcher aims to provide transparency by keeping an account of their research journey, and providing sufficient information for others to judge the research methods.

Critical realism and contextualism recognize that complete objectivism in a researcher is impossible. However, there is an onus on the researcher to self-monitor how the researcher’s personality and past experiences may influence the implementation of the research and the findings. The researcher had no work experience in the industries that are the basis for the case studies. She worked for many years in the investment industry and on occasion has reflected on parallels or equivalents from the investment industry as a means of improving her understanding of the researched industries. Prior to starting this research, she spent several years working on the implementation of ICT change initiatives and this informed and influenced interpretation of the case data by the researcher.

Validity in hypo-thetico research refers to the findings of the research being true, in terms of contextualist qualitative research it signifies that the findings are justified. This should be demonstrated through the findings being grounded in the qualitative data, such as the use of interview quotes. Throughout the research journey the researcher should strive to be open to recognizing and communicating evidence that contradicts the course their research is taking or their impressions and ideas (Silverman, 2005). The use of multiple sources of data (triangulation)

⁴⁹ Images etc. may also be used.

increases confidence in internal validity of the research (Eisenhardt, 1989; Maxwell, 2009; Yin, 2009).

Zachariadis et al., (2013) have interpreted conventional qualitative quality indicators and re-described them for critical realist qualitative research (see Table 3-1)

Validity Type	Qualitative Conventional Description	Critical Realism
Design Validity	<u>Descriptive validity</u> : Accuracy of events, objects, behaviors, and settings reported	Explanations of mechanisms in action and the conditions with which they are interacting; appreciation of the field by identifying, prioritizing, and scoping boundaries of the study.
	<u>Credibility</u> : Results are believable from the participants of the research	
	<u>Transferability</u> : Results can be generalized and transferred to other settings	The idea that similar or related events that occur (or might occur) in other settings are caused by the generative mechanism that caused the actual events in the field
Analytical Validity	<u>Theoretical validity</u> : the developed theoretical explanation fits the data	Theory is used to help hypothesize about the mechanisms and provide explanations for the events that have occurred.
	<u>Dependability</u> : Researchers describe changes in the research setting and its effects on the research approach of the study	This is an essential part of the retroductive process and identification of contingent factors
	<u>Consistency</u> : Verifying the steps of qualitative research process	Challenge and inform the terms of (quasi-) closure and process of ongoing inquiry in retroductive analysis
	<u>Plausibility</u> : Findings of the study fit the data from which they are derived	Whether data that is empirically available gives valid knowledge about the actual manifestation of the alleged generative mechanism in the field
Inferential Validity	<u>Interpretive validity</u> : Interpretation of participants' views are accurate <u>Confirmability</u> : The results are confirmed by others	Findings from qualitative research can provide information about the mechanisms that cause the events at the empirical level

Adapted from Zachariadis et al., (2013)

Table 3-1: Validity in Qualitative Research

In quantitative studies explicit sampling means results are statistically generalizable to a defined population (Maxwell, 2009) and is a factor in the judgment of the significance of the results of the research. In qualitative research theoretical or analytic ‘transferability’ is a more appropriate measure (Guba & Lincoln, 1989; Maxwell, 2009). External validity is understood in terms of how the research results may be relevant in other cases (Maxwell, 2009). In the contextualist approach, the challenge of generalization is the investigation of smaller numbers of cases explained by concepts with high internal validity (Mjøset, 2009:53). The understanding of a specific case is enhanced through comparison with other cases, and this also creates the development of contextual generalizations (Mjøset, 2009). *‘The contextualist strategy of generalizations is to generalize only*

within specified contexts' (Mjøset, 2009:52).

Issues with qualitative data include reactivity (Maxwell, 2009),

'labor-intensiveness (and extensiveness over months or years) of data collection, frequent data overload, the distinct possibility of researcher bias, the time demands of processing and coding data, the adequacy of sampling when only a few cases can be managed, the generalizability of findings, the credibility and quality of conclusions, and their utility in the world of policy and action' (Miles and Huberman, 1994:2).

Strategies have emerged to manage threats to validity and reliability in qualitative research, though not to eliminate them. Maxwell (2009:244-245) delineates a number of these: *'Intensive, long-term involvement'*, particularly recommending long-term participant observation; *'Rich data'*: including intensive interviews. *'Respondent validation'*; *'Searching for discrepant evidence and negative cases'*; *'Triangulation'*; *'Quasi-Statistics'*; and *'Comparison'*. The creation of case narratives is in itself recommended as a strategy to avoid data overload (Eisenhardt, 1989). Where feasible and appropriate the researcher has adopted these strategies: Comparative case studies achieve *'comparison'*; Triangulation of data was employed; Interviews were used and were transcribed in full. A key finding of the research emerges from an observed variance in patterns between the industries, and there is some limited use made of respondent validation and quasi-statistics. However, longterm participant observation was not appropriate for the study, given the unit of analysis and the requirement to gather historic data.

Ultimately no highly specified step by step process was followed by the researcher to produce research results. The researcher must follow their own path, and the process for this researcher was iterative with repeated revisiting of literature and data and seeking new data, and involved some serendipitous inspiration in recognizing and developing ideas (akin to Mintzberg's creative leap (Mintzberg, 1979)). Inevitably to interpret the research the researcher needs to become immersed in the data and the literature and frequent, repeated, recurrent reflection is required. The chosen research method and other key research design decisions are explained in the next section.

3.4.2 Case Study Method

A case study research method is appropriate for the research because: The exploration of industry structural evolution as defined by Malerba and Orsenigo (1996) requires capturing in-depth, rich data from multiple perspectives, which a case study research strategy facilitates (Flyvberg, 2006; Hitt, Beamish, Jackson, & Mathieu, 2007; Thomas, 2011; Yin, 2009). *'As a research strategy, the distinguishing characteristic of the case study is that it attempts to examine: (a) a contemporary phenomenon in its real-life context, especially when (b) the boundaries between phenomenon and context are not clearly evident'* (Yin, 1981:59). Yin (2009) also notes that case studies are

particularly suitable when *'how or why questions are being posed'*, and *'the investigator has little control over events'* (Yin, 2009:2). Quantitative data is insufficient to explain processes (Silverman, 2005), while case studies are very suited to exploring processes (Siggelkow, 2007) and therefore it is a fitting method for exploring the process of IE.

The case study design for the research is *'multiple-case embedded'* (Yin, 2009:46)⁵⁰. The Irish advertising industry and the Irish retail grocery industry were selected for the research⁵¹. A comparative study of these strongly contrasting industries enables observation of common and contrasting patterns in the data (Eisenhardt & Graebner, 2007; Mjøset, 2009; Pettigrew, 1990, 1997) distinguishing what is industry specific from what may be general for industries. This theoretical sampling offers significant analytic benefits, over a single case study (Eisenhardt & Graebner, 2007; Thomas, 2011; Yin, 2009).

Despite the strengths of the case study method, it is widely acknowledged that doing quality case study research is difficult (Yin, 2009). Concerns have been raised for qualitative methods generally and case studies regarding a potential lack of rigor in its application due to its relatively non-prescriptive procedural guidelines. There can be a danger of leaping to conclusions based on inadequate evidence and/or allowing bias to influence the course of the research and therefore the research findings (Miles & Huberman, 1994; Silverman, 2005; Yin, 2009). The researcher must strive to be open to the data and not ignore conflicting evidence (Silverman, 2005; Yin, 2009). A second concern for case study research is *'that they provide little basis for scientific generalization'* (Yin, 2009:15), this was discussed above. A third concern is that the case study method is overly time-consuming, there is danger of data overload and can result in the production of extensive narratives (Eisenhardt, 1989; Miles & Huberman, 1994; Yin, 2009). Despite the criticism and challenges of case study research, the application of the method has resulted in valued and respected contributions to social science. Additionally case studies have been noted as being particularly suitable for doing critical realist research (Wynn & Williams, 2012)

Producing good case research is challenging, and Yin (2009) advocates paying attention throughout the research process to four key indicators for judging quality in social science methods: Construct validity, internal validity, external validity and reliability⁵². However, Wynn & Williams (2012:805) developed five principles and protocols for assessing the quality of critical realist case study research (See Table 3.2). These encompass: explication of events and structure, retrodution, empirical corroboration, and multimethods (triangulation). The principles do not represent linear steps they are interrelated, informing and reinforcing each other (Wynn & Williams, 2012). The

⁵⁰ The other case design options are: single holistic, single embedded and multiple-case holistic.

⁵¹ The criteria for their selection is discussed later in the chapter

⁵² Echoing criteria for objectivist research.

researcher has endeavored to comply with these principles, except for the use of multiple investigators.

Principle	Tactics	Evaluation Criteria
Explication of Events	Identify and abstract the events being studied, as a foundation for understanding what really happened in the underlying phenomena.	<ul style="list-style-type: none"> • Thick description of case ‘story’ including actions and outcomes • An abstracted sequence of events
Explication of Structure and Context	Identify components of social and physical structure, contextual environment, along with relationships among them.	<ul style="list-style-type: none"> • Description of the structural entities, constituent parts, and contextual conditions existing in the case • Identification of the relationships among the entities • Explication of changes to the structure • Description of the resulting emergent properties
Retroduction	Identify and elaborate on powers/tendencies of structure that may have interacted to generate explicated events.	<ul style="list-style-type: none"> • Identification of a set of plausible candidate causal mechanisms • Logical and analytical support for the existence of proposed mechanisms linking the structure to events
Empirical Corroboration	Ensure that proposed mechanisms have causal power and that they have better explanatory power than alternatives.	<ul style="list-style-type: none"> • Analytical validation of proposed mechanism based on case data • Assessment of explanatory power of each mechanism relative to alternative explanations • Selection of the mechanism(s) that offers the best explanation
Triangulation & Multi-methods	Employ multiple approaches to support causal analysis based on a variety of data types and sources, analytical methods, investigators, and theories.	<ul style="list-style-type: none"> • Multiple theoretical perspectives • Multiple analytical and methodological techniques • Variety of data sources and types • Multiple investigators
Adapted from Wynn & Williams (2012:796)		

Table 3-2: Principles for Critical Realism Case Studies

3.4.2.1 Level of Analysis

In case study design, selection of the unit of analysis is imperative as it defines the boundary of the study, and informs in regard to the arena of knowledge contribution (Yin, 2009). In many instances the ‘case’ is treated as synonymous with the unit of analysis (Miles & Huberman, 1994). In this research the industries: the ‘Irish advertising industry’ and the ‘Irish retail grocery industry’ are the units of analysis. The research seeks to understand the influence of ICT on the evolution of these industries, thus providing the lens for studying the industries/units of analysis.

Researching the process of change requires multi-level analysis (Pettigrew, 1987, 1990, 1997): ‘[A]ctions are embedded in multiple levels of context’ and are mutually influencing (Pettigrew, 2012:1315). There is interaction between multiple levels of contexts, and in Pettigrew’s study of

the *'changing relative performance of firms'*, explanations were *'linked to higher higher levels of analysis, such as sector and political and economic change, and lower levels of analysis, such as the contests for ideas and power and influence inside the firm'* (Pettigrew, 2012:1315). Thus in studying the process of IE, attention needs to be paid to the macro environmental context the industry is embedded in, and the competitive environment of the industry, including the actions of firms. Additionally as noted by Cortada (2004:38), to understand the influence of ICT requires paying attention *'to the level of how this technology was used within a firm'*.

3.4.2.2 Case Selection

Pettigrew (1990: 275-276) provides the following guidelines in selecting research sites for comparative cases:

- (a) go for extreme situations, critical incidents, and social dramas;
- (b) go for polar types;
- (c) go for high experience levels of phenomena under study;
- (d) go for more informed sites to increase the probabilities of negotiating access.

The research was sponsored by the Ogilvy and Mather Group in Ireland. A desire to increase the understanding of the influence of ICT for the advertising industry provided a motive for the sponsorship of the research, and cases have the potential to achieve this i.e. case reconstructions *'can lead to the self understanding of a community'* (Mjøset, 2009:47). The inclusion of the advertising industry is a condition of the sponsorship.

The retail grocery industry provides a strong contrast to the advertising industry, as recommended by Pettigrew (1990). Additionally, the selection of the retail grocery industry provides the opportunity to complement the work by Dr. Jim Quinn, the supervisor of this PhD, and Dr. Helen Marks, both of whom have researched the evolution of the wholesale grocery industry in Ireland.

Cases should be chosen for their potential to illuminate the research objectives (Eisenhardt & Graebner, 2007; Flyvberg, 2006; Pettigrew, 1990; Thomas, 2011) and information-intensive industries provide a good exemplar for exploring ICT impacts, as these industries are likely to be significantly effected by their pervasive use of ICT (Crowston et al., 2001). The selected industries are information intensive, and both practitioner and academic literature assert that the industries have been significantly impacted by ICT, therefore the selected industries provide good exemplars for the research. The Table 3-3 delineates the case site selection criteria against Pettigrew's (1990) advised selection criteria.

The selection of the Irish advertising and Irish retail grocery industries as cases also contributes to redressing specific weaknesses identified in the literature: The majority of existing research relates to manufacturing industries (Audretsch, Klomp, & Thurik, 1997; Klepper, 1997; McGahan & Porter, 1997; Quinn & Leavy, 2004, 2005; Quinn & Sparks, 2007); and there is a strong bias towards US industries; Cortada (2006a) calls for non-US industry studies.

Selection criteria		Advertising	Retail Grocery
(a) and (c) high levels of experience of the phenomena, and good exemplars			
Information Intensive		Yes: A communications industry. Significant data mining	Yes: Data driven supply chain, Significant data mining activity.
Institutions related to Digital ICT reflecting the significance of the technology for the industry		Yes: Institutions focusing on educating professionals in digital ICT for the industry. IAB – Interactive Advertising Bureau	Yes: GS1 Ireland: Responsible for promoting the development and use of bar coding, scanning and EDI ECR – Efficient consumer Response
Literature supports view that industries will be good exemplars		Yes: Both Academic and Practitioner. e.g. The emergence of ‘ <i>internet-based advertising</i> ’ is cited as a ‘ <i>gale of creative destruction</i> ’... for the advertising industry (Evans, 2009:37).	Yes: Both Academic and Practitioner. e.g. Enabled by digital technologies such as POS and EDI ‘ <i>[n]o segment of the American economy has changed so much because of information technology than retail</i> ’ (Cortada, 2004:258)
(b) Strong Contrasts			
Industries Provide a strong contrast to each other for comparative case research	Industry Category	Service	Distribution
	Customer base	Business to business	Business to consumer
	Primary Product	Creative communication	Physical goods
(d) Access considerations: The supervisor of the researcher has a network of contacts in both of the selected industries, this alleviated the researchers concerns in this regard			

Table 3-3: Case Selection Criteria

Ireland as an open market is regarded as a representative in many ways of other Western markets, increasing the relevance of the research to other geographic locations, (although country specific context still matters). The scope of the industry research was limited to one country to respect feasibility challenges. However, the cases acknowledge global influences on the Irish industry and indeed recognises an influx of international players.

3.4.2.3 The Time Period

The industry studies focus on the time period 1970- 2016⁵³ and 1959-2016 for the advertising and grocery industries respectively, chosen to capture the beginning of the use of computers in the

⁵³ Context information is provided for the industries prior to this date.

industries⁵⁴. (This agrees with the logic of Pettigrew choosing 1965 as his start date for ICI as it coincided with the approximate beginning of the use of OD within the company (Pettigrew, 1985a).) It also provides sufficient time for patterns in both continuity and change to be revealed as advised by Pettigrew (1997, 2012).

3.4.2.4 Industry Boundaries

Some of the difficulties in defining industry boundaries were discussed in the literature review, these included that boundaries change dependent on the perspective taken, and additionally that the boundaries of industries change over time. Wider rather than narrower boundaries⁵⁵ are advised for full structural evolution analysis (Malerba & Orsenigo, 1996; Quinn & Murray, 2009), and several prior contextualist based IE studies have done this (e.g. Beere, 2015; Hanchar, 2011; Marks, 2015; Quinn, 2002). The boundaries for the Irish advertising and Irish retail grocery industry were guided by standardised activity classifications developed by bodies such as the Irish CSO, OECD, Competition Authority (for retail grocery) and IAPI (for the advertising industry)⁵⁶.

The boundaries of both industries changed across the research period with new services provided by players and new types of firms operating in the industry. This is recognised in the case studies, and is a research finding.

Retail Grocery Industry

The industry is primarily engaged in selling ‘grocery goods’ to consumers. ‘*Grocery goods*’ encompass ‘*food and drink for human consumption and household necessities*’ (Competition Authority, 2008) (see [Appendix D](#) for details). The main categories of competing ‘strategic’ groups across the case period were: multiples (including discounters), wholesaler operated symbol groups, co-ops and independents. RGDATA are the representative body of retailers in Ireland and the vast majority of independent retailers (including symbol group retailers) are members.

Advertising Industry

There are two key services provided by the industry: devising creative communications, and the media placement of the creative communications. Across the case these services came to be supplied by two different types of agencies. Creative advertising agencies devise communications (ads) to solve advertisers’ (clients) problems or achieve the advertisers’ objectives. The ads are communicated via media and media agencies devise media placement strategies and purchase media ‘space’ to communicate the ‘ad’ most effectively to target consumers. (See [Appendix E](#) for a

⁵⁴ The grocery industry date is also pitched to capture the takeoff of the supermarket revolution as this is a key contextual factor.

⁵⁵ Beyond directly competing firms

⁵⁶ RGDATA the retail grocery equivalent represents the independents and many of the major grocery players are not members.

NAICS definition). IAPI are the trade association for the advertising industry in Ireland and the case focused on these agencies throughout the research, as all significant agencies tend to become IAPI members, and there is very limited data available in regard to non IAPI agencies. The actual execution of the research is outlined in the next section.

3.5 THE EXECUTION OF THE RESEARCH

'Collecting and analysing comparative and longitudinal data on change process is a highly complex social and intellectual task' (Pettigrew, 1990:274).

3.5.1 Data Collection

Yin (2009:114-125) advocates the adherence to three principles of data collection for case studies

- Using multiple sources of evidence
- Creating a case study database
- Maintaining a chain of evidence

These activities mitigate threats to validity and aid in establishing the *'reliability of the case study evidence'* (Yin, 2009:114). Yin's approach has a positivist flavor; however, the principles do not contradict a critical realist perspective. The researcher implemented these principles and this is discussed below along with detailing the actual data collection.

Sources of data for case studies can include: documentation, archival records, interviews, direct and participant observation, questionnaires, and physical artifacts (Eisenhardt & Graebner, 2007; Yin, 2009). Evidence can span qualitative and quantitative data (Eisenhardt, 1989). The case studies were built from documentation, archival and interview data.

The archival and documentary evidence included: government statistics and reports, articles from academic journals, books, trade association publications, trade magazines, newspaper articles⁵⁷, web pages and some proprietary documentation⁵⁸. It is noted that the collection of documentary data can reflect selected survival bias (Pettigrew, 1990; Yin, 2009). Documentary evidential support is essential for retrospective longitudinal case studies (Pettigrew, 2012) and data was gathered for both industries spanning more than 50 years, focusing on key industry events and ICT technologies. Contextual research necessitates the collection of data from different levels of analysis (Pettigrew, 1990), and data was gathered from macro environment, industry, trade

⁵⁷ Over 700 documentary pieces were consulted for each case study. Books about the industry or companies in the industry, or written by industry members, company websites were also consulted. Given the purpose of some of the government reports in retail grocery industry, (industry investigations) these may be considered as primary data (note precedent in Dempsey, 2014).

⁵⁸ From Ogilvy & Mather and some interviewees. For example Frank Young provided access to the Wilson Hartnell Agency Magazine.

association, strategic group, firm, individual and technology levels. Gathering sufficient evidence to build a narrative was an intensive and time consuming endeavour.

'The interview is one of the key tools for the qualitative researcher' (Bryman & Cassell, 2006:41), and primary data was collected through a number of in-depth interviews. Interviews for case studies have been described as 'guided conversations', requiring fluidity to follow the *'need of your line of inquiry'* while maintaining a conducive conversational atmosphere (Yin, 2009:106-107). The interviewer also needs to be open-minded and flexible to recognise and benefit from previously unconsidered themes/paths that may emerge (Doody & Noonan, 2013). Interviews can provide 'rich empirical data', provide insights, be shortcuts to understanding circumstances surrounding events, and suggest new sources of data (Eisenhardt & Graebner, 2007; Yin, 2009). However, interview data has also been criticised as *'presenting biased views and retrospective sensemaking'* (Eisenhardt & Graebner, 2007:28). Using multiple sources of evidence mitigates against this risk (Eisenhardt & Graebner, 2007; Yin, 2009), including other interviewees and documentary evidence.

Strict ethical guidelines were adhered to for this research. For interviews three ethical considerations are paramount: informed consent, confidentiality and consequences (Kvale, 1996). In advance of each interview an email explaining the purpose and the nature of the research was sent to the interviewee, and this was revisited at the beginning of each interview. Assurances were given in regard to the researcher's adherence with interviewee requests to exclude material from publication. All interviews were recorded with the permission of interviewees.

Acclimatizing interviews were done in the advertising industry and the researcher spent a week in the Ogilvy & Mather office. This aided in building the researcher's understanding of the industry and in forming a nascent perspective of the influence of ICT in the industry⁵⁹. An acclimatizing interview in the retail grocery industry provided a whistlestop overview of the role of ICT in supporting industry processes, and was also invaluable. Material from these interviews informed and was included in the case studies.

The interviews were semi-structured, with open ended questions, which were adapted to the experience of each interviewee and based on the accumulating data set. Prior to doing the interviews the researcher had collated a significant amount of documentary evidence for the industries⁶⁰, which informed the direction of the interviews, and the selection of interview informants. The interviews enabled the researcher to deepen their understanding of the

⁵⁹ It was also a good opportunity to build the researcher's interview skillset.

⁶⁰ Aside from the preliminary interviews at Ogilvy & Mather and at BWG to familiarize the researcher with the industry and to act as a pilot research study.

documentary data they had collated, refocused the researcher on previously neglected areas⁶¹ and prompted further gathering of documentary evidence.

Interviews took place at various locations⁶² chosen by the interviewees. The duration of the interviews spanned from just over an hour to just under 3 hours⁶³. A brief memo document was created by the researcher directly after each interview to capture salient impressions. All interviews were transcribed. During the acclimatizing interviews in the advertising industry the researcher noted a discomfort⁶⁴ in some interviewees in regard to the arena of ‘digital’. This experience informed both the interview requests and questionnaire design. The researcher adapted interview requests to reduce the risk of refusals due to ‘anxiety’ in regard to digital knowledge, and this can be deemed to have worked well.

The researcher was aided in arranging a number of valuable interviews in the industries through her supervisor and through a college colleague⁶⁵. The researcher contacted additional potential interviewees through social media, email and on 2 occasions through phone calls, and some interviewees recommended her to other interview candidates (i.e. ‘snowballing’). Each interview request was personalised based on information gathered about each interviewee⁶⁶. Possibly because of the tailoring and the interviews being one off-requests, and aided by the reputation of Trinity College Dublin, the responses were almost overwhelmingly positive⁶⁷. A table of interviewees is included in [Appendix F](#), comprising 8 early interviews and an additional 15 interviews in the advertising industry, and 1 early interview, followed by 7 more interviews in the retail grocery industry. The retail grocery industry had a richer stream of documentary evidence in regard to ICT use than the advertising industry⁶⁸. The interviews illuminated, enriched and complemented the collated documentary evidence, in both industries, but proved essential in building-out the advertising industry data.

Triangulation of evidence, (Eisenhardt, 1989; Wynn & Williams; 2012; Yin, 2009) was achieved in this case study through the use of multiple sources of data⁶⁹, as discussed above. Triangulation

⁶¹ E.g. the media function in the advertising industry

⁶² Place of business, coffee-shops or their homes

⁶³ Interviewees were presented with a small box of chocolates to thank them. Additionally a follow up thank-you email was sent.

⁶⁴ Along the lines of ‘I know nothing about technology/digital’

⁶⁵ Dr. Jim Quinn and Dr. Helen Marks. Additionally, the writer Hugh Oram was particularly helpful and provided several introductions to interviewees.

⁶⁶ Including articles by, or about the interviewee and their LinkedIn profiles.

⁶⁷ Both phone call interview requests were successful. There were 4 failures to respond to interview requests, and 1 refusal accompanied by a referral to what was deemed a more appropriate person, this in itself was insightful.

⁶⁸ Since its initial adoption digital ICT has been central in the provision of services in the retail grocery industry, whilst until the take-off of online advertising it has played a more peripheral role in the advertising industry. This forms part of the research conclusion.

⁶⁹ Other potential paths include: multiple investigators, multiple methods and theory triangulation.

increases the workload of the researcher, but strengthens validity and reliability, through providing convergence of evidence.

The principle behind maintaining a case study database is to enable other researchers to review the case evidence and not be solely reliant on the case reports (Yin, 2009). In this way the case database augments the reliability of the case study (Yin, 2009). The researcher has organised the underlying ‘raw’ case data for each case in two separate computer folders⁷⁰, which store the collected documentation (including researcher memos) along with the original interview recordings and their transcripts. Two versions of the case narratives⁷¹ are also included in the database. Additionally the raw data is saved in two EndNote folders, with records including researcher derived key words and abstracts of the content.

A chain of evidence must be viable between conclusions of a case study report and the basis of those conclusions (Yin, 2009). This can be achieved through sufficient and appropriate citations in a case study report, enabling the ‘raw’ data i.e. evidence to be retrieved from the case database. Providing sufficient detail of the actual research process also supports this aim.

3.5.2 Data Analysis

‘[T]he most serious and central difficulty in use of qualitative data is that methods of analysis are not well formulated...’ (Miles & Huberman, 1994:2).

There is no one best way or straight path for qualitative data analysis; however, the researcher endeavours in this section to make explicit her process during this research. Data collection and data analysis should not be considered as separate tasks, but should be concurrent activities, enabling the researcher to ‘*progressively focus*’ data collection and ‘*observations*’ and ‘*test..emerging conclusions*’ (Maxwell, 2009:236). Sensemaking (through analysis and reflection) should be done after each phase of data collection (Miles & Huberman, 1994). The research process was iterative and cycled repeatedly between data collection, data assessment and further data collection. Early assessment of and reflection on the data guided further data gathering.

It is recommended that qualitative data analysis encompasses three strategies: categorizing; connecting; and memos and display (Maxwell, 2009). This reflects the need for coding to evolve. These strategies can be embedded in Pettigrew’s (1997:344) recommended iterative cycle between deduction and induction that could encompass: *‘the core question of the study → related themes and questions → preliminary data collection → early pattern recognition → early writing → disconfirmation and verification → elaborated themes and questions → further data collection → additional pattern recognition across more case examples → comparative analysis → a more*

⁷⁰ And in several categorized subfolders within these.

⁷¹ An initial very detailed lengthy study and a very condensed version for this thesis.

refined study vocabulary and research questions'. This is not a prescriptive process but illustrates a need for repeated cycling between induction and deduction, data collection and analysis.

The researcher carried out manual analysis of the data, and did not use computer-assisted qualitative data analysis software (CAQDAS) such as NVivo etc. Although software can be extremely helpful, it does not actually do the analysis (Yin, 2009). There is no substitute for knowing the data indepthly and doing some really hard thinking. Abductive reasoning⁷² can emerge from cycling between iterations of induction and deduction (Klag & Langley, 2013). Pettigrew (1997:344) identifies a need for '*conceptual ability*' for this creativity which is a crucial component of analysis, and no computer software can do this.

This researcher chose manual coding in order to keep close to the data. EndNote proved to be very useful through word searches for locating relevant stored data as new themes emerged. Microsoft Excel was used to create tables and organise data. Colour codes and comments (equivalent to Miles & Huberman's (1994) 'marginal remarks') were used in Microsoft Word and on printouts of the interviews to chunk and categorise data. Sorting data by different themes and categories, and trialing data displays is recommended (Miles and Huberman, 1994) and A3 paper was used to create numerous mind maps and diagrams to envisage relationships between data.

'[C]onceptual frameworks and research questions are the best defense against overload'; however, there is also a requirement to be open to discovering the unexpected (Miles & Huberman 1994:55). The researcher had developed a conceptual framework and research questions, as outputs of the literature review. These guided the collection and analysis of data, and were used to inform initial codes; however, mindful of Pettigrew's (1985a:50) advice to '*let the data speak*' the researcher was open to the new codes that emerged inductively from the data.

3.5.2.1 Phase 1 Creation of Chronology from Documentary Data

In this phase for each industry case study, data was collated from documents, and the early interviews. Keywords (early coding) and short memos in EndNote⁷³ were created for each document, including the interview transcripts. Pan & Tan (2011) recommend a temporal bracketing strategy to develop clarity when studying a phenomena undergoing evolution. To this end the researcher created a chronological timeline table which captured relevant contextual, industry and ICT activities for each industry⁷⁴. This table was built gradually as the researcher collected data from across the researched period and was added to throughout the project (see excerpt in [Appendix G](#)).

⁷² This corresponds to retroductive reasoning in critical realism (Wynn & Williams, 2012).

⁷³ A referencing management software application.

⁷⁴ The individual cases were in the main completed separately advertising first and then retail grocery. However, some notes were made for the other industry as by happenstance relevance/insights emerged in articles.

This phase was very time consuming as there was considerable effort required to collate sufficient data spanning the longitudinal case periods, and within this phase there were iterations as the researcher went back again to earlier dates seeking further data/clarification when the significance of information was not realised until the data had been reflected upon (this continued throughout the research). To mitigate against data overload and to direct further data gathering, Miles & Huberman (1994) identify the need to condense and analyse data after each round of data collection. Consequentially, the researcher produced brief narratives (memos) structured around what appeared to be key industry events/changes or significant ICT solutions. ‘Products’ from this phase included preliminary identification of key ICT for the industries, key empirical industry events and contextual changes. Additionally this phase also included a record of industry dynamics in terms of firm entry, exit, merger and takeover activities⁷⁵, (this data is presented in tables in the case study chapters e.g. Table 5-20: Entry/Exit/Acquisitions 1997-2016).

3.5.2.2 Phase 2 Interviews and Initial Analysis of Transcript: Expanding Data Coding

The products from ‘Phase 1’ were used to inform the questions for interviews and further documentary data collection. As advised by Pan and Tan (2011) the timeline was useful to refer to in interviews⁷⁶. Documentary evidence gathering continued throughout this phase as the researcher found new sources, or recognised the importance of events through insights from the interviews, and through reflection. The interviews enriched the documentary data, and enhanced the researchers understanding of the industries, brought to life the content of the documents, and provided insights that could not have been gleaned from the documentary evidence e.g. power shifts within ad agencies. In the advertising industry, the interviews were essential as documentary evidence directly relating to ICT was a rare and valued find⁷⁷ (until the emergence of online in the industry). The interviews also allowed the researcher to sanity check her emerging ideas such as her recognition of key industry outcomes and important technologies in the industries⁷⁸.

Interviews were transcribed to Microsoft Word, and printed and sections were highlighted and comments were added, including codes (either theoretical, empirical and/or descriptive such as power, skills, the rise of the accountants etc. See [Appendix H](#) for an example). New codes were added as they emerged from the data. Brief memos and key words for each interview were added to EndNote, for sensemaking and as it could not handle the full length transcriptions⁷⁹. The researcher

⁷⁵ These ‘products’ were added to throughout all phases of the analysis process

⁷⁶ The researcher created tailored timelines for each interview, with highlight dates and events from the industry and specific companies

⁷⁷ This reflects the industry attitude to digital ICT, as reflected in the case analysis and conclusion

⁷⁸ By asking the interviewee what they perceived as the most significant changes in the industry etc.

⁷⁹ Except as attached files, but the content of these are not searchable in endnote.

began to collate relevant excerpts of the interviews and documents under category headings in an analysis file for each industry⁸⁰.

3.5.2.3 Phase 3 Creating Case Narratives

'Writing is thinking, not the report of thought' (Miles & Huberman, 1994:101)

Writing is a form of analysis (Miles & Huberman, 1994), and the process of writing the case narratives enabled the researcher to increase her sense of the data and her focus on the overall shape of the evolution of the industry and the story of ICT in each industry. The first versions of the cases were very detailed and rich in context and empirical evidence, but were overly long for the purpose of this thesis⁸¹. However, they proved to be a valuable exercise in building the researcher's mastery of the empirical data, and in enabling the researcher to recognise patterns and to develop insights. As part of this process several tables were created organising data, such as the diffusion of each key ICT in the industries (see [Appendix O](#) for the advertising industry and [Appendix P](#) for the retail grocery industry, additionally relevant tables were included in the case study chapters). It is recognised that multiple-case research creates challenges in regard to 'spatial constraints' (Eisenhardt & Graebner, 2007). The first versions of the case were periodized around key industry events e.g. media separation in the advertising industry. At the end of this phase the cases were rewritten and were reduced in length⁸² and periodized by key ICT diffusion phases in the industries. The researcher focused on the requirements of addressing the research questions to produce these revised shortened case narratives.

3.5.2.4 Phase 4 Within Case Analysis and Cross Case Analysis

'Everything depends on the creative leap' (Mintzberg, 2005:369)

Within case analysis was produced for each case, in accordance with main categories that corresponded to the sub research questions. Prior to this the literature chapter was reread to become resensitised to the literature. Then the case narratives were reread and comments were inserted, and the researcher worked with the data using various displays, organising it in different ways and summarising it as advised by Miles & Huberman (1994) (see the Tables and Figures in Chapter 6 and see [Appendix M](#) and [Appendix N](#) for examples). The conceptual framework first presented in Chapter 2 was leveraged and updated for each case, aiding in the process of, and reflecting the outcomes of data analysis. Discussing the case data and emerging ideas was also helpful. All are methods of deepening the researcher's knowledge of the data, and aid the researcher to 'see'

⁸⁰ Excerpts could appear under more than 1 heading.

⁸¹ They also serve as a data repository, and were referred to during later analysis and are anticipated to be useful in the future.

⁸² Although they were still too long for inclusion in a thesis, it can be 'painful' for a researcher to let go some of the detail, and richness of material, but this is also part of the analysis process.

relationships and patterns and understand the data in different ways. The researcher is creating ‘*a dialogue between ideas (theory) and the evidence (data)*’ (Miles & Huberman, 1994;144, paraphrased). Within case analysis reports were created.

The cross-case analysis entailed the researcher comparing the patterns that had emerged in each industry across the sub research questions, exploring the drivers of the adoption of ICT and patterns of diffusion of ICT in the industries, and the outcomes of ICT influenced IE. Correspondance and divergence in patterns were exposed and considered. Writing the cross case analysis included blending/fusing the conceptual frameworks which had emerged from the within case analysis. This phase of the analysis led the researcher to review additional literature.

The research conclusions are the the ultimate products of the analysis. ‘*[Q]ualitative research is expected to deliver some kind of conceptual insight beyond the data themselves*’ (Klag & Langley, 2013:150). A conceptual leap or more likely a series of leaps are required to bridge the empirical and the theoretical, abductive reasoning is required (Klag & Langley, 2013). Fine & Deegan (1996) suggest that insight(s) emerge gradually over time through ‘the twists and turns’ of the research journey. The researcher’s experience aligns with this. These insights or inspirations began as hunches that ‘this’ was important, with the researcher not yet understanding why. These instincts encouraged the researcher to continue, to loop back to the data, and to explore further. It was a cumulative iterative process, gradually building realisations.

Although the phases above are presented as distinct separate steps in reality there was spillover across the the phases, and data gathering continued across all phases, just as analysis and writing occurred in all phases. The researcher made notes relevant to ‘later’ phases as they occurred to her, and each phase fed both forwards and backwards. Whilst guided by the conceptual model the researcher sought to allow the data to speak and the conceptual model was amended throughout this phase. Data analysis prompted the search for additional literature. The cumulative outcome is the research conclusions but a circuitous route was followed to arrive there. Figure 3-4 provides a highlevel representation of the overall process.

3.6 CONCLUSION

The chapter began with an overview of philosophical paradigms in social science research, through contrasting the extreme positions of the subjectivist and objectivist. The appropriateness of the selection of a contextualist methodology and the adoption of longitudinal comparative case studies for addressing the aims of the research, was explained. Other key research design decisions were justified, such as the selection of the specific industries, the defining of the industry boundaries and the time period researched. Quality issues for the research were assessed and validity threats were considered, and managed. Lastly the execution of the research was described. The following 2 chapters present the case narratives.

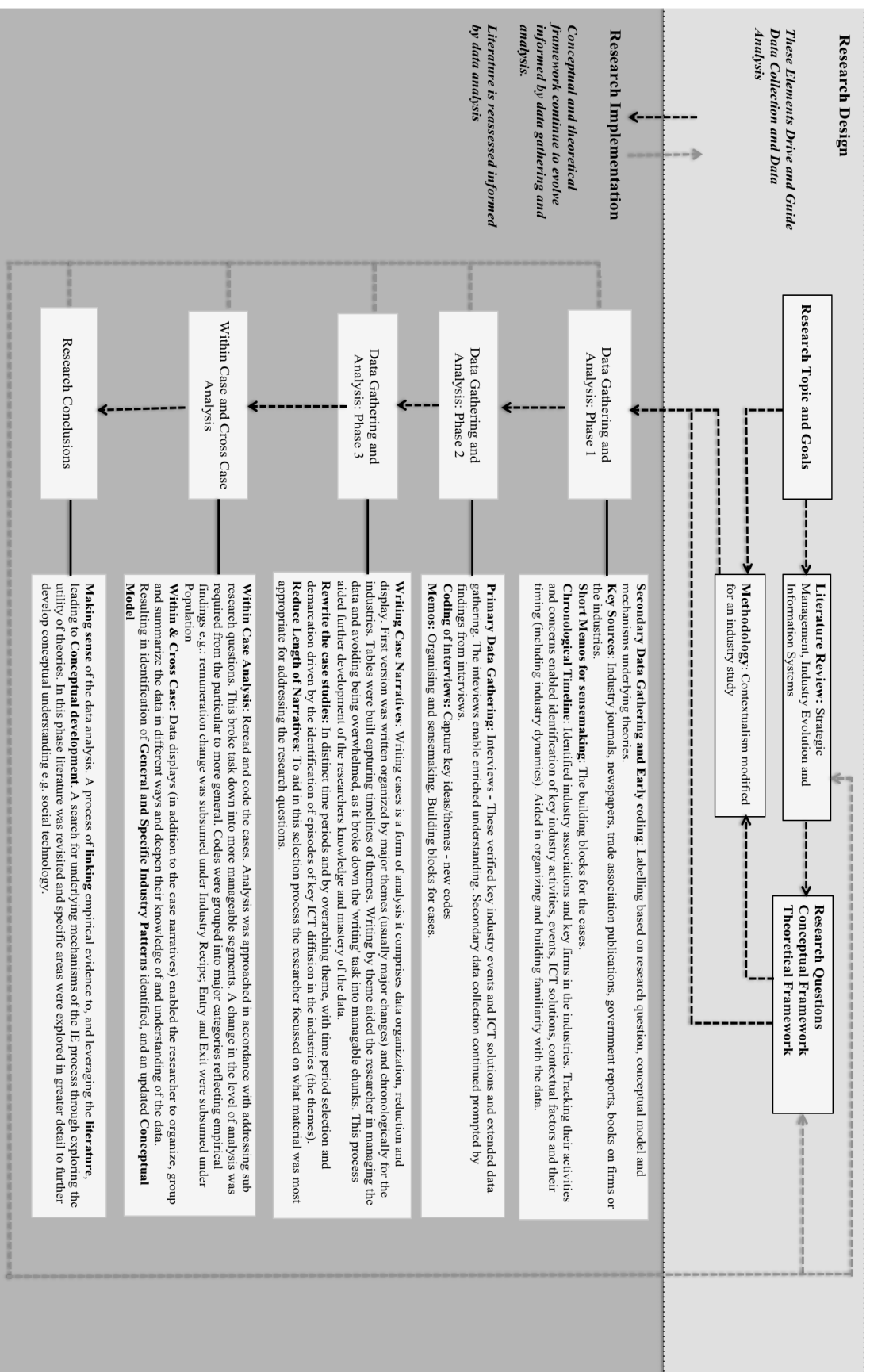


Figure 3-4: High-level Representation of Data Collection and Analysis Process

CHAPTER 4 CASE STUDY: IRISH ADVERTISING INDUSTRY

4.1 INTRODUCTION

This chapter presents the first of two case narratives. It tells the story of the influence of digital information and communications technology (ICT) on the Irish advertising industry 1970-2016. The emphasis is on tracking the adoption and use of ICT in the industry and its influence on the industry structure. It reveals that ICT became embedded in industry processes within firms and across supply chains. Table 4-1 provides some indication of the significant change that occurred.

Year	Dominant Ownership	Number of IAPI Agencies	IAPI Agency Classifications	Number of IAPI Agency Employees	IAPI Agency Billings Adjusted for Inflation - €millions
1973	Irish Family Businesses	<u>34</u>	<u>Full Service</u>	<u>957</u>	<u>€218.1M</u>
2015	Global Marcom Groups	29 20 <u>49</u>	Creative Agencies Media Agencies <u>All Agencies</u>	1,095 516 <u>1,611</u>	€116.4M €639.5M <u>€755.9</u>
<i>Billings is the term traditionally used for revenue in the industry. Full Service and Media agency billings includes the cost of media for clients.</i>					

Table 4-1: Structural Changes in Irish Advertising¹

Across the researched period much changed in the industry including:

- The industry shifted from being characterized as Irish and family owned, to become dominated by global marcoms groups. None of the main agencies from the beginning of the case survived.
- The provision of the two key advertising services separated: agencies transformed from being full service agencies to become demarcated as creative or media agencies.
- Advertising agencies became marketing communications agencies, as advertising lost its salient dominance in the marketing communications mix.
- A new medium emerged ‘online’, along with a corresponding new type of agency ‘digital’. Traditional agencies were forced to engage with online as it grew to challenge ‘traditional’ media.
- Agencies provided new services. Styles of advertising evolved and brand management became a central concern. Many skillsets changed with some becoming defunct, whilst new skillsets needed to be developed
- Clients developed marketing expertise, and became less reliant on agencies. Clients also became more finance driven which increased focus on measurability and costs.

- Industry standard commission rates disappeared, to become competitively negotiated. There was a change in the basis of the majority of earnings for creative agencies.
- The pace in the industry increased, as ICT became progressively more entwined in industry processes.

The chapter begins with a contextual section covering the emergence of ICT in business use, and its nascent use in the global advertising industry. Then the Irish advertising case begins with an overview of the industry in 2016, before presenting the equivalent state of the industry in the early 1970's when the case begins. The narrative is divided into three time periods that align with shifts in the use/application of ICT in the industry. The first period 1970 – 1986 captures the initial adoption of ICT. The second period encompasses 1986 – 1994 when ICT became endemic in the industry including in industry specific processes. The third period 1994 – 2016 aligns with the adoption of online technology in industry processes and the slow emergence followed by rapid take-off of digital advertising. The chapter ends with a summary section presenting some highlights from the narrative.

4.2 DIGITAL INFORMATION AND COMMUNICATIONS TECHNOLOGY

A general context for ICT is provided through a table featuring important ICT development milestones in general and for the researched industries in [Appendix C](#).

4.2.1 Emergence of Digital ICT Use Globally and in Ireland

Digital computers were initially developed for military purposes, but before long were adapted for use in government administration² and business operations. Early business applications included managing payroll, production and delivery schedules, recording sales and general business administration tasks. The LEO (Lyons Electronic Office), cited as the first business computer, was used by Lyons in 1951 in the UK to improve office efficiency (including production and delivery schedules)³. It was designed to process vast numbers of transactions and swiftly produce management information⁴.

When business computers first emerged they were too expensive to be considered for use in Ireland. Their use in very large US and UK businesses resulted in further developments of computer technology. Improvements in ICT function, usability, support and infrastructures⁵ along with falling costs of ICT solutions, made the adoption of ICT more accessible and a more attractive investment, i.e. the emergence of computer bureaux, software companies⁶, the development of mini and then microcomputers. It was the combined power of complementary developments that led to ICT's extraordinary impact. In Ireland the emergence of technology suppliers and computer bureaux opened the use of computers to a wider array of companies. Table 4-2 provides a brief overview of early computer adoption in Ireland.

Year	Event	Company
1957	1 st company to get a computer in Ireland	Irish Sugar Company (State owned)
1962	1 st computer bureau in Ireland	ICT (International Computers and Tabulators)
1967	Irish Computer Society established	Comprised of companies using computers and suppliers ICT and IBM
1968	1 st Computer software company in Ireland	System Dynamics (offered technical consulting and bespoke programming, it was comprised of ex-IBM staff)

Table 4-2: Irish Context for the Initial Adoption of Computers⁷

At the beginning of the 1960's the term data processing was associated with the use of mechanical '*punched card accounting machines and desktop calculators*'⁸. In the early 1970's most Irish companies were not large enough to own a computer⁹, so they used time sharing schemes on the computer company's own computer¹⁰. By 1970 there were eight computer bureaux operating in the Dublin area offering services such as accounting and billing¹¹.

4.2.2 Emergence of Computers in the Advertising Industry Globally

Market research is likely to have been the first use of computing of specific relevance to the advertising industry¹². Cited as the 'research revolution', computers were used to '*speed and expand*' market research in the '*use of test markets and new product concept testing, and ...work ...on measuring advertising effectiveness*'¹³. The availability of increasing amounts of market research data provided a stimulus to advertising agencies to adopt computerization.

Big agencies in the US were the first to adopt digital computing. In 1962 within weeks of each other several agencies announced their procurement of or intent to use a computer¹⁴. Computers were adopted by agencies with a twofold purpose: to save money through their use in agency administration tasks, and to save money for their clients through more effective media buying¹⁵. There was exuberance within the industry where it was expected that computers would produce the optimum media allocation and spend for every client, and that within a few years the industry would be able to achieve the holy grail of advertising, i.e. precise measurement of advertising effectiveness demarcated from all other market factors¹⁶. However, some agencies suggested that the advantages of computers for the industry were being overstated¹⁷.

In 1964 the primary area of interest for computers usage by the agencies was media management¹⁸ and market research¹⁹. Young & Rubicam (Y&R) developed their own media selection system in 1962²⁰, and in 1968 three ex-Y&R employees developed the Telmar system, a specialist media system for use by ad agencies, advertisers and media companies²¹. In 1967 Donovan Data Systems (DDS) offered the first off-the-shelf media selection solution for advertising agencies²². Subsequently they launched 'Spotpak' (1972) for TV buying, 'Printpak' (1974) for print buying, production software 'Prodpak' and accounting software 'Accpak' (both 1977)²³.

Buying and maintaining a computer was a significant investment. The continuous investments required in hardware, software and labour meant that agencies' envisaged operational cost savings were not realized²⁴. In 1969 Grey Advertising and Bates Advertising set up subsidiaries offering computer services to non-clients²⁵ to provide a revenue stream to offset against their investments in computer capabilities²⁶.

The advertising industry was regarded as being a relatively late adopter of computing technology²⁷. By 1968 in the US there were 25 ad agencies with computer facilities²⁸, most of the largest and an increasing number of medium sized advertising agencies owned or shared a computer²⁹. Agencies were advised that the electronic processing of data was an inevitable trend and therefore they would need to acquire knowledge of computers³⁰. However, they were also advised not to currently consider getting a computer unless they had revenue exceeding US\$40m per annum³¹. Adhering to this advice would effectively exclude Irish agencies from computer ownership as the total billings of the entire industry for 1968 was IR£9.8m³².

4.3 DIGITAL INFORMATION AND COMMUNICATIONS TECHNOLOGY AND THE IRISH ADVERTISING INDUSTRY 1970-2016.

4.3.1 Advertising

Advertising 'should make you money'³³

Traditionally advertising is defined as *'any paid form of non-personal presentation and promotion of ideas, goods or services by an identified sponsor'³⁴*. It is a *'mass-mediated action to inform or persuade individuals to undertake an action associated with a product or service'³⁵*. Advertising is a one to many communication, where the communications channel(s) is paid for rather than owned or earned. Advertising comprises two key components the message (called the advertisement or ads) and the medium (the channel used for communication). The purpose of advertising is to effectively communicate to an audience to sell a product/service/idea/ideal.

4.3.2 Industry Definition

A simplistic representation of the advertising industry supply chain would depict: advertisers, advertising creative agencies, media agencies, media and consumers (see Figure 4-1).

Advertisers are the customers and source of business for the industry. Creative agencies devise communications (ads) to solve the advertiser's problem or achieve the advertiser's objectives. The ads are communicated via media, and media agencies devise media placement strategies and purchase media 'space' to communicate the 'ad' most effectively to target consumers. Media are suppliers to agencies and advertisers. Media includes press (newspapers, magazines, journals), television, radio, outdoor (posters, buses, bus shelters etc.), cinema and online/interactive (internet, mobile, online TV, online radio). Consumers are the audience for advertising.

This represents a gross simplification of the industry value chain, it excludes market research firms, production companies, technology firms, the myriad of media related intermediaries³⁶ that have emerged for online advertising etc. and hides the multitude of overlapping communication services now provided by advertising agencies. Indicative of agency and industry boundary changes across the case, the advertising industry has become the marketing communications (marcoms) industry.

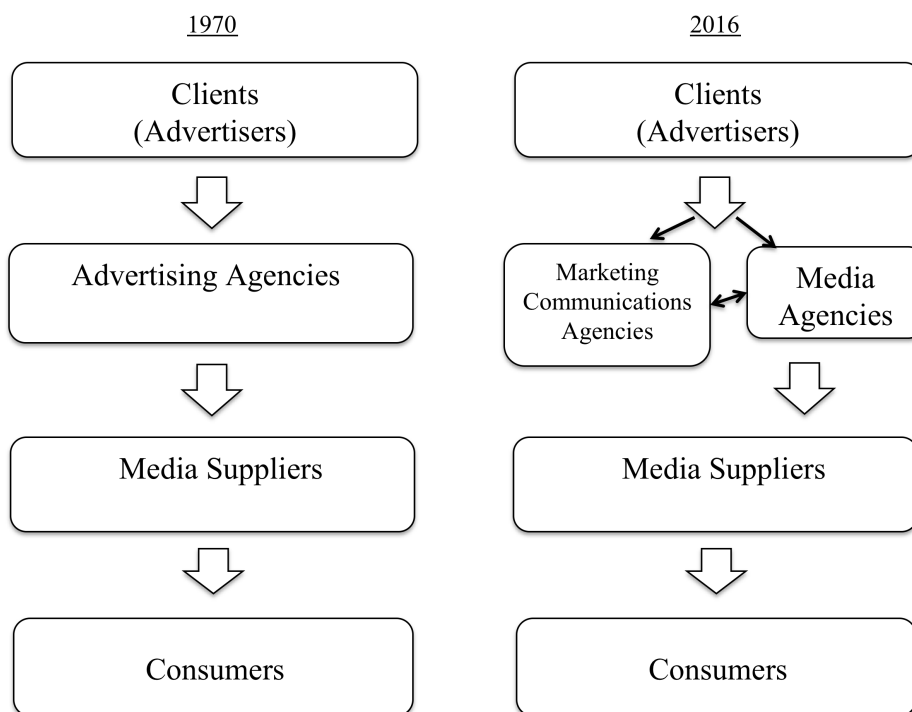


Figure 4-1: Simplistic Representation of Industry Supply Chain

4.4 THE ADVERTISING INDUSTRY IN 2016

4.4.1 Global Synopsis

Globally the industry is dominated by six giant marcoms groups which began to emerge in the 1980's³⁷: WPP, Publicis Groupe, Dentsu, Omnicom Group, IPG (Interpublic) and Havas³⁸. At the other end of the spectrum there is a burgeoning number of small '*digital, app and social media agencies*'³⁹. The big six are holding companies for numerous operating companies and sub-brands that provide services across the array of clients' marcoms needs⁴⁰. The giants have been on an acquisition spree for several years, buying up agencies and digital specialists⁴¹ including tech companies to secure their place in the growing digital advertising arena. WPP the largest group shifted towards pursuing a vertical acquisition strategy buying up digital technology providers in their supply chain (such as AppNexus the adserver) in addition to the horizontal acquisition strategy that made WPP the giant it is today⁴².

New competitors have entered the industry and consulting firms such as Deloitte, Accenture, IBM, and software companies have been acquiring companies in the digital marcoms domain⁴³. The dominance of Finance departments in client companies means that cost has become an increasingly important criterion in clients' selection of an agency⁴⁴. Finance has also increased its dominance within agencies, and across the case period a shift in power occurred, *'[w]ith the previously mollycoddled creative egos [now] playing second fiddle behind managing directors and finance directors...'*⁴⁵.

4.4.2 The Industry in Ireland

The Institute of Advertising Practitioners in Ireland (IAPI) is the trade association for Irish advertising agencies. In 2015 there were 54 IAPI registered agencies employing 1,611 full time staff. The agencies were classified as either: Creative, Media, Digital or Full Service⁴⁶. The industry is dominated by the global marcoms groups⁴⁷ many owning an array of agency types, and frequently owning directly competing agencies within the Irish industry. Thus agencies that are part of the same global group *'compete with daggers drawn for business'*⁴⁸.

In 2015 total billings were €116m for the creative agencies and €640m for media agencies⁴⁹. Table 4-3 displays published creative and media agency earnings and profits, ordered by decreasing revenue values⁵⁰. A few firms dominate earnings: it's estimated that 6 firms take 80% of the creative agency revenue, *'which doesn't leave a lot for the other agencies'*⁵¹.

4.4.3 Array of Services Provided by Advertising Agencies

Ad agencies seek to provide fully integrated marketing communications (marcoms) for their clients. The global groups operating in Ireland offer the spectrum of services through having an array of agencies specializing in different marcoms disciplines. Whilst smaller indigenous companies offer multiple services within one company e.g. creative agency 'Boys and Girls' offers through the line services *'making above-the-line, below-the-line, through the-line, on-line and off-line communication for brands'*⁵². Rather than selecting one agency to provide their total communication needs, clients generally select agencies on an 'a la carte' basis to provide the required elements of their marcoms mix. Clients expect all the selected agencies to co-operate to provide the best total communication solution for the brand, despite it being natural for each agency to try to gain the largest share of the budget for their element of the marcoms mix⁵³. Recently there have been signs that clients are moving towards grouping different marcoms together in awarding business to agencies⁵⁴.

	Agency	Revenue €millions	Profit/loss € millions	For Year Ending	Int'l Affiliations
Creative Agencies	DDFH&B	24.4	3.38	31-Dec-13	WPP (2)
	Ogilvy & Mather	21.78	1.66	31-Dec-13	WPP
	Irish International	19	2.52	31-Dec-13	Omnicom
	Publicis Dublin	17.71	0.96	30-Jun-13	Publicis Groupe (1)
	Target McConnells	10.12	0.9	31-Dec-13	WPP
	Havas Ireland	10.32	-1	31-Dec-13	Havas
	Cawley Nea\TBWA	7.73	-0.5	31-Dec-13	Omnicom Group
	McCannBlue	3.83	-0.1	31-Aug-14	IPG (3)
	Rothco	n/a	0.9	31-Dec-13	Independent
	Media Agencies	Core Media	155.4	2.06	31-Dec-14
Dentsu Aegis Media		108.53	2.49	31-Dec-13	Dentsu
Mindshare		60.09	0	31-Dec-13	WPP(2)
Omnicom (OMD)		62.12	0.7	31-Dec-13	Omnicom Group
Notes					
1	The majority shareholding is held by local management for Publicis agencies.				
2	For DDFH&B the majority shareholding is held by local management, who also have a share in Mindshare				
3	McCannBlue have an affiliation with Interpublic but no equity is involved.				

Table 4-3: Agency Earnings 2013/2014⁵⁵

4.4.4 Industry Concerns

Since the 2009 recession and the take-off of online advertising the industry appears to be in a state of disruption. There are frequent calls for the need to restructure agencies, coupled with comments that the agency model is broken⁵⁶. Additionally, consumers are inundated with advertising messages and there is growth in active ad avoidance, such as using ad blocking technology online⁵⁷. Agencies endeavored to survive the recession, gain some mastery of the online communications environment and adjust to the changing needs of their clients.

The power in the client/agency relationship lies with the clients⁵⁸. There are also concerns about the developing practice of clients managing their Irish marcoms from London or other global hubs⁵⁹ and clients taking more marcoms work in-house⁶⁰. The perceived devaluation of agency services through the increasing focus of cost of service in clients' agency selection processes is of particular concern in the industry⁶¹.

4.5 THE IRISH ADVERTISING INDUSTRY IN THE EARLY 1970'S

In the early 1970s the Irish industry could be characterized as being both Irish and family owned⁶². In 1974 the industry comprised 34 IAPI full service 'creative' agencies⁶³, with 950 employees⁶⁴ and billings of IR£17m⁶⁵. The industry was relatively concentrated, with the four largest agencies (see Table 4-4) accounting for almost 50% of industry earnings, leaving IR£8.7m between 30 IAPI agencies. Incumbent agencies perceived the industry as being overcrowded⁶⁶.

Agency	Revenue IR£ Millions	Market Share %
McConnells	2.75	16
Wilson Hartnell	1.95	11
O'Kennedy Brindley	1.88	11
Arks	1.75	10

Table 4-4: 1974 Largest Agencies by Revenue⁶⁷

Advertising agencies earned the bulk of their income from the commission they received from media suppliers for the space bought on behalf of their clients. In 1974 media bookings accounted for almost 80% of the earnings of IAPI agencies⁶⁸. Media supply was rather limited with only one national broadcaster (RTÉ) broadcasting one television and radio station.

Marketing was still a fairly new phenomenon in Ireland, having emerged as a concept in the 1960's⁶⁹. In the early 1970's several ad agencies offered marketing services⁷⁰. *'Agencies were dynamic, inexperienced but eager to try out ideas, and they watched what was happening in the US'*⁷¹. They drove the development of clients' marketing plans. According to industry veteran Frank Young *'agencies had the power in [the client/agency relationship], clients looked to them for guidance. [C]lients used to come in, in the late 60s, early 70's and sit at the feet of the advertising agencies'*⁷².

Ireland joined the EU in 1973⁷³ and an influx of foreign originated brands offered opportunities for advertising agencies. Set against this there was a global recession, and high inflation in Ireland.

4.5.1 1970-1986 Adoption of Computers

*'[S]aying nothing of the department that collects the bills' is a fairly well established tradition in the advertising industry'*⁷⁴

4.5.1.1 First Irish Agency Adopts Computers

The advent of minicomputers from the mid 1960's made computer technology more financially accessible for Irish agencies. (See Table 4-5 for schedule of computing adoption.) In 1972 McConnells became the first agency to get a computer⁷⁵. They used their minicomputer⁷⁶ for payroll and accounting functions, to record and report media bookings⁷⁷ and intended to apply the

computer to making traffic management processes more efficient⁷⁸ and to analyze the extensive media and market research data becoming available in Ireland. They promoted that the systems enabled them to be more responsive to client requests for information, including the production of media spend reports. In 1977 McConnells upgraded to a new computer, bought a 15% share in a computer rental and software company, and formed McConnell Computer Bureau⁷⁹ which offered computer services to other agencies⁸⁰.

Year	Adoption	Agencies
1972	1 st agency	McConnells
1973	Computer Bureaux	Agencies had access to Media Analysis of JNMR Data available in 4 locations
1974	Irish Press Newspaper	Offers Media Analysis of JNMR Data
1975	McConnells	Offer Bureau services for TV media analysis
1977	McConnells	Upgrade to new computer and set up McConnell Computer Bureau
1978	2 nd Agency	Wilson Hartnell
1982	General adoption	Des O'Mearas, The Marcom group, Hunter Advertising, Young Advertising, Peter Owens

Table 4-5: Timeline Initial Adoption of Computers by Irish Agencies⁸¹

4.5.1.2 Computers are Applied to Media Services

In the early 1970's there was increasing pressure on agencies to buy media efficiently due to harsh economic conditions and unprecedented media inflation. In 1974 media costs increased by as much as 33%, across TV, Radio and Print⁸². Cost efficiency was frequently used to judge a campaign's effectiveness and was measured in cost per thousand homes (CPT)⁸³.

The economic climate and prevailing industry norms provided impetus for the use of databases for devising media buying schedules and the use of database analysis facilities enabled the evaluation of alternative media schedules across effectiveness and cost parameters⁸⁴. When the first Joint National Media Research (JNMR) report was published in 1973, computer bureaux offered data analysis services to media owners and advertising agencies⁸⁵. The JNMR captured print and radio audience numbers and profiles⁸⁶.

4.5.1.3 Diffusion of Computers

A ripple of shock swept through the Irish industry when the formerly profitable ad agency O'Donnell Earl went into receivership in 1974⁸⁷. The speculated cause was delayed payment of invoices by clients⁸⁸ and thus provided impetus in agencies to improve the management of their finances. Agencies financed their clients media buying, so timely payment by clients was important for healthy cash flow and profitability⁸⁹. Computing offered increased speed of information and automated invoicing.

In January 1978 Wilson Hartnell became the second agency to use their own computer⁹⁰. Within seven weeks they had produced their *'first live run of accounts...'*⁹¹. By September the system had developed into a fully integrated financial and management accounting suite encompassing over 250 mainly tailor-made programs⁹². They had also begun to explore leveraging the system to aid in media buying and performance analysis, through building a data bank based on *'JNMR, TAM and ABC data'*⁹³ with the *'ultimate aim of computerised media selection and evaluation'*⁹⁴.

By 1982 Wilson Hartnell had spent six years working closely with Eukon Management Consultants to develop software packages tailored to support agency processes⁹⁵. The resulting ADPACK software which could be run on a mini or microcomputer was adopted by several other agencies including: Des O'Meara & Partners, The Marcom Group, Hunter Advertising and Young Advertising⁹⁶. Other agencies took different routes to computerization, for example Peter Owens installed a system called Adserve created by a specialist London firm⁹⁷. There were some laggards in adoption of computers, Alan Cox who worked in the Media departments of two agencies in the late 1980's used pen and paper to devise and analyze media schedules in both (one had no computers, although he remarked that this was unusual)⁹⁸.

4.5.1.4 Computers Uses

Irish agencies used computers to support their day to day functioning, with software supporting: Media, Voucher Management⁹⁹, Production, Accounts, Finance and Account Handling¹⁰⁰, (see Table 4-6 for more detail).

Function	Processes/Tasks
Media	Planning, analysis, order entry, invoicing, write-offs, schedules, sales history and analysis.
Vouchers	Historic records, automatic mailing requests for unreceived vouchers.
Production	Order entry, job bag analysis, work in progress analysis, cost allocations, job-bag transfer, invoicing, revenue analysis, budget control, exception reporting.
Accounts	Debtor, creditor records and control (balance forward or open-item), accruals, cheque preparation, automatic invoicing, comparison of supplier invoices to order values before acceptance.
Finance	Nominal ledger producing trial balance, profit & loss account and balance sheet. Allocation of overheads to client profitability, current control, bank reconciliation.
Account Handling	Full client analysis including Sales over 24 months by media and production, Gross Profits and Net Profits and Budget comparisons. Automatic fee invoicing for retainers, media fees etc. Client ranking by sales, or gross profits.

Table 4-6: 1982 Advertising Agency Functions Supported by Computers¹⁰¹

Computerized records enabled tighter monitoring and control of the profitability of each client account and agency job and provided automated invoicing. Prior to computer use *'it was archaic'*, invoices were raised manually by accountants on a monthly or a weekly basis, based on records written on index cards¹⁰². Computer usage for planning and recording media plans made the

process more efficient as previously plans were worked out using pen and paper and then typed by secretaries¹⁰³.

4.5.1.5 Reflection on the Impact of Computer Adoption

The initial adoption of computers in agencies was not deemed to be of particular importance: according to John Fanning of McConnells ‘*it wasn’t wildly significant*’¹⁰⁴, although ‘*once you got hooked on it you couldn’t get away from it*’¹⁰⁵. Frank Young of Wilson Hartnell recalled ‘*it was finance led ... it was a management tool really and it wasn’t at the front end of the advertising process...It was all account and admin*’¹⁰⁶. However, ‘*[i]t made us profitable and it made us well run and well organized*’¹⁰⁷. The adoption of computers gave finance departments more control within agencies¹⁰⁸.

4.5.2 Suppliers – Media Fragmentation Begins

The impact an advertisement can have is dependent on the audience it reaches through media. In the early years media supply was limited and generally demand exceeded supply¹⁰⁹. Media included press, outdoor, radio, television and cinema. Press and television received most media spend, radio ranked third followed by outdoor, and cinema spend was included with other media¹¹⁰ (see Table 4-7).

By 1974 over 90% of households had a radio¹¹¹ with almost 70% of the population listening on a daily basis. Both ‘*national and local advertisers clamor[ed] for air –time*’¹¹². Ireland’s only television channel RTÉ¹¹³ reached over 85% of the population of the Republic of Ireland, achieving 90%¹¹⁴ coverage of ‘*Young Housewives*’¹¹⁵ a key audience for many advertisements¹¹⁶. The development of colour TV broadened creative opportunities for agencies by increasing the number of suppliers interested in TV ads¹¹⁷ and providing greater creative scope. RTÉ broadcast its first colour advertisements in 1974¹¹⁸. TV became a prerequisite in the advertising mix¹¹⁹. In 1978 a second public channel RTÉ2¹²⁰ was launched¹²¹ amidst concerns of media fragmentation from agencies: ‘*The real effect of this, given that RTÉ2 will carry commercials, is that advertisers will pay more for the privilege of reaching the same audience*’¹²².

Year	Medis Spend	Press	TV	Radio	Outdoor	Cinema/Other
1960	-	82.99%	0.49%	3.33%	3.29%	2.24%
1970	-	55.31%	33.3%	4.75%	2.98%	0.96%
1974	IR£20.5m	57.3%	30.1%	8%	3.4%	1.1%
1980	IR£71m	52.4%	31.4%	10.3%	4.9%	<0.1%
1986	IR£138m	39%	37%	15%	9%	<0.1%

Table 4-7: Media Spend Allocations 1960-1986¹²³

Print was dominated by the national newspapers¹²⁴. Other print options included: provincial press¹²⁵, women’s magazines, the Golden Pages (a business directory)¹²⁶ and trade magazines. In

1962, fighting back against the new media of TV, the Irish Times newspaper ran its first colour advertisement, the Irish Press and the Irish Independent swiftly followed¹²⁷. Creating a colour press or a TV ad was a prestigious and desirable opportunity for agency creatives¹²⁸.

4.5.2.1 RTÉ Adopts Computing for Inventory Control

In 1982 RTÉ was handling over 100,000 advertisements a year¹²⁹ and they launched a computer-based advertising booking system *'to deal with the complexities of handling advertising on two television and two radio channels'*¹³⁰. The sales system was used to record time slots booked by the agencies and controlled agency billing¹³¹.

4.5.3 Internationalisation and a New Agency Type

4.5.3.1 The Emergence of Media Independents

*'Inexplicably, agency bosses had missed the fact that 85 to 90 per cent of their income came from the media department'*¹³²

Historically media buying was the service that agencies provided to clients¹³³ and they initially provided the service of creating advertisements for clients, *'... in order to sell media space and thus earn media commission'*¹³⁴. However, over time 'creativity' came to be seen as the core function of the agencies.

In the 1950's O'Kennedy Brindley became the first agency in Ireland to appoint a Media Manager, signaling the emergence of the media department and specialization within Irish ad agencies¹³⁵. Prior to this the same person would write copy, do layouts, book space etc.¹³⁶ *'[A]gencies traded on their creativity'* and the media function was neglected and often did not receive strategic consideration or investment¹³⁷ despite media commission accounting for the majority of earnings¹³⁸. The prevailing thinking was that media buying was not a differentiating function for agencies. An excerpt from an article in the IMJ&A captures this:

*'One can expect that the basic mechanical processes of an agency, such as media buying, print buying, etc. can be efficiently performed by any agency within Dublin. However, the question of interpretation and creative approach, which tends to be individual, is the principal characteristic which marks one apart from the others'*¹³⁹

Computing was an enabler for the emergence of the media independents. The first media independent in Ireland was established two years after increasing amounts of media data became available on databases¹⁴⁰. The media separation trend was initiated by individuals who worked in media departments¹⁴¹. The first Irish independent media agency 'The Media Bureau' was created in 1976, by Michael Bowles a former employee of Hunter Advertising¹⁴² to provide media advice,

planning and analysis. (Table 4-8 lists Media Agencies set up 1976-1986.) Bowles offered to provide clients with better value through better buying. The agency aimed to provide services to Irish and UK advertising agencies and directly for advertisers¹⁴³.

The growing marketing expertise of advertisers over the prior 5-10 years meant that clients had become less dependent on agencies¹⁴⁴ and could now look for agencies solely to provide ‘*creativity and media planning and negotiation*’¹⁴⁵. The existence of independent creative houses made independent media specialists viable as it was feasible for advertisers to choose an ‘a la carte’ approach to their advertising needs.

Year	Company	Comment
World		
1964	Norm King	United States
1968	Carat	Carat set up in Paris
1969	Media Buying Services	1 st in UK
Ireland		
1976	The Media Bureau	1 st Media Independent in Ireland
1983	GT Media	
1985	All Ireland Media (AIM)	The company rebranded as Carat Ireland in 2001.
1986	Media Guilfoyle Cullen (MGC)	

Table 4-8: Emergence of Media Independents to 1986¹⁴⁶

4.5.3.2 Internationalization of the Industry

The internationalization of advertising agencies began through requests from clients¹⁴⁷ e.g. in the 1920’s General Motors asked J. Walter Thompson (JWT) to set up agencies in each country where it sold its products¹⁴⁸. Advertising agencies mirrored the global expansion of client firms¹⁴⁹.

Internationalization in Ireland

In an evaluation of the industry in 1986 Hugh Oram commented ‘*the most far-reaching change of all in the advertising business since 1974 has been the drastic shift in ownership among larger agencies, part of an on-going trend towards greater internationalization, pan European, if not global advertising*’¹⁵⁰.

Ireland’s EU membership increased the likelihood that ‘*the Dublin agencies w[ould].. face competition from big international shops*’¹⁵¹. The changing context prompted Irish agencies to form international alliances. In 1971 Peter Owens announced a link with McCann-Erickson¹⁵² and in 1973 O’Kennedy Brindley, McConnells and Janus all formed associations with international groupings¹⁵³.

In 1975 industry commentator John McCarthy wrote ‘*[c]reativity and media buying are an agency’s two most vital functions, [and therefore m]ost clients ... want them done locally*’¹⁵⁴. US agencies established themselves throughout Europe¹⁵⁵ to win international accounts¹⁵⁶.

Year	Agency	International company	Notes
1950's late	Royd's a London agency set up in Dublin	Royd's (London)	
1966	Irish International formed through the merger of Sun Advertising and Royds	Royd's (London)	
1969	Grosvenor Publicity Pearce	Collette Dickenson Pearce (CDP)	The agency was bought out and renamed Collette Dickenson Pearce (Dublin) CDP
1975	Contrary to Trend: CDP Dublin management buy out agency from London CDP with the exception of 5%		
1979	O'Kennedy Brindley (OKB's)	Saatchi & Saatchi	Considered as the 1 st internationalization. O'KB sold a stake to S&S it was later renamed Saatchi & Saatchi
1981	Arks Advertising	Lopex Group	Lopex acquire Arks Advertising
1983	Hunter's	Saatchi & Saatchi	Their 2 nd Dublin agency acquisition
1984	Brian Cronin & Associates	Walsh Reinhart & Puccio.	Irish agency buys New York Agency.
1984	Young Advertising	Lopex Group	
1984	Rowe Advertising	Lopex Group	
1984	The Wilson Hartnell Group	Ogilvy & Mather	O&M bought an 80% share in The Wilson Hartnell group which comprised 2 advertising agencies and the PR company WHPR
1986	<i>International agency sets up under own name, non acquisition/affiliation strategy.</i>	DMB&B	Set up an agency in Dublin. (Later seen as QMP/DMB&B)
1986	Contrary to Trend: Irish International local management buy back agency from London Management		Had been part London owned since 1966

Table 4-9: Internationalisation of Agencies in Ireland to 1986¹⁵⁷

1979 is considered the beginning of the internationalization of the Irish industry when Saatchi & Saatchi acquired O'Kennedy Brindley¹⁵⁸. By the end of 1984 half the billings earned in the Irish advertising industry were going to internationally owned agencies, prompting the comment '[h]alf the advertising industry is now foreign owned'¹⁵⁹ (Table 4-9 lists key Irish agencies that opted for an internationalization strategy) .

4.5.4 Summary 1970-1986

From 1970 to 1986 the Irish advertising industry adopted computers and, beginning with finance and accounts, applied them to a widening array of operations including the provision of media services. The application of computing was enabled and encouraged by: ICT developments such as the mini and microcomputer and the emergence of computing support services, including software developers; Ireland joining the EU and a harsh economic climate with high inflation; the shock failure of O'Donnell Earl; and the launch of RTÉ2 representing media fragmentation.

Industry employment dropped dramatically across the period: *'...over the past five years [1981-1986] agencies have cut personnel numbers by a quarter...Dublin's 50 plus agencies are employing in total just 800 people, fewer people are doing far more work'*¹⁶⁰. Computer adoption made the agencies more efficient and more aware of profitability. Software formalized agency processes¹⁶¹ and gave power to agency accountants/financial controllers¹⁶². The use of technology in finance and administration came to permeate every agency function and changed them in ways that were not immediately apparent but were far reaching.

At the beginning of this period the media function was not considered a strategic function, creativity and/or the character of the agency owner/managing director were characteristics that distinguished agencies. As internationalization took hold, the role of the 'character' of the leader of the agency in differentiating agencies weakened. In 1986 Hugh Oram concluded that between the mid 1970's and 1986 the industry had changed dramatically, with *'the cult of personality and "characters" ...[becoming] subservient to computerised statistics. Agencies have become slimmer, more productive and less prepared to take creative risks'*¹⁶³.

4.6 1986-1994 COMPUTERS ARE EMBEDDED AND SCOPE OF USE EXTENDS

Within this period the use of computers became further embedded in the industry with increasing investments required in ICT. Compatible systems became a prerequisite to qualify for many client tenders. Computers, specifically the Apple Mac, caused a revolution in creative departments. The advent of digital printing promised increasing creative opportunities. The supremacy of advertising in the marcoms mix began to be challenged by direct marketing. Media separation accelerated and the internationalization trend continued.

4.6.1 Use of Computers in Irish Agencies Escalates

Computer adoption had gained further momentum by 1992 with 10 of the top 20 agencies including Arks, Irish International and McCann Erickson (Dublin) using Adpack software (an Irish made fully integrated media, production and accounting system)¹⁶⁴. Agencies with international affiliations generally leveraged their parent's systems e.g. CDP Dublin used CDP London's software¹⁶⁵ and the AdPack system used by McCann Dublin was integrated with McCann's worldwide proprietary system¹⁶⁶. According to Breandan O'Broin each multinational agency had their own system which they marketed as a point of uniqueness: this was *'a mixture of technology and hocus pocus, superior 'ways in which we find the universal truth' versus other agencies. A formula was developed for interpretation of research etc.'*¹⁶⁷

The use of technology in accounting and administration meant that agencies '*manage[d] money better*'¹⁶⁸. They became more aware of profitability and tighter controls were put in place, with approval and costings required in advance rather than the old way of calculating how much a job had cost after it was completed¹⁶⁹. It enabled a formalizing of business processes including processes that supported work books, handling media, client relationships, and time structures¹⁷⁰. Finance software became an essential part of an agency's credentials in the client pitching process, particularly for global clients who insisted agencies had systems compatible with their own financial systems¹⁷¹.

4.6.1.1 Computers Use in the Creative Department.

Computer Aided Design

Key Dates

1977 April - Apple II - The first PC with colour graphics

*1984 April - Apple IIc - the Apple Mac*¹⁷²

In the US in 1983 computer graphics technology was deemed to be '*reshaping careers in the graphic arts*'¹⁷³. The fusion of word processing and computer graphics which enabled the production of '*complicated page layouts*' combining words and images, which were easily adjusted on screen, was predicted to '*drastically alter the world of ...advertising*'¹⁷⁴. Computer aided design (CAD) significantly increased production speed and offered greater design flexibility¹⁷⁵. The computer was set to replace pen and ink.

The use of CAD became synonymous with the use of the Apple Macintosh (Apple Mac) in the advertising industry. Apples were perceived by several interviewees to be the first impact of ICT in the Irish advertising industry.

CAD Adoption in Ireland

In the UK, partly because of investment and training costs, it was newer and smaller agencies who adopted the Apple Mac and '*led the revolution*'¹⁷⁶. In Ireland Des O'Meara & Partners a medium sized Irish owned agency are remembered as the first to get Apples¹⁷⁷. In 1989 they advertised for a finished artist with Apple Mac II experience¹⁷⁸. Irish International and Peter Owens are also remembered as early adopters¹⁷⁹. Irish International was a creative led agency, and Barry Dooley remembers; '*the creative guys when they heard about Apple Macs ..[said] we must have this, and they got it*'¹⁸⁰. McConnells began using them in 1991¹⁸¹ and were considered followers rather than the leaders of the trend¹⁸². Saatchi & Saatchi (Ireland) got them in the early 1990's¹⁸³. Gradually other agencies like Wilson Hartnell¹⁸⁴ and CDP also got computers¹⁸⁵. Breandan O'Broin recalls that the company secretary in CDP '*was resistant to investing in Macs, thinking they were too expensive, gave art directors too much power, and that they were elitist*'¹⁸⁶.

Apple Mac adoption happened very quickly, possibly in as little as 5 years. Helen Marks recounted that they gave agencies short-lived creative kudos and were selling points for agencies *'for about a week...anything like that once someone's got one you've got to have them, it felt like it happened really fast'*¹⁸⁷. They became an agency necessity and *'you weren't cool if you didn't have Apple Macs in your agency'*¹⁸⁸.

4.6.1.2 Impact of the Apple Mac in Agencies and the Industry

*The 'arrival of the Apple Mac ...caused the death of the finished artists'*¹⁸⁹

In the UK *'typographers [those who set type] rather than art directors were among the first in agencies to get Macs'*¹⁹⁰. They gave typographers access to numerous varieties of fonts. Likewise in Ireland Macs were often used in the production departments (the studios/finished art department) before being used in the creative departments¹⁹¹.

The arrival of CAD specifically the Mac changed production processes, and finished artists became superfluous¹⁹². They replaced the time consuming Letraset process for assembling type¹⁹³ which involved *'pasting up galleys of type and fitting illustration; the finished artwork then went for separation, if process colour was involved, then film making, then plate making and finally printing'*¹⁹⁴. However, *'Apple Macs...[could] be used for all the text, for the creation of graphics and layouts, with the end result in either film or bromide or full form colour proofs'*¹⁹⁵. By 1990 it was envisaged that the production process could be reduced to 2 stages: *'the creation of text and graphics'* on screen, and printing directly through a link to the computer *'with no intermediate stages'*¹⁹⁶. The integration and reduction in steps in the process was radical.

In creative departments Macs enabled art directors to easily experiment with various fonts (style and size), spacing and location of headings, logos and pictures. They could now import photographs¹⁹⁷ and compile on screen precisely what the final ad would look like. Enabled also by prior and parallel improvements in printing technology, full page colour ads in newspapers and magazines were now possible and were dream jobs for art directors¹⁹⁸. Macs were an enabler of freelance creatives, because they could create finished looking art work without having a separate production department¹⁹⁹.

Suddenly creatives had to be able to use computers²⁰⁰ and not all creatives were enthusiastic about CAD. In 1992 it was considered by some creatives who had *'learned their craft using magic markers and a layout pad'* as *'new technology'* and difficult to use²⁰¹. Some had difficulty adapting to Macs and got others to do up roughs for them²⁰². Art directors (except the older generation) stopped creating on paper and began the creative process on their Mac²⁰³. There is a perception that the art director's job became less skillful, as drawing skills were no longer required²⁰⁴. There was a lingering concern that the use of templates on Macs hindered creatives from thinking beyond them:

delivering *freedom...but freedom with handcuffs*²⁰⁵. Macs could encourage creatives to create without first having an idea, resulting in ads which had style but lacked substance²⁰⁶.

The magnitude of the impact of technologies varied by agency role, so for instance for copywriters the difference between writing on the Remington (electronic typewriter) versus using Word was not that great, but the opportunities CAD software offered designers was an exponential leap²⁰⁷. CAD was a revolutionary technology for advertising agencies²⁰⁸ causing a shift in power within agency creative departments, from copywriter to art director²⁰⁹. The ease and speed with which visual components of ads could be created caused a shift in the importance of visuals in the creative process. Society was becoming more visual, and advertising had become more prolific, visuals were used to grab attention²¹⁰. Visual advertisements were seen as being more effective. Prior improvements in the printing processes facilitated leveraging this new visual creative ability.

Apple Macs have been called the silent revolution in the advertising industry. They changed the ad production process, practically eliminating the role of the finished artist²¹¹, and changed the required skillsets of those working in creative departments. They accelerated the shift in advertising formats from words to image and the power balance within the creative departments. The nature of advertisements evolved with Macs cited as being instrumental in the shift from persuasive towards disruptive advertising²¹². Additionally, Macs were a factor in reducing agency lead times as, not only were production times reduced, but finished-looking roughs produced on Macs gave clients the impression that the ad was finished or almost finished. Yet CAD does not appear to have had a long-term impact on the competitiveness of firms within the Irish industry. Early adoption is likely to have provided short-term advantages in terms of reducing the cost and time required for production of ads and enhancing the agency's image in terms of perceived coolness and creative reputation, but as other agencies adopted the technology these advantages were short-lived.

4.6.1.3 Digital Printing

'Digital printing' was a buzz word in Irish advertising in 1994 and was expected to benefit outdoor media. It provided *'the opportunity to make outdoor advertising more flexible [and] more effective*²¹³. For small print runs digital printing was far cheaper than conventional silk screen printing²¹⁴ and the low cost of small volumes opened poster advertising to new markets, enabled more frequent turnover in campaign messages, and facilitated experimentation with the media, enabling creativity²¹⁵. It also made it possible to print on numerous surface types, thus expanding creative opportunities²¹⁶. Furthermore it was far speedier than alternative methods, with 24 hour turnaround possible by 1994 although the more normal turnaround time was 7 days²¹⁷.

4.6.1.4 *The Use of Computers for Media Management*

As media fragmented, complexity grew, and technology was increasingly used to keep track of media buying schedules, and to assess available media opportunities. Globally by 1989 computers were seen as the engines of media departments. *‘[M]edia managers ha[d] become acutely aware of how software decisions...[could] influence their competitive edge. Names of sophisticated computer data-storage systems...[had become] as much a part of the language of the agency media business as reach and frequency’*²¹⁸. Agencies either developed proprietary systems or bought off the shelf solutions (such as DDS²¹⁹) depending on their view of the role of systems in the media department and whether the increased costs associated with customized systems was justifiable²²⁰.

By 1990 several agencies in Ireland had invested in specific technology for the provision of their media services. The independent media agency The Media Bureau had a computer system which produced *‘complex media analysis’* and was programmable by client. *[T]he agency also provided media information for advertisers, ad agencies and media owners’*²²¹. Young Advertising had invested IR£120,000 in systems for its media department, and Peter Owens had set up two dedicated computer lines to access media research²²². Technology had become an essential tool in media planning and buying and according to Dolores McCarthy (head of the Arks Media Department) providing media services now required *‘a much higher level of skills and knowledge of technology’*²²³. The AdPack software, widely adopted by Irish agencies, added an additional service in July 1992 enabling agencies to analyze UTV and Channel 4 ratings via access to the BARB database²²⁴.

4.6.1.5 *State of Digital ICT in the Industry 1994*

Commenting on the industry in 1994 Jim Donnelly, Managing Director of DDFH&B, said *‘Computers are everywhere - creative, media, administration, accounting’*²²⁵. The universal use of computers coincided with reductions in agency staff numbers: *‘[t]he large agency in 1980 who had about 100 people probably employs around 70 now’*²²⁶. This reduction in staff was due to technology, changing skillsets and because some *‘unessential specialist’* services (enabled by technology) were outsourced and *‘bought on a freelance basis’*²²⁷. In-house agency photographers left agencies and worked freelance, whereas technology changes had made roles such as typesetters, finished artists and copywrite typists redundant²²⁸. Changes in printing processes had reduced the number of porters and delivery boys required²²⁹.

Electronic typewriters and computers reduced the need for secretarial staff²³⁰, and PCs and office software packages escalated this trend. Traditionally each agency account director was likely to have their own secretary²³¹, this came to an end and agency staff had to learn new skills like typing and creating PowerPoint presentations²³².

4.6.2 Growth of Media Independents, Internationalisation and Non-advertising Marketing Communications

4.6.2.1 Media Independents

The separation of media services from advertising agencies took time to gain momentum and was cited as an ‘emerging’ trend in the advertising industry at the 1990 Irish Media Conference²³³ (see Table 4-10). In 1988 globally Saatchi & Saatchi were the first big agency group to create a media independent agency²³⁴ Zenith (UK). It provided centralized media buying for their clients, and enabled the media agency to win independent business²³⁵. Zenith (UK) boasted of ‘*using the most sophisticated hardware and software available in the world...to achieve the most effective exposure against the defined target audience*’ for clients²³⁶.

Year	Company	Comment
1990	Centaur Media	Set up by former media executive at Peter Owens
1991	Pierce Media	
1991	Publicitas	<u>International</u> Media agency.
1992	The Association of Media Specialists in Ireland (AMSI)	Set up by 6 Media independents
1993	Zenith Media	Saatchi & Saatchi agency

Table 4-10: Media Independent Trend 1986-1994²³⁷

During the 1990’s the trend escalated in the Irish industry, as evidenced by the number of new media agencies, increasing level of earnings of the media independents (see Table 4-11) and the establishment of the Association of Media Specialists in Ireland (AMSI) in 1992²³⁸. In 1993 Saatchi & Saatchi set up Zenith Media in Dublin providing media buying services for their BSB Hunter and Saatchi & Saatchi agencies²³⁹. This move was cited as ‘*a watershed for the concept of a full-service agency*’, and signified the ‘*end of days*’ for full service agency structures²⁴⁰.

Year	Allocation of Media spend
1990	7%
1992	20%
1994	6 media specialist in the top 20 TV advertising spenders. Zenith Media (2 nd), Initiative (3 rd)

Table 4-11: Growth of Media Spend through Media Independents 1990-1994²⁴¹

4.6.2.2 Internationalization Continues

The 1987 Single European Act, which was implemented in 1993, added further incentive for Irish agencies to form international connections and/or gain access to international expertise (see Table 4-12). In 1991 it had become ‘*common place for Irish agencies ...to affiliate with international groupings*’²⁴², with only half of the top twenty agencies in Ireland still being Irish owned²⁴³. By

1994 six of the top agencies in Ireland had international links²⁴⁴ and McConnells was the only major Irish agency to remain 100% Irish owned²⁴⁵.

Year	Agency	International company	Comment
1990	Javelin	Young & Rubicam	Y&R take a 40% stake. (Were independent Irish agency again in 2010).
1991	DDFH&B	JWT	JWT take 20% stake in DDFH&B
1991	International agency set up under own name	McCann Erickson	Already in Belfast
1991	Janus	Saatchi & Saatchi	
1992	QMP	D'Arcy	D'Arcy part of Publicis group bought a 17% share

Table 4-12: Internationalization of Agencies 1986-1994²⁴⁶

Internationalization was tough on Irish owned agencies. Frank Young commented '*locally owned agencies, particularly medium sized agencies were being squeezed*'²⁴⁷. This spurred non-aligned Irish agencies to merge with each other²⁴⁸, resulting in some consolidation. For example, the acquisition of Kenny's by Arks and Brian Cronin & Associates by McConnells in 1988²⁴⁹.

Irish agencies also formed links/affiliations with international networks or agencies whilst retaining 100% Irish ownership (e.g., Doherty-Padbury Group, had a formal affiliation with BBDO²⁵⁰, Peter Owens formed an association with DDB, and McConnells had an affiliation with Lowe Lintas). Agencies also sought to achieve international scope through forming groups of international cohorts e.g. in 1990 Davitt & Partners became a member of the International Federation of Advertising Agencies (IFAA)²⁵¹.

Agency	1974 Revenue IR£M	1974 Market Share %	1988 Revenue IR£M	1988 Market Share%
McConnells	2.75	16	22	17
Wilson Hartnell	1.95	11	12	9
O'Kennedy Brindley	1.88	11	14	11
Arks	1.75	10	7	5
Peter Owens	-	-	11	8

Notes: 1988 McConnells revenue includes IR£4m for Momentum a 2nd agency
1988 O'Kennedy Brindley is owned by Saatchi & Saatchi
Peter Owens is 4th Largest Agency displacing Arks from the position it held in 1974.
Top 4 agencies have 45% share of market, top 5 have 50%.

Table 4-13: Top Agency Revenues 1988²⁵²

Mimicking the early 1970s, in 1989 50% of the advertising business in Ireland was handled by four agency groups leaving IR£80m between thirty other agencies²⁵³ (see Table 4-13). Growth opportunities, particularly those achieved through the realignment of clients with international agency affiliations, were a key driver of internationalization. However, access to systems was of particular interest and benefit to the media side of the business. Computer use in media buying

drove up costs, competing required *'added investment and costly expertise'*²⁵⁴. Jim Donnelly (1994) expressed the view that the best international networks shared knowledge, ideas, systems and progress on a 'Pan-European' basis. DDFH&B's connection with JWT had enabled them to *'develop leading edge computer-based systems for media planning and buying which would be impractical and uneconomic to develop exclusively for our own use'*²⁵⁵.

The multinationals also bought into PR, sponsorship, sales promotion and direct marketing agencies, e.g. Saatchi & Saatchi owned Equator a sales promotion company, the Lopex group bought Grayling PR, and when Young and Rubicam bought into Javelin Advertising they also bought into the associated direct marketing company Javelin Direct. This encouraged Irish agencies to also provide a wider range of marketing communications services²⁵⁶.

4.6.2.3 *The Dominance of Advertising in the Marketing Communications Mix is Threatened*

*'What needs to be defined is exactly what is the future role of the advertising agency, what kind of service must it provide, where does its expertise lie in relation to marketer's requirements...'*²⁵⁷ (Editorial in IMJ, 1993)

Changes in the services provided by ad agencies reflect changes in client needs, often indicated by shifts in marketing spend. Media fragmentation and consumer advertising overload led to requests for integrated marcoms, and the ensuing rise of direct marketing within the marcoms mix enabled by developments in databases, data processing and telecommunications.

An increasingly competitive environment encouraged advertisers to embrace below the line (BTL) activities: 'accountability' was demanded and 'effectiveness' became the holy grail²⁵⁸. This pressure was partly due to the increasing focus on financial evaluations in client companies, which had been enabled by computer adoption. BTL activities like sales promotion and direct marketing, produced more immediate and measurable (short-term) returns, and hence were pursued by marketers who were under 'accountability' pressure. This 'sea change' in marketing focus, caused misunderstanding and difficulties in the relationships between advertisers and agencies²⁵⁹.

A 'thriving' BTL sector, independent of the ad agencies emerged, (comprising specialist consultancies in direct marketing, PR, and sales promotion etc.)²⁶⁰ offering alternative and complementary services to advertising. As increasing portions of marketing spend went to BTL, advertising agencies responded by adding these services and rebranded themselves as marcoms agencies, sparking a spate of acquisitions and mergers in the industry²⁶¹. Agencies including Javelin, Saatchi & Saatchi, Arks, Davitts, The Helme Partnership and Irish International all indicated their intentions to become 'full service agencies' through creating an assortment of Public Relations (PR), Direct Marketing, Sales Promotion and Sponsorship companies to accommodate the changing needs of advertisers²⁶² (see Table 4-14). By 1991 the McConnell Group included

McConnells Advertising, Momentum, McConnells Direct and McConnells PR²⁶³. BTL specialists and marketing service groups also began to move into the traditional mass media advertising space e.g. the former sales promotion agency Dimension²⁶⁴.

Year	Ad Agency	Service	Notes
1977	Lalor & Partners form link-up with Wunderman International	Direct marketing alliance with international DM firm formed	Represents the beginning of ad agency involvement in direct marketing in Ireland. Almost no activity in DM until 1977.
1978	Lalor & Partners	Direct marketing agency set up 'Wunderman International Direct Marketing Division'	1 st Ad agency in Ireland to set up direct marketing. Direct market spend in Ireland was estimated as being IR£2m in 1977
By 1988	O'KB	Had a subsidiary for sales promotion	
By 1988	Javelin	Had moved into sales promotion	
1988	IDMA Formed	Irish Direct Marketing Association is formed	
By 1991	Saatchi & Saatchi	'Equator' for direct marketing	By 1991 30% of Equators earnings were non ad agency clients
By 1991	McConnells	Had a PR affiliate and 'McConnells Direct'	
1991	Doherty Padbury group	Set up 'Paramount' for below the line services	
1991	Irish International	Set up direct marketing affiliate	
1993	Ogilvy & Mather	Set up 'Ogilvy & Mather Direct'	By ex Equator team

Table 4-14: Ad Agencies Set-up Below the Line Services²⁶⁵

By 1990 BTL spend was estimated to be 40% of total marcoms spend²⁶⁶. The shift of advertising spend towards BTL, particularly direct marketing, continued unabated prompting speculation by Jim Donnelly that *'[a]dvertising and above the line may never again assume its historical importance'*²⁶⁷. Direct marketing was expected to usurp advertising in the marcoms mix. This was considered a significant challenge for the ad agencies²⁶⁸.

Over time the lines became blurred between direct marketing and advertising as direct marketing 'ads' were issued via mass media such as TV, press and outdoor. What clients required was 'through the line' integrated communications which was challenging to achieve in practice as siloed approaches to marcoms dominated rather than coordinated strategies. Many clients moved to co-ordinate their own marcoms mix, choosing agencies on an a la carte basis for the different elements. Ad agencies responded by promoting their planning capabilities as their USP²⁶⁹.

It was suggested by Liam Gaskin that *'[a]dvertising agencies almost labeled themselves into oblivion by remaining adamantly advertising agencies as such'*²⁷⁰. Agencies who did not expand their services, did not survive, and there were several agency casualties in the early 1990's²⁷¹.

ICT and the Rise of Marketing Communications

*'The computer and other information age technologies have reduced mass down to microbits of data and have revealed precise details about individuals... facilitates the creation of appropriately targeted messages, drives the selection of the ideal media out and helps develop interactive relationships with individuals'*²⁷²

The database was cited as *'the engine that drives the direct marketing vehicle'*²⁷³. In the late 1980's 'direct mail' was relabeled 'relationship marketing'²⁷⁴. Customer information came to be considered as a valuable company asset, and databases enabled storage and leveraging of this information. Direct mail was used to build brand loyalty, increase sales through cross-selling to customers, increase customer retention and gain new customers including gaining referrals from existing customers²⁷⁵. Customer relationship management systems (CRMs) were in vogue and several computer companies specializing in database software started to service the Irish direct marketing industry²⁷⁶.

Databases accompanied by developments in data processing and telecommunications were key to the increased focus on direct marketing having *'an utterly transformational effect on the use of media'*²⁷⁷. Telecom Eireann's freephone service launched in 1988 facilitated increasing direct marketing spend²⁷⁸. Freephone 800 numbers transformed conventional media into direct response media²⁷⁹. During this period mobile phone devices were launched, with SMS (mobile text) enabled in 1992, providing another direct marketing channel.

With the significant shift in marketing spend to direct marketing and other BTL activities, the end of mass marketing was being predicted. Leveraging technology to increase the effectiveness of marcoms was a key factor in this. Clients requested expertise from their agencies and agencies shifted into the area.

4.6.3 Summary 1986-1994

During this period CAD and digital printing caused a revolution in agencies' creative and production departments, expanding creative opportunities, changing required skillsets, reducing headcount, costs and timelines, and shifting power from copywriters to art directors. The global groups garnered increasing market share as internationalization of the industry continued, causing additional merger and acquisition activity. The media independent trend gathered momentum aided by increased media fragmentation, availability of specialist media software, the creation of an industry association and Saatchi & Saatchi's sanctioning of the trend. Advertising reduced its dominance in the marcoms mix as clients sought increased accountability, and direct marketing in particular, aided by ICT, captured increasing share of marketing budgets. In response advertising agencies restructured, becoming marcoms companies.

4.7 1994 - 2016 THE ONLINE ERA

'For much of the 1990s and the early to mid-noughties, the independent agencies that hadn't sold out didn't really need to expand beyond D4²⁸⁰. The Irish economy was coasting along nicely, inward investment was thick on the ground and a bloated public service and expanding state agencies were spending like there was no tomorrow. There was enough meat on the carcass for all to feast on' John McGee of adworld.ie²⁸¹.

In this period revolutionary 'new media' began to impact the industry: the World Wide Web and the Internet. A nascent digital advertising industry emerged in Ireland, and these new technologies began to be used within agencies and across the industry supply chain in the form of email, intranets and extranets. Their use accelerated industry processes. Traditional agency staff numbers continued to drop as ICT progressed and became more embedded in agency processes. A disconcerting change that also occurred was a shift in the basis of agency revenue from media commission to a variety of other arrangements, challenging agencies' profitability. Digital communication greatly reduced face to face communication, reducing agencies influence in the client/agency relationship.

Ireland went into recession in 2008 and there were several very tough years in the wider economy and the advertising industry. IAPI estimates that from 2007 to 2013 the total advertising market fell from €1.16bn to €677m²⁸². During this period online advertising truly emerged in the Irish industry. Digital media became a mass media and advertising spend on the media grew year on year, despite overall spend falling for several years. Traditional media such as TV and cinema also went digital. New types of competitors for ad agencies emerged, and incumbent agencies struggled to gain digital competencies and establish their 'digital' credentials.

4.7.1 Use of the Internet in Industry Processes

The Internet and related services offered opportunities for agencies to increase efficiency and lower costs. Online booking facilities for media emerged e.g. online booking for poster sites was launched in 1996²⁸³. In 1997 Arks were one of the first Irish agencies to use email and the Internet in their processes²⁸⁴. Des O'Meara & Partners were also early adopters²⁸⁵. Adoption resulted in reduced costs and process timescales, which also benefitted clients²⁸⁶. Sending copy to newspapers by email meant a faster process and the elimination of retype errors. It extended newspaper copy deadlines allowing agencies to be more responsive to emergent client requests²⁸⁷.

The creative department in Arks used email and FTP (file transfer protocol) services to send graphics to clients for review and approval, eliminating printing and courier costs and speeding up processes: *'We send material as a PDF file which guarantees that the client see graphics exactly as we see them'*²⁸⁸. The agency also claimed they were finding the Internet useful for creative and

media research²⁸⁹. Due to lack of email discipline, and the ‘research’ on the Internet not always being work related, the new technologies did not always improve efficiencies²⁹⁰.

Dissemination of the technologies throughout the industry took time. For example, Bank of Ireland an important Irish client, did not have external email in 2000²⁹¹. The explosion of email use in agencies happened after 2000²⁹². Agencies began to use intranets, CDP were using one by 2004, and Dentsu had patented a global intranet for use within their network²⁹³.

The use of ICT invariably and progressively shortened lead/delivery times and consequently increased time pressures within agencies²⁹⁴. The increased speed and ease of connectivity, particularly enabled by mobile communication technologies, raised client expectations of faster turnaround and immediate responses from agencies²⁹⁵, compressing the time frames for all jobs²⁹⁶. According to Nick McGivney *‘the luxury of having a long lead time to dream up wonderful campaigns has passed’*²⁹⁷. For digital natives fast turn around and small budgets became a characteristic of the industry²⁹⁸.

Email and mobile changed the relationship between agencies and clients, they became the primary modes of interaction between them,²⁹⁹ (and sometimes between agency co-workers), supplementing or indeed supplanting much reduced face to face communication³⁰⁰. As face to face interaction nurtures relationships this weakened agency/client relationships and agency team synergies³⁰¹.

4.7.2 New Media and the Digital Advertising Industry

*Traditional media is fragmenting ‘[a]nd the challenges for the advertiser laid down by these developments may be nothing when compared to the potential effects of digital communication technology when it reaches consumer markets’*³⁰².

4.7.2.1 The Coming of the Information Superhighway in Ireland

The first banner ad had appeared in HotWired web magazine in the US in 1994³⁰³. In 1995 the Irish advertising industry speculated on the potential impact of the information superhighway and the 1995 IAPI Media Conference was entitled ‘The Space Invaders’. This reflected the increasing incursion of non-Irish originated media including satellite TV, UK press and the Internet³⁰⁴.

In 1996 internet advertising was estimated to be £600,000 in Ireland³⁰⁵. In 1997 the IMJ services listing included ‘internet designers and suppliers’ for the first time³⁰⁶. It was estimated that home subscriptions to the Internet were growing at 15% per month and numbered 40,000, with similar numbers having access at work³⁰⁷. The Internet had begun stealing audience from traditional media, with internet subscribers spending time online in the evenings in lieu of watching TV.³⁰⁸

Despite the initial hype, the Irish digital advertising industry turned out to be a slow burner. Prior to 2000 internet advertising spend was negligible, in 2000 it was estimated to be between £5-6m representing 1-2% of total ad spend³⁰⁹. There was an expectation that the market would take off as penetration of the Internet increased³¹⁰, along with availability of the web on mobiles through WAP enabled phones and the arrival of 3G³¹¹. However, growth expectations in digital advertising proved to be optimistic.

4.7.2.2 *The Early Days*

In Ireland, AFA (Aubrey Fogarty Associates Limited) embraced new technology and promoted themselves as web specialists, through MediaNet/Club Net, earning 15% commission on internet placements³¹². Stuart Fogarty criticized other Irish agencies for being slow to engage with internet advertising³¹³ and AFA offered web services to clients of agencies whose agencies lacked digital expertise³¹⁴. During this period digital advertising mainly amounted to building websites for clients and placing banner ads. There was also some bluffing by agencies who realized they *'just had to be ahead of the clients'*³¹⁵.

The 2000 article 'Ad men hold off jumping into the 'net'³¹⁶ captured the reluctance of many agencies to embrace digital advertising, they were waiting to be sure there was substance beyond the hype³¹⁷. This is cited as a factor in the slow take-off of digital advertising³¹⁸. The dot com crash did not encourage enthusiasm for online. Even digital agencies had cautious expectations, recognizing that *'...online advertising has a long way to go before it becomes a mass medium'*³¹⁹.

The lackluster engagement of established agencies with online, created opportunities for new 'digital creative houses' to enter the industry³²⁰. Startups have traditionally been the innovators in the technology world³²¹, and in the advertising industry it was mainly new ad agencies that successfully developed digital advertising capabilities. New agencies such as ICAN set up in 1998 citing the measurability of online advertising as an advantage of the media³²². By the early 2000's some incumbent agencies were making progress, with international Ogilvy and Mather setting up Ogilvy Interactive (2000), Owens DDB setting up TecBrand (2001) and McConnells³²³ saying they were 'pro online'³²⁴, (see Table 4-15 for digital agency set-up and acquisitions). *'[E]veryone was jumping on the bandwagon'*, e.g. the acquisition of a digital agency to create Ogilvy Interactive *'was not a good match'*³²⁵. In 2004 Stuart Fogarty commented that advertising agencies still saw *'online media as complex and time consuming to buy-in'*³²⁶.

Agencies are frequently accused of being inherently conservative despite the creative nature of the business³²⁷, and in a 2001 study Durkin & Lawlor concluded that the majority of Irish agencies did not understand crucial differences between the nature of traditional 'mass media' and digital media. Most agencies acknowledged that they lacked the in-house capabilities to advise clients on digital media and outsourced any online related services required by clients³²⁸. The study concluded that

‘digital media’ offered agencies the opportunity to regain some power in the client agency relationship, but only if the agencies offered guidance and expertise in this ‘new’ environment. Agencies lacked the knowledge to do this, and the study criticized them for not fulfilling their role as communications experts³²⁹.

Year	Agency	Notes
1994	AFA create MediaNet/ClubNet	Traditional agency creates two of the first internet service providers in Ireland
1998	ICAN	New agency
1999	Cybercom	New agency later renamed as ‘in the company of huskies’
1999	Interactive Return	New agency
2000	Ogilvy Interactive	Created by global agency Ogilvy & Mather, through acquisition of an agency in Spiddal
2001	TecBrand	Set up by Owens DDB
2001	IAB - Internet Advertising Bureau set up in Ireland, affiliated with the European body, ceased to exist as a delayed consequence of the dotcom crash.	
2003	Lucidity	New agency Web design and development agency
2004	BlueCube	Set up in Northern Ireland associated with agency AV Browne
2005	Net Behaviour	Closed in 2009 as ad agencies took their digital business in-house
2006	CKSK	New agency which has expanded abroad
2007	Diffiniti	Created by Aegis part of ISOBAR the Aegis global digital agency
2007	IAPI Accepts membership of the digital agency Interactive Return	
2008	McConnell’s Interactive	McConnells create a digital agency
2008	Interactive Return acquired by Core Media	Renamed as ‘Radical’
2008	IAB (Interactive Advertising Bureau) reestablished. First official digital advertising figures released in 2011 for 2010	
2009	Brand Social	New agency
2009	BlueCube	Digital agency opens in Dublin
2010	Eightytwenty	Digital agency formed from Eighty:Twenty digital strategists, Sector 7 digital content creators and Pareto 3D experiential agency
2013	McCannBlue	Formed through merger of McCann (traditional) and BlueCube (digital)
2013	Aegis acquire Lucidity	Will be subsumed and renamed Lucidity Isobar
2014	Javelin group acquire Brand Social	
2015	Ogilvy & Mather partner with eightytwenty	In 2017 they bought a stake in eightytwenty

Table 4-15: Establishment and Acquisition of Digital Agencies in Ireland³³⁰

In 2006 the Irish online ad industry was dominated by 3 agencies: ICAN (est. 1998), Cybercom (est. 1998) and BlueCube Interactive (est. 2004 Belfast, 2009 Dublin), although there were numerous smaller online specialist agencies, and many of the larger traditional agencies ‘claimed’ to have online capabilities³³¹. There were only 3 online-only media agencies, and few of the established media agencies had specialist digital divisions³³². Initiative claimed to have integrated their digital department into their overall media area. Carat had a specialist digital team, ‘Diffiniti’, who along with MindShare Interaction Ireland, were recognized as relatively big players in the relatively small digital media market³³³. Dave Harland CEO of OMD commented ‘that the size of the Irish market makes it difficult for any agency to fully resource online digital media in-house’³³⁴. However, he believed that the Irish digital advertising industry was finally taking-off after lagging behind the US, the UK and the larger European countries and several false starts³³⁵.

Agencies still needed to develop their online understanding and skillsets to a level similar to their traditional media capabilities³³⁶. They found it difficult to source staff with the required skillsets³³⁷: people who could be creative with ‘new’ technology and understand consumers; ‘*staff with video and interactive skills*’³³⁸.

4.7.2.3 The Development of Online Media in Ireland

*‘Given that the media context has an important influence on the value of advertising, new media technology is thought to represent the most important influence on the future of the advertising industry over the next 10-15 years*³³⁹.

The slow development of digital advertising was mainly blamed on poor infrastructure i.e. the unavailability of broadband in large areas of Ireland³⁴⁰. In 2006 although online ad spend was incrementally increasing significantly (e.g. 30% p.a.) it only represented 2% of overall media spend³⁴¹(see Table 4-16 for trend). In the UK it represented 10.5% of spend³⁴². Broadband penetration rate was 100% in Northern Ireland, 47% in the UK, but only 14.5% in the Republic of Ireland³⁴³ and there was recognition that until the broadband audience was delivered, the potential of digital advertising in Ireland would remain underdeveloped³⁴⁴.

Online was not reducing spend on traditional media, but was treated as an additional outlay by advertisers³⁴⁵. In 2006, according to estimates, 49% of the online advertising spend was going towards SEO (Search Engine Optimization), and significant shares of the remaining spend was going towards ‘straight branding’, banner ads and sponsorship³⁴⁶. Inadequate broadband infrastructure was felt to limit the use of rich media (e.g. video content)³⁴⁷ and there was a requirement for improvement in Irish consumer-based website content quality³⁴⁸.

On the media supplier side, although many Irish newspapers had a strong online presence, they were not pushing cross selling print and digital media space³⁴⁹. *‘[D]igital [was] still outside of the mainstream media mix, [with] the agency focus remain[ing]’* on TV³⁵⁰. Nevertheless, online was growing in importance in the media landscape³⁵¹ and ‘holistic’ had become a buzz word in the ad industry, with agencies claiming to offer fully integrated communication solutions. However, doubts remained about their ability to integrate online into the mix³⁵².

Year	% of Total Media Spend	Spend €	Other Media €
2000	-	5-6m	600m
2003	1%	6.4m	-
2005	-	13m	-
2006	2.42%	41m	€1.65b

Table 4-16: Estimated Online Advertising Spend 2000-2006³⁵³

Another issue which slowed the growth in digital advertising spend was lack of information³⁵⁴: In 2005 AFA O'Meara's, commented *'It is near impossible to establish its true value due to the lack of a structured approach in gathering expenditure data and to the speed of growth in the market'*³⁵⁵. By 2006 *'Ireland continue[d] to rely on anecdotal evidence rather than hard facts about online spend'*³⁵⁶.

In July 2008 broadband subscribers finally exceeded 1,000,000 and continued to increase rapidly³⁵⁷ making the use of rich media viable. Digital had changed the communication relationship between advertisers and consumers³⁵⁸. It offered consumers 24/7 access, and participation in the communications relationship. Over the period advertisers' online communications developed from being primarily direct response advertising to extend into brand building communications territory³⁵⁹. It had taken time for the industry and marketing community to understand that marcoms are rendered differently depending on both the online device type and the operating system that it is running on³⁶⁰. Consumers had, for example, been subjected to shrunk down banner ads from desktop to mobile, and websites that were virtually unusable via their mobile phones³⁶¹.

Continuing developments in ICT enabled the progression of online marcoms across creativity, media placement and measuring effectiveness. Originally banner ads and websites appeared like print ads (without the pictures), more akin to magazine ads and catalogues. Progressions in the technology enabled richer and more creative communications like animated audio-visual communications, akin to TV ads. As the technology and digital advertising developed the nature and scope of what was possible expanded³⁶². New developments such as ad networks, ad servers and Google organized the media landscape to enable effective audience reach³⁶³. The online environment continued to evolve with exponential growth in media supply and complexity, particularly via mobile through iPhone and Android. Solutions including programmatic buying³⁶⁴ emerged seeking to manage this³⁶⁵. Consumer's digital data was used to increase the potential relevance of ads served to them, including retargeting and proximity marketing.

4.7.2.4 The Recession and Digital Advertising Take-off

'.. the disruption unleashed by digital technology coupled with the global financial meltdown that started in 2007 has forced agencies to change their business models ...' John McGee, 2012³⁶⁶

By 2007 digital media was perceived as having reached a tipping point³⁶⁷. Adoption was accelerating³⁶⁸, consumer behavior was changing, and advertising spend patterns were shifting towards digital. Then recession loomed causing uncertainty about digital advertising finally taking flight. In 2008 the advertising industry appeared unaffected by the global crisis, and media spend continued to increase³⁶⁹. However, the recession caused uncertainty and projects were cancelled by advertisers across all media³⁷⁰. Clients reacted differently depending on whether they viewed digital advertising as a cost or an investment³⁷¹.

In 2009 recession really hit with many clients slashing advertising budgets. Recession increased client focus on advertising effectiveness and the measurability promised by digital media³⁷², along with the recognition of changes in consumer behavior caused by digital, resulted in a shift in advertising spend towards digital³⁷³. Total Advertising spend in Ireland continued to fall until 2014, but online advertising spend increased year on year³⁷⁴ (see Table 4-17). According to Michael Cullen *'digital agencies were taking the traditional agencies' lunch*³⁷⁵.

Year	Online	Traditional Media
2006	1.5%	98.5%
2008	7.2%	92.8%
2009	10.0%	90%
2010	10.9%	89.1%
2011	13.3%	86.7%
2012	15.9%	84.1%
2013	18.0%	82%
2014	20.6%	79.4%
2015	41.2%	58.2%
2016	47.1%	52.9%

Table 4-17: Online Advertising Share of Market 2006-2016³⁷⁶

4.7.2.5 Advertising Agency Positioning

With the take-off of digital media, agency heads repeatedly said *'digital sits at the heart of everything we do'* in a mantra-like fashion although a skeptic asked *'where were they all on the night of the ... Digital Awards?'*³⁷⁷. In 2007 the biggest players in Ireland's digital advertising market were digital agencies and online sales houses³⁷⁸. The media agencies Carat and Mindshare were the only incumbents linked to leading digital agencies.

Evidence of the growing market for digital advertising was apparent in incumbent agencies emphasizing their digital services and increases in digital agency staff. Examples include:

- Creative agency McConnells launched McConnells Interactive in 2008 to emphasize their digital capabilities³⁷⁹.
- GT Media announced a restructure to integrate digital into their offering, touting their smaller size and local ownership as making them nimbler and more adaptable³⁸⁰.
- Digital agency ICAN had doubled its staff to 23 over 18 months³⁸¹.

Coinciding with the recession several agencies moved to take formerly outsourced digital activities such as digital media buying in-house to develop digital revenue streams. E.g. Net Behavior a digital media buying specialist lost their Omnicom Media Group Ireland business to this strategy in 2009³⁸². The trend was so significant that Net Behaviour closed³⁸³.

Spend on traditional media stagnated precipitating a merger/takeover epidemic in the Irish Ad industry. Traditional agencies bought digital agencies³⁸⁴ to broaden and integrate their creative and

digital capabilities e.g. in 2013 McCann merged with the digital agency Blue cube to become McCann Blue³⁸⁵, and in 2014 Javelin bought Brand Social (digital specialists) citing the growth in online spend as an incentive for the move³⁸⁶. However, the ability of traditional agencies to assimilate digital competence into their core through acquisitions was questioned with rumours of incompatibility (e.g. McCannBlue). Globally agencies sought to break down silos³⁸⁷ across all their services, but this was challenging³⁸⁸. According to Michael Cullen *'they had to do something because otherwise they just don't have a business it's as simple as that, it's do or die'*³⁸⁹.

4.7.2.6 Digital Strategy

Online technology drove the strategy of marcoms companies. The established global advertising groups expanded their portfolios and made serious investments in digital agencies and digital technology companies. WPP pursued both a horizontal and vertical integration strategy³⁹⁰, such as their purchase of the digital agency AKQA in 2012³⁹¹ and the Ad server company APPNexus in 2014³⁹². Publicis reported that they were becoming more of an internet company than an advertising group³⁹³.

4.7.2.7 Clients and Digital Advertising

*'In 2000 it was difficult to sell digital to clients, these days every business wants a digital strategy'*³⁹⁴

In 2000 there was little evidence of enthusiasm from most Irish advertisers for the new medium³⁹⁵. When Clients made their initial move into digital, generally their goal was to have a website. Financial service companies, travel companies and telecoms were the most significant spenders on online advertising until 2006³⁹⁶ focusing on direct response digital advertising³⁹⁷. FMCG advertisers were slow to include digital in their marketing plans³⁹⁸.

The media environment became unrecognizable, consumers changed, and these elements changed clients' need. Clients criticized incumbent agencies for being slow to up-skill in digital, and the agencies in turn accused clients of being slow to engage with the new medium³⁹⁹. Agencies found it challenging that many clients adopted a 'me too' approach rather than thinking seriously about what they were trying to achieve through digital⁴⁰⁰.

By 2013/2014 the biggest online media spenders were financial companies and FMCG⁴⁰¹, with the exception of the classified sector where the top spenders were recruitment, property and auto related⁴⁰². Investment increased, particularly in brand building digital campaigns⁴⁰³.

Irish ad agencies continued to offer services across the spectrum of marcoms particularly within multinational groups e.g. WPP marcoms included a growing spend on online-based

communications including digital advertising, managing social media, advertising on mobile, native advertising, and blogging. However, most clients chose to work with disparate agencies representative of the elements they wanted in their communications mix, with the expectation that the selected agencies would work together to achieve cohesive communication across the ‘disciplines’.

Clients required guidance in the digital landscape but questions remained regarding agencies’ abilities to deliver it. Globally clients took more of their digital marcoms in-house particularly social media management⁴⁰⁴. In-house, including third party provided services, was emerging as a potential challenger to agencies. Bank of Ireland, BWG and Ryanair used third party in-house marcoms services, although they still used external agencies for some services⁴⁰⁵.

4.7.3 Established Trends and a Change in Agencies’ Income Basis

4.7.3.1 Media Independents

In 1996 IAPI finally accepted media independents as members and following this many of the international agencies created media independents through the consolidation of media departments from their associated advertising agencies (see Table 4-18). The trend had become an industry norm.

Year	Company	Comment
1996	<i>IAPI accepts media agencies as members</i>	
1996	Mediacom	Set up by Campbell Grey & Associates
1996	Media Works	Set up by Peter Owens
1996	The Network	Ogilvy combined the media departments of their 2 Irish agencies Wilson Hartnell and Bell advertising. The Network was already well established in Europe
1996	Shanley Media Solutions	Set up by former Wilson Hartnell Media Director Ciaran Shanley
1996	Carat buys into All Ireland Media	The international media agency Carat buys 22% of A.I. M.
1998	GT Media	Links with media specialists in 9 other countries to form Media Lab
1998	MCM Communication	Set up by McConnells (McConnell’s Multimedia)
1999	Mindshare	Consolidation - Ogilvy create Mindshare in Ireland combining ‘The Network’ with the media department of DDFH&B
2008	PHD Media	Set up by the Omnicom Group (Multinational Group)

Table 4-18: Media Separation 1995-2007⁴⁰⁶

Factors Driving the Growth of Media Independents in Ireland

By 1999 Ireland’s media specialists had become the ‘majority buyers from all media’⁴⁰⁷. In Europe the phenomenon had ‘been driven by technology and deregulation with the commercial media opportunities available to the advertiser becoming increasingly complex’⁴⁰⁸. Similarly, in Ireland media supply increased as more commercial licenses for TV and radio were granted (see [Appendix I](#)). Advances in technology also led to increased media supply as the cost and ease of launching

newspapers and magazines was greatly reduced, and satellite and cable TV provided more channels to audiences⁴⁰⁹ (see [Appendix J](#)). Media fragmentation led to requirements for narrower targeting of audiences by advertisers and increased complexity in media planning and buying⁴¹⁰. Audience fragmentation increased the importance of media selection in advertising effectiveness⁴¹¹. Whilst earlier media was not considered in the pitching process, by 1997 media had become an important part of pitching for new business⁴¹².

The initial strategy of media independents was to provide lower costs to clients, which was probably the biggest driver of client buy-in⁴¹³. By 1994 the major media specialists had invested in proprietary technology as a means of differentiation to provide competitive advantage⁴¹⁴. Scale provided greater bargaining power with media suppliers, and funding for required investments in ICT to efficiently manage increasing complexity⁴¹⁵. This is reflected in Group M's pitch: *'Scale doesn't just give us the strongest trading power - it also gives us the ability to invest in the best technology'*⁴¹⁶.

Clients came to believe that media independents provided a better product, reducing risk for their media strategies⁴¹⁷. Some agencies closed their media department and outsourced to media specialists and new ad agencies began *'increasingly setting up without media departments as the entry costs in personnel and systems ...[became] too great'*⁴¹⁸. Due to increasing industry consolidation and significant investments required in ICT no new indigenous media agencies launched in Ireland (apart from digital specialists).

Media Buyers needed scale to invest in ICT and they needed ICT to manage scale. This was a motivation for Irish media agencies to become part of international groups, as it was expensive to invest in technology and associated expertise⁴¹⁹. Carat Ireland⁴²⁰ leveraged Carat's international research system which they touted as being *'the best media research system in the business'*. In 1999 All Ireland Media (AIM) were the first agency in Ireland to adopt DDS media software, saying the software would enable the agency to make better (more in-depth) and swifter information analysis for their clients⁴²¹. Smaller players could not afford the required investments in technology and the market became dominated by a few big players⁴²². GT Media (est. 1983), succumbed to internationalization in 2014 and became part of the HAVAS group⁴²³.

4.7.3.2 *Change in the Basis of Agency Earnings*

In addition to changing industry structure i.e. fragmentation of service provision, the establishment of independent media agencies threatened the basis of advertising agency earnings. Traditionally agencies earned most of their income through media commission, earning 15% of the cost of media booked for their client's campaigns⁴²⁴.

The media commission-based remuneration system had been an industry standard which meant that negotiation of fees between agencies and clients was avoided, thus removing a potential cause of friction in the client-agency relationship⁴²⁵. The system was simple and provided agencies with a predictable income stream, based on their client's media budgets. An agency might earn 20% of annual income from that year's creative work, whilst 80% came from media placements of ads created in that or prior years⁴²⁶.

In 1997 there was significant variation in the commission rates received by media independents and full service agencies⁴²⁷. As pressures of competition and accountability on clients increased, David Nea of Cawley Nea commented at the Media Summit: '*The inefficient advertising sector*' ..not surprisingly [has] been one of the targets for advertisers in reducing costs⁴²⁸. The shift of clients to selection and use of separate independent agencies meant it was inevitable that the commission structure would change⁴²⁹.

The Internet increased momentum towards changing the basis of advertising agencies' media based commission system; '*...the question of whether we're moving from commissions to fees is a moot point. Each year a higher proportion of dollars will go to interactive. No media no commission. No printing to mark up. You do an hour of work, you get paid for an hour*⁴³⁰.

In 1999 in the US clients Procter & Gamble and Unilever were seen as '*the biggest remaining pillars of commission-based agency compensation*' but in 2001 they shifted remuneration from commission to a fees and incentives basis⁴³¹. By 2000 in Ireland large clients such as Diageo, Nestle, Bank of Ireland and Allied Irish Banks had moved from a commission basis⁴³².

IAPI reported that '*a wide – sometimes bewildering –array of arrangements has arisen in order to compensate agencies*⁴³³ (see Table 4-19). The methods were not mutually exclusive and various combinations of the methods were employed⁴³⁴. Media commission-based remuneration was rarely used for creative agencies, but continued to be regularly used for media agencies⁴³⁵, albeit the share media agencies retained was decimated⁴³⁶. In turn media agencies sought additional rebates from media suppliers to supplement their income⁴³⁷. Traditional media suppliers were under pressure as deregulation, developments in ICT including online media provided seemingly almost limitless media supply.

Client procurement departments became very active in ad agency selection decisions⁴³⁸. According to Michael Cullen '*the accountants have certainly taken over, they're the ones that rule,.. everything is accountable everything is cost driven*⁴³⁹. By 2014 in agency pitches a significant proportion of marks awarded (35-50%) were based on agency cost⁴⁴⁰. There was increasing downward pressure on fees paid to agencies, which threatened agency margins⁴⁴¹, additionally the cost to an ad agency of providing '*digital creative and media services is higher than for traditional advertising*⁴⁴². This trend continued unabated. Increased involvement of procurement and

weighting of cost criteria in agency selection caused concern in the industry⁴⁴³: according to Ciaran O'Reilly *'the margins are low'*⁴⁴⁴.

Method	Proportion of Fees being Earned	% of IAPI Agencies using Method
Commission	33%	Mainly media agencies, rare in creative agencies
Production Mark-up	10%	84%
Retainer	13%	80%
Retainer +Performance Related Bonus	16%	63%
Project Fees	13%	95%
Variable Fees Based on Actual Hours	9%	60%

In agreements with individual clients, 16% of agencies were using combinations of the methods above
Two additional methods Concept fee & Licensing Fee models, and Payment by results were being used internationally but were not in use at any IAPI agency as at 2008

Table 4-19: Remuneration Methods for IAPI Agencies 2008⁴⁴⁵

4.7.3.3 Internationalization

In 1995 a commentary on the industry stated *'[m]any of the [agency] names are still familiar but the nature of their ownership has changed significantly and ... the Irish Advertising agency business is no longer family controlled'* or Irish owned⁴⁴⁶. International links had become an expected model, a prerequisite: *'If Irish agencies want to work for blue chip clients, they are going to find that most are aligned to international agency systems'*⁴⁴⁷, *'serious agencies need international alignments'*⁴⁴⁸. The internationalization spanned into another significant industry change the separation of the media function from advertising agencies e.g. Carat acquired 22% of All Ireland Media⁴⁴⁹.

By 2000 only a few Irish owned agencies of note remained, such as McConnells, Peter Owens, Des O'Meara & Partners, and CDP (95% Irish owned), most agencies were owned or part owned by global networks⁴⁵⁰. By 2003 the Irish industry was dominated by internationally aligned agencies, and the remaining Irish agencies were under pressure to form international links or to merge with other Irish agencies or risk losing accounts⁴⁵¹. In 2003 O'Mearas and AFA merged⁴⁵².

Internationalization was viewed as reducing creative opportunities in Irish agencies: Des O'Meara opined - *'Nowadays it is easy for large international brands to stick with their London or New York based agency and appoint a Dublin-based agency to "Irish-ise" their campaigns. There is still money in this kind of activity but the creative input is minimal'*⁴⁵³. A worrying trend emerged during the recession, with some major international advertisers operating their marcoms strategies for Ireland from the UK.

The internationalization trend spilled over into digital agencies (See Table 4:20). ICT challenges directly played a role in Irish agencies proclivity to seek internationalization, (as an exit strategy),

as per Breandan O’Broin ‘owners were thinking, it [(digital)] will take a big investment, we don’t really know about it, and income is shrinking’⁴⁵⁴.

Year	Agency	International company	Notes
1995	Campbell & Associates	Grey Advertising	Agency renamed as Campbell Grey & Associates
1996	All Ireland Media (A.I.M.)	Carat	Media: Carat who are owned by Aegis take a 22% stake in AIM
1997	Youngs	Leo Burnett	Youngs was already a wholly owned subsidiary of communications group Lopex plc.
1998	Irish International	Abbot Mead Vickers (AMV) and BBDO Worldwide	BBDO is a US company, AMV is a UK company
1998	GT Media	EuroLab	Media: Forms EuroLab along with 9 other media specialists to provide Pan European Media network
1999	Close Dublin Office – pull out of Ireland	Saatchi & Saatchi	Will service international clients from London office
1999	Peter Owens	DDB	DDB (an Omnicom agency). In 1988 Owens became affiliated with DDB , had changed name to Owens DDB in 1997 mark intentions no equity involved.
2000	Arks Young	Havas group (French) buy out Lopex	Arks renamed Euro RSCG. Havas are the world’s 5 th largest and Europe’s largest ad agency
2001	CDP (Dublin)	Leo Burnett	A non equity affiliation so no client alignment will occur. Publicis own the Leo Burnett group
2002	Cawley Nea	TBWA	Majority shareholding sold. TBWA is part of the Omnicom group
2004	The Helme Partnership	Grey advertising	
2005	Brindley Advertising	Aegis	Media Agency.
2008	PhD Media	Omnicom Group	Set up by Omnicom rather than an acquisition
2009	The Larkin Partnership	Leo Burnett	Growth potential reason cited by both parties
2011	CKSK Dublin	CKSK Amsterdam	<i>Trend reversal: Dublin Digital agency CKSK (founded in 2006) open an agency in Amsterdam</i>
2013	Lucidity Digital	Aegis Group	Rebranded as Lucidity Isobar. Then Isobar in 2014.
2013	CKSK Dublin	CKSK New York	<i>Trend reversal: Dublin Digital agency CKSK open an agency in New York</i>
2014	Brand Social	Javelin Group	
2014	GT Media (1983)	Havas Media	Merge to form Havas Media Ireland
2017	Eightytwenty	Ogilvy & Mather	The digital agency had previously been working in partnership with O&M
2017	Rothco	Accenture Interactive	

Table 4-20: Internationalization 1994-2017⁴⁵⁵

4.7.3.4 Marketing Communications

‘Digital advertising needs to be far more integrated than traditional advertising, and to do this requires a holistic approach not solely an advertising focus’⁴⁵⁶Ciaran O’Reilly.

Increasingly the concept of integrated marcoms was referred to during this period. Agencies were advised that they needed to expand their service offerings to survive ... ‘it isn’t all about advertising’⁴⁵⁷. Agencies continued to expand into providing across the board marcoms services.

However, they were accused of focusing on their core strengths and profit opportunities in devising marcoms mixes rather than focusing on the communication needs of the client⁴⁵⁸.

There had been a spate of M&A activity with agencies striving to provide full service marcoms services e.g. Dimension owned by McConnells acquired Adsell and announced that their mission was to provide integrated marcoms. Medium sized agencies such as Des O'Meara's were providing 'through the line promotion' and direct marketing services⁴⁵⁹. In 1996 the Ogilvy & Mather group in Ireland encompassed Wilson Hartnell Advertising, Bell Advertising, Wilson Hartnell Public relations, Ogilvy & Mather Direct and Creative Facilities a computer design company⁴⁶⁰.

To promote their expanded service provision and to gain independent non-advertising business, agencies frequently maintained separate company names per marcoms area of expertise, a structure that hampered achieving integrated marcoms for clients. In 2000 QMP D'Arcy consolidated their marcoms offerings including advertising, PR, below-the-line and media houses into one business, arguing that clients required holistic marcoms solutions and that synergies were possible through this cohesive approach⁴⁶¹. The shift in focus from advertising to marcoms was a global phenomenon as evidenced in 2002 by the WPP group indicating intentions to shift from being '*predominantly an advertising company, towards one-third advertising and two-thirds communications activities outside mainstream advertising*'⁴⁶².

Marketing expertise continued to shift from ad agencies to clients, and this along with the growing importance of non-advertising marcoms reduced the ad agencies power in the client-agency relationship. John Fanning observed that '*the role of advertising agencies is being undermined, partly ... because of the increasing prevalence and relevance of alternative forms of marketing communication*'⁴⁶³.

Digital advertising further blurred the lines between ATL and BTL marketing, '*advertising in the digital world is no longer advertising*'⁴⁶⁴, '*when a consumer clicks on a banner advertisement is that advertising or direct marketing...or something else?*'⁴⁶⁵. The marcoms '*disciplines...of advertising, public relations, direct marketing...no longer live apart*', integration is essential, it is not either or for disciplines or traditional and new media, additive communication is required⁴⁶⁶.

4.7.3.5 New Competitors

Globally

*'..but digital technology has made barriers across industries more permeable. While ad agencies remain focused on competition within the industry, the real threats are coming from outside it'*⁴⁶⁷.

Globally new types of firm entered the industry. Consultancy firms such as Accenture⁴⁶⁸, Sapient and Deloitte built up their marketing and data divisions and provided services once provided exclusively by ad agencies⁴⁶⁹. Google and Facebook became increasingly dominant in the digital advertising industry⁴⁷⁰. Both made significant acquisitions and investments in the ad-tech domain, so as digital media providers and as intermediaries they corralled significant portions of the global digital advertising spend⁴⁷¹.

Dylan Williams of Publicis Worldwide commented: *'The single biggest challenge to our industry is future-proofing the relevance of an agent. Disintermediation is a bigger threat than the fact we sell man-hours or that people are increasingly able to avoid what we produce'*⁴⁷². There were several precedents of clients dealing directly with ad technology companies and/or media providers, and not involving ad agencies⁴⁷³. Companies such as Google and Facebook worked with advertising agencies but also directly with ad agencies' clients⁴⁷⁴.

New types of ad agencies emerged such as 'brand-tech' companies. These new companies had the advantage of not needing to restructure to fit with the digital communications environment. The stated purpose of one such company 'You & Mr. Jones'⁴⁷⁵ was to build brands through leveraging technology: strategies such as crowdsourcing creativity were pursued. According to some observers this business model could potentially *'kill off creative shops'*⁴⁷⁶. Generally ad tech firms were good at technology but weak at creative brand building, whilst marcoms companies had contrary strengths and weaknesses. New competition offered high competence in technology and creative communication⁴⁷⁷. In Ireland the digital agency Huskies had to acquire copywriting skills, a combination of new and old skills being required for optimum outcomes⁴⁷⁸.

New Players in the Irish Advertising Industry

Digital technology blurred the line between marcoms disciplines⁴⁷⁹. Digital spans the traditional BOE⁴⁸⁰ model, e.g. banner ads (bought advertising), company's web site (owned) and online consumer reviews (earned). Creative agencies were the leaders in traditional marcoms, but that model changed and there was potential that media agencies would emerge as the new full service agencies as they began providing creative input⁴⁸¹. They moved into digital creative because production and creative and media selection are so closely intertwined in online communications⁴⁸², e.g. Coremedia provided digital creative services through their agency Radical⁴⁸³. Media agencies increasingly moved into fulfilling the strategic/account planning role previously owned by creative agencies⁴⁸⁴. The 2015 IAPI census noted that there was *'increased competition in the creative space from traditionally non-creative agencies'*, which was putting pressure on margins⁴⁸⁵.

In addition, by 2008 the online advertising sales house eType Ireland was implementing a software tool 'Accelerator' which was to derive *'what creative, ad size and type of publisher is needed to*

achieve [a client's] business goal', through leveraging their adserver data⁴⁸⁶. Epsilon a long-established US data firm took over Acorn in Ireland in 2014, they had been acquiring creativity skills over the prior 2-3 years to leverage their data capabilities. The data led firm, offered full service creativity across all media⁴⁸⁷. Their creative use of the data is effective, and clients wanted measurable results⁴⁸⁸. Accenture Interactive *'bolster[ed] their creative credentials'* in Ireland, through their acquisition of Rothco⁴⁸⁹.

4.7.3.6 Digital Advertising and Agency Skillsets

*'When incumbent agencies in Ireland set up digital divisions they found that doing digital was labour-intensive'*⁴⁹⁰.

Since the beginning of the recession the growth of jobs in ad agencies in Ireland was in the digital domain⁴⁹¹. Digital is very labour intensive involving creative, production, variations for differing platforms, differing versions of the ad, buying on different sites, tracking the effectiveness etc.⁴⁹² Agencies supported many different specialisms to deliver a through the line proposition to clients⁴⁹³. They created banner ads, built websites, managed social media, maintained blogs, Twitter accounts and created apps, spanning the BOE media categories.

Thus agencies required *'significantly more specialized agency resources'* to provide online advertising services⁴⁹⁴. Digital advertising created new roles in the agencies, roles of a definite technological bent, including digital production and design along with project management. Advertising became dominated by data driven insights, and the need for accountability increased again⁴⁹⁵. Maths became fundamental: *'It's about data, formulas, statistics, analytics, correlations, patterns, predictive modeling and testing'*⁴⁹⁶. Agencies hired people with engineering, computer science⁴⁹⁷ and mathematics backgrounds⁴⁹⁸. Agencies required staff with high competence in programming, spanning Flash, .net, Java, C++, Silverlight, video, database etc. But they competed with technology companies to hire staff with nontraditional agency skillsets and due to a global shortage in digital skillsets a premium cost was incurred in attracting and retaining digital talent⁴⁹⁹.

The changed staff profile became evident in Irish media agencies. In 2014 Dentsu Aegis had the same number of staff as before the recession but their profile was very different⁵⁰⁰. Alan Cox commented that that Core Media had 1 'digital' person in 2007 and 50 in 2014⁵⁰¹. In 2015 Core looked to recruit 20 additional staff across the areas of *'online media, search, analytics, social media and creative technology'* for digital service provision⁵⁰² - departments/roles that did not exist in the pre-internet era.

The responsiveness and adaptability offered by digital enabled frequent creative refreshes, but was not effortless for agencies, work was required resulting in labour costs for the agency⁵⁰³. The pace

of change in digital felt relentless and agencies were under pressure to ensure they had access to appropriate digital talent⁵⁰⁴.

Creative Technology

In digital communications technical requirements should inform the creative, and thereby *fuel the generation of ideas*⁵⁰⁵. So ideally ad agencies should have a creative department that can produce rather than a separate production department⁵⁰⁶ i.e. the creator of the communication idea and the person who renders it digitally can be the same individual⁵⁰⁷. 'Createch' is the nomenclature given to a unit which synthesizes creativity and technology to provide effective digital campaigns. These requirements had consequences for 'creatives' working in agencies, changing the skillsets they need. The advertising business is now *a blend of creativity and science*⁵⁰⁸.

There was more work for agency copywriters prepared to be flexible and become content providers. Online communications have a higher frequency of updates than traditional media and copywriters are natural sources for blogs, social network updates, refreshing web pages etc. The range of work broadened, as the number of media platforms mushroomed⁵⁰⁹. But writers needed to be more knowledgeable about technology, for example, they needed to know how search engines worked, to enable a website to be positioned in the first page of results when a relevant search was carried out by a consumer⁵¹⁰. The content needed to be useable by humans, but was actually written for robots⁵¹¹.

Creatives needed to be aware of the latest technology trends, rising new communication trends, and which audiences used which communication tools like Snapchat and Twitter. Nick McGivney postulates that the potential for *'creativity has exploded rather than narrowed'*⁵¹².

4.7.3.7 Agencies Adapt To Digital?

*'We've missed the entire point of it all; we've taken the revolutionary power of digital and found a way to adapt it to what we had'*⁵¹³.

Incumbent agencies struggled to come to grips with digital, and comments continued to emerge from within the industry questioning the comprehension and commitment of ad agencies in relation to digital. *'Digital is still too often tacked onto a campaign at the end of a strategy, rather than introduced as a core element at the start'*⁵¹⁴. The lack of confidence in traditional agencies' competence in digital was also evident in some of the interviews.

According to Ciaran O'Reilly: *'Ad agencies and how they work, is fundamentally why they're so poor at digital...'*⁵¹⁵. There was particular concern that the siloed structures of agencies/marcoms companies made it difficult to provide integrated digital communications and integrate digital with

other marcoms components⁵¹⁶. Amidst criticism that the agency model was broken⁵¹⁷ and calls for agencies to restructure⁵¹⁸ or ‘to blow up the agency environment and start again’⁵¹⁹, agencies tried various strategies to enhance their capability to integrate digital. Agencies found it easiest to exploit functional technologies, such as programmatic buying and retargeting, applying technology to what they were doing, rather than doing something new with technology requiring creative input⁵²⁰. The challenge was to develop the combined creative and technical capabilities to truly leverage digital for clients⁵²¹.

4.7.4 Period Summary

‘[A]gencies will - or should- cease behaving like agents... We have if we want it, the chance to break the shackles of our past’⁵²²

The use of ICT in agency processes extended along the supply chain. The intersection of technology change (slow burn) and the recession (swift) in 2008 resulted in an ongoing period of significant change in the industry. There was a level of uncertainty within the industry and the role of advertising agencies in marcoms, as online activities garnered increasing shares of advertising spend. Facilitated by the emergence of online media, traditional agencies began to face a wider array of competition, from new agency types, new types of player and the increased prospect of clients taking services inhouse. The industry reached a crossroads; ‘traditional’ agencies were forced to examine and reimagine their structures. Jobs were lost in many agencies and some closed⁵²³. New online related agencies were created, and many of these were acquired by traditional agencies. Online drove the requirement for new skillsets in the industry.

The internationalization of the industry continued spreading across all agency types, including digital agencies. Media independents became established as an industry norm. However, as scale becoming an increasingly important factor in media services, no new ‘traditional’ media agencies emerged, and smaller media agencies were acquired. The media independent trend coupled with an increase in finance led decision making by clients, (evident in the use of procurement teams in client’s agency selection negotiations) were key factors in changing the basis of agency earnings. Commission rates earned by media agencies were decimated, whilst creative agencies struggled to adapt to non commission based contracts and to justify their fees. While their revenue streams became less predictable, investments in ICT and staff with suitable online related skillsets increased agency costs.

4.8 SUMMARY

In general the industry trends that have emerged in Ireland first emerged elsewhere in the global industry. In Ireland ICT was first applied in the industry in the early 1970s to general administration functions in the agencies and very quickly, as had happened in the US, Irish

agencies began to apply computers to the industry specific function of media planning and buying. The use of computers increased efficiency in the industry and increased the agencies focus on and visibility of profitability. Adoption of, investment in, and use of ICT in the industry increased throughout the case. It has become endemic in agency processes and across the industry supply chain.

The early adoption of ICT has not generally provided agencies with lasting competitive advantages. Each widely applied ICT became a necessity, making the industry more efficient but not necessarily more profitable. ICT has been a factor in both fragmentation and consolidation in the industry.

ICT through direct and indirect influences has been a major factor in the establishment of media independents, and the ensuing change in the basis for agency revenues. The increasing investment required in operational and 'strategic' ICT has acted as a barrier to entry in the industry in particular for media agencies. ICT increased the need for and benefits of scale in the media function. However, ICT particularly in the guise of the Internet provided the opportunity for new types of firms to enter the industry.

Throughout the case the adoption of ICT required changes in the skillsets in agencies and this has been a factor in the increasing specialization and professionalization of the industry. Technology has changed consumers' relationship with media and advertisers, and thus the most effective strategies for meeting the needs of agency clients. ICT influenced the reduced dominance of advertising in the marcoms mix. ICT (particularly databases and online) aided client's increased marketing capabilities, created opportunities for clients to take elements of marketing communications inhouse and reduced their dependence on agency guidance. Throughout the case ICT increased the pace of the industry. The industry increasingly faced competition on a global basis, and ICT was an enabler of this trend.

ENDNOTES CHAPTER 4

¹ Collated from: 1974. 17.8% Rise in Ad. Agency Billings. *The Irish Times*, 19th Sept ed.: 14; 2015. *IAPI Industry Census 2015*. http://issuu.com/iapi/docs/iapi_industry_census_2015 [Accessed 26th Jan 2016]; 2017. *IAPI Industry Census 2016*. <http://census.iapi.ie/industry.html#introduction> [Accessed 20th July 2017]. Note 1st IAPI Census was in 2013.

² E.g. the US census

³ They had adapted the EDSAC (which was built by Cambridge University). The idea to use computers to improve 'office efficiency' was inspired by a visit to the US where Lyon delegates came across the ENIAC (they were at the time unaware of the Cambridge University EDSAC project, which they subsequently part funded): Land, F. (2014) The Story of LEO – the World's First Business Computer, *Digital Collections*. <https://www2.warwick.ac.uk/services/library/mrc/explorefurther/digital/leo/story/> [Accessed 17th Nov 2015]; 2015, *Timeline of Computer History* [Accessed 13th Nov 2015]

⁴ Land, F. (2014); *Leo Computers Society*, <http://www.leo-computers.org.uk/index.html>, [Accessed 17th Nov 2015]

⁵ Such as technology suppliers, software providers and the emergence of generic solutions etc. i.e. an increased body of knowledge/expertise to access.

⁶ Computer software: Programs for computers that could be used repeatedly. The ability to separate the physical digital device (hardware) from the commands for the device (software) has enabled digital technologies to have widespread and flexible applicability.

⁷ 2017. *Ireland's First Computers 1956-69*. <http://techarchives.irish/irelands-first-computers-1956-69/>. [Accessed April 7th 2017]

⁸ Ibid

⁹ Some companies including retail grocery industry suppliers made direct investments for example, in 1971 Rowntree Mackintosh Ireland (Confectionery) invested IR£55,000 in an IBM System 3 Computer. 1992. *Talking Shop: 50 Years of the Irish Grocery Trade: 1942-1992*. RGDATA

¹⁰ Keatinge, R. 1971. Problems of Converting Business Machines, *The Irish Times*, 12th Feb ed.: 16.

¹¹ E.g. they were used by food manufacturers such as HB, Urney's chocolates and Premier Dairies. Sinnott, B. 1970. H.B.--Urney Forms Branch for Computer, *The Irish Times*, Oct 15 ed.: 14.

¹² For the purposes of manageability of scope, Market Research is perceived as a separate industry to advertising, however it is a service to/within the advertising industry. The first marketing related use of computers was probably in 1952 in the United States when CBS News borrowed a UNIVAC to predict the outcome of the US Presidential election from a sample survey. Cortada, J. W. 2004. *The Digital Hand...*; 2013. UNIVAC:UNIVERSAL Automatic Computer - USA 1951, *The History of Computing Project*. <http://www.thocp.net/hardware/univac.htm> [Accessed 14th Nov 2015]. This could be considered as market research. The US census of 1951 could also be considered as market research. Computing provided a major stimulus to the market research industry in the US. The number of market research companies and internal departments and the spend on market research had more than doubled in 10 years to 1964. Nuccio, S. 1964. Advertising: A Boom in Market Research, *The New York Times* 3rd November ed. http://www.nytimes.com/1964/11/03/advertising-a-boom-in-market-research.html?_r=0: The New York Times. [Accessed 18th Nov 2015]

¹³ Nuccio, S. 1964. Advertising: A Boom in Market Research, *The New York Times*

¹⁴ The agencies included JWT, Young & Rubicam Inc., Batten, Barton, Durstine & Osborn Inc., (BBDO) and the Leo Burnett company. Bart, P. 1962. Advertising: Agencies in Computer Derby, *The New York Times*, 21st Oct ed.: 168.

¹⁵ Smith, W., D. 1964. Advertising: Computer Techniques Winning Support, *The New York Times* Sept 30th 1964 ed.:

¹⁶ This has still to be achieved. Bart, P. 1962. Advertising: Agencies in Computer Derby, *The New York Times*.

¹⁷ Skeptical agencies included Benton & Bowles and representatives from Y&R research department. Bart, P. 1962. Advertising: Agencies in Computer Derby, *The New York Times*; Bart, P. 1963. Advertising: Limits to the Computer, *The New York Times*, 18th March 1963 ed.:14.

¹⁸ Media data and media selection systems were the first computer package solutions that emerged for the advertising industry.

¹⁹ Smith, W., D. 1964. Advertising: Computer Techniques Winning Support, *The New York Times*

²⁰ Bart, P. 1962. Advertising: Computers for Picking Media, *The New York Times* 26th Sept.

²¹ Dougherty, P., H. 1968. Advertising: Computer Aid for Media Men, *The New York Times*, 26th June: 70. In Ireland Telmar was initially primarily used by media suppliers, as the cost of licensing was prohibitive for agencies. Personal interview with Alan Cox.

²² DDS was founded by an engineer and ex-IBM employee. Rodgers, Z. 2011. MediaBank and

Donovan Data Systems to Merge, *ClickZ*.

<http://www.clickz.com/clickz/news/2112122/mediabank-donovan-systems-merge>. [Accessed 25th March 2015]

²³ 2015. Mediaocean Timeline, 2015. <http://www.mediaoceanuk.com/at-a-glance>. *Mediaocean* [Accessed 13th April 2015]

²⁴ Dougherty, P., H., 1970. Advertising: Computer Services Plan Set, *The New York Times*, 9th September: 74

²⁵ The respective subsidiaries were COM-Stop and Cybics Computer Corporation. Dougherty, P., H., 1970. Advertising: Computer Services Plan Set, *The New York Times*

²⁶ The feasibility of creating a central computer service for the industry was explored by the American Association of Advertising Agencies, as there was much duplication of computer use and hence costs within individual agencies. Dougherty, P., H., 1970. Advertising: Computer Services Plan Set, *The New York Times*

²⁷ As per comments in 1962 and 1969: Bart, P. 1962. Advertising: Agencies in Computer Derby, *The New York Times*; Dougherty, P., H. 1969. Advertising: A Co-op Computer is Studied, *The New York Times* 16th September: 78

²⁸ Dougherty, P., H. 1970. Advertising: Computer Services Plan Set, *The New York Times*

²⁹ Dougherty, P., H. 1967. Advertising: Computers Generating Talk, *The New York Times*, 4th May: 51

³⁰ Ibid

³¹ Ibid

³² McCarthy, J. 1971. Billings of Irish Agencies Reach £12m in a Difficult Year, *The Irish Times* 28th Sept: 15

³³ Cox, A. 2013. The Big Comeback, *IMJ* February, 24-37:p.36

³⁴ Kotler, P., et al., 2005. *Principles of Marketing*. Fourth European Edition ed: Pearson/Prentice Hall, p.905

³⁵ O'Guinn, Allen & Semenik, 2009. Advertising & Integrated Brand Promotion. South Western Cengage Learning, cited in Kelleher, C. 2012. The Economic Impact of Advertising in Ireland. *AECOM*: Dublin

³⁶ Such as Agency Trading Desks, DSPs (Demand Side Platforms), Exchanges, Ad Networks, DMPs (Data Management Platforms) and Data Aggregators, Ad Servers, and SSPs (Supply Side Platforms) etc. Young, M. 2017. *Ogilvy on Advertising in the Digital Age*: Goodman.

³⁷ Burke, R. 2013. Ad Agencies Ready to Fight for Share of Diminishing Domestic Pot, *Independent.ie*, 4th Aug. <http://www.independent.ie/business/irish/ad-agencies-ready-to-fight-for-share-of-diminishing-domestic-pot-29470761.html>. [Accessed 20th May 2015]

³⁸ Spanier, G. 2016. The New Deal-makers, *Campaign*, 14th Jan. <http://www.campaignlive.co.uk/article/new-deal-makers/1379167>: Campaign.[Accessed 26th Jan 2016]

³⁹ Burke, R. 2013. Ad Agencies Ready to Fight for Share of Diminishing Domestic Pot, *Independent.ie*

⁴⁰ Ibid

⁴¹ Burke, R. 2013. Ad Agencies Ready to Fight for Share of Diminishing Domestic Pot, *Independent.ie*;

Spanier, G. 2016. The New Deal-makers, *Campaign*

⁴² O'Reilly, L. 2014. The Most Important Man In Advertising Tells Us Why He Sees 'So Many Potential Sarajevos', *Business Insider: UK*, 4th Nov. <http://uk.businessinsider.com/sir-martin-sorrell-qa-interview-2014-10?r=US> [Accessed 28th Jan 2015]

⁴³ Spanier, G. 2016. The New Deal-makers, *Campaign*

⁴⁴ Sudhaman, A. E. 2015. Martin Sorrell: "The Nature Of Creativity Has Changed", *The Holmes Report*, 29 Sep 2015 ed. http://www.holmesreport.com/latest/article/sorrell-the-nature-of-creativity-has-changed?utm_source=dlvr.it&utm_medium=twitter. [Accessed 1st Oct 2015]

⁴⁵ Brownsell, A. 2018. If Sorrell was so Influential, Why Can't Adland Agree on his Legacy?, *Campaign*. 7th May ed.

⁴⁶ *IAPI Industry Census* 2015, http://issuu.com/iapi/docs/iapi_industry_census_2015 [Accessed 26th Jan 2016]

⁴⁷ Harrison, B. 2002. Tribal Leader Shuns Ad Man Tag in Favour of Businessman; WPP's Sir Martin Sorrell believes the advertising sector is more challenging than ever, writes Bernice Harrison, *Irish Times*, 22nd Mar : 54; O'Connell, S. 2007. New Agency to Compete with Big Names, *Irish Times*, 21st Jun 21: 19

⁴⁸ E.g. Irish International and Cawley Nea\TBWA both owned by Omnicom. Burke, R. 2013. Ad Agencies Ready to Fight for Share of Diminishing Domestic Pot, *Independent.ie*

⁴⁹ *IAPI Industry Census* 2015

⁵⁰ Many IAPI agencies do not have to publish earnings. Generally there is no consistency in the reporting of figures in the advertising industry and they can vary quite significantly across sources.

⁵¹ Personal interview with *Barry Dooley*.

⁵² <http://boysandgirls.ie/about/> [Accessed 27th July 2015]

⁵³ According to several interviewees

⁵⁴ 2015. *IAPI Industry Census* 2015

⁵⁵ DDFH&B have been the largest and most profitable creative grouping for over six years. McGee, J. 2014.

Let the Good Times Roll. *IMJ*(August): 18,19

⁵⁶ E.g. 'The traditional advertising agency model is dead and is no longer fit for purpose. It is also guilty of inertia, has remained unchanged for decades and supports a creative process that is both protractive and costly,' Mark McCann, CEO of Oliver cited in McGee, J. 2016. This is no Time to Hang Around – Traditional Ad Agency Model is No Longer Fit for Purpose, *Sunday Independent*. 18th Sep; 'the advertising agency model as we know it has shuffled off its mortal coil, is bereft of life, has run down the curtain and is no longer fit for purpose'. McGee, J. 2017. Time May be Running Out for Traditional Ad Agencies, *Sunday Indo Business*. 27th Aug; Spanier, G. 2017. Accenture Wants to be World's Biggest Experience Agency of Record, *Campaign*. 12th Sept ed.

⁵⁷ Cited as 20% uptake in Ireland in Muzellec, L. 2016, Digital Marketing and Technology Trends and Knowing Which 50% Works, *The Trinity Global Business Forum 2016*, Dublin, Ireland; Cited as 39% in Weckler, Adrian, 2017, Revealed: Ireland now has Highest Level of Adblocking in Europe - Global Report, *Irish Cable & Digital Guide*, <http://www.independent.ie/business/technology/revealed-ireland-now-has-highest-level-of-adblocking-in-europe-global-report-35415444.html>, [Accessed 21st August 2017]

⁵⁸ Personal interview, *Frank Young*

⁵⁹ 2015. *IAPI Industry Census 2015*; O'Connell, S. 2011. Big-brand Creative Shift a Worrying Trend for Ad Industry, *The Irish Times*, 7th April 2011 ed. <http://www.irishtimes.com/business/media-and-marketing/big-brand-creative-shift-a-worrying-trend-for-ad-industry-1.565437>. [Accessed 3rd Feb 2016]

⁶⁰ Bond, S., & Garrahan, M. 2018. WPP Squeezed by Advertisers and Digital Disruption, *Financial Times*, 2nd Feb.

⁶¹ *IAPI Industry Census 2015*

⁶² Oram, H., 1986, *The Advertising Book: The History of Advertising in Ireland*, MO Books;Dublin.

⁶³ 1975. Four Runners in MCCConnell Award Field. *IMJ& Advertising* (July): 6

⁶⁴ The 'full service' agency classification meant that they provided creative and media services. McCarthy, J. 1974. Advertising Faces New Realities. *IMJ&A*, September(2): 16

⁶⁵ Ibid

⁶⁶ Kile, M. 1974. A Case of Jack be Nimble Jack be Quick'. *IMJ&A*. November (4): 12-14

⁶⁷ 1975. Four Runners in MCCConnell Award Field. *IMJ & Advertising*

⁶⁸ Derived from Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*

⁶⁹ The first marketing diplomas in Ireland were awarded in 1963. The exams were set in England. Personal interview, *Frank Young*

⁷⁰ 1975. Agencies 1974. *IMJ*, 2(2): 17-22.

⁷¹ Personal interview, *Frank Young*

⁷² Ibid

⁷³ 2011. *Impact of EU Membership on Ireland*. Representation in Ireland, 8th March [2015 9th March 2015]. At that time the EU was called the EEC (European Economic Community)

⁷⁴ Moore, E. 1978. The Computer and the Ad-man can be friends. *Input*, 3(4): p. 4.

⁷⁵ 1972. McConnell's IBM Computer Adds Ads, Ads and More Ads, *Irish Times* Oct 27th ed.: 9; McCarthy, J. 1972. McConnells Set Hot Pace for Other Irish Agencies, *Irish Times* June 6th 1972 ed.: 14. McConnells then and for much of the case was considered the premier Irish advertising agency. 1st computer adoption in the Irish industry was over a decade after US advertising agencies had begun using them.

⁷⁶ They invested in an IBM System/3, (a mini computer) which was specifically designed for small companies. 1972. McConnell's IBM Computer Adds Ads, Ads and More Ads, *Irish Times* Oct 27th 1972 ed.: 9. The system was launched in 1969 priced at around USD1,000 a month to rent. 2015 IBM System/3, *IBM Archives*, https://www03.ibm.com/ibm/history/exhibits/rochester/rochester_4008.html: IBM. [Accessed 15th Nov 2015]

⁷⁷ McCarthy, J. 1972. McConnells Set Hot Pace for Other Irish Agencies, *Irish Times*, 6th June 14.

⁷⁸ 1972. McConnell's IBM Computer Adds Ads, Ads and more Ads, *Irish Times*. Note:Traffic management is the managemnet of agency workflow processes.

⁷⁹ The new computer was a telex System 3 computer. Campbell-Sharp, N. 1977. "Sharp's Diary". *IMJ & Advertising* (March): 2.

⁸⁰ Byrne, G. 1982, Running an Electronic Agency, *Irish Marketing & Advertising*, (April/May): 2. This echoes a cost recovery strategy of the US agencies Grey and Bates, who in 1969 had set up subsidiaries offering computer services to non clients Dougherty, P., H. 1970. Advertising: Computer Services Plan Set, *The New York Times*

⁸¹ Collated from 1972. McConnell's IBM Computer Adds Ads, Ads and More Ads, *Irish Times*; 1975 'Advertising Review' *IMJ&A*, 2(2):19; Byrne, G. 1982, Running an Electronic Agency, *Irish Marketing & Advertising*; Campbell-Sharp, N. 1977. "Sharp's Diary". *IMJ & Advertising*(March): 2; Hayes, M. 1974, How Mass are the Media? *IMJ&A*, 2(September):11-13; McCarthy, J. 1972. McConnells Set Hot Pace for Other Irish Agencies, *Irish Times*.

- ⁸² Hayes, M. 1974, How Mass are the Media? *IMJ&A*, 2(September): 11-13. In the period Jan 1974 to March 1975 the average price of the national newspapers had risen by 52%, well above the inflation rate for the same period which was 28%. 1975. Advertising Charges Changes Recommended, *Irish Times*, 9th July: 9A.
- ⁸³ Hayes, M. 1974, How Mass are the Media? *IMJ&A*
- ⁸⁴ Meagher, J. 1974, 'Media Research, *Irish Marketing Journal & Advertising*, 4(November):3-4,16.
- ⁸⁵ Meagher, J. 1974, 'Media Research, *Irish Marketing Journal & Advertising*. In 1974 the Irish Press newspaper also offered a computer analysis facility based on the JNMR data to aid agencies in planning their print media buying. Hayes, M. 1974, How Mass are the Media? *IMJ&A*
- ⁸⁶The printed JNMR contained almost 500 pages. Meagher, J. 1974, 'Media Research, *Irish Marketing Journal & Advertising*.
- ⁸⁷ Keatinge, R. 1974. Receiver Appointed to Dublin Ad Agency, *Irish Times* ed. August 14:14; McCarthy, J. 1974. Advertising Faces New Realities. *IMJ&A*, September(2):16
- ⁸⁸ McCarthy, J. 1974. Advertising Faces New Realities. *IMJ&A*
- ⁸⁹ Particularly given the high inflation of the period
- ⁹⁰ It was a 'Systime 5,000 (PDP 11/34) supplied by Systime (Ireland) limited with dec-writer, two 20 MB disc drives, a 400 LPM printer and 6 VDU's using the RSTS V6B operating system'. Moore, E. 1978, The Computer and the Ad-man can be Friends. *Input*, 3(4): 4.
- ⁹¹ The quote continues as '...without a major crisis or an attack on the Department by the Client Service team!' according to the Groups' Financial Director, Eamonn Moore, (the latter part of the statement reflects the expected resistance on the part of other departments in agencies to embrace financial control within the agencies). Moore, E. 1978, The Computer and the Ad-man... *Input*
- ⁹² The system operated in real time. Moore, E.1978, The Computer and the Ad-man... *Input*
- ⁹³ Ibid. TAM is TV audience measurement. JNMR is Joint national media research which provided statistics for printed and radio media. ABC are criteria for segmenting audiences
- ⁹⁴ Moore, E.1978, The Computer and the Ad-man... *Input*
- ⁹⁵ Byrne, G.1982, 'Running an electronic Agency' *Irish Marketing & Advertising*, (April/May): 2
- ⁹⁶ Ibid
- ⁹⁷ Ibid
- ⁹⁸ Personal interview with *Alan Cox*
- ⁹⁹ Vouchers represent proof that an ad was published in the edition of paper/mag etc. as per media booking
- ¹⁰⁰ 1982, Agency Software – An Irish Solution. *Irish Marketing & Advertising Journal* (December): 4
- ¹⁰¹ Ibid
- ¹⁰² E.g. for Irish Permanent (a client) on their associated 'Irish Times card... you'd write on it, *Irish Times booking Thursday, 14 November 10" x 4 Column inches cost £1000*'. Personal interview with *Alan Cox*
- ¹⁰³ Ibid
- ¹⁰⁴ Personal interview with *John Fanning*
- ¹⁰⁵ Personal interview with *John Fanning*
- ¹⁰⁶ Personal interview with *Frank Young*
- ¹⁰⁷ Personal interview with *Frank Young*. Seconded in personal interview with *Barry Dooley*. The initial adoption of computers in agencies served 'to improve the whole accountancy in the agency and more importantly to improve invoicing to clients. That was critical at the time'
- ¹⁰⁸ Personal interviews with *Frank Young* and *Barry Dooley*
- ¹⁰⁹ Media suppliers set the prices and ad agencies were price takers
- ¹¹⁰ Tansey, P. 1975. Advertising Billings Rise £2.3 m to £20.5m *Irish Times* Dec 3 ed.: 12.
- ¹¹¹ Ireland's first radio station Radio Eireann began broadcasting on the 1st of January 1926. <http://www.rte.ie/archives/exhibitions/681-history-of-rte/> [Accessed 10 Feb 2015]
- ¹¹² Hayes, M. 1974, How Mass are the Media? *IMJ&A*, 2(September): 11-13, p.12
- ¹¹³ Ireland's first television channel RTÉ was launched in 1961. RTÉ was launched as Telifis Eireann, later to be called Radio Telifis Eireann abbreviated as RTE. They are the public service broadcaster and a semi-state company. Oram, H. 1986, *The Advertising Book: The History of Advertising in Ireland*
- ¹¹⁴ It had almost a monopoly on the Irish TV audience, as only Dublin and it's environs could receive the UK television channels
- ¹¹⁵ I.e. under 35 years of age
- ¹¹⁶ Hayes, M. 1974, How Mass are the Media? *IMJ&A*
- ¹¹⁷ Colour TV was deemed to be of particular benefit for advertising consumable products. Oram, H. 1986, *The Advertising Book: The History of Advertising in Ireland*
- ¹¹⁸ RTÉ first broadcast in colour in 1968. Moving from broadcasting in black and white to broadcasting in colour was a major technical change for RTE. Hayes, M. 1974, How Mass are the Media? *IMJ&A*
- ¹¹⁹ Naughton, L.1977, "The Anatomy of a TV Commercial" *IMJ & Advertising* (January): 10-11
- ¹²⁰ Later renamed Network2
- ¹²¹ Shaw, H., Picard, R. and Spain H. A. 2010. *Irish Broadcasting Landscape: Economic and Environmental Review for the Broadcasting Authority of Ireland (BAI)*.

- ¹²² Young, F. 1976, Wrong Time for RTE Two. *IMJ&A*, 2(5): 1
- ¹²³ Press encompasses Newspaper & Mags. Collated from: Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*; Tansey, P. 1975. Advertising Billings Rise £2.3m to £20.5m *Irish Times* 3rd Dec: 12; Young, F. 1983, The State of the Ad Business. *Input*. 8(2 May); Young, F. 1990, Ad Spending Softens in 1990. *Input*. 15 (no. 4 December): 1
- ¹²⁴ Hayes, M. 1974, How Mass are the Media? *IMJ&A*
- ¹²⁵ Some provincials had significant population coverage.
- ¹²⁶ Hayes, M. 1974, How Mass are the Media? *IMJ&A*
- ¹²⁷ The 1st colour advertisement was for Jacob's biscuits. Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*
- ¹²⁸ Interview with *Barry Dooley*
- ¹²⁹ 1982. RTE Ads on Computer. *Irish Marketing & Advertising Journal* (September/October): 8
- ¹³⁰ *Ibid*
- ¹³¹ Meanwhile in the UK the feasibility of ad agencies booking media space directly using computers was being explored, and telex lines could be used to communicate with a computer in Fleets street to book space in newspapers. Byrne, G. 1982, 'Running an Electronic Agency' *Irish Marketing & Advertising*, (April/May): 2.
- ¹³² Ingram, C. 2010, Chris Ingram Fifty Years in Media. *Campaign (UK)* 2010. **March 5**: 22-24. p.23
- ¹³³ Ingram, C. 2010, Chris Ingram Fifty Years in Media. *Campaign (UK)*; Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*
- ¹³⁴ Ingram, C. 2010, Chris Ingram Fifty Years in Media. *Campaign (UK)*. p.22
- ¹³⁵ Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*
- ¹³⁶ *Ibid*
- ¹³⁷ 1997. Mediaworks- The Right Move. *IMJ*(February); Personal interview with *Alan Cox*
- ¹³⁸ Media revenue accounted for almost 80% of ad agencies earnings in the industry in 1984. Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*
- ¹³⁹ Clarke, E., 1977. Article 'Vive la Difference'. *IMJ&Advertising* (July): 9.
- ¹⁴⁰ The increasing availability of media data and the ability to analyze it were both facilitated by computing. Computing was an enabler for the emergence of the media independents. This pattern also occurred in the US. E.g. Articles on the early use of computers by advertising agencies in the US highlight the recognition by agencies that clients ultimately cared about how the use of computers by advertising agencies would save money for clients, the most obvious application to achieve this was more effective media buying. When media independents first began to emerge in the US, some agencies had already developed and had been using their own media selection systems e.g. Young & Rubicam from 1962. Bart, P. 1962, Advertising: Computers for picking media, *The New York Times*. Sept 26th ed.
- ¹⁴¹ Personal interview with Alan Cox. There's plenty of evidence of this - looking at the founders of the media independents.
- ¹⁴² Bowles, M. 1977. ...and Now A La Carte. *IMJ & Advertising*(September): 13. In the same year there were 16 Media Independents operating in the UK, winning about 0.5% of the total media spend. Ingram, C. 2010, Chris Ingram Fifty Years in Media. *Campaign (UK)*, March 5: 22-24
- ¹⁴³ Bowles particularly saw an opportunity to act for UK advertising agencies who were buying media in Ireland. Bowles, M. 1977. ...and Now A La Carte. *IMJ & Advertising*
- ¹⁴⁴ *Ibid*
- ¹⁴⁵ *Ibid*
- ¹⁴⁶ Collated from: Bowles, M. 1977. ...and now a la carte. *IMJ & Advertising*(September):13; Ingram, C. 2010, Chris Ingram Fifty Years in Media. *Campaign (UK)*; <http://www.mediaoceanuk.com/at-a-glance> [Accessed 13th April, 2015]. <http://www.carat.ie/careers/us/> *Carat* [Accessed 1st May 2015]. 1995, '1983 Agency Business'. *IMJ* 1995. 21(December); 1990. Independents: Going it Alone, *Irish Times*, Jun 26 ed.: A.6
- ¹⁴⁷ Ogilvy, D. 1983. *Ogilvy on Advertising* (1st American ed.). New York: Crown
- ¹⁴⁸ Hegarty, J. 2011, *Hegarty on Advertising: Turning Intelligence into Magic* : Thames & Hudson;
- Ogilvy, D. 1983. *Ogilvy on Advertising* (1st American ed.). New York: Crown.
- ¹⁴⁹ Leslie, D. A. 1995. Global scan: The globalization of advertising agencies, concepts, and campaigns. *Economic Geography*, 71(4): 402
- ¹⁵⁰ Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*
- ¹⁵¹ McCarthy, J. 1971, Billings of Irish Agencies Reach £12m in a Difficult Year. *The Irish Times*. Sep 28th ed.: 15
- ¹⁵² *Ibid*
- ¹⁵³ Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*
- ¹⁵⁴ McCarthy, J. 1975, Advertising now in economic doldrums. *The Irish Times*, 30th Jul: 16
- ¹⁵⁵ Either through buying into a foreign affiliation, or opening their own agency
- ¹⁵⁶ McCarthy, J. 1975, Advertising now in economic doldrums. *The Irish Times*

- ¹⁵⁷ Collated from: 1969, Grosvenor Publicity still an Irish firm. *The Irish Times*, Mar 7th ed.: 17; 1995, '1979 was the year...' *IMJ*, 21(12): 22; 1995, '1981 was the year...', *IMJ*, 21(12): 26; 1983, Saatchi acquires Dublin agency. *The Irish Times*, Oct 19th ed.: 1; Glacken, B. 1984, Half the advertising industry is now foreign owned. *The Irish Times* Nov 27th ed.:16; Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*; Ogilvy, D. 1983. *Ogilvy on advertising* (1st American ed.). New York: Crown; 1990. The Multis, *The Irish Times*, 26th June ed.: A3. McGee, J. 2012 The Greening of Faraway Hills. *adworld.ie*, (Jul/Aug) [Accessed 29th Oct 2014]. 1984, 'New Chief for Young's But Clients Move on ...' *Irish Marketing & Advertising Journal*, (January/February): 1; 1995, '1986: People in the News'. *IMJ*. 21(12): 36
- ¹⁵⁸ Oram, H. 1991, Multinationals move in on Irish agencies. *The Irish Times*, Mar 8th ed.:15
- ¹⁵⁹ Glacken, B. 1984, Half the advertising industry is now foreign owned. *The Irish Times* Nov 27th ed.:16
- ¹⁶⁰ Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*: p.273
- ¹⁶¹ Personal Interview with **Breandan O'Broin**
- ¹⁶² Personal Interview with **Frank Young** and **Barry Dooley**
- ¹⁶³ Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*: p.271
- ¹⁶⁴ The company Strata IT, set up in 1990/1991. 1992. Strata I.T. – Full computer service for advertising/marketing *IMJ*. (July): 20.
- ¹⁶⁵ Personal Interview with **Breandan O'Broin**
- ¹⁶⁶ 1992. Strata I.T. – Full computer service for advertising/marketing *IMJ*. (July): 20
- ¹⁶⁷ Personal Interview with **Breandan O'Broin**
- ¹⁶⁸ Donnelly, J. 1994. The Quiet Revolution: Agencies have been slimming down to improve effectiveness. *IMJ&A*, (April): 11-14, 20. p.11
- ¹⁶⁹ Personal Interviews with **Breandan O'Broin**, **Alan Cox**, and **Frank Young**
- ¹⁷⁰ Personal Interview with **Breandan O'Broin**
- ¹⁷¹ Personal interview with **Barry Dooley**
- ¹⁷² Hoy, K. 2015. This month in tech history: April – Apple. <http://www.idgconnect.com/blog-abstract/9688/this-tech-history-april-apple>. [Accessed 3rd April 2015]
- ¹⁷³ Condon, J. C. 1983. Charts on Computer Graphics Are Trending Upwards, *The New York Times* 27th March 1983 ed.
- ¹⁷⁴ Ibid
- ¹⁷⁵ Ibid
- ¹⁷⁶ The launch price of the Apple macs was US\$2,495. 2013. No 81: The first Apple Macintosh. *Campaign (UK)* Oct 25: 12
- ¹⁷⁷ Personal interview **Helen Marks**
- ¹⁷⁸ 1989 was the earliest advertisement found in the main Irish newspapers with an agency looking for mac expertise. In 1986 Des O'Meara's advertised for a Finished artist, the skills required included typography, illustration and darkroom experience. Apple Mac is not mentioned. 1989. Going Places: Finished Artist, *Irish Times* Oct 6th ed.: 23
- ¹⁷⁹ Personal interview with **Barry Dooley**
- ¹⁸⁰ Ibid
- ¹⁸¹ Had an apple macintosh electronic publishing system along with an 800 dpi colour scanner and QMS proof printer Oram, H. 1991. Giving a full range to the customer, *Irish Times*, 4th June: 20
- ¹⁸² Personal Interview with **Barry Dooley**
- ¹⁸³ Personal interview **Helen Marks**
- ¹⁸⁴ Personal Interviews with **Barry Dooley** and **Nick McGivney**. According to Nick it was early to mid 1990's
- ¹⁸⁵ Personal Interview with **Breandan O'Broin**
- ¹⁸⁶ Ibid
- ¹⁸⁷ Personal interview **Helen Marks**
- ¹⁸⁸ Personal Interview with **Barry Dooley**
- ¹⁸⁹ Personal Interview with **Breandan O'Broin**
- ¹⁹⁰ 2013. No 81: The First Apple Macintosh. *Campaign (UK)* Oct 25: 12
- ¹⁹¹ Personal interview with **Helen Marks**
- ¹⁹² Personal interview with **Breandan O'Broin**
- ¹⁹³ Personal interview with **Helen Marks**. Letraset had previously replaced an even more time consuming process hot metal printing and typographers
- ¹⁹⁴ Oram, H. 1990. Learning to Live with the Once Humble Little Microchip, *Irish Times*, 25th Sep: 18
- ¹⁹⁵ Oram, H. 1990. Learning to Live ..., *Irish Times*; Oram, H. 1991. Giving a full range to the customer, *Irish Times*, 4th June: 20
- ¹⁹⁶ Oram, H. 1990. Learning to Live..., *Irish Times*
- ¹⁹⁷ Personal Interview with **Breandan O'Broin**

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- ¹⁹⁸ In 1985 The Irish Press Newspaper moved from Hot metal to Comptuerised type
<http://www.rte.ie/archives/2015/0518/701889-irish-press-group-dispute/> ; Personal Interview with **Breandan O'Broin**
- ¹⁹⁹ Personal interview with **Helen Marks**
- ²⁰⁰ Personal interview with **Barry Dooley**
- ²⁰¹ 2013. No 81: The First Apple Macintosh. **Campaign (UK)** Oct 25: 12
- ²⁰² Personal interview with **Helen Marks**. Drawing capturing proposed concepts/ideas for ad
- ²⁰³ Ibid
- ²⁰⁴ Personal interviews with **Breandan O'Broin** and **Helen Marks**
- ²⁰⁵ Brian Watson former FCB creative chief (UK agency) in 2013. No 81: The First Apple Macintosh.
Campaign (UK) Oct 25: 12
- ²⁰⁶ Personal Interview with **Barry Dooley** and **Helen Marks**. Oram, H. 1990. Learning to live..., **Irish Times**; 2013. No 81: The First Apple Macintosh. **Campaign (UK)** Oct 25: 12
- ²⁰⁷ Personal interview with **Nick McGivney**
- ²⁰⁸ Personal interviews with **Barry Dooley** and **Breandan O'Broin**; Oram, H. 1990. Learning to live ..., **Irish Times**; 2013. No 81: The First Apple Macintosh. **Campaign (UK)** Oct 25: 12
- ²⁰⁹ Personal interview with **Breandan O'Broin**
- ²¹⁰ Ibid
- ²¹¹ Although macs were initially used by creative artists, as skills in using it and complementary technology developed, and macs migrated to within the creative departments the work of the finished artist was made redundant.
- ²¹² Personal interview with **Breandan O'Broin**
- ²¹³ Warnell, R. 1994. Digital is the Bew Buzz Word – Breakthrough in Low Cost Printing, **IMJ**. October: 16-17, p.17
- ²¹⁴ In 1994 the set up costs for a 48 sheet poster for Silk screen would be about IR£ 4,000, digital printing transferring finished artwork via a scanner to transparencies or colour print would have cost IR£40-IR£100. Warnell, R. 1994. Digital is the new buzz word – Breakthrough in low cost printing, **IMJ**. October: 16-17, p.17
- ²¹⁵ Ibid
- ²¹⁶ Ibid
- ²¹⁷ Ibid
- ²¹⁸ Mandese, J. and D. Kalish, Media department software: The Merge/Purge program; A shopper's guide. **Marketing & Media Decisions**, 1989. 24(10): 47
- ²¹⁹ DDS was founded in the states in 1967. Rodgers, Z. 2011. MediaBank and Donovan Data Systems to Merge, **ClickZ**. <http://www.clickz.com/clickz/news/2112122/mediabank-donovan-systems-merge>. [Accessed 25th March 2015]
- ²²⁰ Mandese, J. and D. Kalish, Media Department Software: The Merge/Purge Program; A Shopper's Guide. **Marketing & Media Decisions**, 1989. 24(10): 47
- ²²¹ 1990. Independents: Going it Alone, **Irish Times**, Jun 26, 1990 ed.: A.6
- ²²² Ibid
- ²²³ Independents: Going it Alone, **Irish Times**, Jun 26, 1990 ed.: A.6; Echoed in Young, F. 1989, The Advertising Business:Real Buoyancy as Competition Hots Up. **Irish Marketing and Advertising Journal** September: 8
- ²²⁴ Non Irish TV stations, but watched in Ireland. 1992, Strata I.T. – Full Computer Service for Advertising/Marketing **IMJ** (July): 20. **BARB** is Broadcasters Audience research board, the official source of television viewing figures in the UK. <http://www.barb.co.uk/> [Accessed 2nd April 2014]
- ²²⁵ Donnelly, J. 1994, The Quiet Revolution:Agencies have been Slimming Down to Improve Effectiveness. **IMJ&A**, (April): 11-14, 20. p.11
- ²²⁶ Ibid
- ²²⁷ Personal Interview with **Breandan O'Broin**. Donnelly, J. 1994, The Quiet Revolution.... **IMJ&A**, (April): 11-14, 20
- ²²⁸ Personal Interview with **Breandan O'Broin**
- ²²⁹ Ibid
- ²³⁰ Ibid
- ²³¹ Ibid
- ²³² Ibid
- ²³³ Ray Morgan, chairman of Zenith presented at the 1990 Irish media conference. Morgan, R.1990. The Zenith Case for Centralised Media Buying. **IMJ**, (April): 20-24
- ²³⁴ Ingram, C. 2010. Chris Ingram Fifty Years in Media. **Campaign (UK)** 2010. March 5: 22-24 p.23
- ²³⁵ Morgan, R.1990. The Zenith case for Centralised Media Buying. **IMJ**, (April): 20-24
- ²³⁶ Morgan, R.1990. The Zenith case for Centralised media buying. **IMJ**, (April): 20-24: p.23
- ²³⁷ Collated from: 1990. Company Announcement, **Irish Times**, 11th Sep: 12; 1993, Added Muscle for Media

- Specialists, *IMJ* (October): 2; 1991, Easier to Buy Space in Europe. *IMJ*, (July): 2; 1992. Independent Media Men Form New Group *IMJ* (February): 4; <http://iapi.ie/members/pierce-media-and-advertising-ltd.html> [Accessed 4th May 2015]
- ²³⁸ AMSI was created by: All Ireland Media; Centaur Media, GT Media; Media Guilfoyle Cullen; Pierce Media and The Media Bureau. 1992. Independent Media Men Form New Group *IMJ* (February): 4
- ²³⁹ 1993. Ad Business in Need of an Uplift *IMJ*(October): 2; 1993. Added muscle for Media Specialists *IMJ* (October): 2
- ²⁴⁰ 1993. Ad Business in Need of an Uplift *IMJ*(October): 2
- ²⁴¹ Collated from: 1990. Independents: Going it Alone, *Irish Times*, Jun 26 ed.: A.6; 1992 Independent Media Men Form New Group *IMJ* (February): 4; 1994. The Big Coming of the Media Gurus: No Stopping the Media Specialists. *IMJ* (July/August): 6-7
- ²⁴² Paraphrased Hughes, L. 1991. Heineken Loss Heralds Start of the New Saatchis, *IMJ* (Feb): 9-10 p.9
- ²⁴³ 1991. The Ad Capital of Europe, *IMJ*, 1991(5): 3-4
- ²⁴⁴ Donnelly, J. 1994. The Quiet Revolution: Agencies... *IMJ&A*, (April): 11-14, 20
- ²⁴⁵ McConnells for much of the research period was the largest agency in Ireland and considered the premier Irish agency. Glacken, B. 1984, Half the advertising industry is now foreign owned. *Irish Times* Nov 27th ed.:16; Oram, H. 1986. *The Advertising Book: The History of Advertising in Ireland*; Oram, H. 1991. Multinationals move in on Irish agencies *Irish Times*, Mar 08 ed.: 15; 1990. The Multis, *Irish Times*, 26th June: A3
- ²⁴⁶ Collated from: 1991. The ad Capital of Europe, *IMJ*, (5): 3-4; 1990. Javelin Joins forces with Y&R. *IMJ&A*(September): 10; 1991. 'Was that the year that was?'. *IMJ*, (12):1; Harrison, B. 2002. D'Arcy to close but situation for Dublin unclear. *Irish Times*, 17th Oct: 19; 2010. Dobbin's Delight, AdWorld Features. [Adworld.ie http://www.adworld.ie/features/read/?id=959203d2-a785-406b-9239-48405cfc2e0e](http://www.adworld.ie/features/read/?id=959203d2-a785-406b-9239-48405cfc2e0e): [Accessed 19th March 2015]
- ²⁴⁷ Frank Young Cited in Oram, H. 1991. Multinationals move in on Irish agencies. *Irish Times*, 8thMar: 15
- ²⁴⁸ Oliver, E. 2003. Top advertising agencies in merger talks, *Irish Times*, 25th Jan: 17; Young, F. 1989. The Advertising Business: Real Buoyancy as Competition hots up. *Irish Marketing and Advertising Journal* (September).
- ²⁴⁹ 1988. Arks takes over Kennys, *The Irish Times*, Oct 21 ed.:16; Young, F. 1989, The Advertising Business: Real Buoyancy as Competition hots up. *Irish Marketing and Advertising Journal* (September):8
- ²⁵⁰ Oram, H. 1991. Multinationals move in on Irish agencies, *Irish Times*, Mar 08 ed.:15
- ²⁵¹ 1990, Davitts link up with Europe, *IMJ*, (February): 27
- ²⁵² 60 agencies making up 33 IAPI full service agencies. Billings IR£131 for 1988. Oram, H. 1988. Less Cake for More Eaters, *Irish Times*, 24th May: 19
- ²⁵³ Young, F. 1989, The Advertising Business: Real Buoyancy as Competition hots up. *Irish Marketing and Advertising Journal* (September): 8. For 1988 there were 60 agencies representing 33 IAPI full service agencies, billings of IR£131 million, and Mcconnells had 18m, a share of 14%, plus 4 mill from it's 2nd agency Momentum, top 4 agencies had a 45% share some changes in top 4 positioning Oram, H. 1988. Less Cake for More Eaters, *Irish Times*, 24th May: 19
- ²⁵⁴ Young, F. 1989, The Advertising Business: Real Buoyancy as Competition hots up. *Irish Marketing and Advertising Journal* (September): 8
- ²⁵⁵ Donnelly, J. 1994. The Quiet Revolution: Agencies have Been Slimming Down to Improve Effectiveness. *IMJ&A*, (April): 11-14, 20, p.12; 1993. Ad Business in Need of an Uplift *IMJ*(October): 2
- ²⁵⁶ 1991. The Ad Capital of Europe, *IMJ*, (5): 3-4
- ²⁵⁷ 1993. Ad Business in Need of an Uplift, *IMJ*, (October): 2
- ²⁵⁸ 1993. Ad Business in Need of an Uplift, *IMJ*, (October): 2; Taylor, G. 1993. Agencies Must Give Value for Money. *IMJ*(June): 6
- ²⁵⁹ Personal interview with *John Fanning*
- ²⁶⁰ 1993. Ad Business in Need of an Uplift, *IMJ*, (October): 2; 1993. Added Muscle for Media Specialists, *IMJ*, (October): 2
- ²⁶¹ 1990. 'Is it the End of the Line for the Ad Business? *IMJ* (December): 1. 1991. Companies go the Integrated Marketing Route *IMJ* (February): 14-16
- ²⁶² 1990. 'Is it the End of the Line for the Ad Business? *IMJ* (December): 1
- ²⁶³ 1991. The Ad Capital of Europe, *IMJ*, (5): 3-4
- ²⁶⁴ 1990. 'Is it the End of the Line for the Ad Business? *IMJ* (December): 1; 1991. Companies go the Integrated Marketing Route *IMJ* (February): 14-16
- ²⁶⁵ Collated from: 1977. New Marketing Links Forged, *IMJ & Advertising* (August): 3; 1978. "New Direct Marketing Division Formed" *IMJ&Advertising* 5(May): 6; Oram, H. 1988. Less Cake for More Eaters, *Irish Times*, 24thMay: 19; 1991. Companies go the integrated marketing route *IMJ* (February): 14-16; 1993. Ex Equator team set up O&M direct. *IMJ* (September): 13; <http://idma.ie/> [Accessed 24th July, 2015]

- ²⁶⁶ Oram, H. 1990. Goodbye Camelot, hello Paris, *Irish Times*, 26th Jun 26: A.1. In 1988 below the line spend had grown to almost 37% of total marketing communication spend. Oram, H. 1989. The advertising pool may remain too small to fund the new commercial stations, *Irish Times*, 12thApr: 14
- ²⁶⁷ Donnelly, J. 1994. The Quiet Revolution: Agencies have Been Slimming Down to Improve Effectiveness. *IMJ&A* (April): 11-14, 20
- ²⁶⁸ Donnelly, J. 1994. The Quiet Revolution... *IMJ&A*; 1993. Ad Business in Need of an uplift, *IMJ*, (October): p. 1-2. Personal Interview with *John Fanning*
- ²⁶⁹ Donnelly, J. 1994. The Quiet Revolution... *IMJ&A*
- ²⁷⁰ Liam Gaskin of Watermarque Integrated Marketing services in Gaskin, L. 1995. Promotions or Direct Marketing – the Difference?. *IMJ* (February): 2
- ²⁷¹ 1993. Ad Business in Need of an Uplift, *IMJ* (October): p. 1
- ²⁷² Reitman, J. 1995. The Collapse of Mass Marketing. *IMJ* (April): 17
- ²⁷³ Rosenfield, J. 1991 Defining Direct Marketing *IMJ* (February):16
- ²⁷⁴ Personal interview with *John Fanning*
- ²⁷⁵ 1991. Companies go the Integrated Marketing Route *IMJ* (February): 14-16
- ²⁷⁶ Ibid
- ²⁷⁷ Rosenfield, J. 1991 Defining Direct Marketing *IMJ* (February):16
- ²⁷⁸ Oram, H. 1991a. An Industry at an Exciting Stage of Development, *Irish Times*, 12th Mar: 18
- ²⁷⁹ Rosenfield, J. 1991 Defining Direct Marketing *IMJ* (February):16
- ²⁸⁰ Dublin 4
- ²⁸¹ McGee, J. 2012. The Greening of Faraway Hills. *adworld.ie*. July/August
- ²⁸² Market shrank by 42%. Banotti cited in Gallagher, A. 2014. Meet the Mad Women, *Irish Times*, 29th Mar
- ²⁸³ O’Boyle, R. 1997, President’s Address. *IMJ Poster Advertising Awards 1997* (April): 3
- ²⁸⁴ 1997. ARKs Benefit from the Net *IMJ*, (July/August): 15
- ²⁸⁵ The agency had e-mail and internet access by late 1997. Personal interview with *Helen Marks*
- ²⁸⁶ 1997. ARKs Benefit from the Net *IMJ*, (July/August): 15
- ²⁸⁷ Previously ‘copy’ was faxed to newspapers who would then rekey the ‘copy’. Ibid
- ²⁸⁸ Ibid
- ²⁸⁹ Ibid
- ²⁹⁰ Lack of discipline meant that people spent significant time managing and assessing the deluge of emails which they received. Personal interview with *Helen Marks*
- ²⁹¹ Personal interview with *Miriam Hughes*
- ²⁹² Ibid
- ²⁹³ Personal Interview with *Breandan O’Broin*
- ²⁹⁴ Harrison, B. 2013. Irish advertising industry takes a good look at itself, *Irish Times*, 5th Sept
- ²⁹⁵ Personal Interview with *Barry Dooley*, *Miriam Hughes*, and *Helen Marks*. E.g. Mobile phones, e-mail, laptops, tablets
- ²⁹⁶ Personal interview with *Nick McGivney*
- ²⁹⁷ Ibid
- ²⁹⁸ Ibid
- ²⁹⁹ Personal Interview with *Barry Dooley* and *Miriam Hughes*
- ³⁰⁰ *IAPI Industry Census 2015*. http://issuu.com/iapi/docs/iapi_industry_census_2015 [Accessed 26th Jan 2016]; Personal Interview with *Barry Dooley*
- ³⁰¹ Personal Interview with *Barry Dooley* and *Miriam Hughes*
- ³⁰² 1994. The Big coming of the Media Gururs: No Stopping the Media Specialists. *IMJ* (July/Aug): 6-7 p.6
- ³⁰³ Evans, D.S. 2009, The Online Advertising Industry: Economics, Evolution, and Privacy. *Journal of Economic Perspectives*, 23(3): 37-60
- ³⁰⁴ 1995. Coping with the Space Invaders *IMJ* (April): 8-14
- ³⁰⁵ It was \$126million in the US. 1997. Net Ads to Exceed £2m. *IMJ* (May): 20-21
- ³⁰⁶ 1997. The *IMJ* Guide to Marketing and Advertising Services *IMJ&A*,(Supplement): 30
- ³⁰⁷ 1997. Net Ads to Exceed £2m. *IMJ* (May): 20-21
- ³⁰⁸ Ibid
- ³⁰⁹ Oram, H. 2001. Advertisers Get to Grips with the Internet. *Irish Times*, 27th Feb: A.2. Note: no official figures are available and this spend is likely to be an over estimate.
- ³¹⁰ In 2001 internet coverage was estimated at being between 27% (Thompson, L. 2001. Supplement on Ireland: Ireland’s Spinning a Web of Prosperity. *marketingmagazine.co.uk*) and 40% of households in 2001: Oram, H. 2001. Advertisers Get to Grips with the Internet, *Irish Times*, 27thFeb: A.2
- ³¹¹ Oram, H. 2001. Advertisers Get to Grips with the Internet. *Irish Times*, 27th Feb: A.2
- ³¹² Net Ads to Exceed £2m. *IMJ* (May): 20-21
- ³¹³ Ibid
- ³¹⁴ Ibid
- ³¹⁵ Anonymous source

- ³¹⁶ Kerr, C. 2000. Ad Men Hold off Jumping into the 'Net - for Now. *Irish Independent*, 21st May: 8.
- ³¹⁷ Durkin, M. and M.-A. Lawlor. 2001. The Implications of the Internet on the Advertising Agency-Client Relationship. *The Service Industries Journal*, 21(2), 175-190; Kerr, C. 2000. Ad Men Hold off Jumping ... *Irish Independent*
- ³¹⁸ Oram, H. 2001. Advertisers Get to Grips with the Internet, *Irish Times*, 27th Feb 27: A.2.; Oram, H. 2006. Ireland - Why Digital Needs to Prove its Worth. *mediaweek.co.uk*, 9th May 2006 [Accessed 17th April 2015]
- ³¹⁹ Peadar Pierce of I-MAP cited in Oram, H. 2001. Advertisers get to Grips with the Internet, *Irish Times*
- ³²⁰ Oram, H. 2006. Ireland - Why Digital Needs to Prove its Worth. *mediaweek.co.uk*
- ³²¹ Anderson, C. 2012. *Makers: The New Industrial Revolution*, Great Britain: Random House
- ³²² They were using online to promote financial products for their client 'First Active'. Oram, H. 2001. Advertisers Get to Grips with the Internet. *Irish Times*, 27th Feb: A.2
- ³²³ In 2000 McConnells were looking to recruit someone experienced in search engines, and had appointed a director of New Media. 2000. Classified Ad, *Irish Times*, 12th May
- ³²⁴ Oram, H. 2001. Advertisers get to grips with the Internet. *Irish Times*, 27th Feb 27: A.2
- ³²⁵ Personal interview with *Helen Marks*
- ³²⁶ Stuart Fogarty cited in Gibson, A. 2004. Online Ads Boom, *Irish Times*, 16th Dec: 19
- ³²⁷ Alan Cox, Core Media Group cited in Cullen, 2009 Cullen, M. 2009. Agencies face rough ride, *marketing.ie: Marketing and Media Matters*. <http://marketing.ie/articles/media/>. [Accessed 2nd Sept 2016]; Fanning, J., Irish Advertising Bhfuil SÉ or Won't SÉ? *Irish Marketing Review*, 2003. 16(2): 3-14
- ³²⁸ Frequently the clients liaised directly with the recommended third parties. Durkin, M. and M.-A. Lawlor. 2001. The Implications of the Internet on the Advertising Agency-Client Relationship. *The Service Industries Journal*, 21(2), 175-190
- ³²⁹ Ibid
- ³³⁰ Collated From: 2009 Net Behaviour Calls it a Day, *Adworld News*, 11 Dec ed. <http://www.adworld.ie/news/read/?id=eec72040-655f-4248-bcb4-ee222b16fea4>: *Adworld Ventures Ltd.* [Accessed 2nd Aug 2015]; Conlon, A. 2013. McCann Dublin and Digital agency Blue Cube are to Merge Operations, *IAP Blog*, July 2nd 2013 ed. <http://iapi.ie/blog/2013/07/mccann-dublin-and-digital-agency-blue-cube-are-to-merge-operations/>: IAPI.; Kenny, C. 2014. Waking up Invigorated Every Day in the City that Doesn't Sleep. *Irish Times* 21st Mar: 12; Oram, H. 2001. Advertisers Get to Grips with the Internet, *Irish Times*, 27th Feb 27: A.2.; Slattery, L. 2013. Aegis Acquires Irish agency Lucidity Digital, *Irish Times*, 8th Jan: 2.; Skelly, B. 2008. Online is Lit - Time for Take Off, *AdWorld Features*. <http://www.adworld.ie/features/read/?id=7e48e2f9-a575-43cf-b59c-75b703bb2f39>: *Adworld Ventures Ltd.* [Accessed 2nd Aug 2015]; <http://mobilemarketingawards.ie/judges/> [Accessed 4th Aug 2015]; 2008. In short: Online Marketing Agency Takeover, *Irish Times*, 9th May: 2.; 2007. Display Ad 15: New Digital Agency Arrives in Ireland - Diffiniti, *Irish Times*, 15th Mar: 20; O'Connell, S. 2007. Online Advertising Makes Net Gains as Spend Hits [euro]40m, *Irish Times*, 10th May: 23.; 2017. Ogilvy Confirms Acquisition of Shareholding in eightytwenty, *Adworld*. 10th Mar <http://www.adworld.ie/2017/03/10/ogilvy-confirms-acquisition-shareholding-eightytwenty/>.; 2014. Justin Cullen Appointed Chief Digital Officer of Core Media *Adworld News*. 20th June. <http://www.adworld.ie/news/read/?id=43d06958-1eb5-4974-b4be-1f73749993c1>: Adworld.; Slattery, L. 2014. Ad Group Javelin Acquires Brand Social. *Irish Times*, 13th Feb: 10; 2010. eightytwenty/interactive™ New Vision – The New Model Agency Vol. 2017. *eightytwenty* <https://http://www.facebook.com/notes/eightytwenty/eightytwentyinteractive-new-vision-the-new-model-agency-399008155677/> [Access 20th Oct 2017]. Oram, H. 2001. Advertisers Get to Grips with the Internet. *Irish Times*, 27th Feb: A.2. Kennedy, J. 2008. Reborn IAB Embarks on a Search and Display Mission, New Media, 9th June <http://www.siliconrepublic.com/new-media/item/10767-reborn-iab-embarks-on-a-sea>: *Siliconrepublic*.
- ³³¹ Oram, H. 2006. Ireland - Why Digital Needs to Prove its Worth. *mediaweek.co.uk*, 9th May [Accessed 17th April 2015]
- ³³² Ibid
- ³³³ Dennys, H. 2007. Ireland - Digital gets Creative, *mediaweek.co.uk*, 6th June ed. <http://www.brandrepublic.com/article/662149/ireland---digital-gets-creative>: BrandRepublic. [Accessed 15th April 2015]
- ³³⁴ Oram, H. 2006. Ireland - Why Digital Needs ... *mediaweek.co.uk*, 9th May. Echoed in Johns, K. 2006. Ireland - Media grows as it Adapts to a Thriving Irish Market, *mediaweek.co.uk*, 9th May - 'The potential earnings simply don't warrant staffing up just yet'
- ³³⁵ Oram, H. 2006. Ireland - Why digital Needs *mediaweek.co.uk*, 9th May
- ³³⁶ Carat's Dave Winterlich cited in Oram, H. 2006. Ireland - Why Digital Needs *mediaweek.co.uk*, 9th May 2006.
- ³³⁷ Dennys, H. 2007. Ireland - Digital gets Creative, *mediaweek.co.uk*, 06 June; Johns, K. 2006. Ireland - Media Grows as it Adapts to a Thriving Irish Market, *mediaweek.co.uk*, 9th May
- ³³⁸ Shenda Loughnane MD of ICAN cited in Dennys, H. 2007. Ireland - Digital gets Creative, *mediaweek.co.uk*, 06 June

- ³³⁹ Ducoffe, 1996 cited in Durkin, M. and M.-A. Lawlor. 2001. The Implications of the Internet on the Advertising Agency-Client Relationship. *The Service Industries Journal*, 21(2), 175-190
- ³⁴⁰ Blyth, A. 2009. Ireland - Digital: Ireland Plays Digital Catch-up, 18th June. <http://www.campaignlive.co.uk/news/914237/IRELAND---DIGITAL-Ireland-plays-digital-catchup/?DCMP=ILC-SEARCH:mediaweek.co.uk>. [Accessed 17th April 2015]; Dennys, H. 2007. Ireland Digital gets creative, *mediaweek.co.uk*, 6th June; Dennys, H. 2007. Ireland - Introduction, *mediaweek.co.uk*, 6th June <http://www.brandrepublic.com/article/662146/ireland---introduction>; Brandrepublic. [Accessed 17th April 2015]; Parker, S. and Smith S. 2001, The Future of Digital Media? *IMJ*, 27(5): 30-31.; Johns, K. 2006. Ireland - Media Grows as it Adapts to a Thriving Irish Market, *mediaweek.co.uk*, 9th May
- ³⁴¹ Oram, H. 2006. Ireland - Why Digital Needs ... *mediaweek.co.uk*, 9th May
- ³⁴² Dennys, H. 2007. Ireland - Digital Gets Creative, *mediaweek.co.uk*, 6th June
- ³⁴³ Blyth, A. 2009. Ireland - Digital: Ireland Plays Digital Catch-up, *mediaweek.co.uk* 18th June; Dennys, H. 2007. Ireland - Digital Gets Creative, *mediaweek.co.uk*, 06 June
- ³⁴⁴ Johns, K. 2006. Ireland - Media Grows as it Adapts to a Thriving Irish Market, *mediaweek.co.uk*, 9th May; Oram, H. 2006. Ireland - Why Digital Needs to Prove its Worth. *mediaweek.co.uk*, 9th May
- ³⁴⁵ Oram, H. 2006. Ireland - Why digital needs to prove its worth. *mediaweek.co.uk*, 9th May 2006.
- ³⁴⁶ Simon Ferguson of Salesonline.ie a seller of ad inventory for websites cited in Oram, H. 2006. Ireland - Why digital Needs to Prove its Worth. *mediaweek.co.uk*, 9th May
- ³⁴⁷ Oram, H. 2006. Ireland - Why Digital needs to Prove its Worth. *mediaweek.co.uk*, 9th May
- ³⁴⁸ Ibid
- ³⁴⁹ Ibid
- ³⁵⁰ Johns, K. 2006. Ireland - Media Grows as it Adapts to a Thriving Irish Market, *mediaweek.co.uk*, 9th May
- ³⁵¹ Oram, H. 2006. Ireland - Why Digital Needs to Prove its Worth. *mediaweek.co.uk*, 9th May
- ³⁵² Johns, K. 2006. Ireland - Media Grows as it Adapts to a Thriving Irish Market, *mediaweek.co.uk*, 9th May
- ³⁵³ Collated from: Bowman, T., & Dennys, H. 2008. Ireland Introduction - A Resilient Market, *MediaWeek*, 10th June. <http://www.brandrepublic.com/article/815511/ireland-introduction---resilient-market>; BrandRepublic. [Accessed 17th April 2015]; Collins, J. 2006. Online Advertising to Reach euro €52m in 2007, Meeting Told., *Irish Times*, 19th Oct: 19. Dennys, H. 2007. Ireland - Digital gets Creative, *mediaweek.co.uk*, 06 June; Harrison, B. 2001. Effects of Global Advertising Slide Not Clear Here Till 2002, *Irish Times* 6th Sep: 19. Kennedy, J. 2003. €6.4m Spent on Net Advertising Last Year. *siliconrepublic*, 4th March; Oliver, E. 2005. Media & Marketing, *Irish Times* 3rd Mar: 21. Oram, H. 2001. Advertisers Get to Grips with the Internet, *Irish Times* 27th Feb: A.2
- ³⁵⁴ Blyth, A. 2009. Ireland - Digital: Ireland Plays Digital Catch-up, 18th June; Dennys, H. 2007. Ireland Digital gets Creative, *mediaweek.co.uk*, 6th June
- ³⁵⁵ Oliver, E. 2005. Media & marketing, *Irish Times* 3rd Mar: 21
- ³⁵⁶ 2006. Online Advertising and Promotion, State of the Net: 5. http://amas.ie/wpcontent/uploads/AMAS_state_of_the_net_No2_sep06_web.pdf: *AMAS.ie*. Although an Irish Branch of the internet advertising Bureau (IAB) with affiliation to the European organization was set up in 2001 (Oram, H. 2001. Advertisers get to Grips with the Internet, *Irish Times* 27th Feb: A2). Prior to this an IAB (internet advertising bureau, now called the interactive advertising bureau) branch represented both the UK and Ireland, the Irish Branch of IAB ceased to exist by 2003, as a delayed consequence of the Dotcom crash. It was reestablished in 2008 (Kennedy, J. 2008. Reborn IAB Embarks on a Search and Display Mission, *New Media*, 9th June, <http://www.siliconrepublic.com/new-media/item/10767-reborn-iab-embarks-on-a-sea:Siliconrepublic>). However, it was 2011 before IAB Ireland had published a report on the Digital Advertising spend in Ireland reflecting the 2010 figures.
- ³⁵⁷ Blyth, A. 2009. Ireland - Digital: Ireland Plays Digital Catch-up, 18th June. *mediaweek.co.uk*
- ³⁵⁸ Gunning, D. and R. Maguire, 2014. The Resurrection of Anticipation, *Irish Marketing Journal*, August ed.
- ³⁵⁹ Skelly, B. 2008. Online is Lit - Time for Take Off, *AdWorld Features*. <http://www.adworld.ie/features/read/?id=7e48e2f9-a575-43cf-b59c-75b703bb2f39>: Adworld Ventures Ltd. [Accessed 2nd Aug 2015]
- ³⁶⁰ Personal Interview with *Patrick Casey*
- ³⁶¹ Oakes, O. 2015. Collaborate on Mobile and Learn from Annoying Mistakes, IAB Mobile Engage hears. *Campaign*, 14th May
- ³⁶² Lee Thompson cited in Skelly, B. 2008. Online is Lit - Time for Take Off, *AdWorld Features*
- ³⁶³ 'Ad servers helped serve banner ads more efficiently. Ad networks organized publishers. Google indexed the whole internet'. Rajeck, J. 2015. Programmatic advertising: A Brief History & Predictions for the Future. *Econsultancy.com* <https://econsultancy.com/blog/67050-programmatic-advertising-a-brief-history-predictions-for-the-future>. Pub. 14th Oct [Accessed 1st May 2018]
- ³⁶⁴ Rajeck, J. 2015. Programmatic advertising: A Brief History & Predictions for the Future

³⁶⁵ Ibid

³⁶⁶ McGee., J. 2012. The Greening of Faraway Hills, *adworld.ie*, July/August ed.
<http://adworld.ie/features/read/?id=fda74b87-a52d-4f98-9878-9a93d739c0eb>: [Accessed 29th Oct 2014]

³⁶⁷ Dennys, H. 2007b. Ireland - Introduction, *mediaweek.co.uk*, 6th June
<http://www.brandrepublic.com/article/662146/ireland-introduction>: Brandrepublic. [Accessed 17th April 2015]

³⁶⁸ In July 2008 broadband subscribers finally exceeded 1,000,000 and continued to increase rapidly; Blyth, A. 2009. Ireland - Digital: Ireland Plays Digital Catch-up, *mediaweek.co.uk*, 18th June; Crawley-Boevey, S. 2009 Ireland Agencies: A Question of Value, *mediaweek.co.uk*, 18th June
<http://www.brandrepublic.com/article/914250/ireland---agencies-question-value>: BrandRepublic. [Accessed 20th April 2015]

³⁶⁹ There was a 65% increase in spend on digital media for 2008 year on year Bowman, T., & Dennys, H. 2008. Ireland Introduction - A Resilient Market, *MediaWeek*, 10th June 08
<http://www.brandrepublic.com/article/815511/ireland-introduction---resilient-market>: BrandRepublic. [Accessed 17th April 2015]

³⁷⁰ Crawley-Boevey, S. 2009 Ireland-Agencies: A Question of Value, *mediaweek.co.uk*, 18th June

³⁷¹ For example in the finance sector, Bank of Ireland (BOI) cut their digital spend whilst Allied Irish Banks (AIB) continued to invest in digital advertising. Blyth, A. 2009. Ireland – Digital: Ireland plays digital catch up, *mediaweek.co.uk*, 18th June

³⁷² Digital was more akin to direct marketing, which had gained ad spend in previous recessions whilst advertising spend fell. Personal interview with *Ciaran O'Reilly* 2014; Oram, H. 2001. Advertisers get to grips with the Internet. *The Irish Times* Feb 27 ed.: A.2

³⁷³ Philpott, T. 2009. Swing towards Digital, *Marketing.ie Marketing and Media Matters*, November ed.
<http://www.marketing.ie/index.jsp?p=362&n=376&a=521>. [Accessed 19th May 2014]

³⁷⁴ Power, J. 2015. Quarterly Advertising Barometer: Q4 2014
http://aai.ie/resources/uploads/Economic_Barometer_AAI_March_2015_c1.pdf: *AAI & Nielsen*. Pub. March 2015 [Accessed 23rd April 2015]

³⁷⁵ Paraphrased Personal interview with *Michael Cullen*

³⁷⁶ Note: There can be variation in reported share of advertising spend depending on criteria used e.g. 2013 Cox 2013 reports online as having 22% of media spend. Figures supplied for 2006 differ by source. The same source was not consistently available. 2016 digital spend estimated €406million. Table data collated from: 2017. Digital Poised to Overtake Traditional Media Ad Spending in Ireland <https://http://www.emarketer.com/Article/Digital-Poised-Overtake-Traditional-Media-Ad-Spending-Ireland/1015426>: *eMarketer.com*. Pub 28th Mar. [Accessed 13th Jan 2018]; Dennys, H. 2007a. Ireland - Digital gets Creative, *mediaweek.co.uk*. 6th Jun ed. [Accessed 17th April 2015]; Power, J. 2015. Quarterly Advertising Barometer: Q4 2014. *AAI & Nielsen*

³⁷⁷ Lindsay, T. 2007. Integration: Integration, Lies and Videotape, *campaignlive.co.uk*, 7th Dec
<http://www.brandrepublic.com/article/772518/integration-integration-lies-videotape>: BrandRepublic. [Accessed 15th April, 2015]

³⁷⁸ Such as Diffiniti Ireland, MindShare Interaction Ireland, ICAN, Generator, Net Behaviour, Sales Online and Cybercom in the South and Bluecube Interactive in the North. Dennys, H. 2007. Ireland - Digital Gets Creative, *mediaweek.co.uk*, 6th June

³⁷⁹ Skelly, B. 2008. Online is Lit - Time for Take Off, *AdWorld Features*.
<http://www.adworld.ie/features/read/?id=7e48e2f9-a575-43cf-b59c-75b703bb2f39>: Adworld Ventures Ltd. [Accessed 2nd Aug 2015]

³⁸⁰ Crawley-Boevey, S. 2009 Ireland-Agencies: A Question of Value, *mediaweek.co.uk*, 18th June

³⁸¹ Dennys, H. 2007. Ireland - Digital Gets Creative, *mediaweek.co.uk*, 6th June

³⁸² 2009 Net Behaviour Calls it a Day, *Adworld News*, 11th Dec ed.
<http://www.adworld.ie/news/read/?id=cec72040-655f-4248-bcb4-ee222b16fea4>: Adworld Ventures Ltd. [Accessed 2nd Aug 2015]

³⁸³ Ibid

³⁸⁴ 2013. McCann Dublin to Merge with Blue Cube, *Irish Times*, 29th Jun: 18; Slattery, L. 2014. Ad Group Javelin Acquires Brand Social. *Irish Times*, 13th Feb: 10.

³⁸⁵ 2013. McCann Dublin to merge with Blue Cube, *Irish Times*, 29th Jun 29th: 18

³⁸⁶ Digital acquisition route taken because 'We felt we needed a quantum shift' says Javelin Group chief executive in Slattery, L. 2014. Ad group Javelin acquires Brand Social, *Irish Times*, 13th Feb: 10

³⁸⁷ Sudhaman, A. E. 2015. Martin Sorrell: "The Nature Of Creativity Has Changed", *The Holmes Report*, 29th Sep 2015 ed. http://www.holmesreport.com/latest/article/sorrell-the-nature-of-creativity-has-changed?utm_source=dlvr.it&utm_medium=twitter [Accessed 1st Oct 2015]; Tice, C. 2015. It is Time for Agencies to Stop Resisting Change, *Campaign*. 3rd Sept <http://www.campaignlive.co.uk/article/time-agencies-stop-resisting-change/1362296>: *campaignlive.co.uk*. [Accessed 16th Sept 2015]

³⁸⁸ Bond, S., & Garrahan, M. 2018. WPP Squeezed by Advertisers and Digital Disruption,

- Financial Times*, 2nd Feb 2018 ed.; Brownsell, A. 2018. If Sorrell was so Influential, Why Can't Adland Agree on his Legacy?, *Campaign*. 7th May ed.; Spanier, G. 2017. Accenture Wants to be World's Biggest 'Experience Agency of Record', *Campaign*. 12th Sept.
- ³⁸⁹ Personal interview with **Michael Cullen**
- ³⁹⁰ O'Reilly, L. 2014. The Most Important Man In Advertising Tells Us Why He Sees 'So Many Potential Sarajevos', *Business Insider: UK*, 4th Nov. <http://uk.businessinsider.com/sir-martin-sorrell-qa-interview-2014-10?r=US> [Accessed 28th Jan 2015]
- ³⁹¹ Ibid
- ³⁹² Ibid
- ³⁹³ Suich, A. 2014. Little Brother, *Special Report: Advertising and Technology*. <http://www.economist.com/news/special-report/21615869-technology-radically-changing-advertising-business-profound-consequences>: *The Economist*. 13th Sept. [Accessed 4th Jun 2015]
- ³⁹⁴ *Siobhain Lavery of the Digital Agency ICAN cited in* Roberts, J. 2014. Marketing Agency Keeps up with Cutting Edge of Digital. *Irish Times*, 15th April 15th: 10
- ³⁹⁵ Ibid
- ³⁹⁶ Oram, H. 2006. Ireland - Why Digital Needs to Prove its Worth. *mediaweek.co.uk*, 9th May [Accessed 17th April 2015]; Slattery, L. 2015. 'Relentless' Digital Fuels 20-job Expansion at Core Media, *Irish Times* 6th Aug.
- ³⁹⁷ Slattery, L. 2015. 'Relentless' Digital Fuels 20-job Expansion at Core Media, *Irish Times* 6th Aug.
- ³⁹⁸ Dennys, H. 2007. Ireland - Digital Gets Creative, *mediaweek.co.uk*, 6th June; Oram, H. 2006. Ireland - Why Digital Needs to Prove its Worth. *mediaweek.co.uk*, 9th May
- ³⁹⁹ Baxter, D., *The Agency/Client Perspective: The Digital Luddites of Europe*. *Irish Marketing Journal*, 2010. 36(9); O'Bric, G., *The Agency/Client Perspective: Why We Are Where We Are*. *Irish Marketing Journal*, 2010. 36(9): 21
- ⁴⁰⁰ Personal Interview with **Barry Dooley**; Morrison cited in Slattery, L. 2012. Just Who in the Media World 'Gets' Digital?, *Irish times*, 24th May
- ⁴⁰¹ FMCG were the biggest spenders on mobile display
- ⁴⁰² 2015. Total Online Ad Spend Reaches €263million in 2014, *Adspend studies*, Infographic –IAB PwC Online Adspend 2014. http://iabireland.ie/wp-content/uploads/2015/03/IABPwC_infographic.png: IAB. [Accessed 16th April 2015]; Kennedy, J. 2013. Mobile Ad Spend in Ireland Now at 21pc of Total Digital Advertising Spend, *Business* <http://www.siliconrepublic.com/business/item/34824-mobile-ad-spend-in-ireland>: *Silicon Republic*. [Accessed 13th Aug 2014]
- ⁴⁰³ Slattery, L. 2015. 'Relentless' Digital Fuels 20-job Expansion at Core Media, *Irish Times*, 6th Aug
- ⁴⁰⁴ Fulford, A. 2015. How Media Agencies Can Lead the Industry's Reinvention, *Campaign*, 16th Sept
- ⁴⁰⁵ These clients all use Oliver as their in-house service provider. McGee, J. 2016. 'This is No Time to Hang Around - Traditional Ad Agency Model is No Longer Fit for Purpose', *Sunday Independent*. 18th Sep <http://www.independent.ie/business/media/this-is-no-time-to-hang-around-traditional-ad-agency-model-is-no-longer-fit-for-purpose-35057407.html>. McGee, J. 2017. John McGee: Time May be Running Out for Traditional Ad Agencies, *Sunday Indo Business*. 27th Aug
- ⁴⁰⁶ Collated from: 1999, AIM Splits to Increase Scale and Invest in More Research. *Irish Marketing & Advertising Journal* 25(4): 8; 1996 Peter Owens Set up MediaWorks *IMJ*, (February): 2; Morris, M. 2003 The Hidden Persuaders: They Will Tell you What you Want, What you Really, Really Want ...Melanie Morris Introduces a Few of the Top Creatives in Irish Advertising, *Irish Times*, 11th Oct 11: 74.; 1996. Carat Takes 22% Stake in A.I.M., *IMJ* (November): 14; 1996b. Ogilvy Set up the Network *IMJ*, October: 8; 1998. GT Media Signs up with Euro Network. *IMJ*(February): 7; 1999. O&M Group Goes Full Circle. *Irish Marketing & Advertising Journal* 25(March): 1
- ⁴⁰⁷ Harrison, B. 1999. Specialist Trend in RTE's list, *Irish Times*. 6th May
- ⁴⁰⁸ The Big Coming of the Media Gururs: No Stopping the Media Specialists. *IMJ* 1994(July/August): 6-7 p.6
- ⁴⁰⁹ Ibid
- ⁴¹⁰ Ibid
- ⁴¹¹ Byrne, D., Tapping the White Cane *IMJ*, 1997 (April): 46, 48
- ⁴¹² It would have been very rare for media people to be invited to the pitch in the early years of the case. Byrne, D., Tapping the White Cane *IMJ*, 1997 (April): 46, 48
- ⁴¹³ The Big Coming of the Media Gururs: No Stopping the Media Specialists. *IMJ* 1994(July/August): 6-7
- ⁴¹⁴ Ibid
- ⁴¹⁵ Personal interview with **John Fanning**; Nea, D. 1996. 'A Perspective on Media Planning' *IMJ&A* (April) : 7-8; The Big Coming of the Media Gururs... *IMJ* 1994(July/August): 6-7
- ⁴¹⁶ <http://www.groupm.com/about-groupm/our-approach> *GroupM* [Accessed 6th July 2015]
- ⁴¹⁷ The Big Coming of the Media Gururs... *IMJ* 1994(July/August): 6-7
- ⁴¹⁸ Ibid
- ⁴¹⁹ Bainbridge, J. 2008. Ireland Agencies - Global Networks are Taking on the Indies,

[mediaweek.co.uk](http://www.brandrepublic.com/article/815512/irelandagencies---global-networks-taking-indies), 10th June <http://www.brandrepublic.com/article/815512/irelandagencies---global-networks-taking-indies>; BrandRepublic. [Accessed 18th April 2015]

⁴²⁰ Part of AIM who were part owned by Carat a global media agency

⁴²¹ Although DDS had opened an office in London in 1972, it was 1999 before they began to offer an Irish based service. The AIM contract cost IR£250,000. At that time DDS were supplying advertising and media software to 49 out of the top 50 agencies in the UK. There had been increasing consolidation in suppliers of specialized agency software. 1999. The Media world. *Irish Marketing & Advertising Journal* 25(January): 8

⁴²² Personal interview with **John Fanning**

⁴²³ Corcoran, S. 2014. Havas Media Group and GT Media Join Forces in Ireland, *Business & Leadership*, 9/5/2014 ed. <http://www.businessandleadership.com/marketing/item/45856-havas-media-group-and-gt-me>. [Accessed 28th April 2015]

⁴²⁴ 15% was a standard commission on the additional services they provided. 1975. Advertising Charges Changes Recommended, *Irish Times* 9th July: 9A.; Taylor, G. 1993. Agencies Must Give Value for Money. *IMJ*(June): 6.

⁴²⁵ Personal interview with **John Fanning**

⁴²⁶ Personal Interview with **Breandan O'Broin**

⁴²⁷ Byrne, D. 1997. Tapping the White Cane *IMJ*(April): 46, 48

⁴²⁸ Nea, D. 1996. 'A Perspective on Media Planning' *IMJ&A* (April): 7-8

⁴²⁹ McGonigle, S. 2008. The IAPI Client Guide to Agency Remuneration, *IAPI*. Personal interviews with **Ciaran O'Reilly** and **John Fanning**

⁴³⁰ Internet to Impact on Agency Compensations? *IMJ*, 1996(January): 3

⁴³¹ Neff, J., et al. 2001. Feeling the Squeeze. *Advertising Age*, 72(23): 1-15

⁴³² Personal interview with **Miriam Hughes**

⁴³³ McGonigle, S. 2008. The IAPI Client Guide to Agency Remuneration. *IAPI*

⁴³⁴ Ibid

⁴³⁵ Ibid

⁴³⁶ The clients retain the most and according to rumours sometimes all of the commission. McGonigle, S. 2008. The IAPI Client Guide to Agency Remuneration. *IAPI*; O'Connell, S. 2009. Core Wants Big Slice of Ireland €1.4bn Advertising Spend, *Irish Times*, 5th Feb: 21. Personal interview **Ciaran O'Reilly**

⁴³⁷ O'Connell, S. 2009. Core Wants Big Slice of Ireland €1.4bn Advertising Spend. *Irish Times*, 5th Feb: 21

⁴³⁸ 2015. *IAPI Industry Census 2015*. http://issuu.com/iapi/docs/iapi_industry_census_2015. [Accessed 26th Jan 2016]

⁴³⁹ Personal interview **Michael Cullen**, 2014. Echoed in 'There is so much more pressure on clients to demonstrate the full extent of the return on investment in advertising and this poses challenges for agencies in their ability to clearly demonstrate the effectiveness of their advertising campaigns,' Miriam Hughes, CEO DDFH&B cited in McGee, J. 2017. A Clarity of Purpose in Adland Can Help Stem the Sectoral Threat Posed by Ad Blocking, *Irish Independent*, 8th May. <https://http://www.independent.ie/business/media/a-clarity-of-purpose-in-adland-can-help-stem-the-sectoral-threat-posed-by-ad-blocking-34693568.html>. [Accessed 5th Nov 2017]

⁴⁴⁰ McGrath, G. 2014. Collective Wisdom: Target McConnells ,*Geoff McGrath, Managing Director*. *IMJ*, 2014. August, 59.

⁴⁴¹ 2015. *IAPI Industry Census 2015*.

⁴⁴² Burton, J. 2009. A Marketer's Guide to: Understanding the economics of digital compared to Traditional Advertising and Media Services *Marketer's Guide Series - MG18*: p.37

⁴⁴³ 2017. Industry Census 2017. <http://census.iapi.ie/index.html>: *IAPI and Amárach Research* [Accessed 11th Sept 2017]

⁴⁴⁴ Personal interview with **Ciaran O'Reilly**

⁴⁴⁵ McGonigle, S. 2008. The IAPI Client Guide to Agency Remuneration. *IAPI*

⁴⁴⁶ 1995. Tough Times As Ever for the Ad Business *IMJ*, 21(12): 12

⁴⁴⁷ 1995. Grey Advt. Finally Take a Stake. *IMJ*, 1995(5): 12

⁴⁴⁸ Byrne, D. 1997. Tapping the White Cane *IMJ*(April): 46, 48, p.48

⁴⁴⁹ 1996. Carat Takes 22% Stake in A.I.M., *IMJ* (November): 14

⁴⁵⁰ Preston, L. 2000. VHI Win for QMP D'Arcy Part of Increases, *Irish Marketing & Advertising Journal*, 26(8): 26-27

⁴⁵¹ Oliver, E. 2003. Top Advertising Agencies in Merger Talks, *Irish Times*, 25th Jan 25: 17

⁴⁵² Ibid

⁴⁵³ Des O'Meara cited in Oliver, E. 2003. Top Advertising Agencies in Merger Talks, *Irish Times*, 25th Jan 17

⁴⁵⁴ Personal interview with **Breandan O'Broin**

⁴⁵⁵ Collated from: Oliver, E. 2005. Media & Marketing, *Irish Times* 3rd Mar: 21; 1995. Grey Advt. Finally Take a Stake. *IMJ*, (5): 12; 1996. Carat Takes 22% Stake in A.I.M., *IMJ* (November): 14; 1997. Youngs do deal with Leo Burnett Worldwide *IMJ*(January): 2; Mac Carthaigh, S. 1998. Leading Irish agency

- bought by US/British firms for (pounds) 16m. *Irish Times*, 14th Aug: 50; 1998. GT Media Signs up With Euro Network, *IMJ*, (2): 7; Creaton, S. 1999. Saatchi & Saatchi Leaving Ireland. *Irish Times*, 12th Jan: 17; O'Kane, P. 2001. Ireland: For Better, For Worse? *Campaign*, Sept 14 ed.; 2000. All Change. *IMJ*. 26(Jan/feb): 2; Harrison, B. 2002. D'Arcy to Close but Situation for Dublin Unclear, *Irish Times*, 17th Oct: 19; Harrison, B. 2002. Cawley Nea Sells Majority Stake to TBWA, *Irish Times*, 25th Jul: 15; Bainbridge, J., 2005. Brindley Deal Strengthens Aegis' Irish Position. *Campaign*, 7th Oct: 17; 2009. Upbeat Larkin Looks to Future as Small Fish in a Big Pond, *Irish Times*, 5th June: 16; Bainbridge, J. 2008. Ireland Agencies – Global Networks are Taking on the Indies, *mediaweek.co.uk*, 10th June; Corcoran, S. 2014. Havas Media Group and GT Media Join Forces in Ireland, *Business & Leadership*, 9/5/2014 ed. <http://www.businessandleadership.com/marketing/item/45856-havas-media-group-and-gt-me>. [Accessed 28th April 2015]; Hancock, C. 2009. Irish Ad Agency Snapped Up, *Irish Times*, 5th Jun: 1; Kenny, C. 2014. Waking up Invigorated Every Day in the City That Doesn't Sleep. *Irish Times*, 21st Mar: 12; Slattery, L. 2013. Aegis Acquires Irish Agency Lucidity Digital *Irish Times*, 8th Jan: 2; Slattery, L. 2014. Ad Group Javelin Acquires Brand Social, *Irish Times*, 13th Feb: 10; Taylor, C., & Slattery, L. 2017. Irish Ad Agency Rothco Snapped up by Accenture for Undisclosed Sum, *Irish Times*. 14th Dec; Mulligan, J. 2017. Ogilvy & Mather takes Stake in eightytwenty, *Independent.ie*. 18th Aug <http://www.independent.ie/business/small-business/latest-news/ogilvy-mather-takes-stake-in-eightytwenty-35466878.html> [Accessed 18th Aug 2017]
- ⁴⁵⁶ Personal interview with **Ciaran O'Reilly**
- ⁴⁵⁷ Oram, H., 1996. Capital's Agencies Thrive on Pressure, *Irish Times*, 24th Jul: A.3
- ⁴⁵⁸ Durkin, M. and M.-A. Lawlor. 2001. The implications of the internet on the advertising agency-client relationship. *The Service Industries Journal*, 21(2), 175-190
- ⁴⁵⁹ Oram, H., 1996. Capital's Agencies Thrive on Pressure. *Irish Times*, 24th Jul: A.3
- ⁴⁶⁰ Ibid
- ⁴⁶¹ Preston, L. 2000, VHI Win for QMP D'Arcy Part of Increases. *Irish Marketing & Advertising Journal*, 2000. 26(8): 26-27
- ⁴⁶² Harrison, B. 2002. Tribal Leader Shuns Ad Man Tag in Favour of Businessman; WPP's Sir Martin Sorrell Believes the Advertising Sector is More Challenging Than Ever, writes Bernice Harrison. *Irish Times*, 22nd Mar: 54
- ⁴⁶³ Fanning, J. 2003, Irish Advertising Bhfuil SÉ or Won't SÉ? *Irish Marketing Review*. 16(2): 3-14. p.6
- ⁴⁶⁴ Young, M. 2017. *Ogilvy on Advertising in the Digital Age*: Goodman. p.39
- ⁴⁶⁵ Digital advertising is also known as 'interactive marketing'. Nolan, B. 1997 New.Marketing@.com *IMJ* 1997. Oct: 12
- ⁴⁶⁶ Young, M. 2017. *Ogilvy on Advertising in the Digital Age*: Goodman. P.39
- ⁴⁶⁷ Satell, G. 2014. How Ad Agencies Can Avoid A Death Spiral. *Forbes.com*, 2014. Apr 21 ed.
- ⁴⁶⁸ Accenture Interactive which was founded in 2009 is the largest digital agency by revenue globally. Taylor, C., & Slattery, L. 2017. Irish Ad Agency Rothco Snapped up by Accenture for Undisclosed Sum, *Irish Times*. 14th Dec
- ⁴⁶⁹ 2013. New Ad Giant Chasing Google in Merger Deal, *Irish Times* Aug 2 ed.: 5.; McGee, J. 2017. Time May Be Running Out for Traditional Ad Agencies, *Sunday Indo Business*. 27th Aug
- ⁴⁷⁰ Kihn, M. 2015. What The Past Says About The Future Of Ad Tech. <http://adexchanger.com/data-driven-thinking/what-the-past-says-about-the-future-of-ad-tech/>; *AdExchanger*. 7th Aug [Accessed 9th Aug 2015]
- ⁴⁷¹ Ibid
- ⁴⁷² Dylan Williams of Publicis Worldwide cited in Magee, K. 2015. Will David Jones Kill off the Creative Agency?, *Campaign*. 16th Jul
- ⁴⁷³ 2013. New Ad Giant Chasing Google in Merger Deal, *Irish Times*, 2nd Aug: 5.; Suich, A. 2014. Little Brother, Special Report: Advertising and Technology. *The Economist*. 13th Sept
- ⁴⁷⁴ 2013. New Ad Giant Chasing Google in Merger Deal, *Irish Times*, 2nd Aug: 5
- ⁴⁷⁵ Founded by former Havas CEO David Jones
- ⁴⁷⁶ Magee, K. 2015. Will David Jones Kill off the Creative Agency?, *Campaign*. 16th Jul
- ⁴⁷⁷ Ibid
- ⁴⁷⁸ Personal interview with **Nick McGivney**
- ⁴⁷⁹ Personal Interview with **Alan Cox**
- ⁴⁸⁰ BOE stands for Bought, Owned, Earned, it is also sometimes referred to as POE, with P representing Paid
- ⁴⁸¹ Personal Interview with **Alan Cox**
- ⁴⁸² Personal Interview with **Alan Cox** and **Ciaran O'Reilly**; Burton, J. 2009. A Marketer's Guide to: Understanding the Economics of Digital Compared to Traditional Advertising and Media Services *Marketer's Guide Series - MG18*. <http://www.aaaa.org>; AAAA – American Association of Advertising Agencies, Inc.
- ⁴⁸³ Personal Interview with **Alan Cox**
- ⁴⁸⁴ Ibid
- ⁴⁸⁵ **IAPI Industry Census** 2015.
- ⁴⁸⁶ O'Reilly cited in Skelly, B. 2008. Online is Lit - Time for Take Off, *AdWorld Features*.

-
- ⁴⁸⁷ Personal interviews *Nick McGivney*
- ⁴⁸⁸ Ibid
- ⁴⁸⁹ 2018. Accenture Completes Acquisition of Irish Creative Agency Rothco, *News Release*. <https://newsroom.accenture.com/news/accenture-completes-acquisition-of-irish-creative-agency-rothco.htm>: Accenture. 1st Feb [Accessed 31st Mar 2018]; Taylor, C., & Slattery, L. 2017. Irish Ad Agency Rothco Snapped Up By Accenture for Undisclosed Sum, *Irish Times*. 14th Dec
- ⁴⁹⁰ Bainbridge, J. 2008. Ireland Agencies - Global Networks are Taking on the Indies, *mediaweek.co.uk*, 10th June
- ⁴⁹¹ Harrison, B. 2013. Irish Advertising Industry Takes a Good Look at Itself, *Irish Times*, 5th Sept
- ⁴⁹² Burton, J. 2009. A Marketer's Guide to: Understanding the Economics of Digital Compared to Traditional Advertising and Media Services *Marketer's Guide Series - MG18*.
- ⁴⁹³ Rowley, L. 2015. Carat's Anthony Rhind On His Jump From The Agency World To Ad Tech, *ad exchanger*, June 12th ed. <http://adexchanger.com/agencies/carats-anthony-rhind-on-his-jump-from-the-agency-world-to-ad-tech/>. [Accessed 8th aug 2015]
- ⁴⁹⁴ Burton, J. 2009. A Marketer's Guide to: Understanding ... *Marketer's Guide Series - MG18*: p.38
- ⁴⁹⁵ Capobianco, E. 2014. Maths Marketing: Why Modern Ad Agencies Need Mathletes *The Guardian*, 2nd Oct; Slattery, L. 2015. 'Relentless' Digital Fuels 20-job Expansion at Core Media, *Irish Times*, 6th Aug
- ⁴⁹⁶ Capobianco, E. 2014. Maths Marketing: Why Modern Ad Agencies Need Mathletes *The Guardian*, 2nd Oct
- ⁴⁹⁷ Harrison, B. 2013. Irish Advertising Industry Takes a Good Look at Itself, *Irish Times*, 5th Sept
- ⁴⁹⁸ Slattery, L. 2015. 'Relentless' Digital Fuels 20-job Expansion at Core Media, *Irish Times*, 6th Aug; Gallagher, A. 2014. Meet the Mad Women, *Irish Times*, 29th Mar
- ⁴⁹⁹ Burton, J. 2009. A Marketer's Guide to: Understanding ... *Marketer's Guide Series - MG18*; *IAPI Industry Census* 2015.
- ⁵⁰⁰ Personal interview with *Liam McDonnell*
- ⁵⁰¹ Personal interview with *Alan Cox*
- ⁵⁰² Slattery, L. 2015. 'Relentless' Digital Fuels 20-job Expansion at Core Media, *Irish Times*, 6th Aug 6th
- ⁵⁰³ Burton, J. 2009. A Marketer's Guide to: Understanding ... *Marketer's Guide Series - MG18*
- ⁵⁰⁴ Ibid
- ⁵⁰⁵ Burton, J. 2009. A Marketer's Guide to: Understanding ... *Marketer's Guide Series - MG18*: p.24
- ⁵⁰⁶ Ibid
- ⁵⁰⁷ Ibid
- ⁵⁰⁸ Kyla O'Kelly Direct of the Javelin Group cited in Gallagher, A. 2014. Meet the Mad Women, *Irish Times*, 29th Mar
- ⁵⁰⁹ Personal interviews *Breandan O'Broin* and *Nick McGivney*
- ⁵¹⁰ Personal interviews *Nick McGivney*
- ⁵¹¹ Ibid
- ⁵¹² Ibid
- ⁵¹³ Goodwin, T. 2014. Marketing Agencies Have Completely Missed the Potential of Digital *The Guardian*, 20th Oct 20 <http://www.theguardian.com/media-network/media-network-blog/2014/oct/20/marketing-technology-potential-digital-possibilities>. [Accessed 4th May 2015]. Echoed in 'Like the early days of television, people are still repurposing from the media that came before' Scheppach, cited in Heussner, K. M. 2012. Do Mobile Ads Still Suck?, *Adweek*, 13th February <http://www.adweek.com/digital/do-mobile-ads-still-suck-138189/> [Accessed 3rd Oct 2017]
- ⁵¹⁴ 2013. The Future is Now. *IMJ*(August) p.60-64.; Blyth, A. 2009. Ireland - Digital: Ireland Plays Digital Catch-up, 18th June; Orlaith Blaney cited in Conlon, A. 2013. McCann Dublin and Digital Agency Blue Cube are to Merge Operations, *IAPI Blog*, July 2nd 2013 ed. <http://iapi.ie/blog/2013/07/mccann-dublin-and-digital-agency-blue-cube-are-to-merge-operations/>; IAPI; Dennys, H. 2007. Ireland - Digital Gets Creative, *mediaweek.co.uk*, 6th June. <http://www.brandrepublic.com/article/662149/ireland---digital-gets-creative>: BrandRepublic [Accessed 15th April 2015]; Donnelly, J. 2014. If It Isn't Creative, It Doesn't Sell. *IMJ*(Aug): 24-25; Goodwin, T. 2014. Marketing Agencies Have Completely Missed the Potential of Digital *The Guardian*, 20th Oct 20 <http://www.theguardian.com/media-network/media-networkblog/2014/oct/20/marketing-technology-potential-digital-possibilities>. [Accessed 4th May 2015]
- ⁵¹⁵ Personal interview with *Ciaran O'Reilly*
- ⁵¹⁶ Lindsay, T. 2007. Integration: Integration, Lies and Videotape, *campaignlive.co.uk*, 7th Dec <http://www.brandrepublic.com/article/772518/integration-integration-lies-videotape>: BrandRepublic [Accessed 15th April, 2015]
- ⁵¹⁷ Fulford, A. 2015. How Media Agencies Can Lead the Industry's Reinvention, *Campaign*, 16th Sept http://www.campaignlive.co.uk/article/media-agencies-lead-industrys-reinvention/1364207?bulletin=campaign_daily_fix&utm_medium=EMAIL&utm_campaign=eNews_Bulletin&utm_source=20150916&utm_content=www_campaignlive_co_uk_ar_5: *campaignlive.co.uk*. [Accessed 16th Sept 2015]

-
- ⁵¹⁸ 2013. The Future is Now. *IMJ*(August): 60-64.; Herlihy, U. 2014. Getting the Best of Agency Talent and Value, *Irish Marketing Journal*, Oct/Nov <http://www.adworld.ie/features/read/?id=56f984a9-4bdc-430f-bc54-8e17296cb022>. [Accessed 29th March 2015]; Lindsay, T. 2007. Integration: Integration, Lies and Videotape, *campaignlive.co.uk*, 7th Dec <http://www.brandrepublic.com/article/772518/integration-integration-lies-videotape>: BrandRepublic. [Accessed 15th April, 2015]
- ⁵¹⁹ Goodwin, T. 2014. Marketing Agencies Have Completely Missed the Potential of Digital *The Guardian*, 20th Oct 20 <http://www.theguardian.com/media-network/media-network-blog/2014/oct/20/marketing-technology-potential-digital-possibilities>. [Accessed 4th May 2015]
- ⁵²⁰ Ibid
- ⁵²¹ Skelly, B. 2008. Online is Lit - Time for Take Off, *AdWorld Features*. <http://www.adworld.ie/features/read/?id=7e48e2f9-a575-43cf-b59c-75b703bb2f39>: Adworld Ventures Ltd. [Accessed 2nd Aug 2015]
- ⁵²² Young, M. 2017. *Ogilvy on Advertising in the Digital Age*: Goodman: p.75
- ⁵²³ Personal interview with *Nick McGivney*

CHAPTER 5 CASE STUDY THE IRISH RETAIL GROCERY INDUSTRY

5.1 INTRODUCTION

This chapter presents an account of the influence of digital information and communications technology (ICT) on the Irish retail grocery industry 1959-2016. The case primarily focuses on the industry, but changes in the wider sector and external industry context are also tracked.

Across the researched period:

- There were big changes in participant's market shares. Small independent shops were usurped by large multiple players¹, including new entrants from abroad. Somewhat countering this trend, the symbol group format thrived enabling the survival of many family owned independents.
- There was a lot of entry/exit and takeover activity, and of the large players from the beginning of the case, only one survived the researched period.
- There was a significant increase in the number and range of products offered by retail grocers.
- Large retailers took over responsibility for distribution from suppliers.
- ICT became embedded in industry processes, jobs changed and the pace in the industry increased. Despite prevalent fears of ICT replacing workers, employment in the industry increased significantly across the period.

Table 5-1 provides some indication of the degree of change that occurred across the researched period.

Year	Number of People Engaged	Number of Employees	Number of Establishments	Turnover in the Industry €millions	Turnover Adjusted for inflation to Dec 2012 €millions	Turnover adj. for inflation per person engaged €thousands
1966	21,671	19,364	8,405	€74M	€1,183M	€55K
1977	24,634	12,425	7,555	€400M	€2,011M	€82K
2012	97,114	90,986	6,586	€16,400M		€169K

Figures are not directly comparable as the CSO changed its criteria and classification for categorizing grocery businesses a number of times across the case period. Part-time versus fulltime were not recorded for early years.

Table 5-1: Irish Retail Grocery Indicators of Change 1966-2012²

Despite a significant fall in the number of shops (>20%), the number of employees increased (370%). Over the period 1966 - 2012 turnover earned in the industry has increased by 1,386% and productivity of workers as measured by revenue produced per person working in the industry has increased by over 200%. The 200% increase is likely to be quite understated as part-time workers could not be distinguished in this calculation.

The case begins by setting the ICT context for the industry, followed by an overview of the industry in Ireland as at 2016. Then the case is presented in chronological time frames representative of major episodes of ICT application in the industry. The first section spans 1959-1980, capturing the emergence of modern grocery retailing and the nascent adoption of ICT. The second period spans the emergence and diffusion of electronic point of sale with scanning from 1980-2000. The final period 2000-2016 reflects the emergence of online grocery and an ICT enabled restructuring of the industry supply chain. A summary is presented at the end of each section.

5.1.1 The Emergence of Digital ICT in Retail Grocery

5.1.1.1 Digital ICT in Retail in America

The first era of computer adoption by American retailers and wholesalers spanned the 1950s to the mid 1970s³. Initially computers were very expensive and few retail businesses could afford them⁴. In the mid to late 1950s companies such as Burroughs⁵ and IBM⁶ began to supply computer systems to supermarkets. In the 1960s computer bureau services aimed at small and medium sized stores emerged⁷. Computers were applied to accounting, payroll, inventory control, sales analysis and forecasting, scheduling of work, and in measuring the effectiveness of merchandizing and promotions⁸.

Retailers' key areas of concern were the cost of labour and inventory, and they applied computers only when potential savings in these areas relative to the cost of computers became evident⁹. From the 1950s to the 1970s retailers found that *'general-purpose computers ... systems were too expensive and were less reliable than the mechanical alternatives'*¹⁰. ICT application accelerated in the 1980's, following the emergence of industry specific technologies such as UPC (Universal Product Code) and EPOS (Electronic Point of Sale)¹¹.

5.1.1.2 EPOS and Scanning in America

In the 1960s the US retail grocery industry sought a technology solution *'to automate checkout at stores to increase speed, drive down the cost of hiring so many checkout clerks and systematize in-store inventory management'*¹². In 1973 the American grocery industry

selected the linear barcode as the UPC, and supermarket owners and manufacturers agreed to use it¹³. The first UPC was scanned in 1974¹⁴. It was considered to be a ‘*major innovation in the supermarket industry*’¹⁵.

Barcode numbers were printed on product packaging to identify the product and the manufacturer¹⁶. These were ‘read’ by scanners using laser and a computer interpreted the data communicating the price and product name to the cash register¹⁷. An EPOS system consisted of a terminal (an electronic cash register), a scanning device that read barcodes on product packages and a central computer which contained all the data on prices, taxes and inventory¹⁸.

In 1975 around 30 sites across America had EPOS¹⁹. The cost of installation of a full point-of-sale system for an 8 check-out lane (average sized) US supermarket was between US\$77k-150k²⁰, too expensive for most Irish grocery stores at the time.

EPOS was probably the first time the general public experienced interfacing with a computer²¹. Consumers were wary of the replacement of individual product price stickers with shelf pricing²². Industry representatives promoted the technology as offering consumers greater accuracy, higher speed through the checkout²³, better use of labor²⁴, and itemized till receipts²⁵. Retailers also anticipated increased ‘*managerial efficiency*’²⁶, and reduced costs, ‘*about 20-25% of the savings expected ... depend[ed] on the elimination of item price marking*’²⁷.

Manufacturers had to adapt product packaging to display a barcode²⁸. In 1975 about 50% of products in supermarkets in the US had barcodes. A 70-80% level was required before supermarkets could really reap the gains of adopting EPOS²⁹.

5.1.2 Industry Overview

The Irish retail grocery industry is significant for the economy, in 2012 19% of consumer spending was in grocery stores and grocery store turnover amounted to 7.2% of Ireland’s GDP³⁰. Grocery retailers in Ireland are generally grouped into 3 classifications primarily based on the retailers’ supply chain structures (see [Appendix K](#) for definitions).

1. Multiples
2. Symbol Group Retailers
3. Independents

The industry supply chain comprises suppliers, wholesalers, retailers and consumers (see Figure 5.1). This excludes many essential supporting services in the industry such as distributors, banks, marcoms and a growing technology vendor and support sector.

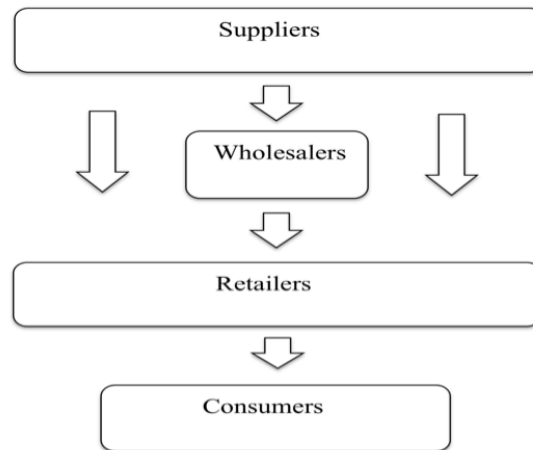


Figure 5-1: Simplistic Representation of Retail Grocery Supply Chain³¹

The industry was comprised of somewhat overlapping segments: supermarkets, discounters, convenience stores, specialist stores and TSN's (Tobacconist Stationer Newsagents). Multiples in general operated as supermarkets with large format stores, aiming to provide a one-stop shop for consumers, however, some also operated in the convenience market³². Enabled by ICT the major multiples took on the distribution function for their stores by adopting central distribution (CD) strategies, and to an extent through the provision of own brands, may be considered to have integrated backwards into manufacturing³³. Within the multiple sector, the hard discounter's focus on pared back shop fittings, limited stock range and products without big brand status etc., allowed them to offer low prices to consumers.

In 2015 89% of the estimated 5,000 independent grocery shops operated as symbol groups³⁴. These generally operated as convenience shops facilitating top up purchases by consumers; however, SuperValu, Eurospar and some individual symbol group shops³⁵ operated as supermarkets³⁶. Several symbol group convenience stores operated from petrol forecourts. Supermarket and convenience stores were assumed to service different consumer needs. However, according to a government report *'there [were]... difficulties in determining where one market ends and another begins'*³⁷. There was competition within and between segments³⁸.

The basic function of wholesalers is to buy goods from suppliers and offer them for resale to retailers. Wholesalers *'[d]istribution is generally centralized through large-scale warehouses*

*managed through sophisticated ICT systems*³⁹. Wholesalers distributed via cash and carry services and/or delivery services to retailers⁴⁰. Through their franchised symbols and the extensive support services they provided to retailers, wholesalers had moved towards forward integration into retailing⁴¹. Wholesalers played a significant role in the industry through their symbols gaining significant market share, and through their leadership and support of innovation in affiliated retailers. Their buying power enabled independents⁴² to compete effectively in the industry.

The economic analyst Jim Power noted that *'[t]here is a dearth of comprehensive data on the size and nature of the retail grocery sector in Ireland'*⁴³. This lack of information has been commented on by RGDATA, industry executives and in government reports⁴⁴.

5.2 THE INDUSTRY 2016

'It's an extremely, competitive, challenging market' Tara Buckley, Director General of RGDATA⁴⁵

5.2.1 Retailers

The industry in 2016 was highly concentrated, the 3 largest retail names had almost 70% of the market (see Table 5.2)⁴⁶, and 5 buyers accounted for 90% of sales for Irish suppliers⁴⁷. The recession had increased focus on cost, and driven efficiency initiatives across all functions, however, as the economy recovered retailers sought opportunities for growth⁴⁸. Retailers increased sales volume, but sales value had not grown proportionately, reflecting *'an inability to pass on higher food prices to a very price resistant consumer'*⁴⁹.

5.2.2 Wholesalers

The wholesalers had over 30% of the grocery market⁵⁰. Affiliated retailers account for the majority of the wholesaler's retail grocery sales. The wholesale grocery sector is highly concentrated (see Table 5.3).

5.2.3 Consumers

Retailers grow market share by *'getting more customers through their doors'* (including making more frequent visits)⁵¹ and/or getting *'customers to increase the amount they spend'*⁵². By extending their opening hours and locations, and through offering online shopping options, retailers provided consumers with more opportunities to shop⁵³. Consumers shopped more frequently, shopping *'little and often'* and this increased consumer spend⁵⁴.

Store	Share	Type	Ownership
SuperValu	23.50%	Wholesaler operated 'Supermarket' Symbol Group	Symbol groups stores are managed and owned by independent retailers. Musgraves the wholesaler are an Irish and family owned, private company.
Tesco	22.90%	Multiple	UK originating multinational, publically quoted company.
Dunnes Stores	22.50%	Multiple	Irish, family owned, unlimited company
Lidl	10.40%	Hard Discounter	International, private ownership
Aldi	10.30%	Hard Discounter	International, private ownership
Other	10.40%	Smaller multiples, non SuperValu symbol groups and non aligned independents	<p>Examples include:</p> <p>Symbol Groups : Centra operated by Musgraves; Spar, Eurospar, Londis and Mace operated by BWG⁵⁵; Costcutter operated by the Barry Group and Gala operated by multiple wholesalers.</p> <p>International multiples from the UK: M&S and Iceland.</p> <p>UK General Discounter offering a limited range of grocery products: - Dealz.</p> <p>Petrol Forecourt: - Applegreen</p> <p>Specialist: Lifestyle including grocery - Avoca. Gourmet Grocery - Donnybrook Fair. Organic - The Organic Shop</p>

Table 5-2: Market Share as at January 2016⁵⁶

No of Players	% Share of Wholesale Market	Wholesalers/Wholesale Groups
2	80%	<ul style="list-style-type: none"> • Musgraves • BWG
5	15%	<ul style="list-style-type: none"> • ADM Londis** • Barry Group • Gala Wholesalers, • Mangan Wholesale*, • Stonehouse group
	5%	Others

*Consolidation has increased since e.g. *BWG acquired Mangan Wholesale in 2008⁵⁷ **BWG acquired ADM Londis in 2015⁵⁸*

Table 5-3: Wholesaler Market Share 2006⁵⁹

Cost and value came into focus for consumers during the recession⁶⁰ but consumers also valued convenience⁶¹. Providing convenience for consumers influenced firm's strategies⁶² which ICT played a role in delivering⁶³. Ownership of smart phones and mobile tech devices made consumers more tech savvy.

5.2.4 Digital Information and Communications Technology

The use of ICT was endemic within the industry, spanning along the entire supply chain, even into consumers homes and/or wherever their smartphones were. Retail operations were managed and run by people but with considerable and what had become necessary and irreplaceable reliance on ICT⁶⁴.

Retail sales, display, stock orders, food safety and delivery utilized technological support. Concepts such as perpetual inventory and related high product availability, relied on integrated ICT systems, such as point of sale linked with computer assisted ordering, and electronic communication along the supply chain. ICT created a wealth of data that informed management decisions and enabled the measurement of their effectiveness⁶⁵. Access to ICT expertise was an acknowledged advantage and attraction for retailers to become symbol groups members⁶⁶. Training and support for retailers and their employees were delivered via ICT⁶⁷. These applications represent just a flavor of the significance of ICT for the industry.

ICT played an increasing role in informing and potentially driving corporate strategy, *'digital innovations [were] not only changing traditional business models but also inventing totally new ones'*⁶⁸. Key trends in the application of ICT included: the growth of and experimentation with models of online grocery shopping; Self-scan and self-checkout; Contactless payment technology for consumers; Leveraging the growing comfort of consumers with ICT to improve the in-store shopping experience and customer loyalty; and sharing information between retailers and suppliers to improve efficiency, revenue, profits and consumer satisfaction.

5.3 1959-1980: MODERN RETAILING, AND NASCENT DIGITAL ICT ADOPTION

5.3.1 Economic context

Ireland had a protectionist economy from the 1930's until 1959⁶⁹, which limited the viability of importing goods and hence curtailed the range of grocery goods sold⁷⁰. Economic depression reigned during the 1950's, with high levels of emigration and unemployment. Retailing in Ireland was seen as being decades behind the US⁷¹. The 1960's brought hope. The *'economic policy of attracting foreign investment and free trade was a resounding*

success, with incomes rising ... This prosperity meant that the long forecast rise of the multiples became a reality...⁷². Free trade brought the availability of a wide range of branded goods that enabled the supermarket format to take-off⁷³.

The outbreak of troubles in Northern Ireland in 1969 had a negative impact on tourism and hence the economy, the oil crisis in 1973-74 put the world into recession, coupled with continued serious inflation in Ireland and high interest rates that continued throughout the decade⁷⁴. Retailers also had to adapt to, decimalization in 1971 and a multi-tier complex VAT (value added tax) system which replaced turnover tax in 1972⁷⁵.

5.3.2 Legislation

A number of legislative changes promoted price-based competition (see [Appendix L](#)), encouraging the growth of the multiples in Ireland. In the 1950s these included; the introduction of the requirement to display prices for goods being sold⁷⁶. The abolition of resale price maintenance, and the prohibition of price fixing⁷⁷. Suppliers were now allowed to offer different terms to different classes of buyers, which enabled buyers to benefit from buying in large quantities⁷⁸.

5.3.3 Consumers

By the 1970s increasing car ownership⁷⁹ augmented the feasibility of out of town shopping, and multiples aggressively expanded into the suburbs. There was an increased trend towards a once a week 'trolley' shop because so many women were now working⁸⁰. Freezers were a growing trend and this was expected to reduce shopping frequency⁸¹.

5.3.4 Self-service Revolution

'The gap in the market was price competitiveness' Fergal Quinn founder of Superquinn⁸²

The supermarket self-service model began to emerge in the late 1950's and took off during the 1960's⁸³. The format changed from counter service with credit and delivery, to self-service, individually priced products and cash purchasing⁸⁴. Price competitiveness, was set against 'credit, delivery' and having your shopping done for you⁸⁵. Traditional grocers thought it was bad form to compete based on price⁸⁶. A revolution in food packaging was required to enable the self-service revolution⁸⁷. In 1959 H. Williams began converting their stores to self-service format⁸⁸. During the 1960's several key players joined the industry⁸⁹ utilizing the self-service format (see Table: 5-4).

Year	Retailer	Notes
1960	Dunnes Stores	The drapers owned by Ben Dunne made a tentative entry by selling fruit in their stores
1960	Superquinn (called Quinn's Supermarkets)	Fergal Quinn opened the first non Dublin supermarket in Ireland in Dundalk
1961	Five Star Supermarkets	Limerick
1962	Roches Stores	The department store began to sell food
1963	Power Supermarkets	Associated British Foods (ABF) open their 1st store in Ireland.
1966	Dunnes Stores	Opened Ireland's largest supermarket in Cornelscourt in Dublin
1966	Quinnsworth Supermarket	Pat Quinn opened his 1st store in Longford

Table 5-4: Key New Supermarket Entrants 1960s⁹⁰

RGDATA (the trade association for independent retailers⁹¹) offered guidance to independents encompassing: self-service, store layout, construction and design⁹². In 1961 the first two independents converted to self-service⁹³. The self-service cash-only model achieved higher turnover, improved retailers' cash flow and reduced their administration⁹⁴. By 1966 only 5% of stores were self-service but these earned 1/3 of grocery sales⁹⁵.

Year	Acquisitions, Entries and Exits	Comment
1972	Power's Supermarkets acquire Quinnsworth	Chain was rebranded as Quinnsworth. Owned by ABF
1974	Kut-Prices	Ireland's 1st discount grocery opened in Kilkenny
1975	Lipton's go into receivership	In Ireland since 1891 failed to successfully convert to Self-service.
1975	Five Star chain acquire Lipton's stores	Five Star was owned by DE Williams of Tullamore
1977	3 Guys	Albert Gubay launches discount style stores in Ireland
1977	P.Q. Discounts (Quinnsworth)	Discount format (later renamed as Crazy Prices) launched by Quinnsworth in response to '3 Guys' entry
1978/1979	Tesco acquire 3 Guys	Tesco's 1st international venture
1979	Quinnsworth acquire Five Star	A reaction to Tesco's entry
1979/1980	M&S	Uk Player M&S Drapery and Grocery. The original pioneers of Own Brand.

Table 5-5: Multiples Population Changes 1970-1979⁹⁶

In 1970 the main competitors in the market were Quinnsworth, Powers Supermarkets, Dunnes Stores, Superquinn, H. Williams⁹⁷, Liptons and Five Star⁹⁸. These 7 major multiples competed fiercely against each other⁹⁹ and were reported as having 30% of the market¹⁰⁰ and their owners/CEOs were deemed to be powerful men in retail in Ireland¹⁰¹. All of the multiples had plans for expansion¹⁰². Table 5-5 shows population changes.

Self-service was the model of the future. *‘Independent retailers were experiencing competition such as they had never faced before’*¹⁰³. The multiples had greater buying power than small stores, which enabled them to sell products at lower prices, and their larger store sizes offered a wider selection of products for sale. They had adopted *‘modern marketing techniques’* such as *‘national advertising, merchandising and special promotions creating consumer excitement’*¹⁰⁴.

5.3.4.1 Discount Stores

In 1974 ‘Kut-Prices’ opened the first discounter style store in Ireland¹⁰⁵. It was cash and carry for the consumer¹⁰⁶. In 1977 Albert Gubay¹⁰⁷, brought his hard discounter format to Ireland, through ‘3 Guys’ stores¹⁰⁸. The company focused on efficiency: operating with minimum staff, minimal shop fittings, a focus on dry goods of limited product range¹⁰⁹ and cardboard signage pricing rather than individually priced products¹¹⁰. In 1978/79 ‘3 Guys’ had 7 stores, and 2% of the market¹¹¹ when Tesco the biggest grocer in the UK acquired them¹¹². Quinnsworth responded by acquiring the profitable Five Star chain of 27 stores¹¹³.

Players	No. of Stores	Notes
Dunnes Stores	49	A reputation for keen prices. Drapery still their main focus.
Quinnsworth	41	Also sold wine and some hardware.
H. Williams	18	Publically Quoted Company
Five Star	27	No stores in Dublin. Reputation for quality and range. <i>Acquired by Quinnsworth (ABF) in 1979</i>
Superquinn	8	Switched profile from low price to quality and fresh foods.

Table 5-6: Profile of Main Multiples 1978¹¹⁴

Throughout the decade the multiples continued to increase their share of the market¹¹⁵. In 1978 five major multiples (see Table 5-6) along with the recently arrived ‘3 Guys’ had 40% of the market¹¹⁶.

5.3.4.2 Co-operatives, Cash & Carry and Symbol Groups

Inspired by trends in Europe, ADM (Allied Dublin Merchants) was established in 1954, as a buying group for grocers, aiming through pooled buying to get wholesale rates from suppliers¹¹⁷. The co-operative movements offered better prices than wholesalers to independent retailers. Wholesalers responded by introducing ‘cash & carry’ and symbol/voluntary group models¹¹⁸. By the end of the 60’s several voluntary groups were established (see Table 5-7). By 1966 the 851 voluntary group or co-operative members had 22% of the market¹¹⁹.

Year	Co-op/Symbol	Associated Wholesaler	Notes
1954	A Co-op	ADM (Allied Dublin Merchants ltd.)	
1956	A Co-op	MNC (Merchant’s National Co-operative)	Founded by RGDATA
1960	VG	Musgraves	Musgraves create 1st Voluntary trading group. 150 ‘traditional’ grocers joined before the year ended
1960	Mace	Lee & Co Dublin, Punch & Co. Cork, J. &J. Haslett (Dundalk), Mangan Brothers Clare, O’Neill and McHenry (Donegal)	Collaboration of 5 wholesalers
1963	Spar	MUM (Munster United Merchants) Cork and A.W.L. (Amalgamated Wholesalers Ltd.) Dublin	Spar Ireland was operated jointly. By 1967 Spar was in all 26 counties.
1966	Max Value	N.W.G. A (National Grocers’ Wholesale Association)	Voluntary Group created by 14 wholesalers
1967	Piggybank Food Market	Carton Bros	Carton Bros break away from VG
1968	Centra	E.D.L (Efficient Distribution Ltd.)	

Table 5-7: Co-op and Symbol Groups Entry 1950-1969¹²⁰

Cash-and-carries offered stock at more competitive prices than independents could negotiate for themselves¹²¹. Independents joining symbol groups gained from wholesaler bulk buying, access to special product promotions, marketing and guidance on how to run their business¹²². The symbol group format was generally stronger in rural areas than in Dublin¹²³. In 1971 there were five wholesale groups and 92% of symbol retailers were aligned to the largest

three: SPAR, VG and Mace¹²⁴ (see Table 5-8). Consolidation in wholesalers operating the symbol groups¹²⁵ increased their buying power¹²⁶.

Symbol	No. of Members	Comments
Mace	510	After Mace Group (300) merge with EDL (Golden Goose symbol (200)) – forming Associated National Distributors (AND)
SPAR	320	7% of Market by 1978
VG	287	In 1978 314 members and est. 7% of market. Shoprite had 166 members run by Irish Modern Distributors (IMD) comprising Musgraves, Nilands and J. Garvey
Piggybank	54	1978 60 members in Dublin and environs. Operated by Carton Bros.
Londis	46	Operated by the ADM co-op, in 1978 had 125 members
MNC (co-op)	1,200 (800 active)	1978 550 members most operating under their own name

Table 5-8: Symbol Groups and Co-ops 1971¹²⁷

5.3.5 Price-Based Competition Escalates

‘The 70’s was the era of the “pile ‘em high, sell ‘em cheap” style of supermarket where customers were seduced primarily by prices’ Fiona Kelly, The Irish Independent Newspaper¹²⁸

During the 60’s shopping centres began to emerge with grocery retailers as their anchor store¹²⁹, this trend continued in the 70s. There were several price wars as multiples battled for customers.

There was increasing concentration of the market from the mid 1950’s and across the 1960’s¹³⁰. Between 1966 and 1971 there had been a significant reduction in grocery outlets throughout Ireland¹³¹, *‘[t]he growth of the supermarkets so far has largely been at the expense of smaller traders’*¹³². Cash and Carry and voluntary group membership helped *‘the small independent retailer to remain viable’*¹³³. In the 1960’s the well known Findlaters (Dublin) and Lipton’s (nationwide) continued to offer traditional counter service, with credit and delivery¹³⁴. Several independent and major stores did not survive the transition to self-service¹³⁵.

In 1969 H. Williams introduced ‘Green Shields Trading Stamps’¹³⁶, this was akin to a declaration of war to other multiples¹³⁷. A major price war in 1970 was a prompter of a Fair Trade Commission (FTC) investigation of the industry¹³⁸. Below cost selling or loss leading

was used by supermarkets and less frequently by other players to drive footfall¹³⁹. Independents, voluntary groups, some supermarkets (e.g. Lipton's) and manufacturer's deplored the tactic¹⁴⁰. Price wars gained significant 'free' publicity for retailers¹⁴¹. The entry of '3 Guys' was predictably followed by *'a bout of price cutting'*¹⁴². In 1973 Superquinn switched strategy from discount prices to increased customer service focus¹⁴³: as reflected in Fergal Quinn's memoir *'...from low prices to quality shopping and fresh foods'*¹⁴⁴.

The multinationals could afford to subsidize losses for a while to gain market share¹⁴⁵. Local shops could not remain competitive when a multiple entered their area, selling goods at prices less than the independent could buy them for¹⁴⁶. The prohibition in place against below cost selling was ineffective¹⁴⁷.

Unnoticed by consumers the multiples did not sell all their products cheaply¹⁴⁸. The multiples needed consumers to purchase sufficient higher margin goods along with the loss leaders to keep a healthy profit¹⁴⁹. Retailers had begun to recognize the supreme importance of margin, rather than an over focus on *'turnover for turnover's sake'*¹⁵⁰. Estimations of gross margin in the industry were multiples 13% and voluntary groups 14%, with wide variations for non-aligned independents¹⁵¹.

By the end of the 1970s the multiples main basis of competition was price, whilst the symbol groups¹⁵² pushed convenience, friendliness and private label (in lieu of low prices on branded goods)¹⁵³. Having made significant investments in computers to monitor product margins¹⁵⁴, Londis were the only group to push a low cost image¹⁵⁵. Additionally, as a co-op they did not need to make profits on their wholesale operations¹⁵⁶. In 1979 Musgraves began to transition VG and some Centra stores into Supervalu a symbol group that was to operate as a supermarket and compete with the multiples¹⁵⁷.

5.3.5.1 Supply Chain

As at the beginning of the 1970s Liptons were the only multiple operating central warehouse distribution¹⁵⁸. However, L&N stores had a central warehouse attached to their main supermarket. They delivered dry good from there to their 17 other grocery stores¹⁵⁹. When '3 Guys' entered the Irish market they used a central warehouse structure for distribution, which had worked well in the UK. However, in Ireland suppliers provided direct delivery to stores whilst still giving best terms¹⁶⁰. In 1978 only 8% of the '3 Guys' central warehouse capacity was being used as there were only 6 stores to service¹⁶¹.

Cash and carry operations had no onward distribution costs, and this helped keep prices low¹⁶². The wholesalers had central warehousing and delivered to their symbol group members on a weekly basis. The regular deliveries cut down on storage space required in retailers' stores and enabled shops to devote more space to retail¹⁶³. It was anticipated that the multiples would move to central warehousing: according to Bruce Carswell of Musgraves *'although on paper direct delivery makes goods cheaper for them it means a loss of control and the leakage on direct delivery is wild'*¹⁶⁴.

5.3.5.2 Product Range

In the early 1970s there was a wide variance in the breadth of products sold by the supermarkets: P. Q. Discounts opened with 600 lines¹⁶⁵; H. Williams offered 1,000 lines; Quinnsworth stocked 6,000 lines¹⁶⁶. Product range increased across the period, for example Quinnsworth's range had increased to 9,000 by 1977. Product ranges began to change as the importance of chilled and frozen food products grew¹⁶⁷. The price wars put pressure on margins and grocers extended their range of goods to improve their overall margins through product mix. The application of ICT aided retailers in managing increased product range and in informing stock selection.

There was variance in the categories managed by the stores, some groceries sold drapery and hardware goods, and had in-store off-licenses¹⁶⁸. Meat and fresh vegetables offered *'profit margins ... far superior to those on grocery sales'*¹⁶⁹, making them attractive categories for multiples.

5.3.6 Adoption of Digital ICT

By 1960 both electromechanical and manually operated cash registers were being used in Ireland but not in all stores¹⁷⁰. The availability of cash registers, along with a new type of weighing scales, aided the shift in shops from counter to self-service¹⁷¹. In 1962 RGDATA appointed a technical consultant to their member advisory service¹⁷².

In 1971 Ireland moved to decimalization¹⁷³ and computer programs had to be rewritten¹⁷⁴. All price information had to be changed, and transactions for invoices needed to be adjusted¹⁷⁵. Industry conferences informed retailers about the availability and potential of ICT¹⁷⁶. In 1978 electronic tills and barcoded prepackaged products were expected to arrive in Ireland in the near future¹⁷⁷.

5.3.6.1 Early Adopters

Early adopters of computers in the industry (see Table 5-9) applied them to accounting, payroll, administration, stock control, buying functions, analysis of and management of product profit margins, and the general improvement of management information. Adopters saw computers as an enabler of growth and improved profitability through improved access to information¹⁷⁸.

Year	Company	Use & Comments
1967-1969	H. Williams	Own computer used for accounting.
By 1969	Superquinn	Stock control through computer bureau.
1971	ADM (co-op)	Finance functions, with particular attention to monitoring profit margins on own mini computer.
1972	H. Williams	Use extended to creditor's ledger and invoices
1973	ADM (co-op)	Continued investment in technology. Intent to provide centralised accounts for co-op members, and be ready for CD if necessary.
1974	Bests	Accounts, creditor's ledger, and management information, including sales trends and profit margin analysis on rented mini computer. Inform rationalization of products.
1974	H. Williams	Produce 'Tru-price' (i.e. unit prices for products) shelf-edge labels for products. 1 st in Europe.
1974	Kut-Prices	Modeling and setting product prices.
1975	H. Williams	Upgrade computer system to enable CD, and improve stock control and purchasing control.
1976	Quinnsworth (Power Supermarkets)	Accounting (own computer - replacing punch-card system).
1977	3 Guys	Price setting and automated stock control.
1979	Superquinn	Buy computer. Debtors, wages, stock holdings, general administration, and in the buying function, modeling prices versus margins.
1979	O'Connors (Nenagh) Independent	Payroll, stock ordering and management. Intent to add sales data.
1980	H. Williams	Revert from own computer to using a bureau service
1980	Mangans (wholesalers for Mace and Keencost Cash & Carry, West Ireland)	Computer used to improve efficiency of distribution of groceries, and provide management information to retailers.
By 1980	Musgraves (Wholesalers for Supervalu, VG and Centra Symbol Groups and Cash and Carry)	Stock management, ordering, invoicing, and management information. Using computer bureau service in UK.
By 1980	Punch & Co. (Wholesalers for Mace symbol Group and Cash & Carry)	Computer used in warehouse to update orders from customers (received via post or salesperson). Offered computer bureau service. Creditor management.
As at 1980	Wholesalers - Brooks Watson (Later became BWG). MUM (Cork)	No computer in use but doing research on possibilities. MUM intend to use Brooks Watson as computer bureau.

Table 5-9: Timeline of Adoption of Computers to 1980¹⁷⁹

In 1967 H. Williams advertised for a Data Processing Manager, to take responsibility for '*preplanning and installation*' of their computer system'¹⁸⁰. By 1969 they were using the

computer for accounting¹⁸¹. However, the delayed issuing of their year-end accounts for 1969 and 1970 was attributed to computer issues¹⁸². In 1971 they were the only retail grocers to own a computer¹⁸³ and the *'creditors ledger, the matching of invoices and other tasks'* were being *'computerised'*¹⁸⁴. In 1972 H. Williams reported that the computer system would enable them to expand their network of stores¹⁸⁵.

Across the same period, computer bureau services were being used by Superquinn to try to ensure they were *'never out of stock that was in demand, nor stuck with stock that did not sell'*¹⁸⁶, (this remains a key ambition for retailers). Computer rental was also an option¹⁸⁷. Amongst the co-ops and wholesalers ADM were the earliest investors in computing, buying a mini-computer in 1971¹⁸⁸.

In 1974 using the capabilities of their computer H. Williams provided unit pricing for products¹⁸⁹, anticipating that it would attract customers¹⁹⁰. It did not, customers needed to be educated about unit price and also the computer printed *'unit price'* shelf labeling was difficult to read¹⁹¹.

By 1975 H. Williams had installed *'a new computer system'*, were recruiting a *'Computer Manager'*¹⁹² and were planning to install an additional computer¹⁹³, to support the implementation of central distribution (CD). The application of computers coupled with CD was expected to increase their efficiency, through improved stock control, buying, and more effective accounting and future planning¹⁹⁴. These initiatives were publicized as enabling H. Williams to better serve their customers through achieving *'keener pricing of products'*¹⁹⁵. However, they continued to have issues with their computer systems and in 1980 they reverted to using a bureau service¹⁹⁶.

5.3.6.2 Computers Calculate Products Prices.

Getting the stock and price mix right was paramount in keeping retailers profitable¹⁹⁷. Retailers did complex calculations to plan and balance their overall margins from their range of products¹⁹⁸. Retailers who adopted computers used them to perform product margin profit analysis¹⁹⁹.

The discount store *'Kut-prices'* had used a computer to assess the feasibility of the discount model. They analysed product price and purchasing trends data and created a formula to allow them to offer discounted prices across their entire range²⁰⁰. The *'3 Guys'* discount prices, were *'enabled by the computer system'*, which calculated the price points required by volume to make profits²⁰¹.

5.3.6.3 Stock Control

The use of computers in stock control was also common; however, the 3 Guys operation was 'Ireland's first fully computerized supermarket stock control system'²⁰², and allegedly 'the world's only fully automated reordering system'²⁰³. 'The computer terminals at the checkout... [gave] constant feedback to the warehouse'.²⁰⁴ This worked without barcodes on products or the use of scanning²⁰⁵. The checkout staff memorized the prices of the products sold as the prices were only listed on banners above the product displays²⁰⁶. The leveraging of computerization was cited as 'probably Gubay's biggest single advantage'²⁰⁷.

5.3.7 Summary

Price based competition and new retail formats emerged and thrived. Multiples continued to open new supermarkets and likewise the symbol groups and co-ops attracted new members. The number of independent grocers declined, with a drop of 1,000 cited for the Dublin area²⁰⁸. A new model of supermarket the 'hard discounters' emerged. As the 70s ended Tesco entered the Irish market for the first time²⁰⁹. By 1980 multiples were reported as having an 80% share of the Dublin market, whilst elsewhere in Ireland their share ranged from 15-30%²¹⁰ (see Table 5-10).

Year	1971	1975	1980
Multiples	33%	36%	44%
Symbol Groups	40%	33%	31%
Independents	27%	31%	25%

Table 5-10: Market Share by Strategic Group²¹¹

By the end of the 1960's the grocery retailers were just beginning to adopt computers²¹². The large grocery chains applied computers to improve their financial and margin/profitability management, for pricing decisions and to support stock control functions. Computer use enabled retailers to more easily manage numerous stores, and expand their category range and the number of lines they stocked. However, the adoption of computers in the industry was by no means universal.

5.4 ELECTRONIC POINT OF SALE WITH SCANNING: 1980-1999

5.4.1 The Environment

As Ireland entered the eighties, inflation was high, there was 'unrest in the public sector' and the only growth figures seemed to be for unemployment and government borrowing²¹³. The country was experiencing its 'severest recession since the mid-1950's'²¹⁴. It was a time of

political instability²¹⁵, and it took until 1987 for a real plan for the economy to emerge. A consistent economic approach began to pay dividends, and from the mid 1990s the *‘Irish economy was coasting along nicely’*²¹⁶ experiencing growth rates exceeding 7% for the rest of the decade²¹⁷. The implementation of the Single European Act in 1993²¹⁸, coupled with Ireland’s continued economic success brought the expectation of entry by large international retailers to the Irish market²¹⁹.

5.4.1.1 Consumers

*‘With the 80’s came a new wave of customer service - bakery counters, exotic fruits, convenience foodhalls and the introduction of the credit card culture’*²²⁰

Consumers became more affluent and had more disposable income, by the mid 1990’s they were described as ‘cash rich - time poor’. Increasing ownership of cars²²¹ along with fridges and freezers empowered the custom of the weekly shop²²². Holidaying abroad increased consumers’ interest in wine and in a wider range of food products²²³. A continued increase in the number of married women working and single and two person households created an amenable environment for convenience stores²²⁴. Retailers had to consider ‘time’ in addition to the traditional variables of price and value, in product range decisions²²⁵.

By the mid 1990’s the range of products and services provided by retail grocers had expanded. Across 30 years the choice for consumers had enlarged considerably: from a range of 700 lines to 8,000 lines in a supermarket in 1996²²⁶. The hot deli counter and the provision of pre-prepared convenience meals emerged in response to the changing habits of consumers²²⁷, as grocery retailers competed with fast food and pub restaurants²²⁸. In addition to the traditional dry goods stocked in groceries, fresh fish and meat had become standard in supermarkets along with expanded health and beauty ranges²²⁹ and off-license sales²³⁰. Lines were blurring between outlets: newsagents were selling groceries, convenience shops were selling newspapers, wine and providing food service, and supermarkets were selling cooked meals²³¹.

5.4.1.2 Legislation - Below Cost Selling is Banned²³²

Despite a strengthened ban on below cost advertising²³³, price wars were a recurrent feature of the 1980’s²³⁴. Sustained lobbying by the joint forces of IADT (Irish Association of Distributive Trades) and RGDATA resulted in the 1987 Order prohibiting below cost sales²³⁵. Restricting price-based competition caused a change in focus by retailers in the industry²³⁶.

5.4.1.3 The Pursuit of Customer Loyalty

During the 1990's a key global trend in the industry was a focus on increasing customer retention through improved customer services. Many 'improvements' were ICT enabled. Initiatives included:

- point of sale scanning, which improved speed through checkout and billing accuracy for customers;
- the introduction of loyalty cards rewarding customers mainly based on the amount they spent in store;
- home shopping initiatives such as fax shopping and teleshopping were trialed before online shopping emerged;
- and shops extended their opening hours²³⁷

According to RGDATA's Michael Campbell, by the mid 1990s ICT had raised consumer's expectations, it had '*conditioned ...[customers] to expect immediate service and satisfaction*'²³⁸.

5.4.2 The Momentum of the Multiples Continues

In 1987 Quinnsworth, Dunnes Stores, H. Williams, Superquinn, L&N and Roches Stores, were the major retailers in the market²³⁹. By the beginning of the 1980s individual multiple players had begun to gain notable market share. Dunnes and Quinnsworth were the most significant players. Market consolidation increased, whilst overall store numbers dropped (see Table 5-11).

The industry in the mid 1990's was '*deceptively competitive*'²⁴⁰. The profit margins in Ireland (3-5%) were lower than the UK figure (8%)²⁴¹, (the European average was 3%)²⁴². The difference between Irish and UK margins was attributed to: the lower level of own brand penetration, higher transportation costs, smaller purchasing economies because of scale, and the intensity of price competition²⁴³. By 1995 UK grocery players had applied ICT extensively to reduce cost bases and improve efficiency of operations, including in logistics operations²⁴⁴. Players in Ireland had concentrated on building market share rather than focusing on short-term profitability - the larger players had pursued scale through price-based competition²⁴⁵.

Company	Market Share 1979	No. of stores 1979	Market Share 1998	No. of stores 1998
<u>Total Multiples</u>	<u>44%</u>	<u>178</u>	<u>57%</u>	<u>157</u>
Quinnsworth/Tesco (incl. Crazy Prices)	16%	84	25%	
Dunnes	13%	37	22%	
Superquinn	5%	8	8%	
H. Williams	4%	17	Exit	
Tesco	3%	12	Exit & Re-entry	
Roches Stores	2%	5	2%	
L&N	2%	15	Acquired	
<u>Total Symbol Groups</u>	<u>31%</u>	<u>1,641</u>	<u>28%</u>	<u>1,152</u>
VG/ SuperValu	7%	317	15%	
SPAR	6%	339	4%	
Mace	6%	360	2%	
Shoprite (became Centra in 1980)	2%	122	3%	
Piggybank	-	32	n/a	
Others	11%		4%	
<u>Independents</u>	<u>25%</u>	<u>9,533</u>	<u>15%</u>	<u>7,872</u>

Table 5-11: Market Share and No. of Stores 1979 and 1998²⁴⁶

The growth of the symbols as a competitive force and the entry of additional international players were two key features of the late 90s²⁴⁷. Ireland had a relatively low population density (see Table 5-12). As 60% of the population lived in rural areas, small independent and symbol group shops could thrive in rural catchment areas²⁴⁸. By 1999 Ireland's far smaller grocery market, had a higher density (3-4 times) of grocery stores per capita, than the UK, France or Germany²⁴⁹. Sales per square foot in Irish supermarkets were about half the equivalent of the big British multiples²⁵⁰. Mary Wilcox (School of Retail and Services Management, DIT) noted that towards the end of the 1990s *'the multiples with nuanced differences, ... touted price sensitivity, quality, customer service and customer retention through loyalty cards as market building strategies'*²⁵¹.

Country	Population in Millions	Population Density per Sq. km
Ireland	3.5	50
UK	58	237
Denmark	8	120

Table 5-12: Population Density Examples 1995²⁵²

5.4.2.1 Entries and Exits

The expansion of the major multiples through new builds and acquisitions continued, along with the demise of independent supermarkets²⁵³. H. Williams' exit through bankruptcy and Tesco's exit and reentry were big stories (see Table 5-13 for population changes).

Year	Company	Entry/Exit/Acquisition	Comment
1980	O'Briens Supermarket (Naas)	Exit	Lost trade to local Quinns store
1980	BWG acquire Lee & Co (wholesalers)	Acquisition & exit	This included the Mace franchise for Leinster
1982	Ormstons of Limerick	Exit	Cannot compete with multiples
1982	Holland Quinn buy H. Williams	Acquisition	New owners for H. Williams. Cost IR£4.3million
1982	Quinns acquires 3 H. Williams stores	Acquisition	Dundrum, Rathfarham and Baggot st Dublin. Sold by HQ to ease liquidity pressure.
1983	Crazy Prices (Quinns)	Entry	Crazy Prices The Quinns Discount format is launched
1983	BWG acquire MNC co-op	Acquisition & exit	BWG rebrand the 200 MNC retail stores as Wisebuy
1984	Musgraves acquire Garveys (wholesalers)	Acquisition & exit	Gaining access to Dublin market, 1st SuperValu in Dublin opens in 1985
1985	Musgraves acquire Clifford's	Acquisition & exit	Tralee
1986	Tesco	Exit	30 Tesco Stores Sold to H. Williams for £17million
1986	H. Williams	Acquisition	
1986	Quinns buy 4 of the former Tesco stores from H. Williams	Acquisition	
1987	7-eleven	Entry	Convenience stores
1987	H. Williams	Exit	Bankruptcy - the trade was in shock, continuous price wars were blamed.
1987	SuperValu (Musgraves)	Acquisition	Musgraves acquires 15 of the former H. Williams stores, 11 in Dublin.
1987	Quinns	Acquisition	Acquire some of the former H. Williams stores
1987	Dunnes Stores	Acquisition	Acquire some of the former H. Williams stores
1987	Joe Nally's convert to SuperValu	Join Symbol Group	3 stores - Trim, Finglas and Tallaght
1988	Eight to Twelve joins SPAR	Join Symbol Group	
1989	Musgraves acquire Niland's	Acquisition & exit	Musgrave's gain full control of their symbol brands
1991	7-eleven	Exit	Receiver appointed
1991	Eight to twelve acquire former 7-eleven stores	Acquisition	trading as SPAR
1991	Laird's	Exit	Leitrim
1994	Fareplay	Entry	Petrol Forecourt convenience stores launched by Statoil
1995	SuperValu (Musgraves) Acquire L&N chain	Exit and Acquisition	18 L&N stores to become SuperValu stores
1996	Quikpick	Symbol Group Entry	Wholesaler symbol group launched by Barry Group
1996	Iceland	Entry	Frozen food Specialist from UK

Year	Company	Entry/Exit/Acquisition	Comment
1997	Tesco acquire Quinnsworth	Exit and Acquisition	Re-entry of Tesco into Irish market, buying 78 Quinnsworth/Crazy Prices stores (Powers supermarkets owned by ABF) for IR£630million
1997	XL Symbol Group	Entry	Launched by wholesalers BWG for retailers who wanted a balance between support and independence
1997	Maxol trades under Mace Symbol	Join Symbol Group	Maxol's 60 petrol forecourt shops trade under the Mace a BWG Symbol Group. BWG had upgraded Mace in 1995
1998	Roches Stores convert to SuperValu	Join Symbol Group	The 9 supermarkets convert to SuperValu Franchises. Increases SuperValu market share to 20%
1998	Costcutter Symbol group	Symbol Group Entry	Launched by Vantage Wholesalers (Punch & co.) - 'a British symbol with a no frills emphasis'
1998	Gala Symbol group	Symbol Group Entry	Launched by NWGA
1999	Aldi	Entry	German discounter - 1 store in Dublin and 1 in Cork

Table 5-13: Entry/Exit/Acquisitions 1980-1999²⁵⁴

By the early 1980's H. Williams were in financial difficulties²⁵⁵. They were bought by Holland Quinn (HQ) in 1982²⁵⁶ who implemented several changes in strategy²⁵⁷. They invested IR£1/4 million in a new computer system²⁵⁸ which was cited as being 'vital' and 'the data heart' of the company²⁵⁹. The computer was applied to 'receipt of goods and the control of stores trading profitability' and then extended to accounts, wages, personnel and administration²⁶⁰. Improvements in administration and management information were to enable the company to be more responsive to market changes²⁶¹. By 1983 H. Williams were back in profit and were pursuing a program of expansion²⁶². When Tesco exited the market in 1986, H. Williams acquired their chain of 30 stores²⁶³; however, in 1987 H. Williams went bankrupt²⁶⁴. Musgrave's acquisition of 15 H. Williams stores enabled them to further establish their SuperValu symbol in Dublin²⁶⁵. SuperValu had an 11% share of the market by 1990²⁶⁶.

Consolidation increased in the wholesale sector²⁶⁷, with Musgrave and BWG making significant acquisitions. The co-ops declined with MNC being sold to BWG²⁶⁸, and ADM/Londis exiting the cash and carry business, to concentrate on their symbol group²⁶⁹. In 1995 Musgrave acquired the L&N chain of 18 stores, rebranding them as SuperValu²⁷⁰. By 1996 the symbol groups 'SuperValu, Londis and a number of Mace and Spar shops [were] compet[ing] with the multiples for the weekly "trolley" spend²⁷¹.

5.4.2.2 General Trends

Own Brand

Irish consumers remained concerned with price and in 1981 both Superquinn²⁷² and Quinnsworth introduced own brand economy ranges ‘Thrift’ and ‘Yellow Pack’ respectively²⁷³. Although the Irish were generally loyal to product brands, retailer own brands put pressure particularly on 2nd and 3rd tier manufacturers²⁷⁴.

Convenience

Convenience shops including petrol forecourt shops began to take-off in 1985²⁷⁵. By 1993 there were 11,000 forecourt shops²⁷⁶. These were well positioned to fit with the changing lifestyle of consumers and presented an attractive growth opportunity for the symbol groups. Growing the number of symbol outlets, including forecourts augmented both the symbol’s brand and buying power²⁷⁷. Price was not a primary factor in the convenience stores, stores appealed *‘to top-up or basket shoppers’*²⁷⁸. They differentiated themselves from multiples through *‘convenience’*²⁷⁹, with longer trading hours²⁸⁰, Sunday opening and being well located²⁸¹. The benefits of being a symbol member included: group buying power and hence more competitive prices, including special offers; group marketing; streamlined administration through central billing²⁸², one stock order form²⁸³, one main delivery at improved frequency²⁸⁴; and support services including guidance in the implementation and use of ICT²⁸⁵.

Different formats of stores emerged, such as Spar Express and Spar ‘Eight-till Late’²⁸⁶. By 1996 there were 966 retailers signed up to the SuperValu, Centra, SPAR, MACE, Londis and Vivo symbol groups²⁸⁷. Despite convenience stores thriving during this period, there were casualties and in 1991 the ‘Seven-Eleven’ stores which had entered Ireland in 1987 went into receivership²⁸⁸. In the mid 1990’s it was estimated that 3,000 independents had exited the industry since 1977²⁸⁹.

Internationalization

By the Mid 1990s in the US and in Europe retailers had become larger and power had shifted in their favour from manufacturers²⁹⁰. European retailers began to range across national boundaries, with Aldi, Carrefour and M&S leading the trend²⁹¹. Irish multiples began to prepare defenses (including improving their ICT capabilities) for the predicted entry of a major UK multiple²⁹².

In 1997 Tesco re-entered the Irish market by acquiring the Quinnsworth/Crazy prices chain in

Ireland comprising 78 stores²⁹³. According to Fergal Quinn *'[a]ll the main supermarket chains ha[d] been preparing ...for three years'*²⁹⁴. Their re-entry *'represented serious competition for the established grocery trade'*, their UK£16 billion turnover, represented over four times the value of the entire Irish grocery market²⁹⁵. Tesco's entry acted as a catalyst, leading incumbents to reexamine their strategies and in particular to reevaluate their supply chains²⁹⁶. Their re-entry *'was met with a storm of resistance'*²⁹⁷. Tesco expanded the grocery offering to include *'non food products such as music, films and clothes...and mobile phones'*²⁹⁸.

5.4.3 EPOS and Loyalty Schemes 1980 - 1999

5.4.3.1 Global Retail Grocery ICT

*'To realize the potential of computerization, we will have to wait for an entire generation of managers to die'*²⁹⁹

The barcode was one of the key developments required to make computers useful in retail industries³⁰⁰. In the US by 1980 90% of US manufactured supermarket products had barcodes³⁰¹. Electronic point of sale with scanning (EPOS) improved the productivity of workers, increased sales, and shifted purchasing power in favor of retailers³⁰². Retailers also used EPOS data to adjust the merchandising mix in individual stores to tailor it to local demands³⁰³. EPOS could process machine-readable credit cards³⁰⁴. The *'cost of installing computerized checkout-scanning and product-monitoring systems'* was said to *'have tilted the balance in favor of large grocery outlets'*³⁰⁵. Enabled by EPOS several 'Loyalty programs' were implemented by 1989³⁰⁶.

By the end of the 1980s the US retail industry was *'adopting all kinds of computing and changing business practices in fundamental ways'* and by the end of the 1990's ICT had enabled so many links between retailers, wholesalers and manufacturers that an interdependency had been created: *'patterns of behavior... had been transformed'*³⁰⁷.

5.4.3.2 Digital ICT Ireland

By the early 1980s retailers increasingly used computers for product price calculation, to balance competitive pricing with sufficient overall margins.³⁰⁸ However, the Irish grocery industry was perceived to be slow to adopt ICT innovations³⁰⁹. The industry generally adopted ICT after it had become stabilized³¹⁰. During the 1990's reports referred to the Irish market as lagging in terms of ICT adoption³¹¹, albeit with considerable disparity across retailers³¹² (see Table 5-14). However, the application of ICT was seen as having the potential

to deliver competitive advantage, and was viewed as likely to be ‘a major factor in determining the relative success of the major players’³¹³.

Year	Company	Use & Comments
1982	H. Williams	IT strategy change - Invest in a computer to be the 'data heart' of the company. Stock intake, managing profit margins. Intend to apply to accounts, wages, personnel and admin. Enable responsiveness.
1986	Superquinn	Fire illustrates dependency on computer records – thankfully computer files stored off-site at weekends.
1996	Independents	Diffusion continues - Many independents still not using computers according to RGDATA, who recommend computing for use in administration tasks.

Table 5-14: Computer Adoption Timeline from 1980

During the mid 1990’s it was concluded that although most of the leading multiples and symbol groups used ‘recent’ technology including electronic point of sale (EPOS), scanners and inventory control’, overall only a small percentage of retailers did³¹⁴. Concurrently RGDATA were advising ‘...there is a significant amount of resources needed, in both time and money, to set up and maintain the system [EPOS with scanning] and these should not be underestimated’³¹⁵.

Electronic Data (EDI) interchange was trialed to replace paper orders, invoices and other documentation. At the end of the 90s the major players began to establish a presence online, launching websites. But it was 2000 before online grocery shopping emerged in Ireland. Retailers needed to adopt technology to remain competitive³¹⁶, and across the 90s there was a growing acceptance of ICT in the industry.

5.4.3.3 EPOS in Ireland

‘[W]e do not know what to do with all the information coming out’³¹⁷

In 1980 the Article Number Association of Ireland (ANAI) was created to facilitate the introduction of barcoding in Ireland³¹⁸. Chaired by Fergal Quinn of Superquinn, members included major retailers, manufacturers and wholesalers³¹⁹. Manufacturers came under pressure to barcode their products³²⁰, to make scanning viable in supermarkets³²¹.

Technology Suppliers

EPOS with scanning was particularly suited to the high volume low margin sales of the industry³²². By 1983 companies such as Sweda, IBM, ICL, and Nixdorf were advertising

programmable EPOS with integrated scanning solutions, to Irish retailers³²³. Integrated software was a key requirement, e.g. Digi systems offered a software package ‘PROFIT’³²⁴, as well as scanning systems³²⁵. In 1984 a Sweda scanning system cost between IR£5,000 - 10,000³²⁶. The retail systems could provide numerous benefits (see Table 5-15).

Processes	Potential Benefits
Customer Service	Faster checkout. Reduced errors. Itemized receipts. Increased engagement of checkout assistant with customers.
Inventory Management	Improved stock control and turnover: provide sales forecasts and improve in-stock positions ³²⁷ ; identify fast and slow moving stock and improve market mix; inventory efficiency and cash management. Reduce overstocking ³²⁸ . Stock could be scanned in upon delivery at shops and scanned out at checkout, and applied to stock ordering ³²⁹ .
Management Information	Sales analysis by department, product, time, cashier productivity. Improved Stock information. Informed decision-making.
Other	Individual product pricing had been incredibly labour intensive, ‘ <i>time consuming and expensive</i> ’ ³³⁰ . EPOS vastly increased the ease, speed and flexibility of implementing new offers and making product price changes ³³¹ . Also, reduced opportunities for fraud.

Table 5-15: Advantages of Integrated EPOS with Scanning³³²

5.4.3.4 EPOS Adoption in Ireland

Superquinn Pre-EPOS

In 1980 Superquinn trialed the adoption of new electronic cash registers in one store before rolling them out across their 8 stores³³³. Scanning was not used, cashiers memorised codes for the top selling 100 products³³⁴. Superquinn’s ‘Thrift’ range, had EAN (European Article Number) codes. In advance of adopting scanning, checkout operators typed the last 3 digits of the barcode number into cash registers³³⁵. Receipts for these products were itemised, and their stock records were updated from the registers³³⁶. This detailed data capture was used to create weekly reports analysing sales by product, by branch etc.³³⁷. It improved Superquinn’s stock control and informed decisions on adjusting product mix and enabled them to swiftly assess the impact of changes made³³⁸. Product price updates for these products were updated centrally, saving having to remove and replace price tickets on every single product³³⁹.

Adoption of EPOS

Until late 1983 ‘*no supermarket in the Republic of Ireland ha[d an] electronic barcode scanning system*’³⁴⁰. Quinnsworth worried that the rapid development occurring in EPOS would quickly make an investment obsolete³⁴¹. Additionally only 65% of imported products and 35% of products produced in Ireland had barcoded packaging³⁴².

In November 1983 L&N³⁴³ became the first multiple in Ireland to use scanning technology³⁴⁴,

implementing it in a new store³⁴⁵. The IBM³⁴⁶ system was installed at 7 checkouts and linked to L&N's mainframe computer in their head-office³⁴⁷ (See Table 5-16).

Year	Store	Comments
1974	Marsh's Supermarket	World 1st in Ohio USA
1978	Ahold	European 1st Dutch retailer
1980	Tesco	Trialing in UK, no plans for Ireland
1980	<i>ANAI set up in Ireland to facilitate Barcode Adoption</i>	
1983	L&N	1st in Ireland adopted in new store in Cork
1984	Quinnsworth	1 st large multiple to adopt
1984	Various independents	By 1987 estimated 5 independents had EPOS
1986	Superquinn	
1986	Roches Stores	Installs in new shop in Cork
1986	Quinnsworth	Installs in 2 nd Store
1988	A SuperValu store	Independently of head office
1989	Quinnsworth	Installing across 35 Stores
1990	SuperValu (Musgraves)	Recruit a head office scanning installation team
1990	O'Briens a Mace store	Independently of symbol, costs IR£20k per checkout
1990	Quinnsworth	1 st large retailer to have EPOS in all their stores
1993	Quinnsworth	Upgrading their checkout technology
1992	SuperValu (Musgraves)	Rolling out EPOS solution. Tried in 2 stores.
1992	SPAR (BWG)	Selected EPOS solution for group
1996	Dunnes Stores	Considered Laggards – rollout across all stores was completed in 2004
By 1996	Independent Retailers	Estimated: 60 non –aligned retailers, 140 Symbol Group shops – out of 9,000 independents.
1997	Superquinn	Trial hand held self-scan for customers
1997	BWG Wholesalers	Encourage non-aligned independents to adopt scanning
1998	Londis (Co-op)	The co-op was investing in EPOS. The group decided not to proceed with the selected system in 1999.
2001	ALDI	Begin to adopt scanning

Table 5-16: Timeline Adoption of EPOS³⁴⁸

Retailers generally trialed the technology in a new store, before rolling out EPOS across their chain³⁴⁹: In 1984 Quinnsworth '*incorporate[d] computerised automatic scanning*' in a new store³⁵⁰. Two years later Quinnsworth installed scanning technology in a 2nd store³⁵¹. In 1989

they were rolling out a new EPOS across 35 stores³⁵². In 1990 they became the 1st large retailer to complete scanning rollout across all their stores³⁵³.

By 1987 there had been a significant and swift increase in the number of manufacturers bar-coding their products³⁵⁴; however, only about 10 stores used scanning³⁵⁵. It was cheaper to install EPOS in new stores³⁵⁶ than to convert existing checkout systems³⁵⁷. However, many supermarkets bought equipment that was capable of being upgraded to scanning later³⁵⁸.

The diffusion process was protracted³⁵⁹, in the early 1990's EPOS continued to be adopted. The rates of adoption were lower than the average in Europe³⁶⁰. In 1995 only 28% of grocery turnover was processed via scanning³⁶¹, the equivalent figure for the UK was 70%³⁶². There was also a perception that there was *'limited usage of sales information'*³⁶³. By 1996 only an estimated 200 retailers out of 9,000 independents had adopted EPOS³⁶⁴. Most retailers used electronic cash registers and a key selling point for models was *'the number of department buttons they could accommodate for reporting purposes'*³⁶⁵.

Consumers Reaction

Some stores issued customer information leaflets on scanning in advance of launching it³⁶⁶. Consumers had concerns that despite itemized receipts it was difficult to check they had been charged the correct price, because products did not have price stickers³⁶⁷. In the early days of scanning there were several overcharging errors³⁶⁸. However, *'scanning systems were far less likely to err than a tired supermarket assistant'*³⁶⁹. In 1999 Tesco had to apologise to the Irish public, after shelf label prices for products were displayed in sterling, but higher Irish pound equivalent prices were charged at checkout³⁷⁰.

Emergence of EFTPOS – Electronic Funds Transfer at the Point of Sale

Across the case there was a shift from store credit to cash and then as ICT enabled it, a slow shift from cash to electronic card based payments³⁷¹. EFTPOS technology had emerged by 1984 but was not used in Ireland until the 1990s³⁷². In 1996 both Bank of Ireland and AIB successfully piloted the use of 'Laser cards' (debit cards) by customers to pay for goods³⁷³. In 1997 the technology suppliers CBE installed their first point of sale integrated electronic credit card solution in an Irish retail grocers³⁷⁴.

EFTPOS brought advantages for customers, banks and retailers in terms of speed and convenience³⁷⁵. It transferred money directly and immediately from a customer's bank account via credit card to the retailer³⁷⁶, rather than the 3 day clearance needed for the counterfoil system that it replaced. It was expected to reduce incidents of fraud³⁷⁷. EFTPOS

encouraged consumers to spend more³⁷⁸.

Self-Scan

In the global industry two contrasting trends emerged in relation to self-scan for customers: Handheld self-scan where customers scanned products as they shopped and then paid the scanned total at a dedicated checkout, versus self-scan at unmanned checkouts³⁷⁹. In 1997 Superquinn became the first mover in self-scanning³⁸⁰, trialing handheld self-scan in one store³⁸¹. Spot checks were carried out at checkout³⁸². Self-scanning vastly speeded up checkout³⁸³, reduced queuing times, and allowed consumers to monitor their spend³⁸⁴. Superquinn's membership of AMS³⁸⁵ enabled them to fast-track applying the technology as they leveraged the Dutch grocery chain Albert Heijn's solution³⁸⁶.

5.4.3.5 Loyalty Cards

In the 1990's loyalty card schemes which rewarded customers were introduced as a device to win and retain customers in a competitive environment³⁸⁷. The data gathered through the cards could provide insight into customers' buying patterns³⁸⁸, be used for marketing purposes³⁸⁹, for more efficient store management³⁹⁰ and for innovative customer growth and retention³⁹¹. Multiples extended loyalty benefits through forming partnerships with other retailers³⁹², e.g. by 1999 each of the multiples had linked their scheme to petrol³⁹³ station outlets³⁹⁴.

In 1992 Superquinn became the first multiple in Europe to launch a loyalty card scheme³⁹⁵ leveraging Ukrop's (a US supermarket) loyalty scheme experience³⁹⁶. The ban on below cost selling played a role in inspiring this³⁹⁷, it was an ICT enabled alternative to price based competition. Customer's records were updated with points based on their purchases each time they scanned their loyalty card via the EPOS³⁹⁸. *'The scheme worked amazingly well'*³⁹⁹.

Superquinn's loyalty enabled initiatives included:

- Recruiting B&Bs as customers after identifying that many of their 100 highest spending customers were B&Bs⁴⁰⁰
- Cossetting the 20% of their customers who accounted for 80% of their revenue⁴⁰¹
- Identifying geographic gaps⁴⁰² in customers within key catchment areas, and pursuing a recruitment initiative to get trial of those households: *'we converted thousands of households to suddenly shopping with us'*⁴⁰³.

- Superquinn used the program to improve quality control and customer experience in their stores, through their ‘Goof’ scheme which rewarded customers with points for finding problems in the store⁴⁰⁴.
- They created a revenue stream through selling anonymized customer data to suppliers⁴⁰⁵.

Frank Murphy recalled that Superquinn increased sales and *‘improved the quality of [their]... customers [achieving] at least a 1% increase in margin’*⁴⁰⁶. As databases and the technology improved their capabilities improved: *‘we were learning and relearning and constantly looking at customers in innovative ways’*⁴⁰⁷. Large UK players visited to learn about Superquinn’s loyalty program⁴⁰⁸.

In the UK Tesco launched their loyalty scheme ‘Clubcard’ in 1995 with the professed aim *‘of getting to know what its customers wanted’* and improve their responsiveness to changing customer preferences⁴⁰⁹. Tesco launched their ‘Clubcard’ loyalty scheme in Ireland upon reentry in 1997. In response Dunnes Stores launched their ‘Valueclub’ loyalty scheme⁴¹⁰, even though their EPOS implementation was incomplete⁴¹¹. By the end of the 1990’s Dunnes and Tesco had over 600,000⁴¹² loyalty card holders⁴¹³, whilst Superquinn had 410,000⁴¹⁴. Overall 55% of grocery shoppers had loyalty cards, with many having more than one⁴¹⁵.

5.4.4 Electronic Data Interchange - EDI

In Ireland in 1990 the use of fax was growing, whilst the use of telex was declining⁴¹⁶. Electronic data interchange (EDI) of structured documents, electronic mail and Minitel⁴¹⁷ were considered the cutting edge communication devices that businesses should be interested in leveraging⁴¹⁸.

By the early 1990s suppliers had already begun to adopt handheld terminals that reduced the paper work for ordering, and provided remote data entry. The handhelds were *‘an Irish solution to an Irish problem’* where approximately 50% of retail FMCG sales were via a *‘fragmented network of geographically dispersed independents’*⁴¹⁹. Given the number of and dispersion of relatively small independent retailers in Ireland and the lack of centralized distribution (CD) in symbols, suppliers perceived handhelds as offering a reasonable alternative to EDI, delivering many of its benefits.

Trials had indicated that EDI was easier to introduce between suppliers and retailers where CD was in operation⁴²⁰. Analysis had concluded that CD was not characteristic of the Irish industry, having been deemed to be of limited benefit due to: low population density, wide

distribution of population and uneven distribution of manufacturing and multiples. I.e. multiples concentrated in Dublin⁴²¹.

Service Providers

In the early 1990's the communication of EDI was facilitated by third party providers of Value-added networks (VAN), performing the function of an electronic mail service delivering the data to the intended destination⁴²². The state bodies Telecom Eireann (EIRTRADE launched 1990) and An Post (PostGEM launched 1989), offered EDI⁴²³.

EDI was seen as a strategic competitive device and secrecy surrounded its planned implementation⁴²⁴. The multiples were unwilling to work together for a combined introduction of EDI. Suppliers⁴²⁵ feared having to comply with separate systems for each multiple⁴²⁶.

An EEC scheme promoted the adoption of EDI through covering half the cost for AnPost/PostGEM EDI new customers⁴²⁷. In 1992 setup cost for EDI was between IR£10k - 12K⁴²⁸, a company needed a service provider and *'a modem a telephone line, a computer and software'*⁴²⁹. In late 1989 ANAI supported Superquinn and Quinnsworth trialing EDI with some suppliers. The trials incorporated: Invoices and Price Catalogues⁴³⁰, Purchase Orders were also tested but were not a high priority⁴³¹.

In 1991 L&N stores were actively working on implementing EDI with their key suppliers⁴³². In 1991 Superquinn informed their suppliers of their intention of adopting EDI⁴³³, but only adopted it to enable the implementation of CD after 2000⁴³⁴.

By 1992 the retailers Dunnes Stores, L&N superstores and the Quinnsworth/Crazy Prices chains were using Telecom Eireann's Eirtrade EDI service⁴³⁵. Dunnes had over 70 stores and were processing over 1,000,000 invoices from 400 suppliers through their accounting system⁴³⁶, so EDI offered significant efficiency improvements. They used EDI to manage transactions, replacing paper documentation such as invoices, purchase orders and credit notes⁴³⁷. Dunnes also used EDI to regulate reorder of stock, with minimum and maximum order volumes preset, as they did not have EPOS with scanning⁴³⁸. In the mid 1990's The Barry Group (wholesalers) selected Celtrino to provide an EDI solution between them and their suppliers, to reduce the operating costs of the company⁴³⁹.

In Ireland the larger retailers were the drivers of the adoption of EDI⁴⁴⁰. However, there was a reported *'marked reluctance on the part of grocery multiples to recognise the benefits of sharing information with suppliers'*⁴⁴¹.

Across the same period the majority of independent retailers were phoning in orders and were very much paper document dependent⁴⁴². In 1996 RGDATA were advising independent retailers to use faxes rather than the telephone for placing orders⁴⁴³. When the use of the Internet became widespread, EDI solutions migrated online.

5.4.5 Digital ICT Strategies of the Multiples

Superquinn

'Fergal insisted that we travelled and effectively robbed any good idea that we could find anywhere in the world' Frank Murphy⁴⁴⁴

Superquinn fostered a culture of innovation in the company, including in the application of ICT. *'Fergal's attitude on all these things was, go off do it, if it works great, if it doesn't we've learnt something'*⁴⁴⁵. Superquinn decentralized responsibility to store managers⁴⁴⁶. This attitude was enabled by the company's reliance on their management information system (MIS) to expose any problems that were emerging locally⁴⁴⁷. ICT enabled the easy tracking and assessment of the impact of innovation in stores⁴⁴⁸, allowing staff to make mistakes⁴⁴⁹.

In 1991 Superquinn were judged to be marketing savvy and sophisticated in their use of computers⁴⁵⁰. Their focus was customer service⁴⁵¹. In 1993 Superquinn trialed shopping via fax⁴⁵²: a precursor to online shopping. Superquinn were part of Supermarket 2000 comprising 12 leaders of supermarket chains globally sharing ideas etc⁴⁵³. The self-scan shopping solution implemented by Superquinn emerged from this group.

Dunnes Stores

The 1990s was a decade of change for Dunnes. In 1991 they embarked on an image change and increased the range of branded products that they stocked⁴⁵⁴. They continued to open new stores⁴⁵⁵.

The decade included:

- a major internal familial power struggle (a quasi civil war⁴⁵⁶) resulting in the departure of Ben Dunne (junior) which diverted focus from running the company;
- clashes with workers;⁴⁵⁷
- struggles to update their ICT to catch up with the other multiples;
- and the inclusion of specially sourced external talent on the board of the historically family led company.

Dunnes were lagging behind their competitors in terms of ICT investment and application⁴⁵⁸. They had focused on keeping their labour costs down⁴⁵⁹ and on bargaining hard with their suppliers⁴⁶⁰. Dunnes achieved lower labour costs as a proportion of revenue than their key competitors (Table 5-16). Labour is traditionally the largest business expense for retailers. Dunnes had a very high proportion of casual labour and tended to have employees with shorter tenure, both of which reduced staff wages. Dunnes had the advantage of earning the majority of their revenue from higher margin textile sales⁴⁶¹.

Retailer	Labour cost as a % of Revenue	Annual Staff Turnover Rate	Proportion of Part-time/casual staff
Dunnes Stores	5-6%	50%	90% of non management staff
Quinnsworth	7.5-8%	20%	60%
Superquinn	12%		48%

Table 5-17: Retailers Labour Factors Comparison 1996⁴⁶²

[E]ssential changes [were] required at Dunnes Stores - in technology, industrial relations and marketing⁴⁶³. Dunnes needed to make ‘a significant investment to bring their technology use inline with their competitors⁴⁶⁴, not only in EPOS but also ‘throughout its operations⁴⁶⁵. They were seen as technology luddites⁴⁶⁶. In 1996 Dunnes were only beginning to invest in EPOS⁴⁶⁷, which could improve the efficiency of stock control⁴⁶⁸ and reduce the value of cash tied up in stock⁴⁶⁹

Recognizing the need to take ICT seriously⁴⁷⁰ Dunnes appointed Andrew Street, (Director of Information Systems at Boots⁴⁷¹), as director⁴⁷² of ‘*Information Systems and Logistics*⁴⁷³. He was required to ‘*drag the company into the era of new technology*⁴⁷⁴. In 1997 they were recruiting a range of IT professionals: Business Analysts, Programmers and Senior IT Managers⁴⁷⁵, to implement EPOS, Data Warehousing, ‘*logistics and stock systems*⁴⁷⁶.

Quinnsworth

In 1991 Quinnsworth⁴⁷⁷ were ‘*the most efficient and marketing oriented*’ of the grocery operators, and had ‘*highly effective computer systems*⁴⁷⁸. In 1990 having already invested in superminis, distributed minis, personal computers and networks they were recruiting IT employees to enable further rollout of ICT across their ‘*Retail operations, Marketing, Administration, Warehousing and Distribution*’ functions⁴⁷⁹. Quinnsworth regularly invested in upgrading their ICT, their scanning technology was updated in 1993⁴⁸⁰, and in 1995 they were again investing in ICT to make improvements across the business from logistics to checkout⁴⁸¹.

Quinnsworth leveraged their ICT to inform management decisions and actions⁴⁸². This

allowed the decentralization of power in regard to stock decisions, which were under the remit of store managers. Under Tesco's ownership decisions became more centralized⁴⁸³.

Staff Negotiations Required to Introduce Technology

The increasing application of ICT was expected to reduce the number of jobs: there would be '*cost savings at the expense of employment*'⁴⁸⁴. The planned introduction of new ICT caused staff anxiety, and was used by unions to negotiate pay increases. Offering co-operation with the introduction of new technologies in return for pay increases was a reoccurring pattern⁴⁸⁵.

5.4.5.1 The Symbol Groups and Non-aligned Independents

In the early 1980s wholesalers were said to be '*fully computerised with Plofs, picking lists and invoices printed by computer*'⁴⁸⁶. There was increasing use of ICT in invoicing and delivery⁴⁸⁷.

Musgraves

In 1987 Musgraves began rolling out handheld computers to their symbol retailers, for use in submitting stock orders, replacing the issuing of a weekly price book⁴⁸⁸. The handhelds plugged into the phone line each night to submit retailers' orders and update Musgrave's records⁴⁸⁹. A Centra retailer found the solution improved accuracy and reduced their stock ordering process from 1.5 days to 3 hours⁴⁹⁰.

In 1992 reflecting their commitment to leveraging ICT, Brian Mahony Musgraves' Financial Controller was appointed to the newly created position of '*Information Technology Director*'. At this time both Centra and SuperValu retailers ordered stock via computer⁴⁹¹, and the rollout of EPOS had begun in SuperValu⁴⁹². Musgraves were exploring the potential of EDI and EFTPOS for the business⁴⁹³. In 1995 they were recruiting for the implementation of EDI⁴⁹⁴.

BWG

In 1988 BWG⁴⁹⁵ invested £800,000 in a computer link between their 5 warehouses, 24 cash and carries and their head office⁴⁹⁶. Early in the 1990's BWG had again invested in ICT to improve distribution efficiency and implement central billing for their symbol group members⁴⁹⁷. In 1992 an EPOS system had been selected for implementation in the SPAR symbol group⁴⁹⁸.

In 1997 Value Centre (BWG) after investing IR£2million in upgrading their cash & carry's were offering their non symbol group customers access to '*an electronic ordering system and in store scanning*'⁴⁹⁹. They encouraged non-aligned independent retailers to adopt scanning advising they needed to '*become computer literate if they wished to survive*'⁵⁰⁰

Independents.

Most independents stores did not have scanning, but their electronic cash registers could report by product category e.g. groceries, cigarettes, sweets/minerals, frozen food etc.⁵⁰¹ Monitoring and analyzing cash register data enabled retailers to understand profit margin on each product category⁵⁰². If stores were '*lucky enough to have scanning*', the wealth of information available could improve retailers' market mix, ensure high selling products got sufficient shelf-space, optimize sales per square foot⁵⁰³: improve stock returns and overall margins⁵⁰⁴

Computerization offered improved information and control⁵⁰⁵. RGDATA⁵⁰⁶ recognized difficulties for independents in making decisions about ICT investments, warning '*[o]n your own - the cost of error is high!*'⁵⁰⁷ Caution was advised to ensure EPOS adoption was cost justifiable⁵⁰⁸. EPOS required significant time investment and a level of computer literacy to get the full advantages from the system⁵⁰⁹. Joining a group enabled independents to gain from the symbol groups technological know-how, and ease scanning adoption⁵¹⁰.

5.4.6 Retailer Involvement in ICT Development

Some retail players became involved in ICT system development. In 1984 Musgraves invested in a communications software company⁵¹¹ working on VAN (Value added Networks) an emerging technology which facilitated communication between computers⁵¹² having obvious potential in retail grocery.⁵¹³

Other examples include Mayfield Technology Ltd. (MTL, est. 1985) a joint venture between Punch & co. (wholesalers) and ex ICL staff, which launched EPOS software suitable for use in smaller supermarkets in 1989⁵¹⁴. A Galway retailer established Merit Systems Ltd, and in 1994⁵¹⁵ launched the '*Merit Solution Overview System*', '*designed to integrate everyday shop-floor operations, management and accounting procedures*'⁵¹⁶ and enabled for electronic fund transfer at point of sale (EFTPOS)⁵¹⁷.

Superquinn developed their loyalty system in-house which incorporated scanning devices, scanable loyalty cards for customers and a database to award customers points for their

purchases, as there was no solution in the market⁵¹⁸. They won the 1994 '*Computer Professionals of the Year*' award for this development⁵¹⁹. (In the 2000s Superquinn were so successful in their involvement in developing an online grocery technology solution that the online company was sold on and still operates in the US).

5.4.7 Summary 1980-1999

In the 1980's the multiples continued to open new stores, and consolidation in the industry increased whilst the number of non-aligned independents continued to fall. Tesco exited the market and H. Williams went into receivership. Musgraves launched the SuperValu symbol group and it became a viable competitor to the multiples⁵²⁰. The Groceries Order of 1987 introduced a ban on below cost selling. This enabled a shift in focus by retailers to other ways of differentiating their offerings and attracting consumers.

When the economy began to thrive, consumers became more affluent and their relative preferences in grocery shopping changed. The petrol forecourt and convenience shop with extended trading hours emerged and thrived. The reentry of Tesco to the market in 1997 prompted strategic reactions from the major players in the market.

Adoption of EPOS with scanning built slowly but momentum escalated as the 1990s ended⁵²¹. Loyalty schemes were launched by the main multiples. EDI was trialed and was being used by some players. There was a shifting up of gears in the application of ICT in the industry, but it still lagged the US and general European markets, despite Superquinn's reputation for innovation. As the 90s ended Forfás urged retailers and suppliers to increase their application of ICT, and to formulate an ICT strategy, encompassing its application across operations, supply chain, marketing (including market research) and to '*develop electronic commerce activities*'⁵²². ICT application provided opportunities for improving efficiency, competitiveness and being more responsive to changing consumer requirements/preferences⁵²³. Buzz words in the industry included '*JIT (just in time) delivery, ECR (Efficient Consumer Response) and Category Management, all designed to cut costs and provide more efficiency*'⁵²⁴. By 1999 CD was also a hot topic and the structure was emerging among major retailers⁵²⁵. ICT was expected to continue to '*transform the Irish retail sector*'⁵²⁶.

5.5 DIGITAL ICT BECOMES UBIQUITOUS 2000-2016

'Food retailers in particular have taken the role of 'channel captaincy', where they have substantial power over the supply chain' Forfás Report, 1999⁵²⁷

5.5.1 Macro Context

5.5.1.1 Consumers and Economic Context: Boom, Bust and Recovery

'Long gone are the days where you had loyal committed customers... Now people spread their money out to maybe three or four shops' Noel Darcy, Spar Retailer⁵²⁸

As the noughties emerged the Celtic tiger was roaring and shoppers were not particularly price conscious ranking it below *'convenience, car parking, level of stock, helpful staff, layout and hygiene'*⁵²⁹. Tastes had evolved and demand for convenience food and international dishes had risen⁵³⁰. Repeated news coverage of *'rip-off Ireland'*⁵³¹ influenced the repeal of the Groceries Order in 2006, (thus allowing below cost selling). However, consumer price concerns continued,⁵³² there was a lack of transparency in pricing in Ireland⁵³³

Following an economic collapse recession hit hard in 2008. The grocery industry is considered less sensitive to recession than many other industries: as Terry Leahy, CEO of Tesco commented *'a lot of what we sell is basic stuff, we don't suffer from the lows'*⁵³⁴. However, the recession changed consumers' shopping habits. Their focus shifted from convenience to price, benefitting the discounters Aldi and Lidl⁵³⁵. Other retailers responded, e.g. Tesco cut 1,000 product prices⁵³⁶. Veronica Sullivan noted that austerity increased retail players focus on ICT *'to put in efficiencies, cost savings, business process improvements...'*

The economy began to recover in 2012, but consumers remained resistant to rising grocery prices⁵³⁷: inflation in the consumer price index between 2005-2015 was 14.5 % whilst food prices dropped by 0.2%⁵³⁸.

Own Brand Penetration Increases

Retailers had introduced low priced own brands in the 1980's, however, the products were generally of low quality⁵³⁹ and consumers generally eschewed them⁵⁴⁰. The discounters Aldi and Lidl encouraged own brand⁵⁴¹ acceptance, and the recession escalated own brand market penetration (see Table 5-18).

Year	Market Share
2005	9%
2010	20%
2013	40%
2015	50%

Table 5-18: Growth in Own Brand Market Penetration⁵⁴²

Retailers earned higher margins and gained more power in the supply chain from own brand products⁵⁴³. Own brand is a form of direct competition between the retailer and branded manufacturers⁵⁴⁴. Retailers applied ICT to inform the selection of own brand categories.

Consumers and ICT

'One should never underestimate the ability of the ordinary Irish consumer to adapt to new technology' Tara Buckley, RGDATA⁵⁴⁵

By the end of 2015 70% of people in Ireland had a smartphone⁵⁴⁶. Consumers' increasing comfort with ICT made them more informed, and encouraged them to be *'choosy and mobile'*⁵⁴⁷ and expect *'[q]uality and competitive pricing'*⁵⁴⁸. ICT content in the delivery of services to consumers increased, and were seen as potential differentiators by retailers⁵⁴⁹ (e.g. fintech, loyalty schemes, self scan and apps, online communications etc.). Online grocery was slow to gain favour, with many consumers preferring to select their own fresh produce. Consumers also expected free online grocery services⁵⁵⁰.

5.5.2 Growth of the Discounters and Increased Focus on Supply Chains

Company	Market Share 1998	Market Share 2016
Total Multiples	<u>57%</u>	<u>66.1%</u>
Tesco	25%	22.9%
Dunnes	22%	22.5%
Aldi	-	10.3%
Lidl	-	10.4%
Superquinn	8%	Exit & Acquired
Roches Stores	2%	Convert to Symbol & Exit
Total Independents	<u>43%</u>	<u>33.9%</u>
SuperValu	15%	23.5%
Other Symbol Groups and non-aligned Independents	28%	10.4

Table 5-19: Market Share 1998 and 2016⁵⁵¹

Market consolidation increased and in 2016 the top 5 retail names had had almost 90% of the market (See Table 5-19). Across the period the hard discounters Aldi and Lidl emerged as serious competition for all players. Overall the independents lost market share, even with SuperValu's impressive growth.

5.5.2.1 Entries and Exits

A second hard discounter ‘Lidl’ arrived in 2000⁵⁵², (see Table 5-20). Influenced by increasing levels of competition in the market emerging from the hard discounters and the subsequent responses of the largest players⁵⁵³ the Quinn family sold Superquinn to Select Retail Holdings (SRH) in 2005⁵⁵⁴. Superquinn’s policy of owning its stores had made it challenging for the company to expand, particularly as property values soared⁵⁵⁵.

Year	Retailer	Entry/Exit/Acquisition	Comments
2000	Lidl	Entry	German discounter
2001	Tesco Petrol Stations	New Format	Begin opening Petrol stations located with their stores. 22 by 2017
2002	On the Run	Entry	41 Petrol forecourt convenience stores in Dublin by Esso Ireland costing €70m.
2004	Londis	Co-op to Plc.	Becomes an unlisted plc.
2004	Tesco Express	New Format	Tesco convenience stores
2005	Superquinn	Ownership change	Quinn family sold to Select retail Holdings (SRH) Group
2005	Superquinn Select	New Format	Superquinn convenience format
2008	Mace, Vivo, Xpress stop	Acquisition	BWG acquires the symbol franchises
2011	Superquinn	Exit	Casualty of the recession – receivership
2011	Superquinn acquired by SuperValu (Musgraves)	Acquisition	Stores were rebranded as SuperValu in 2013
2011	Dealz	Entry	UK Discounter with a limited grocery range of branded products.
2015	Londis	Acquisition	BWG acquired 200 Londis stores

Table 5-20: Entry/Exit/Acquisitions 1997-2016⁵⁵⁶

Recession brought casualties. Within the symbols decisions were taken to let some members fail early and protect the overall group⁵⁵⁷. Superquinn was the most significant recession related exit⁵⁵⁸. Property prices plummeted and slashed the value of the highly leveraged Superquinn. The company eventually went into receivership⁵⁵⁹. In 2011 it was acquired by the Musgraves group⁵⁶⁰. The stores were rebranded as SuperValu symbols in 2013⁵⁶¹, making SuperValu by a narrow margin the largest player in the market.

5.5.2.2 Convenience Sector

Some of the larger multiple players entered the convenience market e.g. M&S, Tesco and Superquinn. In 2004 the Londis co-operative became an unlisted plc., to enable required investment in the group⁵⁶². They made significant investments in an ICT program in the ensuing years. They joined the Nisa alliance in 2009 to increase their buying power⁵⁶³. In 2015 the Londis franchise was acquired by BWG, bringing BWG's share of the Irish convenience market to almost 50%⁵⁶⁴.

The number of symbol stores increased through: the acquisition of multiples, the forging of forecourt partnerships, and through independent retailers joining their ranks. The increasing number of independents joining symbol groups, coincided with increased adoption of ICT (e.g. EPOS) (see Table 5-21). Symbol group operators continued to invest in ICT both in-store and in operations, improving business processes and enhancing overall efficiency⁵⁶⁵. The increased efficiency in supply chains kept distribution costs down and aided the competitiveness of their members⁵⁶⁶. The independents sought mentoring and improved buying economies⁵⁶⁷.

Year	Proportion of Independents	Number of Symbol Group Members
1966	10%	851
1993	11%	1,015
2005	40%	2,110
2015	89%	3,560

Notes: *Figures derived, and there may be some inconsistency in comparisons as CSO retail grocery classifications have changed over the years. 1993 was prior to the mass adoption of EPOS with scanning by independent retailers in Ireland.*

Table 5-21: Symbol Group Membership Growth⁵⁶⁸

5.5.2.3 Discounters

The entry of the German discounters was *[h]eralded as the biggest threat to the established Irish grocery sector⁵⁶⁹*. By 2007 Aldi and Lidl had 60 and 90 stores respectively⁵⁷⁰. The discounters stocked a very limited range of branded goods and far fewer lines overall⁵⁷¹, than other retailers. Their market share grew gradually, escalating when consumer's focus shifted to price⁵⁷² (See Table 5-22).

Year	Combined Market Share %
2000	0.5
2004	5.2
2007	6.7
2010	10
2016	20.7

Table 5-22: Hard Discounters Market Share 2000-2016⁵⁷³

5.5.3 Extended Services and Scope

Multiples, convenience stores and TSN's offered additional services to drive footfall to stores, gain additional revenue on impulse purchases, and as differentiation from the discounters, including: the national lottery, phone credit top-ups, bin tags, travel cards and money transfers. Many consumers who used the electronic bill payment services offered by stores spent on average an additional €15⁵⁷⁴. Larger players leveraged their brand to extend beyond traditional industry boundaries. Tesco⁵⁷⁵ and SuperValu⁵⁷⁶ moved into the financial services area⁵⁷⁷. Tesco also sold mobile phone packages⁵⁷⁸ and opened petrol stations⁵⁷⁹. Across the industry non-grocery revenue share grew, e.g. from 18% to 30% between 2001 and 2006⁵⁸⁰.

5.5.3.1 Efficient Consumer Response - ECR

ECR Europe was established in 1994 'to make the grocery sector as a whole more responsive to consumer demand and promote the removal of unnecessary costs from the supply chain'⁵⁸¹. In 1998 Efficient Consumer Response (ECR) Ireland, was established by supplier and retailer representatives⁵⁸².

The threat of the emergence of online shopping added impetus to engage with ECR concepts⁵⁸³, 'improvements in the supply chain relationship [were]... viewed as the way forward for the retail industry'⁵⁸⁴. ECR encouraged the development and adoption of best practices and co-operation between trading partners⁵⁸⁵. Traditionally there was an adversarial relationship between retailers and suppliers⁵⁸⁶, co-operation was a somewhat alien concept⁵⁸⁷, and ECR Ireland faced a challenge to sell ECR principles.

ICT was seen as a 'a vital enabler for the successful implementation of ECR initiatives'⁵⁸⁸. The barcode was essential to facilitate supply chain players working together⁵⁸⁹. EDI was also required to implement ECR principles⁵⁹⁰.

Vendor managed inventory (VMI), the practice of suppliers managing retail 'product categories, placement and replenishment', required data integration along the entire supply

chain⁵⁹¹. 'Pioneered by the likes of Walmart and Proctor & Gamble in the 1980s,... VMI has become a driving force for the industry to cut costs while increasing customer service'⁵⁹². Implementation was tentative in Ireland, occurring only between major players e.g. Tesco and Coca Cola HBC in 2013⁵⁹³. ECR showcased successful co-operative innovations to promote wider industry adoption.

5.5.4 Central Distribution

'In the retail grocery industry, logistics is of paramount importance due to the low margins, numerous inventory turns, and perishable nature of the product' Lynch et al., Journal of Business Logistics⁵⁹⁴

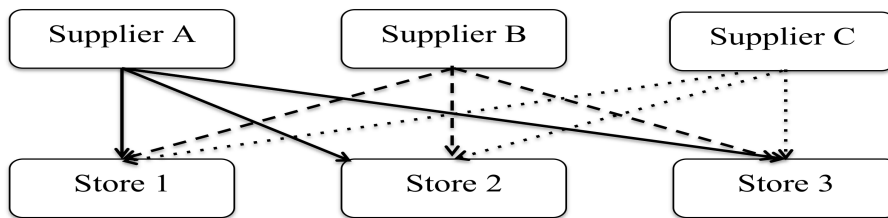


Figure 5-2: Direct to Store Delivery

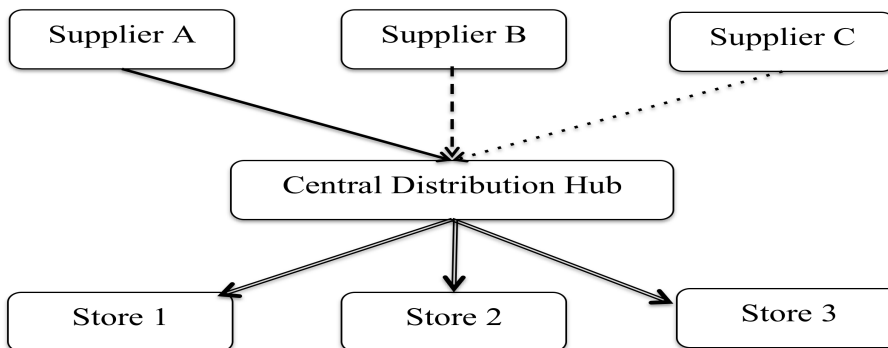


Figure 5-3: Central Distribution

In the UK grocery industry multiples viewed ‘*logistics as a competitive weapon*⁵⁹⁵: ‘*supply chains compete, not companies*⁵⁹⁶. As early as the 1980s strong own brand penetration in the UK market encouraged multiples to operate CD through which they gained significant power in the supply chain⁵⁹⁷. At the end of the 1990’s it was speculated that ‘*the Irish grocery supply chain was comparable to the 1970 UK position*⁵⁹⁸. Logistics costs in Ireland were higher than the European average for grocery retailers⁵⁹⁹. In 2001 the Irish grocery industry was ‘*in the embryonic stage of implementing central distribution*⁶⁰⁰.

Under CD multiples or voluntary groups undertake the management of the delivery of products to their associated stores (see Figure 5-2 and 5-3). In the late 1990’s and early 2000 CD became ‘*the burning issue*’ for Irish retailers, despite the uniquely Irish obstacles, (a dispersed population base, poor road infrastructure, the practice of over-stocking by retailers and low own brand penetration)⁶⁰¹. CD provided an opportunity to reduce costs and better serve the customer⁶⁰², ‘*the ...system of dozens of manufacturers making deliveries to each individual multiple outlet was an inherently inefficient method of distribution*⁶⁰³. By 2001 ‘*all major grocery retailers ..[were] in the process of reconfiguring their supply chains*’ towards CD⁶⁰⁴ (See Table 5-23).

Year	Company	Central Distribution Status
By 2001	Musgraves	66% across ambient, chilled, fresh and frozen foods
	Tesco	60% ambient and chilled foods ⁶⁰⁵ . Implementing for frozen foods.
	Superquinn	Frozen foods (1999). Implementing for ambient and chilled.
	BWG	Ambient products from 3 distribution centres.
	Dunnes Stores	No central distribution
By 2005	Musgraves, Tesco and Superquinn	CD across ambient, fresh, chilled and frozen products
By 2009	Dunnes Stores	A hybridized CD in operation for chilled, fresh and frozen foods, and a selection of branded ambient products facilitated through 3 rd party distributors. No owned central warehouse.
2012	BWG ⁶⁰⁶	Extends CD to chilled foods. Ambient consolidated to 1 distribution centre.
2012	Londis	Implement CD for chilled products.

Table 5-23: Central Distribution Timeline ⁶⁰⁷

The CD trend had significance for the grocery industry⁶⁰⁸. It raised concerns for the feasibility of manufacturers retaining their existing distribution networks⁶⁰⁹ and the impact on

intermediary distributors⁶¹⁰. CD reduced the access of small suppliers to supermarkets, as suppliers needed a minimum scale to be eligible for selection⁶¹¹.

Direct store delivery (DSD) became the exception and CD or hybrids of CD⁶¹² accounted for over 90% of supply chain volume⁶¹³. CD extended competition between retailers vertically, with supply chains competing against each other.

Musgraves and MSVC

Musgraves were leaders in the CD trend. In 1998 they⁶¹⁴ extended CD⁶¹⁵ to chilled, fresh and frozen foods, *'despite having small average store sizes and having the widest geographical spread of stores'*⁶¹⁶. This took 2 years and cost IR£22 million⁶¹⁷. Musgraves applied logistics ICT seeking to maximize the efficient usage of their delivery fleet⁶¹⁸.

The number of deliveries their symbol stores received per week dropped from over 150 to a maximum of 5⁶¹⁹. Retailers' goods inwards processing could be managed far more efficiently and required far less accounting and administration work⁶²⁰. Suppliers were expected to pass on a share of their savings on distribution cost to Musgraves, who passed on a share to their symbol retailers. Musgraves extended the category range from 950 to 3000 lines⁶²¹.

Superquinn

In 1999 Superquinn centralised its frozen foods via a third party service provider⁶²². The process was EDI-driven. They extended CD to chilled and ambient foods in 2002, building a new warehouse distribution centre to facilitate it. The implementation cost IR£35 million⁶²³. However, the *'central distribution model which was expensive to introduce, never worked in Superquinn's favour'*⁶²⁴, it was a *'disaster'*⁶²⁵.

Dunnes Stores

Potentially Superquinn's experience with their SAP ERP and CD implementation caused Dunnes to hesitate⁶²⁶. By 2009 Dunnes out of the 6 largest players was the only one without a CD facility. Whelans and other distributor companies⁶²⁷ operated Dunnes' chilled, fresh and frozen food distribution⁶²⁸. Dunnes had moved to a hybrid central distribution format for *'a number of branded international accounts'*, but there had been problems with product availability and rumblings from suppliers that Dunnes looked for field sales support with a CD cost model⁶²⁹. Dunnes were using a number of third party logistics suppliers (3PLs) for ambient distribution⁶³⁰, a hybridization of CD⁶³¹.

In 2011 Dunnes intended to move to CD⁶³². Dunnes were considered to be underestimating the time and effort required to migrate to a CD model⁶³³. Despite numerous rumours, distribution remained under third party operators' co-ordination⁶³⁴.

5.5.4.1 Digital ICT in Central Distribution

According to Keegan et al. in the Irish Marketing Review: *'Innovative advances in national and international retailing have been largely underpinned by technology'*. They identified ICT as one of the key factors in supply chain development⁶³⁵. The application of ICT systems (such as EDI links with suppliers) was a prerequisite for the effective operation of CD⁶³⁶. Logistics technology returned control of the supply chain and shelf space to the retailer and opened up new opportunities for cost efficiencies and profit⁶³⁷.

5.5.5 Digital ICT in Retail Grocery

5.5.5.1 Global Developments

By the end of the 1990's ICT was being applied extensively *'in market research and analysis, and supply chain management'*, *'leading to significant change in international supply chains'*, increasing their efficiency and reducing inventory levels⁶³⁸. Cumulatively the application of ICT including online, enabled retailers to begin to shift from focusing on products to focusing on consumers, (supply push to demand pull)⁶³⁹. The Internet, made it possible *'to create new channels for distributing information and products to and from wholesalers and manufacturers and to and from customers'*⁶⁴⁰. It enabled redesign of supply chains for retailers, creating greater integration between activities, and increasing efficiency and speed of performance⁶⁴¹. EDI migrated online from private networks⁶⁴². The scope of EDI continued to extend beyond orders and invoices, including increasing efficiencies in receiving stock through electronic delivery notes (e-DN)⁶⁴³. New online grocery models were trialed by incumbents and new players seeking to make online grocery more cost effective. New players entered the grocery arena e.g. Ocada and Amazon in the UK.

There was plenty of hype in regard to new ICT based product identifiers that enhanced information availability and efficiencies, however, none gathered enough traction to replace the barcode.

5.5.5.2 Ireland

*'...technology is playing an ever more important role in helping retailers gain a competitive edge'*⁶⁴⁴

Fears of the Y2K bug meant that businesses had reviewed, amended and tested information systems before the new decade began. Amendments were also required for the introduction of the European common currency the Euro in 2002.

In the early noughties the adoption of ICT in the Irish grocery industry was viewed as lagging the general pace in Europe⁶⁴⁵. However, by 2002 most of the main players in the industry had made significant investments in ICT, including scanning, point of sale technology, and '*data capture and communications facilities*'⁶⁴⁶. Trade bodies such as ECR had been established to promote increased adoption of ICT by both retailers and suppliers⁶⁴⁷. ECR promoted the use of '*EDI, planograms, category management, and efficient replenishment systems*'⁶⁴⁸. Generally retailers were encouraged to '*stop tinkering and start thinking strategically*' about their ICT⁶⁴⁹.

ICT became embedded in retail processes. It was applied to drive down costs, and to increase sales⁶⁵⁰. It became an integral part of the sales process, and data collection through point of sale resulted in greater alignment between marketing and technology⁶⁵¹. ICT developments offered opportunities to '*revolutionise the supply chain*', high levels of competition and pressure on margins made these investments attractive⁶⁵². Automated capture of data along the supply chain was pursued, and required increased integration of systems.

During the recessionary years suppliers of retail technology experienced an increase in retailer interest in ICT solutions. ICT provided cost cutting opportunities, additionally technologies were more competitively priced.

5.5.6 Retailers' ICT Strategies

Tesco

Within the UK Grocery industry, Tesco were cited as pioneers in adopting ECR and focused '*on leveraging systems to manage costs and make the operation more competitive*'⁶⁵³. Tesco had superior and more comprehensive systems than Quinns⁶⁵⁴, but initially a patchwork of legacy and Tesco systems were used⁶⁵⁵. In the early 2000's Tesco launched a program to complete migration to Tesco's systems and practices, to facilitate cost savings and economies of scale⁶⁵⁶. Sales based ordering and centralized buying from head office were introduced⁶⁵⁷. When system standardization was achieved, the Irish ICT helpdesk migrated to a shared service operation in India⁶⁵⁸.

In 2009 after further transformation in business processes, significant Irish head-office work migrated to India and the UK, accompanied by a 75% reduction in support services staff in

Ireland⁶⁵⁹. Much of the responsibility for buying moved to the UK, and further ICT support responsibilities moved to India⁶⁶⁰. These operational changes were expected to save circa €13 million⁶⁶¹.

Superquinn

'The 'new central distribution centre... changed just about every system we were using'
Eamonn Quinn⁶⁶²

Across this period Superquinn were early adopters of online grocery and continued to leverage their Superclub loyalty program. Their difficult experience with SAP ERP illustrated challenges of ICT implementation.

In 2003 Superquinn became the 1st retail grocer in Ireland or the UK to adopt a SAP ERP (Enterprise Resource Planning) system⁶⁶³, to *'consolidate and integrate the company's entire management information systems'*⁶⁶⁴. According to Fergal Quinn the investment of €10million in SAP, *'State of the Art technology'* was *'an important step in providing the platform for growth in the future'*⁶⁶⁵.

The SAP ERP system was to enable the rollout of full CD. It would integrate *'Supply Chain, Financials, Customer Relationship Management, Quality Assurance, Talent (HR) and Data Warehousing'* creating *'one common data source'*, to deliver fully planned end-to-end business process analysis; fully integrated with financials⁶⁶⁶ and real-time data, including customer spend. The data was expected to improve the quality of forecasts, demand planning, inventory control, stock availability and the effectiveness of promotional offers⁶⁶⁷.

Superquinn were managing 11,500 products⁶⁶⁸. Holding stock costs money so turnaround from warehouse receipt to store delivery was organized to keep stock moving, e.g. same day turnaround for their chilled products in the warehouse⁶⁶⁹. Running tighter logistics *'means tolerances grow tighter, a delay in delivery can have disproportionate consequences'* i.e. shops could be left with several products out of stock⁶⁷⁰.

The SAP ERP was a disappointment⁶⁷¹. System issues meant that *'stores temporarily ran out of many leading brands'* as they were unable to order stock through the new system⁶⁷². Ultimately Superquinn's sales were said to be down by 10% in 2004⁶⁷³. There's a view that Superquinn never really recovered from this, it lost sales and customers⁶⁷⁴. Problems persisted: in 2005 Superquinn's new owners viewed the implementation of CD as something that needed to be fixed⁶⁷⁵; in 2009 there were *'reports of SAP still causing huge problems'*⁶⁷⁶.

In 2007 Superquinn invested €400k in a voice stock-picking system⁶⁷⁷ to improve CD operations⁶⁷⁸. The system improved efficiency, increasing both the accuracy (to 99.8%) and speed (+20%) of stock selection, and improved stock availability⁶⁷⁹. Voice picking systems were an industry trend and Musgraves⁶⁸⁰ and BWG were adopters across this period.

The Symbol Groups and Independents

'IT underpins SuperValu and Centra's highly efficient supply chain systems and the company's ability to deliver the right product, at the right price and at the right time' John O'Callaghan, IT Director Musgraves⁶⁸¹.

ICT had been an enabler for the management, growth and operation of the wholesaler symbol groups. *'[S]ubstantial technological investment in both 'front of house' and 'back of house' systems .. and the resultant benefits from supply chain investment (central distribution systems).. [made] the symbols formidable competitors'*⁶⁸². Musgraves claimed that they were matching the prices of Dunnes and Tesco. They attributed this value capability to the effective implementation of ICT which enabled them *'to keep distribution costs to an absolute minimum and pass on the good value'*⁶⁸³ to retailers. ICT aided wholesalers in strengthening their position with both suppliers and retailers⁶⁸⁴. Investments included voice picking technology for use in warehouses, EDI for e-DN and e-invoicing for retailers, central billing and facilitating online ordering of stock.

The wholesalers offered ICT support and guidance, and facilitated enabling other symbol members to learn from pilot sites. Tara Buckley noted that symbol membership *'helped ...[independents] to adopt new technology and engage with new technology'*⁶⁸⁵ and enabled the survival of many independent players.

Musgraves made significant investments in the application of ICT⁶⁸⁶, throughout the *'complete supply chain from manufacturer to the shopfloor, and within the store itself, from back-office to the checkout'*⁶⁸⁷. In 2006 'Aldata Gold' was adopted to deliver total integration of systems for stores i.e. the integration of *'point-of-sale, ordering and back office systems [including finance and integrated payroll], as well as labeling and stocktaking solutions'*⁶⁸⁸. The system provided comprehensive management information such as sales and gross profit by store and by product and access to in-depth analysis, to highlight issues and trends, and improve category management⁶⁸⁹. BWG symbol retailers could order stock and access planograms etc. via their iPads⁶⁹⁰.

5.5.6.1 ICT Implementation Challenges

Retailers sought to gain competitive advantage and/or reduce competitive threats through the application of ICT⁶⁹¹. However, the learning curve and the changes required to leverage ICT could be very challenging⁶⁹². Successful ICT application was not a given. Despite significant investment (time and money) in ICT, companies could fail to exploit the technology *'to achieve greater efficiencies and increase their competitiveness'*⁶⁹³. Adoption issues could arise due to *'pressures to meet the deadline and 'go live' before systems have been fully tested, and staff trained ...or ..before new processes have been worked through...as indeed can 'the human dimension'*⁶⁹⁴.

Superquinn decided that processes would be adapted to fit with the SAP ERP system, rather than adapting the system to their existing processes⁶⁹⁵. Despite lengthy experimentation, the system could not replicate their capability for loading goods on trucks, ordered for efficiently replenishing the store shelves⁶⁹⁶. Staff belatedly had to work out new processes for store ordering and delivery⁶⁹⁷. Declan Carolan recollected that the six months after go live *'were characterized by firefighting regarding the management of the stock system'*⁶⁹⁸. The company never regained their lost market share across this period. Other players besides Superquinn had ICT mishaps including Musgraves⁶⁹⁹ and Londis.

ICT had the capability to increase staff productivity, and reduce *'costs across the board'*⁷⁰⁰. However, system capabilities/functionalities might not be used or utilized effectively⁷⁰¹. The mountains of data that retailers collected was underused⁷⁰². RGDATA acknowledged that *'some retailers use their EPOS in 5th gear, others never get past 1st'*⁷⁰³. Additionally technology trial did not necessarily lead to widespread adoption, examples include Minitel and electronic shelf-edge labeling (ESL)⁷⁰⁴.

5.5.7 Electronic Point of Sale with Scanning

*'Retailers moved en-masse from electronic cash registers to registers ... more akin to PCs'*⁷⁰⁵

5.5.7.1 The Symbol Groups and Non-aligned Independents

By 2001 the vast majority of Musgrave's 500 symbol retailers had adopted EPOS with scanning. Musgraves benefitted from learning from the multiples earlier adoption, the falling cost and improvements in EPOS systems. EPOS had become more cost effective for smaller stores⁷⁰⁶.

5.5.7.2 EPOS Functionality

*'Information is king within retail'*⁷⁰⁷. A key benefit of EPOS was the rich sources of data that it provided to retailers to leverage particularly when integrated with a loyalty scheme. In 2000 Superquinn were producing figures for all their stores weekly, and operating an open book policy. Every department in each store could see how they compared against the other stores⁷⁰⁸. By 2007 Musgraves were touting the benefits of the rich data that was now available to each of their symbol retailers from the scanning data gathered, such as: Revenue and gross profit margin by individual product for their store; Stock data; and collated centralized data provided a performance benchmark of similar stores for symbol group retailers⁷⁰⁹. The Internet had enhanced the availability of data.

ICT developments enabled increased integration of business processes including between back office and front of shop functions, thus increasing the operational efficiency of the business⁷¹⁰. By 2009 retailers were increasingly looking for EPOS that could manage *'their business from end-to-end'*⁷¹¹ and generalized EPOS products emerged⁷¹². Retailers were increasingly capable of linking systems to third parties⁷¹³.

EPOS automated many manual everyday processes in retail⁷¹⁴ and it could be argued EPOS became a general-purpose technology. EPOS functionally expanded significantly to encompass:

- CRM – enabled loyalty cards, updated loyalty data, processed rewards/deductions, product promotions, produced personalized coupons and offers, identified purchase patterns. Data enabled effective personalized marketing and promotions. Improved customer service – more responsive.
- Inventory Management – updated stock information, transactions at checkout fed directly into reordering, improved 'in-stock' positions and reduced over stocks. Could be linked to supplier systems. Previously stock might have been ordered on the basis of noticing a gap in the shelf-space⁷¹⁵.
- Accounting - updated accounting records.
- MIS –
 - Reporting capability supplied management with rich data such as tracking of margins and products sold and profitability on a daily basis and other KPI's.
 - Monitored margins and the health of the business, thus enabling timely responsive actions
 - Assessed the impact of adjustments in product mix and/or displays etc.

- Calculated the prices of products based on margins to be achieved.
- Scheduling Staff and tasks –improved rostering of staff and task planning based on shopper pattern information. Could optimize the labour: turnover balance, and improve labour overheads. Integrated with payroll.
- Other
 - Reduced shrinkage.
 - Facilitated EFTPOS including contactless payment.
 - Faster checkout and self-scan for consumers
- Could improve labour efficiency – no individual pricing of products was required, just a price update to EPOS, and the shelf edge label for the product⁷¹⁶.

5.5.7.3 Self-scanning and Self-service Checkout

Self-scanning

In 2003 Superquinn’s SuperScan handheld scanners were in 4 stores, but further roll-out stalled, due to it being a ‘*relatively expensive*’ system, which new emerging technologies might surpass⁷¹⁷. However, the hand-held self-scan process was adopted in SuperValu in 2013⁷¹⁸, and was in 17 stores by early 2014⁷¹⁹.

After trialing self-service checkouts in the UK, Tesco introduced them to Ireland in 2004⁷²⁰. The tipping point for the self-scan takeoff was almost a decade later, with Dunnes stores, and the symbol group members of BWG and Musgraves rolling out the technology (See Table 5-24). By 2014 there was strong demand for self-checkouts from multiples, and convenience retailers⁷²¹. New adoptees benefitted from the experience of their peers, the expertise acquired by technology suppliers, and improvements in the technology⁷²².

Year	Store	Comment
1988		<i>1st trials of Self-service checkouts in the US</i>
1997	Superquinn	Handheld self-scan trialed in 1 store
By 2003	Superquinn	Handheld self-scan in 4 stores
2004	Tesco	Self-service checkouts
2012	Centra	1st Musgraves symbol group member, pilots system
2013	Eurospar	1st BWG symbol group member, pilots system
2013	Dunnes Stores	Labeled laggards
2013	SuperValu	1 st Store adopts handheld self-scan
2014	SuperValu/Superquinn	17 stores offer self-scan checkouts/handheld

Table 5-24: Self-Scanning Adoption⁷²³

Self-checkout were a good fit for convenience stores and could increase ‘convenience’

shopping in supermarkets⁷²⁴. They enabled more efficient use of labour⁷²⁵, being very effective for managing queuing times during busy periods without having to roster extra staff⁷²⁶. Self-checkout was perceived as a potential differentiator from discounters⁷²⁷. Self-checkout installation was reported as reducing shrinkage⁷²⁸. Many consumers used *'self-checkout lanes for speed and more control of their shopping experience'*⁷²⁹. The emergence of contactless payment technology made the checkout process even faster⁷³⁰, saved time on cash handling⁷³¹ and limited the possibility of cash mistakes at the till.

5.5.7.4 Payment Technologies

In the early 2000s the verification of card payment via pin began to replace signature based verification (e.g. Superquinn made the move in 2003)⁷³². The faster and more secure 'chip and pin' method became mandatory in Ireland in 2007⁷³³. Providing card services costs retailers money; however, consumers have a tendency to spend more using cards, and administration of card payments is more efficient than managing cash⁷³⁴.

Contactless payment ('tap and go') became a trend, and was provided by all the major grocery retailers⁷³⁵. In 2015 the transaction limit for contactless payment was raised from €15 to €30⁷³⁶. Visa reported that contactless payment was used for 1 in 5 face to face purchases⁷³⁷.

In 2016 'Android Pay'⁷³⁸ was introduced allowing consumers to use the app on their mobile phones to pay⁷³⁹. The launch was partly driven by the very high level of ownership of smartphones in Ireland⁷⁴⁰.

5.5.8 Loyalty Schemes

Loyalty scheme data was *'a game changer for the industry'* according to Richard McKeown (Tesco)⁷⁴¹. It could inform: *'targeting advertising, setting product prices and changing the range of goods stocked by specific stores'*⁷⁴². Tesco's Clubcard was recognized as being a key tool for understanding and retaining customers, and as a competitive tool to prevent customers migrating to hard discounters such as Aldi and Lidl through issuing customized vouchers to consumers identified as likely to stray⁷⁴³. With EPOS and loyalty data a store's most profitable customer segment(s) could be identified, and a change in management focus was advised⁷⁴⁴. Superquinn's scheme led to a shift in mindset⁷⁴⁵ to *'manage by customer, not product'*⁷⁴⁶.

Leveraging loyalty data the multiples could design *'special offers and promotions ... focused on what the buying public will respond to'*⁷⁴⁷. Superquinn tested Superclub communications

with pilot groups and thus honed their effectiveness. Uptake of over 60% was reported to be achievable through Superclub direct marketing⁷⁴⁸. By 2000 Superquinn were providing database services to suppliers and other companies, and communicating offers to selected Superclub members⁷⁴⁹.

Store problems could be identified through data analysis⁷⁵⁰ and loyalty data was combined with other data sources such as AC Nielsen data, Kantar panel data, demographics etc., to investigate these issues⁷⁵¹. Data also enabled the assessments and costing of proposed solutions⁷⁵². ICT enabled retailers to *'fine tune their merchandizing...[to] meet customer expectations but in a profitable way'*⁷⁵³.

Leveraging loyalty data could lead to improved *'channel operations, store management and consumer marketing strategies'*. However, the potential for direct marketing and micro marketing strategies leveraging loyalty data was under utilized⁷⁵⁴. Tesco did not begin leveraging the Irish Clubcard data until 2005 when they created an *'insight'* team⁷⁵⁵ and Dunhumby Ireland were given responsibility for leveraging the data⁷⁵⁶. In 2010 SuperValu launched a loyalty scheme *'Real Rewards'*⁷⁵⁷, as the case period ended they were *'reenergizing their scheme'* but were viewed as *'not really using the data'*⁷⁵⁸. In Frank Murphy's opinion *'Dunnes don't have and never had the ability to analyse their data'*⁷⁵⁹.

Product Identification

The universal acceptance and application of a data standard was a prerequisite to enable *'the data revolution'* in the industry. The barcode facilitated enormous improvements in efficiency and availability of information. Improved or more extensive methods/tools of capturing product information have emerged, such as the Data Matrix Code⁷⁶⁰; however, the barcode is embedded in industry processes and it will (if ever) take some time for the barcode to be superseded by another standard. It is likely to require retail giants such as Wal-Mart to force widespread adoption before real momentum can be gained⁷⁶¹.

For 20 years Radio Frequency Identification (RFID), has been discussed as having the potential to improve the operational efficiency of supply chains⁷⁶². By 2004 RFID was used in some retail supply chains in the US⁷⁶³, however, programs stalled⁷⁶⁴. RFID's potential remained untapped in the Irish industry.

5.5.9 Online Grocery Shopping

Online shopping has been a hot topic since the emergence of the Internet. In the US as general e-commerce emerged, online groceries services were launched, with retailers expecting

consumers to switch to online shopping in droves⁷⁶⁵. However, the uptake was much slower than anticipated, and by 2002 many of the online only grocery operators had failed/exited⁷⁶⁶.

Tesco UK

In the UK Tesco began offering an online grocery shopping service in 1996⁷⁶⁷ pioneering the model of using stores as warehouses⁷⁶⁸. Offering online sales provided growth opportunities, by 2000 Tesco (UK) reported that 50% of their online users were new customers⁷⁶⁹. By 2012 Tesco had integrated their online offering with their customer databases. This allowed them to make shopping list suggestions and offer customized promotions to users⁷⁷⁰.

New Players and Experimentation

In the UK new types of firms with no physical stores entered the industry including Amazon⁷⁷¹ and Ocado⁷⁷². Ocado were the world's largest online grocery retailer⁷⁷³.

Incumbents that offer online purchases benefit from having an established reputation⁷⁷⁴ and experience in home delivery⁷⁷⁵. However, generally retail grocery has struggled to find an online shopping model⁷⁷⁶ that is profitable. e.g. *'Supermarket giants lose £100million a year from online delivery services: Cost of delivery means they are effectively paying customers to shop with them'*⁷⁷⁷. Grocery retailers experimented with various formats and versions of online shopping e.g. delivery solutions such as 'Tesco on the move'.

In recent years in the UK online grocery has been the only channel growing⁷⁷⁸. However, perhaps there were better returns on investments pursuing other strategies: the hard discounters such as Aldi and Lidl achieved enviable growth frequently at the expense of the large multiples (in Ireland and the UK) and neither offered online shopping.

5.5.9.1 Online Grocery Shopping Ireland

By 2000 when Superquinn and Tesco began offering grocery sales online the 'clicks and mortar' model was well trialed in the UK, US and in Europe⁷⁷⁹. However, by 2016 online grocery shopping had yet to really take off⁷⁸⁰, representing only 1.2% of sales⁷⁸¹. Tesco and SuperValu were the only major retailers to provide online shopping⁷⁸². Several specialist independent retailers offered online grocery services (see Table 5-25).

Year	Retailer	Comment
2000	Superquinn	Launch in Dublin
2000	Tesco	Launch
2002	Twomey's (SuperValu)	Independently of Musgraves
By 2002	Superquinn	Extend online offering to parts of Wicklow, Kildare and Meath.
By 2006	Tesco	Nationwide online service from 17 stores
2011	SuperValu	Musgraves Pilot service in Symbol Group
2013	SuperValu	Online Shopping Ap
2014	SuperValu	Pilot 'Online Drive Through Service'
2014	Tesco	Offer 'Drive in click & Collect'
2014	Tesco	'Tesco on the Move' offers option to collect online orders at selected Luas stations
2016	Buymie	New model in Dublin – no physical store or warehouse - supply online from local stores

Table 5-25: Online Grocery Participants

Superquinn

In 2000 Superquinn was the first of the supermarket multiples to announce an online shopping service⁷⁸³. Superquinn had partnered with the ecommerce site Buy4Now⁷⁸⁴. The service was only available in Dublin and cost IR£5⁷⁸⁵. They outsourced the delivery services⁷⁸⁶. By 2002 service extended to parts of Wicklow, Meath and Kildare, and around 1,500 customers used the service weekly⁷⁸⁷. In 2003 Superquinn broadened the uptake of online through launching 'click & collect'⁷⁸⁸.

Tesco

Tesco launched online shopping in Ireland in 2000⁷⁸⁹, leveraging their experience from their parent's UK offering⁷⁹⁰. It was initially trialed in two locations⁷⁹¹. By 2002 Tesco had 27,000 online customers, spending an average of €130 per order. The service encompassing 15,000 product lines was available to 75% of the population⁷⁹². By 2006 Tesco online sales in Ireland were €18 million, from 17 stores nationwide, across 140,000 registered customers⁷⁹³. In 2014 Tesco offered a 'drive-in click and collect' service at a limited number of their stores in Ireland⁷⁹⁴. They also launched 'Tesco on the Move', where customers could pick up online shopping orders at specific Luas stops⁷⁹⁵.

SuperValu

In 2002 independently of Musgraves, Twomey's SuperValu shop offered the first online same day delivery service of groceries from a supermarket in Ireland⁷⁹⁶. SuperValu began piloting online sales in 2011⁷⁹⁷, along with an online app which offered customers either store collect or delivery options⁷⁹⁸. SuperValu stores are independently owned so owners need to buy into offering the online service, potentially a store offering online shopping could take business from another SuperValu within the vicinity⁷⁹⁹. In 2013 SuperValu launched an online shopping app for use on either Android or iPhone mobiles⁸⁰⁰. The app linked to their loyalty scheme⁸⁰¹. In 2014 SuperValu piloted 'Online Drive Through service'⁸⁰²: Customers online orders were placed in their car boot in the store collection bay⁸⁰³.

Independents and a New Model

Prior to the arrival of the Internet, a number of independent retailers offered grocery delivery, particularly to build business in more remote rural areas⁸⁰⁴. E.g. in 1990 O'Briens Mace supermarket offered free grocery delivery, and achieved weekly orders of around IR£15,000 for around 300 deliveries⁸⁰⁵.

Independent and specialist retail grocers such as the Organic Supermarket used the online channel to widen their market far beyond their physical footprint⁸⁰⁶, providing delivery throughout the Republic of Ireland, (on certain locations they made a loss on delivery)⁸⁰⁷.

The incumbent retail grocers had yet to face any serious potential competition from a new online model. In 2016 Buymie launched, *'an on-demand grocery delivery app that allow[ed] users to order goods from a variety of local stores and have them delivered by a personal shopper in as little as one hour'*⁸⁰⁸ in Dublin⁸⁰⁹. The model enabled small to medium retailers to participate in online grocery without responsibility for technology or delivery etc.⁸¹⁰ Subscribing retailers paid a monthly subscription⁸¹¹. The revenue model for the company was based on adding mark-up (14.75%) to each product⁸¹². The model had been successful in the US⁸¹³.

Retailers faced challenges in offering online services: they needed to ensure *'the timely delivery of perishable goods'*⁸¹⁴; handle substitution for out of stock products; and manage the quality of fresh foods and longevity of products selected for customers. Providing online services was costly for retailers, but consumers expected it to be free⁸¹⁵. Demographic patterns also made it difficult in certain areas for retailers to *'make online grocery a cost effective service'*⁸¹⁶.

'Omni channel' became a buzz word in the industry⁸¹⁷ and GS1 advised retailers to use 'all their assets (stores as well as the Internet) to maximise their options to fulfill consumer demand'⁸¹⁸. Retail grocers strove to apply ICT 'to maximize in-store sales conversions and to enhance customer experience'⁸¹⁹. Social media was used by retailers to build relationships, to grow online sales⁸²⁰ and was mined to source consumer insights and for ideas to improve the consumer experience⁸²¹. Mobile apps included layouts of the store to help customers find products easily, and check stock availability⁸²². Retailers experimented with tracking consumer behaviour in store by installing electronic chips in baskets and trolleys⁸²³. In 2015 the wholesalers BWG in Ireland used wifi receptors attuned to customers smartphones to track instore shopper behaviour⁸²⁴.

5.5.9.2 EDI for Central Distribution

Beyond introducing an additional shopping channel, the Internet had a significant impact on the retail industry supply chain. EDI via the Internet was 'cheaper, faster and more accurate'⁸²⁵. In Ireland by 2001 the application of ICT in the industry supply chain provided efficiency gains, and was seen as a potential and critical source of competitive advantage⁸²⁶. The entry of international players⁸²⁷ and the growing success of the symbol groups, accelerated this sense of increasing competition and interest in the application of ICT for supply chain efficiencies⁸²⁸. However, relative to their European counterparts, the Irish industry as a whole was slow to adopt EDI, and was deemed to be generally behind in the adoption of ICT, (e.g. e-commerce and e-procurement)⁸²⁹. In mid 2000 only 40% of industry players (across suppliers and retailers) had adopted EDI⁸³⁰, (see Table 5-26).

Year	Company
By 2000	40% of Retailers and Suppliers had adopted EDI according to EAN
By 2002	Musgraves implementing CD and insist all suppliers are EDI capable.
By 2003	Superquinn, were implementing a SAP ERP and CD and EDI seen as imperative for this. Dealing with over 200 suppliers. Had very limited EDI before this.
Early 2000s	BWG Adopt EDI
By 2007	Musgraves extend EDI to e-DN - electronic invoices and delivery notes for their retailers.
2009	Dunnes move to implement EDI with all their suppliers.
2010	Londis outsource EDI from in-house, to cloud-based platform service by Celtrino
By 2010	Musgraves are clients of Celtrino for EDI
2012	Barry Group already with Celtrino migrate to cloud-based service, and extend EDI to e-invoicing their retailers

Table 5-26: EDI Adoption Timeline⁸³¹

By 2001 four different EDI standards had been issued by EAN Ireland. Industry operators e.g. Dunnes Stores, Tesco and Musgraves used different standards⁸³², which suppliers had to comply with. In addition to technical incompatibility issues, trust issues in supplier-retailer relationships slowed EDI adoption in the industry⁸³³. In 2003 Superquinn experienced unexpected difficulties with suppliers when adopting EDI for CD, partially due to the multiple standards being used⁸³⁴. Superquinn adopted a different version of EDI software and suppliers needed ‘handholding’ through the new process⁸³⁵. Suppliers may not have been particularly interested in the process changes going smoothly⁸³⁶.

In 2009 Dunnes extended EDI communication to all their suppliers, requiring: All *‘invoices, credits and dispatch advice documents to be communicated electronically’*⁸³⁷. Dunnes were the last of the big multiples to do this⁸³⁸. Suppliers had to pay to have their products listed on Dunnes new EDI, some suppliers were unhappy but could not afford to refuse compliance⁸³⁹. Other suppliers anticipated the end of delayed payments due to mismatched invoices and prices⁸⁴⁰.

The original EDI solutions were surpassed by web and then cloud-based ‘EDI’ solutions. EDI as a service emerged, and several players outsourced their EDI requirements⁸⁴¹ to Celtrino⁸⁴². Cloud-based EDI meant web-based services and no requirement to invest in technology⁸⁴³. The electronic communication of documents enabled savings for firms⁸⁴⁴: when the Barry Group extended EDI to include e-invoicing to their 300 retailers in 2012, they replaced over 400,000 invoices, credit and debit notes, saving 2.5 man days per week by not handling paper invoices⁸⁴⁵.

EDI became embedded in the industry and its adoption and application expanded. For example by 2012 Londis retailers were using electronic delivery notes (e-DN). This improved the efficiency of goods inwards processes, as delivery data was automatically updated to store records, by being imported to the ePOS⁸⁴⁶. EDI was applied to invoicing⁸⁴⁷, which improved transaction administration. It enabled faster resolution of queries and issues⁸⁴⁸. EDI reduced costs, improved efficiency of supply chain processes, offered wider services and improved scalability⁸⁴⁹.

Symbol Groups Ordering Products

By 2001 Musgrave’s symbol group retailers could order goods using pcs that were connected to Musgrave’s centralized warehouse facility. While Musgraves had *‘direct access to [retailers’] store tills’* and could monitor the sales performance of each shop⁸⁵⁰.

The wholesalers BWG⁸⁵¹ 'implemented an E-Order platform' offering 1,800 chilled and frozen products, for Value Centre customers. Online ordering improved accuracy, enabled faster response times for retailers and increased the efficiency of BWG's operations⁸⁵². Using the service required retailers to change their routines and in 2006 only 10% of orders received in Value Centre were online⁸⁵³. However, over the following years the use of 'E-ordering' became widespread⁸⁵⁴. By 2012 Londis retailers ordered 98% of their stock electronically with over 70% being ordered via iPads⁸⁵⁵.

5.5.10 Summary of 2000s Onwards

'Technological innovation plays a central role in the wholesale and retail sector by driving productivity improvements, underpinning effective marketing decisions, removing inventory and working capital from the system, eliminating stock-outs, matching staffing levels to workload, driving decisions on stocking and space utilisation, and improving sourcing and purchasing decisions' Forfás Report, 2010⁸⁵⁶.

The industry became more consolidated particularly as the wholesalers Musgraves and BWG made acquisitions of those who were vulnerable to the recession. The Groceries Order was revoked after much publicity which compared the Irish grocery prices unfavourably with other European countries. Throughout the industry there was an increased focus on supply chain economies and investments were made in CD and ICT in this regard. Consumers became increasingly comfortable with technology. Online shopping emerged in Ireland and began to gather some momentum.

5.6 SUMMARY

'Retailers are drivers of change in the industry' Forfás Report, 1999⁸⁵⁷.

The self-service revolution was followed by other innovations in retail practice including the emergence of new retail formats such as convenience stores, petrol forecourts and discounters, extended opening hours including opening on Sundays, food-to-go and ready meals. The number and variety of products supplied by retailers expanded phenomenally, enabled by ICT and in response to consumer demand.

America was a significant source of retail innovations for the industry, and these innovations in general travelled to the European mainland and the UK before reaching Ireland⁸⁵⁸. Retailers benefitted from observing and adopting trends from other countries⁸⁵⁹.

The researched period was characterized by population turbulence. The Irish and family owned Dunnes Stores were the only major retailer to have survived intact. Symbol groups aided the survival of many independent retailers. The SuperValu symbol group emerged as a dominant player in the market. Industry consolidation and the multiples share of the market increased significantly, whilst the non-aligned independents' share decreased dramatically. International players entered the market and had gained over 40% of it by 2016⁸⁶⁰. International players benefitted from global sourcing, economies of scale, and best practices and innovations leveraged across the group⁸⁶¹. ICT was a key enabler for multinational strategies.

Power shifted from suppliers to retailers as the market became more concentrated⁸⁶², retailers outpaced suppliers⁸⁶³ and ICT enabled retailers to gain information advantages. The shift from 'direct to store delivery' by suppliers, to a retailer controlled CD model which was enabled by ICT, was a significant industry change⁸⁶⁴.

Industry revenue increased, and despite fears of ICT resulting in job losses the number of workers and their productivity increased significantly. The skills required in retail work increased, '*retail is not a low skill job*'⁸⁶⁵, and the ability to use ICT became essential.

The adoption of computer systems and the now ubiquitous product barcode changed industry processes throughout the industry, including shelf layout and loading, checkout, stock ordering, decision-making, firm boundaries and supply chain structures etc. Cumulatively ICT influenced process changes have resulted in and enabled significant industry change. Across the case period ICT was a key enabler for the development of retailers capabilities, but it also contributed to making managing a retail grocery business more complex.

ENDNOTES CHAPTER

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- ¹ E.G. in 1978 the 6 largest multiples had a 40% share of the grocery market. Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9; In 2016 the largest 3 players have 74% of the market. 2016. Grocery Market share: Ireland. *Kantar* <http://www.kantarworldpanel.com/grocery-market-share/ireland> [Accessed 22nd March 2016]
- ² 1966 *Census of Distribution*; 1977 *Census of Distribution*; Power, J. 2016. Local Heroes II: A Study of the Economic, Financial and Social Significance of the Independent Retail Grocery Sector. http://www.rgdata.ie/images/rgdata/pdf/local_heroes_II.pdf: *RGDATA*. [Accessed 17th Feb 2017] - Sourced from *CSO 2012*
- ³ Cortada, J. W. 2004. *The Digital Hand: How Computers Changed the Work of American Manufacturing, Transportation, and Retail industries*. Oxford: Oxford University Press.
- ⁴ Initially only iconic retailers such as Sears Roebuck, Montgomery Ward, J. C. Penney, Bloomingdale's and Macy's had the reserves to invest in expensive computing equipment. In the early 1950s the department stores began to apply technology to inventory management⁴, and to billing customers. Initially applying a mechanical solution using machine readable tickets and accounting machines. Ibid.
- ⁵ In 1956 when Burroughs launched a datafiling device to be used in conjunction with their Datatron computer, they received some orders from supermarkets for the \$75,000 device (\$835 a month to rent), the system was touted as being suitable for numerous tasks including inventory control. 1956. Burroughs Displays Big electronic Filing Device, *New York Times*, Dec 11th ed.: 69.
- ⁶ By 1959 IBM marketed its 1401 computer system as a 'merchandise control system'. Cortada, J. W. 2004. *The Digital Hand...*
- ⁷ E.g. In 1961 National Cash Registers (NCR) launched a computer bureau for use by small to medium sized businesses, with services available from \$25 a month: suitable for use by even a small grocer with only one cash register. The computer could produce analysis of up to 50,000 sales transactions within an hour, and produce daily sales reports. Additionally it could be used for the payroll function. 1961. Computer Centre Here to Serve Small Businesses, *New York Times*, Jan 9th ed.: 64, 65.
- ⁸ There were 500 computers in use in 300 large retail or wholesale firms in the US. Cortada, J. W. 2004. *The Digital Hand...*; Sloane, L. 1966. Small Stores Turn Increasingly to Electronic Data Processing, *New York Times* Feb 6th ed.: F1, 14.
- ⁹ Labour had been identified as a significant cost for retailers and many stores converted to self service format to reduce labour requirements and increase the productivity of remaining staff. In the US in 1954 labour costs were cited as amounting to 18.7% and 19.8% of sales for national and regional retail chains respectively (not just grocery retailers). Inventory was another significant cost area for retailers, and reducing inventory costs whilst increasing inventory turns, remains a key ambition for retailers. In 1957 inventory amounted to 11-12% of sales for US retailers. Simplistically retailers needed to track inventory to provide better services to customers, and run more effective businesses. As the number of lines of stock carried in stores increased the problems of and the need to improve inventory management also increased. Cortada, J. W. 2004. *The Digital Hand...*
- ¹⁰ Cortada has complained about a severe lack of information for the early period of adoption of computers in retail in the US. "There are very few real success stories to date" C. Robert McBrier's cited in 1963 (a vice president of an upscale department store in Washington). Cortada, J. W. 2004. *The Digital Hand...*
- ¹¹ Cortada, J. W. 2004. *The Digital Hand...*
- ¹² Meanwhile, the grocery industry in post-war America was adapting to the boom in suburban supermarkets—seeking to automate checkout at stores to increase speed, 'drive down the cost of hiring so many checkout clerks and systematize in-store inventory management'. Stores were stocking 10,000 lines. UPC - The Transformation of Retail, *IBM- 100: Icons of Progress*. <http://www.03.ibm.com/ibm/history/ibm100/us/en/icons/upc/>. [Accessed 2nd May 2017]
- ¹³ The concept of an automated checkout had been in the minds of the industry since the 1950's Smith, W., D. 1975. Bidding to Automate the Check-out, *The New York Times* Dec 14th ed.: F.3.
- ¹⁴ A packet of Wrigley's chewing gum was scanned in Marsh's supermarket in Ohio. 2014. The Future of Retail. *Checkout*, 40(6): 28; Cortada, J. W. 2004. *The Digital Hand...*
- ¹⁵ 1976. Computers Take Over the Check-out, *Irish Times* 1st Jan ed.: 10.
- ¹⁶ Smith, W., D. 1975. Bidding to Automate the Check-out, *The New York Times* Dec 14th ed.: F.3.
- ¹⁷ 1976. Computers Take Over the Check-out, *Irish Times*; Smith, W., D. 1975. Bidding to Automate the Check-out, *The New York Times*

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- ¹⁸ Smith, W., D. 1975. Bidding to Automate the Check-out, *The New York Times*
- ¹⁹ Ibid
- ²⁰ Ibid
- ²¹ 'The success of point of sale in supermarkets could contribute considerably to the acceptance of the computer by consumers and the growth of many other aspects of the computer industry' Mr. Peacock, of Autotransaction - a computer watcher. Smith, W., D. 1975. Bidding to Automate the Check-out, *The New York Times*
- ²² 1976. Computers Take Over the Check-out, *Irish Times*
- ²³ A productivity gain of as much as 45%. Smith, W., D. 1975. Bidding to Automate the Check-out, *The New York Times*
- ²⁴ 1974. Checking out Computer Checkouts, *The New York Times*, 11th Sept ed.; Smith, W., D. 1975. Bidding to Automate the Check-out, *The New York Times*
- ²⁵ 1976. Computers Take Over the Check-out, *Irish Times*
- ²⁶ Particularly in the area of stock control enabling more efficient reordering and reduced inventory levels
- ²⁷ 1976. Computers Take Over the Check-out, *Irish Times*
- ²⁸ Ibid
- ²⁹ IBM were a supplier of scanning equipment. Smith, W., D. 1975. Bidding to Automate the Checkout, *The New York Times*
- ³⁰ Power, J. 2016. Local Heros II: *RGDATA*.
- ³¹ Adapted from Competition Authority. 2008. A Description of the Structure and Operation of Grocery Retailing and Wholesaling in Ireland: 2001 to 2006 *Grocery Monitor: Report No. 1* http://www.ccpc.ie/sites/default/files/documents/grocery_monitor_report_1.pdf; The Competition Authority [Accessed 9th Sept 2016]. Note: Suppliers encompasses: suppliers, food producers, manufacturers, and food processors. Distributors are not shown but may operate between suppliers and retailers, and between suppliers and wholesalers, and between wholesalers and retailers.
- ³² by launching smaller format stores e.g. Tesco Express. Harrington, G. 2016. From Coupons to Convenience Foods: 10 Trends Every Irish Retailer Needs to Know to Make an Impact in a Competitive Industry, *Independent.ie*, Sunday Indo Business ed. <http://www.independent.ie/business/irish/from-coupons-to-convenience-foods-10-trends-every-irish-retailer-needs-to-know-to-make-an-impact-in-a-competitive-industry-34491565.html> [accessed 12th Sept 2016]
- ³³ Competition Authority. 2008. A Description of ... *Grocery Monitor: Report No. 1*
- ³⁴ Power, J. 2016. Local Heros II: *RGDATA*.
- ³⁵ Dependent on their location in Ireland
- ³⁶ Competition Authority. 2008. A Description of... *Grocery Monitor: Report No. 1*
- ³⁷ 2005. Interim Report on the Impact of Grocery Multiples on the Grocery and Retail Markets and its Effect on Consumers, Small Grocery Retailers and Small Grocery Suppliers, *Joint Committee on Enterprise and Small Business*, Vol. Third Report. <http://www.oireachtas.ie/documents/report/ESBSupermarket.doc>; Houses of the Oireachtas:p.25 [Accessed 22nd Apr 2016]
- ³⁸ Many TSN's stock a limited range of grocery products and supermarkets and convenience stores generally sell a small selection of newspapers. Specialist food shops including 'fruit and vegetable shops, butchers, bakeries, etc.' are also part of the industry, additionally restaurants are competitors for the industry particularly in providing 'food to go'. 2005. Interim Report on ..., *Joint Committee on Enterprise and Small Business*; Harrington, G. 2016. From Coupons to Convenience Foods... *Independent.ie*
- ³⁹ Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*. Doctoral Thesis. Trinity College Dublin
- ⁴⁰ Arranged direct from suppliers or via their warehouses
- ⁴¹ Because of the 'close co-operation' in the relationship, the competition Authority has come to view the wholesaler-franchisee structure as akin to 'the vertically integrated multiples'. Competition Authority. 2008. A Description of ... *Grocery Monitor: Report No. 1*. Although it is not the norm for wholesalers to own symbol group stores this does occur on occasion
- ⁴² Whether affiliated or through cash and carry
- ⁴³ Power, J. 2016. Local Heros II: *RGDATA*
- ⁴⁴ E.g. Tony Keohane, then Chief Executive of Tesco Ireland commented 'we don't discuss our profitability in Ireland because nobody else does' cited in Hancock, C. 2011. Driver of hard bargains, *Irish Times*, 8th July ed.: A4; Tara Buckley of RGDATA commented 'Each of the large multiple

retailers operating here go to inordinate lengths to conceal details of the turnover and profit generated by their activities in Ireland' in 2013. RGDATA calls for Profits 'Veil of Secrecy' to be lifted for large multiple retailers, Press Releases. <http://www.rgdata.ie/index.php/press-room/archives/130-rgdata-calls-for-profits-veil-of-secrecy-to-be-lifted-for-large-multiple-retailers>: **RGDATA**. [Accessed 6th July 2017]; The Interim Report 2005 noted the difficulty of obtaining 'accurate and consistent information on the industry, such as turnover and net profit for key players and the number of independent stores'. The report recommended that '[c]ompanies operating in important sectors of the economy, such as the grocery trade, should be required to publish turnover and net profit statistics' in 2005. Interim Report on the Impact of..., **Joint Committee on Enterprise and Small Business**

⁴⁵ Personal interview with **Tara Buckley**

⁴⁶ As at 2009 the level of retailer concentration in the industry was higher than in any other EU country aside from the Scandinavian countries. Ruddy, J. 2009. David Vs Goliath? **Checkout**, 35(2): 4; As at 2013 '80% of the retail grocery trade [was] controlled by three players – Tesco, Musgraves [Supervalu and other symbol Groups] and Dunnes'. 2013. Report on the Grocery Goods Sector 'Increasing Equity and Transparency in Producer - Processor - Retailer Relationships', <https://www.oireachtas.ie/parliament/media/Final-Report-on-Groceries-Goods-for-publishing-on-website.pdf>: **Houses of the Oireachtas: Joint Committee on Agriculture, Food and the Marine**. [Accessed 9th Sept 2016]

⁴⁷ 2005. Interim Report on the Impact of..., **Joint Committee on Enterprise and Small Business** :p.25; Ruddy, J. 2009. Dunne Deal? Not quite. **Checkout** (November): 24-26

⁴⁸ Whelan, J. 2015. ECR Summit Discusses How Growth Is Driven By Supply Chain Excellence, **Checkout**, 22nd Oct ed.

⁴⁹ This is illustrated by the Consumer Price index 2005-2015 showing general inflation of

14.5% whilst food Prices show deflation of 0.2%. Power, J. 2016. Local Heroes II. **RGDATA**

⁵⁰ These types of detailed figures generally only become available through government related inquiries. As at 2006 Turnover was €3.6 billion, whilst the retail grocery market value was estimated to be €11.6 billion (also grocery products only). Competition Authority. 2008. A Description of ...

Grocery Monitor: Report No. 1

⁵¹ Including their 'virtual' doors i.e. online

⁵² Harrington, G. 2015. Ireland's number 1 retailer grows for first time since 2013, 28th Sept ed. **Kantar** <http://www.kantarworldpanel.com/ie/Press-Releases/Irelands-number-1-retailer-grows-for-first-time-since-2013> [12th Sept 2016]; Harrington, G. 2016. Irish grocery market continues rapid growth in 2016, 15th Feb ed. **Kantar**. <http://www.kantarworldpanel.com/ie/Press-Releases/Irish-grocery-market-continues-rapid-growth-in-2016> [Accessed 12th Sept 2016]

⁵³ Harrington, G. 2016. From Coupons to Convenience Foods: 10 Trends Every Irish Retailer Needs to Know to Make an Impact in a Competitive Industry, **Independent.ie**, 28th Feb ed.

<http://www.independent.ie/business/irish/from-coupon-to-convenience-foods-10-trends-every-irish-retailer-needs-to-know-to-make-an-impact-in-a-competitive-industry-34491565.html>. [Accessed 12th Sept 2016]

⁵⁴ Consumers are doing top-up shops 188 times a year. Ibid

⁵⁵ In 2005 BWG self reported as having 7.5% of the market which would have made it the 5th largest player in the Irish market, at that time the Musgraves group had 21.7% through their symbol group stores. 2005. Interim Report on the Impact of..., **Joint Committee on Enterprise and Small Business**

⁵⁶ Collated from: Market shares sourced from **Kantar world panel** <http://www.kantarworldpanel.com/ie/grocery-market-share/ireland/snapshot/03.01.16/> [Accessed 20th July 2016]. The Symbol groups listed were identified as 'main symbol groups' in the Irish market as at 2016; Power, J. 2016. Local Heros II. **RGDATA**; Applegreen had 65% of PFS sites in Ireland as at end 2015. Comprised of Convenience - Petrol Forecourt (77) and Motorway Service Areas (33) as per applegreen annual report. Kitchen, D., & Etchingham, R. 2016. **Annual Report and Financial Statements 2015**: Applegreen plc, Vol. 2016. <http://investors.applegreenstores.com/> <http://investors.applegreenstores.com/~media/Files/A/Applegreen-IR/documents/annual-reports/2015-annual-report.pdf>. [accessed 22nd Feb 2017]

⁵⁷ 2015. April 2008: BWG Acquires Mangans Wholesale Business. **Checkout**, 41(2).

⁵⁸ Burke-Kennedy, E. 2015. Competition body approves BWG's [euro]23m purchase of Londis, **Irish Times**, 16 June 2015 ed.: 3.

⁵⁹ Competition Authority. 2008. A Description of ... **Grocery Monitor: Report No. 1**

⁶⁰ Irishness is important to Irish shoppers. Pope, C. 2013. Emerald Aisles, **The Irish Times** Aug 10 ed.: B.1

⁶¹ E.g. consumers are increasingly seeking meal solutions. Personal Interview **Georgieann Harrington**;

- Harrington G. 2016. From Coupons to Convenience Foods..., *Independent.ie*, 28th Feb ed.
- ⁶² Personal Interview *Georgieann Harrington*; Hamill, G. 2014. Driving online shopping forwards, *ShelfLife*, 19th March ed. <http://www.shelflife.ie/driving-online-shopping-forwards/> [Accessed 3rd Sept 2016]
- ⁶³ 2016. Innovation in Digital Grocery Retail, 18th Aug ed. https://http://www.clickz.com/reports/innovation-in-digital-grocery-retail/?utm_source=Search+Engine+Watch&utm_campaign=a4f29fe3b031_08_2016_NL&utm_medium=email&utm_term=0_e118661359-a4f29fe3b0-17733101: *Clickz Intelligence* [Accessed 12th Sept 2016]
- ⁶⁴ For example ‘applegreen’ identify their reliance on ‘*Information technology networks and computer systems*’ including its ‘*point-of-sale*’ system under ‘*Risks*’ in Kitchen, D., & Etchingham, R. 2016. *Annual Report and Financial Statements 2015*: Applegreen plc
- ⁶⁵ Personal interviews with *Declan Carolan* and *John Prendergast*; 2015/16. Nobody Does it Better, *RGDATA Annual 2015/16*: 14-24. https://issuu.com/sheilamoran/docs/rgdata_annual_2015-16. [Accessed 6th Sept 2016]
- ⁶⁶ 2016. A Symbol of Success, *ShelfLife*, 18th Aug ed. <http://www.shelflife.ie/a-symbol-of-success/> [Accessed 2nd Sept 2016]; 1996. Should I Join a Group? In M. Campbell (Ed.), *How to Manage Your shop*, 3rd Edition ed.: 6-8; O’Callaghan, J. 2007. Technology Know-How. *Checkout.*, 33(October): 2.
- ⁶⁷ 2015/16. News Updates-RGDATA, *RGDATA Annual 2015/16*: 6-12. https://issuu.com/sheilamoran/docs/rgdata_annual_2015-16 [Accessed 6th Sept 2016]; 2015/16. RGDATA 24/7 Member's Advice, *RGDATA Annual 2015/16*: 44. https://issuu.com/sheilamoran/docs/rgdata_annual_2015-16 [Accessed 2nd Sept 2016]
- ⁶⁸ 2016. Innovation in Digital Grocery Retail, 18th Aug ed. *Clickz Intelligence*: 8
- ⁶⁹ Quinn, F. 2016. *Quinntessential Fergal: A Memoir*. Dublin: The O’Brien Press.
- ⁷⁰ Ibid.
- ⁷¹ 30 years. 1992. *Talking shop: 50 Years of the Irish Grocery trade: 1942-1992*: RGDATA; 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000*
- ⁷² White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc: 69
- ⁷³ Quinn, F. 2016. *Quinntessential Fergal: A Memoir*. Dublin: The O’Brien Press.
- ⁷⁴ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.
- ⁷⁵ Under VAT different product classes were subject to different rates of tax. Retailers complained about the complexity of the system, and that it was particularly challenging for small retailers to adapt to. Keating, R. 1971. Competition will continue in the supermarkets, *The Irish Times* Dec 8th ed.: 17; 1992. *Talking shop... 1942-1992*: RGDATA.
- ⁷⁶ Thus enabling price comparisons by consumers. 1992. *Talking shop...1942-1992*: RGDATA; S.I. No. 183/1955 - *Retail Prices (Display) Order, 1955.*, Vol. 2016. <http://www.irishstatutebook.ie/eli/1955/si/183/made/en/print> [Accessed 17th Nov 2016];
- ⁷⁷ This was an outcome of a Fair Trade Commission enquiry into ‘the supply and distribution of Grocery goods’. Donnelly, G. 2005/2006. ‘The Impact of the Restrictive Practices (Groceries) Order on Competition in the Irish Grocery Trade’. *Journal of the Statistical and Social Inquiry Society of Ireland*, XXXV: 151-178 p.151
- ⁷⁸ Ibid.
- ⁷⁹ In 1959 there were approx. 40,000 cars registered, by 1970 there were over 80,000 and across the remainder of the 70s they reached almost 200,000. Hanchar, A. 2011. *Exploring the Role of Trade Associations in Industry Evolution: Banking and Motor Industries in Ireland*. Unpublished Doctoral Dissertation. Trinity College Dublin. P.304
- ⁸⁰ Keating, R. 1971. Competition Will Continue in the Supermarkets, *The Irish Times* Dec 8th ed.: 17
- ⁸¹ Ibid
- ⁸² Fergal Quinn founder of Superquinn in Quinn, F. 2016. *Quinntessential Fergal: A Memoir*. Dublin: The O’Brien Press: p.174
- ⁸³ 1992. *Talking shop...1942-1992*: RGDATA.
- ⁸⁴ The shift from credit to cash began before the shift to self-service. Beginning in 1936 ‘cut price grocers’ began offering limited stock, on a cash only basis, with no delivery service, but low prices, and by 1955 there were 200 of them operating in Dublin. 1992. *Talking shop...1942-1992*: RGDATA.
- ⁸⁵ Quinn, F. 2016. *Quinntessential Fergal: A Memoir*. Dublin: The O’Brien Press: p.174
- ⁸⁶ ‘[t]hat would be unethical...you had to compete on service and quality. Quinn, F. 2016. *Quinntessential Fergal: A Memoir*. Dublin: The O’Brien Press: p.21
- ⁸⁷ Brody, A. L., Bugusu, B., Han, J. H., Sand, C. K., & McHugh, T. H. 2008. Innovative Food Packaging Solutions, *Institute of Food Technologies*. <http://www.ift.org/~media/Knowledge>

Center/Science Reports/Scientific Status Summaries/InnovFoodPkg_1008.pdf. [Accessed 14th Sept 2016]

⁸⁸ This was H. Williams second attempt, in 1950 they abandoned the format, the unavailability of packaged products made the format unworkable. Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press; According to RGDATA the format was abandoned because of rampant shoplifting. 1992. *Talking Shop...1942-1992*: RGDATA.

⁸⁹ Fitzgerald, K. 1996. *Dunnes at the crossroads*; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁹⁰ Collated from: 1992. *Talking Shop... 1942-1992*: RGDATA; 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000*; Daly, M. E. 2016. *Sixties Ireland: Reshaping the Economy, State and Society: 1957-1973*: Cambridge University Press; *Dunnes Stores: Our Story*, Vol. 2016. <http://www.dunnesstores.com/ourstory/content/fcp-content> [Accessed 8th Feb 2016]; Keatinge, R. 1971. Who Sells Ireland's Food Part 3: Supermarkets, *Irish Times* 20th Oct 1971 ed.: 13; O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan; Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press; Ruddy, J. 2010. 50 More Years. *Checkout.*, 36(11): 4; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc; Wilcox, M. 2012. The Development of Retailing in Ireland, 1900-2010. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*

⁹¹ The Retail Family Grocers, Purveyors, Dairy Proprietors and Allied Trader's Association founded in 1942. 1992. *Talking shop...1942-1992*: RGDATA.

⁹² White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁹³ Pat Dawson of Connolly Road and Pat O'Shea of Cobh, Co Cork. White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁹⁴ Ibid

⁹⁵ By 1966 only 429 of 8,364 grocery stores in Ireland were self-service format. Wilcox, M., *The Evolution of Grocery Retailing in Ireland, in Retailing in Ireland: Contemporary Perspectives*, E. O'Callaghan and D. O'Riordan, Editors. 2012, Gill & MacMillan: 21-32; Sexton, J. J. 1970. 'Retail trade in Ireland: A Study of its Structure and an Analysis of Trades over the Period 1956/1966'. *Journal of the Statistical and Social Inquiry Society of Ireland*, XXII(11): 140-178.

⁹⁶ Collated from: 1978. Gubay sells major share in 3 Guys to Tesco, *The Irish Times* Dec 13th ed.: 14; 1992. *Talking shop... 1942-1992*: RGDATA; 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000*; 2015. September 1974:Kut-Prices Hits Kilkenny: Ireland's First Discount Store? *Checkout*, 41(1); Fitzgerald, K. 1996. *Dunnes at the crossroads*; Keatinge, R. 1976. Can Albert Gubay make a few more millions in Dublin?, *Irish Times*, 9th Aug ed.: 12; Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: the Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol.14.

<http://arrow.dit.ie/cgi/viewcontent.cgi?article=1000&context=buschrsmcas>. [Accessed 14th Mar 2016]; O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan; O'Sullivan, A. 1979.

Government Approves Takeover of Five Star, *The Irish Times*, May 11th ed.: 12; Seth, A., & Randall, G. 2001. *The Grocers: The Rise and Rise of the Supermarket Chains* (2nd edition ed.): Kogan Page; Taylor, S. 1979. Gubay gets Tesco to buy him out of '3 Guys', *The Irish Times*, Mar 23rd ed.: 14

⁹⁷ H. Williams were the only publically quoted retail Grocery company in Ireland in 1978 they recorded profits of IR£563,263. Big groups are reluctant to publish their turnover. Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9.

⁹⁸ Canniffe, M. 1997. Quinnsworth Attractive Purchase for Predator: Quinnsworth and Crazy... *The Irish Times*, March 20th ed.: 16.

⁹⁹ Keating, R. 1971. Competition Will Continue in the Supermarkets, *The Irish Times* Dec 8th ed.: 17

¹⁰⁰ Their share in Dublin was higher. Ibid

¹⁰¹ Fennell, N. 1977. Unit Pricing *Irish Press*, 19th Oct ed.: 9.

¹⁰² Dunnes Liptons, Five Star and Quinnsworth were intent on building national chains Quinnsworth had recently opened their first non Dublin store in Cork. Superquinn and H.Williams were concentrating on the Dublin market and were opening stores in the Dublin suburbs. Keating, R. 1971. Competition will Continue in the Supermarkets, *The Irish Times* Dec 8th ed.: 17

¹⁰³ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc: 69

¹⁰⁴ Keating, R. 1971. Competition will Continue in the Supermarkets, *Irish Times* Dec 8th ed.: 17;

Keatinge, R. 1971. Who Sells Ireland's Food Part 3: Supermarkets, *Irish Times* 20th Oct

1971 ed.: 13

¹⁰⁵ Following the US and UK examples such as Albert Gubay's cut-price Kwik discount stores. 2015. September 1974:Kut-Prices Hits Kilkenny: Ireland's First Discount Store? *Checkout*, 41(1).

¹⁰⁶ The operation was geared towards cutting out all non essential costs and passing the savings onto consumers. It followed the larger sized, minimalist fittings, limited range and focus on dry goods (it had no refrigeration) model of the US and UK discounters. In contrast to the multiples that offered just a few special deals on a very limited number of products, Kut-prices offered everyday discounted prices across a broad range of goods. 1974. Kut Prices cuts the cost of living, *Kilkenny People*, Aug 9th ed.: 6; 2015. September 1974:Kut Prices Hits Kilkenny: Ireland's First Discount Store? *Checkout*, 41(1).

¹⁰⁷ He had been inspired by the success of deep discounters in the US, Who had a knack for gaining publicity. Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press

¹⁰⁸ 1992. *Talking Shop...1942-1992*: RGDATA. Kelly, D. 1978. The Supermarket War, *Irish Times* Feb 11th ed.: 9; He told the Irish public that his products would be 20% cheaper than all existing supermarkets. Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press.

¹⁰⁹ Fresh food concession operated within the 3 Guys shops

¹¹⁰ Checkout workers (always female) had to memorize the prices of the 1,000 products sold. Keatinge, R. 1976. Can Albert Gubay make a few more millions in Dublin?, *Irish Times*, 9th Aug ed.: 12.

¹¹¹ 6 stores were in Dublin and averaged 18,000 sq ft. '3 Guys' had 8 additional sites with retail planning permission. 1979. Tesco's Irish deal makes good Sense, *Irish Independent*, 3rd Jan ed.: 18; Murdoch, B. 1978. Vital questions raised by Tesco stake in 3 Guys, *Irish Times*, 18th Dec ed.: 12; Taylor, S. 1979. Gubay gets Tesco to buy him out of '3 Guys', *Irish Times*, Mar 23rd ed.: 14

¹¹² It was Tesco's first international venture. They financed the deal by raising money on the stock exchange. 1978. Gubay sells major share in 3 Guys to Tesco, *Irish Times* Dec 13th ed.: 14; 1979. Tesco's Irish deal makes good Sense, *Irish Independent*, 3rd Jan ed.: 18

¹¹³ O'Sullivan, A. 1979. Government Approves Takeover of Five Star, *Irish Times*, May 11th ed.: 12

¹¹⁴ Ibid

¹¹⁵ 1992. *Talking Shop...1942-1992*: RGDATA

¹¹⁶ Generally the major multiples did not publish turnover so figures were estimated Kelly, D. 1978. The Big Names and the Big Money, *Irish Times* Feb 11th ed.: 9

¹¹⁷ 1992. *Talking Shop...1942-1992*: RGDATA; 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000*; Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*. Unpublished Doctoral Dissertation. Dublin City University

¹¹⁸ The Cash & Carry format enabled wholesalers to sell at lower prices because the format eliminated delivery costs and also eliminated administering a credit based relationship with the retailers. The cash & carry format was already successful in the US and the UK. White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

¹¹⁹ Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.

¹²⁰ Collated from: 1992. *Talking Shop...1942-1992*: RGDATA; 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000*. Murdoch, B. 1971. Mace Group to merge with Golden Goose in big grocery trade expansion, *The Irish Times* Jan 1st ed.: 14; <https://www.mace.ie/about-us/mace-in-ireland> (Accessed 24th Feb 2017). Note: Musgrave's 'VG' had originated as VeGe in the Netherlands in 1935 and by the late 1950;s had been established in Belgium, France, Germany, Switzerland and the UK (where it was known as VG). Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*. Unpublished Doctoral Dissertation. Dublin City University; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

¹²¹ Cash & Carry: Wholesalers had superior bargaining power, they incurred no distribution or credit and related administration costs and thus could charge lower prices to retailers. Keatinge, R. 1971. Competition will continue in the supermarkets, *The Irish Times* Dec 8th ed.: 17; The Cash and Carry model offered to grocers by wholesalers continued to grow and Musgrave's opened a 'monster' sized (the largest in Ireland) 90,000 sq. ft. cash & carry site in Tallaght in Dublin in 1972. 1992. *Talking Shop... 1942-1992*: RGDATA

¹²² E.g. Mace retailers received a manual which included guidance on store layout, how to train staff, and advice on financial controls and managing finances Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15; Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9

¹²³ Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15.

- ¹²⁴ Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15; Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*. Doctoral Dissertation. Trinity College Dublin.
- ¹²⁵ Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*
- ¹²⁶ Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15
- ¹²⁷ Collated from: Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15; Keatinge, R. 1971. Who Sells Ireland's Food?: Londis---a national network planned in next five years, *The Irish Times*, 22nd of Oct ed.: 17; Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9.
- ¹²⁸ Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34.
- ¹²⁹ 1992. *Talking Shop...1942-1992*: RGDATA
- ¹³⁰ Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ¹³¹ In Dublin the number of stores had reduced by 371. Keatinge, R. 1971. Competition will continue in the supermarkets, *The Irish Times* Dec 8th ed.: 17; Kelly, D. 1978. The Supermarket War, *The Irish Times* Feb 11th ed.: 9
- ¹³² Keatinge, R. 1971. Competition will continue in the supermarkets, *The Irish Times* Dec 8th ed.: 17.
- ¹³³ Through achieving effective buying power and providing marketing aids to their members. Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15. Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9; Murdoch, B. 1971. Mace Group to merge with Golden Goose in big grocery trade expansion, *The Irish Times* Jan 1st ed.: 14; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc
- ¹³⁴ Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ¹³⁵ Independents: Kelly, D. 1979. Power struggle in the supermarkets, *The Irish Times*, Nov 7th ed.: 12; Major Players: Including Findlaters, Leverett and Frye, the Monument Creameries Maypoles and Home and Colonial. E.g. in 1969 unable to match the competition from the new style supermarkets Findlaters grocery stores were sold to Power Supermarkets. (Galen Weston and ABF). 1992. *Talking Shop...1942-1992*: RGDATA; O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan(Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ¹³⁶ 1969. Problems of the big buyers, *Irish Independent* July 3rd ed.: 3
- ¹³⁷ There had been a gentleman's agreement between the Dublin retailers not to adopt them. 1969. Problems of the big buyers, *Irish Independent* July 3rd ed.: 3; RGDATA and leaders of some of the symbol groups and multiples were strongly against the introduction of trading stamps contending that they resulted in higher prices for consumers. E.g. Piggybank, Quinnsworth Superquinn, and Dunnes. Operating Green Shield stamps cost the retailer about 2-2.5% of total turnover, so significant increases in turnover (estimated as 30%) were required to gain from offering them. Keatinge, R. 1971. Who Sells Ireland's Food: Retailing Profit - The Pressures and Problems, *The Irish Times* 15.
- ¹³⁸ Keatinge, R. 1971. Competition will continue in the supermarkets, *The Irish Times* Dec 8th ed.: 17; Keatinge, R. 1971. Who Sells Ireland's Food: Retailing Profit - The Pressures and Problems, *The Irish Times* 15.
- ¹³⁹ The practice was generally applied to basic products. Keatinge, R. 1971. Who Sells Ireland's Food: Retailing Profit - The Pressures and Problems, *The Irish Times* 15.
- ¹⁴⁰ Manufacturer's are against below cost selling as they feel it devalues their product and when prices return to normal levels they are less acceptable to customers and the product is less attractive. Occasionally they have refused to supply their product to stores applying the loss leader tactic. Keatinge, R. 1971. Who Sells Ireland's Food: Retailing Profit - The Pressures and Problems, *The Irish Times* 15.
- ¹⁴¹ Quinn, F. 2010. *Crowning the Customer: How to become customer-driven*: O'Brien Press; Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press
- ¹⁴² Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9; 1979. Watch this space . . . *The Irish Times*, Mar 23rd ed.: 21.
- ¹⁴³ Superquinn ran consumer panels in order to keep the business relevant and customer focused. Kelly, D. 1978. The Big Names and the Big Money, *The Irish Times* Feb 11th ed.: 9

- ¹⁴⁴ Superquinn as it entered the 1970s was most definitely a discount retailer, engaging 'in below cost selling regularly' to attract customers. 1992. *Talking Shop...1942-1992*: RGDATA; . 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000.*; Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press : p.105
- ¹⁴⁵ Kelly, D. 1979. Power struggle in the supermarkets, *The Irish Times*, Nov 7th ed.: 12; 1980. RGDATA attacks £200m drive by Tesco, *The Irish Times*, Jan 19 ed.: 10
- ¹⁴⁶ 1992. *Talking Shop...1942-1992*: RGDATA
- ¹⁴⁷ It did not prohibit selling below cost, it just prohibited advertising the goods in newspapers and in promotions external to the store at below cost prices. Also the 'near impossibility of defining cost' added further implementation issues. Keatinge, R. 1971. Who Sells Ireland's Food: Retailing Profit – The Pressures and Problems, *Irish Times* 15; Kelly, D. 1979. Power struggle in the supermarkets, *Irish Times*, Nov 7th ed.: 12.
- ¹⁴⁸ The multiples aimed to offset their losses on below cost sales of dry grocery products against higher margins charged on fruit, vegetables and meat. Kelly, D., Kelly, D. 1979. Power Struggle in the Supermarkets, *Irish Times*, Nov 7th ed.: 12.
- ¹⁴⁹ Supermarkets relied on consumers having been drawn in by 'special' offers to do the bulk of their shopping in the store, thus buying lots of higher margin goods to offset the few bargain prices. 1969. Problems of the big buyers, *Irish Independent* July 3rd ed.: 3; Keatinge, R. 1971. Who Sells Ireland's Food: Retailing Profit - The Pressures and Problems, *Irish Times* 15; Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press
- ¹⁵⁰ Keatinge, R. 1971. Who Sells Ireland's Food: Retailing Profit - The Pressures and Problems, *Irish Times* 15; Keatinge, R. 1971. Who Sells Ireland's Food: Supermarkets' growing share, *Irish Times* 18th Oct ed.: 12.
- ¹⁵¹ Keatinge, R. 1971. Who Sells Ireland's Food?: Profitability, *The Irish Times*, Oct 20th ed.: 12.
- ¹⁵² Such as Mace, VG and Spar
- ¹⁵³ As the 1970s ended the gap that had emerged between the multiples versus group prices was the most significant factor which is the balance of power in the grocery trade in Ireland. Kelly, K. 1978. 1977 was Not an Exciting Year for Voluntary Groups! *Checkout Yearbook & Buyer's Guide* 6; Kelly, K. 1978. The Irish Grocery Trade. *Checkout Yearbook & Buyer's Guide* 3
- ¹⁵⁴ Hennessy, J. 1971. Cash and Carry Trend Flourishes Apace, *The Irish Times*, 30th Mar ed.: 19; 1973. Londis to Build £1m. Warehouse, *The Irish Times* May 2nd ed.: 16.
- ¹⁵⁵ 'Apart from Londis, little serious competition has been offered the multiple...more of Ireland's grocery trade is passing out of the hands of the many into the few'. Kelly, K. 1978. 1977 was Not an Exciting Year for Voluntary Groups! *Checkout Yearbook & Buyer's Guide*: 6; Kelly, K. 1978. The Irish Grocery Trade. *Checkout Yearbook & Buyer's Guide*:3.
- ¹⁵⁶ Kelly, K. 1978. 1977 was Not an Exciting Year for Voluntary Groups! *Checkout Yearbook & Buyer's Guide*: 6
- ¹⁵⁷ Initially stores were labelled VG SuperValu to retain custom. Hancock, C. 2013. Who are the Musgraves?, *The Irish Times*, Aug 17th. Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*. Doctoral Dissertation. Trinity College Dublin; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
<http://arrow.dit.ie/cgi/viewcontent.cgi?article=1000&context=buschrsmcas>. [Accessed 14th Mar 2016]
- ¹⁵⁸ Lipton's did not use a computer for central distribution. Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15
- ¹⁵⁹ Andrews, R. 1982. Twelve Years of Change *Checkout Yearbook & Buyer's Guide*: 193
- ¹⁶⁰ Keatinge, R. 1976. Can Albert Gubay make a few more millions in Dublin?, *Irish Times*, 9th Aug ed.: 12
- ¹⁶¹ 1978. Gubay sells major share in 3 Guys to Tesco, *The Irish Times* Dec 13th ed.: 14
- ¹⁶² Keatinge, R. 1971. Competition will continue in the supermarkets, *The Irish Times* Dec 8th ed.: 17
- ¹⁶³ Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15
- ¹⁶⁴ Bruce Carswell of Modern Distributors (Comprising Musgraves, Nilands and J. Garvey wholesalers) cited Keatinge, R. 1971. Independents' Answer to the Multiples, *The Irish Times* Oct 21st ed.: 15
- ¹⁶⁵ Kelly, D. 1978. The Big Names and the Big Money, *Irish Times* Feb 11th ed.: 9; Kelly, D. 1978. The Supermarket War, *Irish Times* Feb 11th ed.: 9
- ¹⁶⁶ Keatinge, R. 1971. Who Sells Ireland's Food Part 3: Supermarkets, *Irish Times* 20th Oct 1971 ed.: 13
- ¹⁶⁷ 1992. *Talking Shop... 1942-1992*: RGDATA

- ¹⁶⁸ Overall margin depends on product mix with the margin earned varying by product. For examples Dunnes main business was drapery. Superquinn saw themselves as specialists in perishable goods such as fruit and vegetables and meat, whilst several other multiples sold fruit and veg and meat through concessions or stocked quite a limited range Dunnes Stores did not do meat because of issues with maintaining quality nationally. Symbol group members only received a limited product range from the wholesale operators, who at that time did not stock perishable goods. Like meat, vegetables, bread and cakes. Aside from warehouse storage issues related to perishable products, the producers of these goods were very fragmented and could supply directly to shops cheaper than the wholesalers would be able to organize. In addition to grocery products Spar also supplied light hardware products to their stores and about 30% of the Spar shops carried these lines. Collated from: 1992. *Talking Shop...1942-1992*: RGDATA. 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000*; Keating, R. 1971. Competition will continue in the supermarkets, *Irish Times* Dec 8th ed.: 17; Keatinge, R. 1971. Who Sells Ireland's Food?: Profitability, *Irish Times*, Oct 20th ed.: 12; Keatinge, R. 1971. Who Sells Ireland's Food Part 3: Supermarkets, *Irish Times* 20th Oct 1971 ed.: 13; Keatinge, R. 1971. Independents' Answer to the Multiples, *Irish Times* Oct 21st ed.: 15; Keatinge, R. 1972. Grocery groups' cash and carry sales rise by 30% in one year, *Irish Times*, Jul 25th ed.: 12.
- ¹⁶⁹ 1979. Tesco's Irish deal makes good Sense, *Irish Independent*, 3rd January ed.: 18.
- ¹⁷⁰ Replacing shopping bills totted up using pen and paper. Registers cost from IR£205 (electromechanical) and IR£99 (manual). 1992. *Talking Shop...1942-1992*: RGDATA
- ¹⁷¹ In 1961 a new weighing machine arrived in Ireland that was capable of providing price per pound, total weight and calculating the final price. 1992. *Talking Shop...1942-1992*: RGDATA; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ¹⁷² 1992. *Talking Shop...1942-1992*: RGDATA
- ¹⁷³ The UK had experienced a big rise in the demand for business machines (cash registers, vending machines, computers) after decimalisation as people had refrained from investing before D-day .In 1971 as D-day approached in Ireland, RGDATA reported that they were receiving numerous SOS calls mainly from small traders who had not done anything yet about converting their cash registers to decimalization. Keatinge, R. 1971. Problems of Converting Business Machines, *The Irish Times*, 12th Feb ed.: 16.
- ¹⁷⁴ At the time payroll was the most popular function in use and decimalization meant these programs required conversion.
- ¹⁷⁵ Keatinge, R. 1971. Problems of Converting Business Machines, *The Irish Times*, 12th Feb ed.: 16.
- ¹⁷⁶ For example the 1978. Ahold representative was speaking about trialing EPOS. 1978. Dutch Retailer for Grocery Conference, *Irish Independent*, 14th Feb ed.: 4; and the 1979 Checkout conference included 'Electronic Scanning at Work' presented by Mr. Patrick Collins, President of Ralphs Supermarkets Los Angeles' as an item on the agenda. 1979. The Irish Grocery Trade: Operation Checkout. *Checkout Yearbook & Buyer's Guide*: 1; 1979. Operation Checkout, *The Irish Times*, Jan 18 ed.: 18.
- ¹⁷⁷ Kelly, D. 1978. The Supermarket War, *The Irish Times* Feb 11th ed.: 9; 1979. Tesco's Irish deal makes good Sense, *Irish Independent*, 3rd January ed.: 18.
- ¹⁷⁸ 1972. H. Williams Optimistic Despite Merger News, *The Irish Times* Jun 13th ed.: 14; 1974 Bests, Sligo to Install computer, *Irish Press*, 6th February ed.: 8.
- ¹⁷⁹ Collated from: 1971. No Profit Forecast from H. Williams, *The Irish Times* 19th Aug ed.: 14; 1972. H. Williams Optimistic Despite Merger News, *The Irish Times* Jun 13th ed.: 14; 1973. Londis to build £1m. warehouse, *The Irish Times* May 2nd ed.: 16; 1974. Bests, Sligo to Install computer, Irish Press, 6th February ed.: 8; 1974. Kut-Prices cuts the cost of living, *Kilkenny People*, Aug 9th ed.: 6; 1974. The Sayings of Chairman Quinn, Irish Times 13th Feb 1974 ed.: 15; 1980. Further losses on way at H Williams, *The Irish Times* Oct 25th 1980 ed.: 18; 1980. Mangan's Open Smart New Outlet in Sligo. *Checkout*(April):16-17; 1980. The Wholesale/Cash and Carry Business in Cork. *Checkout*(May); 1982. £0.25m computer investment by H. Williams, *The Irish Times*, 07 Dec 1982 ed.: 12; 1982. H. Williams completes phase one of upgrading, *The Irish Times* 10th Dec ed.: 20; 1983. H Williams swings into six-figure profit, *The Irish Times*, Oct 28 ed.: 23; 1996. Technology: Information and Control In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 42-51; RGDATA; 1997. £2m plan to grow Value Centre, *The Irish Times*, Apr 2nd ed.: 16. Hennessy, J. 1971. Cash and Carry Trend Flourishes Apace, *The Irish Times*, 30th March ed.: 19; Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press.
- ¹⁸⁰ An IBM 1130 Multiple disk data processing system. 1967. Data Processing Manager Required by

H. Williams & Co. Ltd., *Irish Independent*, July 22nd ed.: 2.

¹⁸¹ Business changes included 'new stores and increases in turnover'. 1969. Money Matters: Williams Chief Defends Profit Fall, *Irish Press*, Sept 26th ed.: 12.

¹⁸² Citing an inability of 'data processing computer programmers' to keep up with all the changes in the business. Business changes included 'new stores and increases in turnover'. 1969. Money Matters: Williams Chief Defends Profit Fall, *Irish Press*, Sept 26th ed.: 12; 1971. No Profit Forecast from H. Williams, *The Irish Times* 19th Aug ed.: 14.

¹⁸³ In 1971 H. Williams were the only grocery operator who owned a computer, they were also the only publically quoted grocery operation in Ireland. Keatinge, R. 1971. Who Sells Ireland's food Part 3: Supermarkets, *Irish Times* 20th Oct 1971 ed.: 13.

¹⁸⁴ Keatinge, R. 1971. Who Sells Ireland's Food Part 3: Supermarkets, *Irish Times* 20th Oct 1971 ed.: 13.

¹⁸⁵ 1972. H. Williams Optimistic Despite Merger News, *The Irish Times* Jun 13th ed.: 14.

¹⁸⁶ Later renamed Superquinn. 1969. Problems of the big buyers, *Irish Independent* July 3rd ed.: 3.

¹⁸⁷ 1974 Bests rented an IBM computer. Bests had stores in the west of Ireland and also stocked drapery and hardware goods. The capital cost of the IBM computer was IR£30,000. They had plans for expansion and intended to use the computer to inform the rationalization of their product offerings. 1974 Bests, Sligo to Install computer, *Irish Press*, 6th February ed.: 8.

¹⁸⁸ To apply to finance and accounting and product profit margin analysis Hennessy, J. 1971. Cash and Carry Trend Flourishes Apace, *The Irish Times*, 30th March ed.: 19; They made a further investment in computing in 1973 with a view to operating centralized accounts for it's members, and make it feasible if necessary to operate a central distribution facility. It was anticipated that the development would take 2-3 years. At the time ADM operated a cash and carry but their members also received direct delivery from manufacturers on best terms, however the central warehouse investment was a safeguard against a potential change in these trading conditions. 1973. Londis to Build £1m. Warehouse, *The Irish Times* May 2nd ed.: 16.

¹⁸⁹ Unit pricing gave consumers transparency on value comparisons for different sized packets of product. There had been relative furor in the United States over the mandatory requirement for unit pricing some years previously. Unit pricing (also called 'tru price') provided the price per weight of a product (price per litre/per lb) on shelf-edge labels.: 1974 Supermarket's New Pricing System, *Cork Examiner*, 13th February ed.: 7; 1974. The Sayings of Chairman Quinn, *Irish Times* 13th Feb 1974 ed.: 15; 1975 H. Williams Today, *Evening Herald*, Oct 9th ed.: 4.; 1975 H. Williams Unique Tru Price system, *Evening Herald*, Oct 9th ed.: 4.

¹⁹⁰ Ibid

¹⁹¹ Commented that the labels might be suitable for computers to read but not humans. Fennell, N. 1977. Unit Pricing *Irish Press*, 19th Oct ed.: 9.

¹⁹² An ICL 1901A upgrading to ICL1901T Hardware upgrade in Jan 1976 seeking a computer manager urgently - data preparation, computer operations, data control and output distribution. 1975. H. Williams & Co. Ltd. , *Irish Independent*, 12th Sept ed.: 16.

¹⁹³ 1975. Advanced Controls Bring Prices Down *Evening Herald*, 9th October ed.: 4.

¹⁹⁴ Ibid

¹⁹⁵ Ibid

¹⁹⁶ Their chairman, John Quinn commented: 'We didn't have as good a trip with the computer as we had hoped...' 1980. Further losses on way at H Williams, *The Irish Times* Oct 25th ed.: 18

¹⁹⁷ 1969. Problems of the big buyers, *Irish Independent* July 3rd ed.: 3

¹⁹⁸ Early in the case period these calculations had to be done without the aid of a computer. 1992. *Talking Shop...1942-1992*: RGDATA

¹⁹⁹ E.g. 1974 Bests, Sligo to Install computer, *Irish Press*, 6th February ed.: 8; 1975. Advanced Controls Bring Prices Down *Evening Herald*, 9th October ed.: 4; Hennessy, J. 1971. Cash and Carry Trend Flourishes Apace, *The Irish Times*, 30th March ed.: 19

²⁰⁰ 1974. Kut-Prices cuts the cost of living, *Kilkenny People*, Aug 9th ed.: 6.

²⁰¹ In addition to buying in bulk, pared back shop fittings etc., 1977. 5 Mile Queue to me Gubay, *Evening Herald*, March 9th ed.: 8.

²⁰² Gubay had invested £500,000 in the computer system. 1977. Cut Price King Gives Regal Contract, *Irish Examiner*, 3rd February ed.: 4.

²⁰³ Whilst remaining 'tight lipped about the operational details' Keatinge, R. 1976. Can Albert Gubay make a few more millions in Dublin?, *Irish Times*, 9th Aug ed.: 12.

²⁰⁴ 1977. Gubay Shares 3 Guys Spoils, *Irish Press*, 24h Nov ed.: 10.

²⁰⁵ Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press

- ²⁰⁶ Because Albert Gubay bought products in such significant bulk product prices rarely changed. Quinn, F. 2016. *Quinntessential Fergal: A Memoir*. Dublin: The O'Brien Press.
- ²⁰⁷ Kelly, K. 1978. The Irish Grocery Trade. *Checkout Yearbook & Buyer's Guide*: 3.
- ²⁰⁸ 1980. RGDATA Attacks £200m Drive by Tesco, *Irish Times*, Jan 19 ed.: 10.
- ²⁰⁹ With journalistic hyperbole Dermot Kelly wrote '[o]ur major supermarket chains are now owned by multinational conglomerates', The sensationalism is slightly offset by the comment that if all Irish retailers were like Fergal Quinn and Superquinn, multinational competition would not be a problem. Kelly, D. 1979. Power struggle in the supermarkets, *Irish Times*, Nov 7th ed.: 12
- ²¹⁰ 1980. RGDATA Attacks £200m Drive by Tesco, *Irish Times*, Jan 19 ed.: 10
- ²¹¹ Collated from: 1980. The Ever Changing Irish Market. *Checkout*(October): 29,30; 1992. *Talking Shop... 1942-1992*: RGDATA. 1998 'Retail Census', *Nielsen*, Dublin; KPMG/Attwood 1998 cited in 1999. The Dynamics of the Retail Sector in Ireland. http://www.tara.tcd.ie/bitstream/handle/2262/70759/forfas000101c_retail_sector_dynamics.pdf?sequence=1&isAllowed=y: *Forfás* [Accessed 27th Sept 2016] :p.43; Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*; O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD European Association for Education & Research in Commercial Distribution Conference Proceedings*. . ESADE, Barcelona.
- ²¹² In 1967 Associated British Foods (ABF) the owners of Power supermarkets in Ireland invested £2million in computers to facilitate their UK activities, but there was no mention of using computers for their grocery operation in Ireland. They intended using it for their extensive bakery operation throughout the UK and planned on rolling out through a Computer Bureau format to their subsidiaries in the UK across a 5 year timescale. 1967. Communications ABF's data network, *The Financial Times*, Nov 3rd ed.: 9: 1968. ABF Expansion *The Guardian*, Jul 30th ed.: 10. London (UK): Guardian News & Media Ltd.
- ²¹³ Kelly, K. 1981. 1981 It's Tough times ahead, Multiple Growth to Continue but Legislation May slow Growth. *Checkout yearbook & Buyer's Guide 1981*: 2-4.
- ²¹⁴ Fitzgerald, K. 1996. *Dunnes at the Crossroads*: p.15
- ²¹⁵ For much of the 1980s the major parties Fine Fail and Fine Gael swapped in and out of government.
- ²¹⁶ McGee., J. 2012. The Greening of Faraway Hills, *adworld.ie*. <http://adworld.ie/features/read/?id=fda74b87-a52d-4f98-9878-9a93d739c0eb>: First published in *Irish Marketing Journal* (July/August, 2012)
- ²¹⁷ Quinn, J. J. 2002. *Industry Evolution: A Comparative study of Irish Wholesaling*.
- ²¹⁸ Schaeffer, L., P. 1995. Where the Customer is King, *Progressive Grocer*, Vol. 74: 2 (p.73).
- ²¹⁹ Beesley, A. 2008. Talking Shop, *Irish Times*, Jan 18 2008 ed.: A4.
- ²²⁰ Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34.
- ²²¹ An increasing number of households owned one or more cars. 1996. Hot Stuff. In M. Campbell (Ed.), *How To Manage Your Shop*, 3rd edition ed.: 15,17,19: RGDATA.
- ²²² Far more consumers had access to mod-cons, for example between 1993 and 1996 ownership of microwaves increased from 32% to over 50% of the population. 1996. Keeping the Customer Satisfied. In M. Campbell (Ed.), *How to Manage Your Shop*: 11-13
- ²²³ Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*.
- ²²⁴ Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*.
- ²²⁵ Clifford, M. 1997. Consumers' Pose Challenge, *Irish Independent*, Dec 2nd ed.: 17.
- ²²⁶ 1996. Keeping the Customer Satisfied. In M. Campbell (Ed.), *How to Manage Your Shop*: 11-13.
- ²²⁷ By 1996 120 retailers had hot deli counters and the trend was spreading 1996. Hot Stuff. In M. Campbell (Ed.), *How To Manage Your Shop*, 3rd edition ed.: 15,17,19: RGDATA
- ²²⁸ 1996. Keeping the Customer Satisfied. In M. Campbell (Ed.), *How to Manage Your Shop*: 11-13. p.13; 1996. Hot Stuff. In M. Campbell (Ed.), *How To Manage Your Shop*, 3rd edition ed.: 15,17,19: RGDATA.
- ²²⁹ In 1983 Superquinn were the 1st supermarket to introduce salad bars. Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*; Ruddy, J. 2010. 50 More Years. *Checkout.*, 36(11): 4.
- ²³⁰ Hardiman, C. 1995. Food Chief Shreds Report on Irish Industry, *Irish Independent*, Nov 9th ed.: 32.
- ²³¹ Campbell, M. G. 1993. Introduction: How to Manage Your Shop, *How to Manage Your Shop*: 1: RGDATA.
- ²³² 1996. Keeping the Customer Satisfied. In M. Campbell (Ed.), *How to Manage Your Shop*:

11-13. p.13

²³³ 1981 New Groceries order after an RPC review concluded as it had done on all other occasions that a ban on below cost selling could not be justified. Donnelly, G. 2005/2006. The Impact of the Restrictive Practices (Groceries) Order on Competition in the Irish Grocery Trade. *Journal of the Statistical and Social Inquiry Society of Ireland*, XXXV: 151-178.

²³⁴ Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*.

²³⁵ This had taken decades of campaigning by RGDATA and IADT. The net invoice price was to be used as the definition for cost. Popular belief has it that the ban finally came into being as a reaction to the demise of the long trading H. Williams after yet another price war, however the act came into effect before the failure of H. Williams. Some viewed the ban as not being in the best interests of consumers. It was seen as a form of resale price maintenance. Donnelly, G. 2005/2006. The Impact of the Restrictive Practices (Groceries) Order *Journal of the Statistical and Social Inquiry Society of Ireland*; RGDATA and IADT's lobbying also resulted in planning laws which curbed 'the uncontrolled growth of the supermarkets' and prevented the hollowing out of local villages. 1992. *Talking Shop...1942-1992*: RGDATA

²³⁶ Ibid

²³⁷ 1999. The Dynamics of the Retail Sector in Ireland, November 1999 ed.

http://www.tara.tcd.ie/bitstream/handle/2262/70759/forfas000101c_retail_sector_dynamics.pdf?sequence=1&isAllowed=y: *Forfás* [Accessed 27th Sept 2016]

²³⁸ 1996c. Taking Care of Business. In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd ed.: 56,57: RGDATA. p.56

²³⁹ Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.

²⁴⁰ Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*; Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation Prospects for Supply Chain Management in the Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38.

²⁴¹ Another source puts Irish figures at 3.5-5.5 and UK as 6-7% Irish multiples began to prepare defenses for the predicted entry of a major UK multiple entering the Irish market. Fitzgerald, K. 1996. *Dunnes at the crossroads*.

²⁴² 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*; Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*; O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD European Association for Education & Research in Commercial Distribution Conference Proceedings*. ESADE, Barcelona.

²⁴³ Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*; O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ...Conference Proceedings*. . ESADE, Barcelona.

²⁴⁴ Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*

²⁴⁵ There was speculation that this was partly due to private ownership. Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*.

²⁴⁶ Others include Londis/ADM, A&O, Piggybank. Market Shares are estimated: 1980. The Ever Changing Irish Market. *Checkout*(October): 29, 30. Est. Market Shares 1998. 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*

²⁴⁷ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation - Prospects for Supply Chain Management in the Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38.

²⁴⁸ Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*

²⁴⁹ 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*

²⁵⁰ O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ...Conference Proceedings*. ESADE, Barcelona.

²⁵¹ Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan: p.26

²⁵² Ibid

²⁵³ Casualties of competition from the multiples. E.g. the closure of O'Briens Supermarket in Naas in 1980 and Ormstons of Limerick in 1982. 1992. *Talking Shop... 1942-1992*: RGDATA; However some less predominant non Dublin based supermarkets like Pettitt's, L&N and D.H. Burke continued to expand their chains. In the longer term L&N exited with 18 stores sold in 1995, and Pettitt's converted it's 6 stores to the Supervalu symbol group in 2006.

- ²⁵⁴ Collated From: 1992. *Talking Shop... 1942-1992*: RGDATA; 1995. L&N passes to Musgrave, *Irish Times*, Aug 1st ed.: 14; 2000. A Century of Grocery *Checkout Ireland: Yearbook and Buyers Guide 2000*; 2015. June 1988: Spar's First 24-Hour Shop Opens. *Checkout*, 41(1): 41; 2015. Symbol pleasures, *ShelfLife*, 13th Aug ed. <http://www.shelflife.ie/symbol-pleasures/> [Accessed 16th Mar 2016]; Fitzgerald, K. 1996. *Dunnes at the crossroads*; Hancock, C. 2013. Who are the Musgraves?, *The Irish Times*, Aug 17th; Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand and Industry Evolution*; McGrath, B. 1998. Roches Stores Links up with Musgrave's SuperValu chain, *The Irish Times*, Thu, Sept 17th ed; O'Keeffe, B. 1995. Musgrave Buys L&N Supermarket Chain for Around £20m, *Irish Times*, Jul 8 ed.: 14; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: the Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14; O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan; Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ²⁵⁵ Losses were recorded for 1980 for the 3rd year in a row. Sales had been falling and there were liquidity issues 1980. Further losses on way at H. Williams, *The Irish Times* Oct 25th 1980 ed.: 18; 1983. The changing Face of H. Williams *Checkout Yearbook & Buyers Guide*: 25, 27; Murdoch, B. 1981. Williams facing inevitable set of options, *The Irish Times*, Sep 28th ed.: 12
- ²⁵⁶ For IR£4.3 million. 1983. The changing Face of H. Williams *Checkout Yearbook & Buyers Guide*: 25, 27; To ease liquidity problems HQ immediately sold 3 H. Williams stores to Quinnsworth. 1992. *Talking Shop...1942-1992*: RGDATA
- ²⁵⁷ Moving from a highly centralised organisation to decentralising control and giving each store manager autonomy and responsibility for sales, stock and store profitability. There was a severe pruning of overheads. The equivalent of category managers were appointed across 4 grouped product areas. Leveraging the 'Buy Irish' movement, they sought Irish substitutes for products that were imported. A program of store refurbishment was rolled out. Management engaged with unions to ease the implementation of required changes. Collated from: 1982. H. Williams completes phase one of upgrading, *Irish Times* 10th Dec 1982 ed.: 20; 1983. H Williams swings into six-figure profit, *Irish Times*, Oct 28, 1983 ed.: 23; 1983. The Changing Face of H. Williams *Checkout Yearbook & Buyers Guide*: 25, 27
- ²⁵⁸ Comprising hardware and software. Hardware from ICL (Ireland) ltd - a System 25 and a ME29 Model 37 computer and software from the company 'Automatic Management Information Ltd'. 1982. £0.25m Computer Investment by H. Williams, *Irish Times*, 07 Dec 1982 ed.: 12.
- ²⁵⁹ 1982. £0.25m Computer Investment by H. Williams, *Irish Times*, 07 Dec 1982 ed.: 12; 1982. H. Williams Completes Phase One of Upgrading, *Irish Times* 10th Dec ed.: 20; 1983. H Williams Swings into Six-figure Profit, *Irish Times*, Oct 28 ed.: 23
- ²⁶⁰ 1982. £0.25m Computer Investment by H. Williams, *Irish Times*, 07 Dec 1982 ed.: 12; 1982. H. Williams Completes Phase one of Upgrading, *Irish Times* 10th Dec ed.: 20
- ²⁶¹ 1982. £0.25m Computer Investment by H. Williams, *Irish Times*, 07 Dec 1982 ed.:12; 1983. H Williams Swings into Six-figure Profit, *Irish Times*, Oct 28, 1983 ed.:23; 1983. The Changing Face of H. Williams *Checkout Yearbook & Buyers Guide*: 25, 27
- ²⁶² H. Williams were focusing on 'quality, value and convenience' and 1983. H Williams Swings into Six-figure Profit, *Irish Times*, Oct 28, 1983 ed.: 23.
- ²⁶³ And were estimated to have a 14% share of the market. Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ²⁶⁴ O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan
- ²⁶⁵ 1992. *Talking Shop...1942-1992*: RGDATA. The 1st SuperValu in Dublin opened in 1985. Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*
- ²⁶⁶ 1992. *Talking Shop...1942-1992*: RGDATA
- ²⁶⁷ Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*. Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*.
- ²⁶⁸ The wholesalers BWG were acquired by Irish Distillers in 1983, who had recognised the growth of alcohol sales through retail grocery and that publicans had begun to purchase stock from cash and carries. Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*
- ²⁶⁹ Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*

- ²⁷⁰ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.
- ²⁷¹ 1996. Should I Join a Group? In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 6-8: p6
- ²⁷² Superquinn introduced own brand Superquinn sausages which have outlived the company, SuperValu retained the product after the takeover.
- ²⁷³ 1992. *Talking Shop...1942-1992*: RGDATA They were not the first stores in Ireland to tout the unique value proposition offered through own brand. In 1975 H. Williams were advertising the quality and price competitiveness of their own brand range. 1975. H. Williams Today, *Evening Herald*, Oct 9th ed.: 4; Dunnes Stores had always operated an own brand 'St. Bernard' range Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*; In 1985 Murgaves introduced 60 own brand products for offer through their symbol group supermarket format SuperValu. 2015. May 1985: New £10m SuperValu Private Brand Launched. *Checkout*, 41(1)
- ²⁷⁴ They frequently ended up producing the retailers 'own brand' products, enabling them to use excess capacity but threatening their brand. Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*.
- ²⁷⁵ 1992. *Talking Shop...1942-1992*: RGDATA.
- ²⁷⁶ 1993. Forecourt Revolution. *How To Manage Your Shop*: 99, 101, 103
- ²⁷⁷ Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan
- ²⁷⁸ Fitzgerald, K. 1996. *Dunnes at the crossroads*; Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*
- ²⁷⁹ Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*
- ²⁸⁰ Spar were the first symbol group to extend their trading hours, in 1987 they piloted an 'Eight till late' format in urban areas. The 7 Eleven stores also opened in Ireland in 1987. In 1988 Spar acquired the Eight till Twelve group, and opened the first 24 hour Spar shop in Europe (It was located in Rathmines in Dublin). Collated from: 1992. *Talking Shop... 1942-1992*: RGDATA; 2015. June 1988: Spar's First 24-Hour Shop Opens. *Checkout*, 41(1); Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*. Quinn, J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*
- ²⁸¹ They were particularly successful in rural areas. 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26; Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ²⁸² Only having to handle one invoice instead of many
- ²⁸³ Rather than placing multiple orders via numerous reps
- ²⁸⁴ All goods from an order would be received in one delivery, thus making managing the delivery intake far more efficient. Stores at a minimum would receive deliveries once a week, thus reducing the amount of stock that needed to be held, thereby increasing cash flow/improving cash positions.
- ²⁸⁵ Collated from: 1996. Should I Join a Group? In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 6-8; Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*
- ²⁸⁶ Quinn, J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*
- ²⁸⁷ 1996. Should I Join a Group? In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 6-8; Symbol groups had an estimated 26% share of the market. White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc
- ²⁸⁸ The group also bought up the 'shopping basket' chain of 3 stores. 1992. *Talking Shop... 1942-1992*: RGDATA.
- ²⁸⁹ Fitzgerald, K. 1996. *Dunnes at the crossroads*; Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*
- ²⁹⁰ By the mid 1990's in Europe the top 6 retailers were larger in terms of turnover than any manufacturer except Nestle and Unilever. Fitzgerald, K. 1996. *Dunnes at the crossroads*
- ²⁹¹ Fitzgerald, K. 1996. *Dunnes at the crossroads*.
- ²⁹² Ibid
- ²⁹³ O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan; for £630million (€799.9million). Beesley, A. 2008. Talking Shop, *Irish Times*, Jan 18th ed.: A4. In the same year they also sold off the Lifestyle sports chain that was part of the Quinnsworth group, maintaining their focus on the grocery acquisition. O'Keeffe, B. 1997. Tesco to Sell Lifestyle to Concentrate on Food Retailing, *Irish Times*, Jul 5th ed.: 16

- ²⁹⁴ Fergal Quinn cited in Ingle, R. 1997. Quinn Philosophical About Competition: All the main supermarket chains have been preparing for the recent developments for three years. The *Irish Times*, 18th Oct ed.: 8
- ²⁹⁵ 1997. Distribution Faces Major Change, *Irish Times*, Oct 29th ed.
- ²⁹⁶ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation - Prospects for Supply Chain Management in the Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ²⁹⁷ Beesley, A. 2008. Talking Shop, *Irish Times*, Jan 18 ed.: A4. RGDATA played a roll in this negativity
- ²⁹⁸ Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan.
- ²⁹⁹ Dennet Withington in Cortada, J. W. 2004. *The Digital Hand...* p.332
- ³⁰⁰ Cortada, J. W. 2004. *The Digital Hand...*p.297
- ³⁰¹ 1980. UK Manufacturers Claim Little Benefit From Article Numbering, All Gains for Retailers *Checkout*(June): 26, 27, 29.
- ³⁰² Cortada, J. W. 2004. *The Digital Hand...*p.302
- ³⁰³ 1980. UK Manufacturers Claim Little Benefit From Article Numbering, All Gains for Retailers *Checkout*(June): 26, 27, 29.
- ³⁰⁴ And this provided another seam of information to retailers and manufacturers regarding consumers buying habits and demand for products. Cortada, J. W. 2004. *The Digital Hand...*p.302
- ³⁰⁵ Carlson, E. 1988. Neighborhood Groceries Fading Away In Face of High Costs, Big Competition, *Wall Street Journal*, 7th Dec ed. New York, N.Y.
- ³⁰⁶ Discount for data or 'frequent shopper programs' Crossen, C. 1989. If You Are What You Eat, They've Got Your Number, *Wall Street Journal*, 31st Aug ed.: 1. New York, N.Y.
- ³⁰⁷ Cortada, J. W. 2004. *The Digital Hand...*p.284
- ³⁰⁸ Mangan, T. 1983. The Role of the Modern Symbol Group Wholesaler. *Checkout: Yearbook & Buyers Guide 1983*: 28, 29, 31.
- ³⁰⁹ Fynes, B., & Ennis, S. 1993. The Impact of Electronic Data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29; Hardiman, C. 1995. Food Chief Shreds Report on Irish Industry, *Irish Independent*, Nov 9th ed.: 32; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14.
- ³¹⁰ Fynes, B., & Ennis, S. 1993. The Impact of Electronic data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29
- ³¹¹ Hardiman, C. 1995. Food Chief Shreds Report on Irish Industry, *Irish Independent*, Nov 9th ed.: 32; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
- ³¹² Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*
- ³¹³ Fitzgerald, K. 1996. *Dunnes at the crossroads*
- ³¹⁴ Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*
- ³¹⁵ 1994. Know Your Stock. In M. Campbell (Ed.), *How to Manage Your Shop*, 2nd edition ed.: 79, 81, 82: RGDATA; 1996. Taking stock. In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 121-124: RGDATA
- ³¹⁶ O'Hanlon, E. 1993. Retailing the Good News to the Customers, *Irish Times*, Jun 22nd ed.: A.4.
- ³¹⁷ Representative from Migros a Swiss retailer cited in 1983. Revolution at the Checkout, *Irish Independent*, 9th Dec ed.: 4
- ³¹⁸ Now known as GSI
- ³¹⁹ 1980. Quinn leads Grocery Move Towards Laser Checkouts, *Irish Press*: 1st Aug ed.: 6.
- ³²⁰ Desirable not just for domestic markets but also for exports. Ibid
- ³²¹ 70% of products needed to be barcoded for the viable use of scanning in supermarkets 1980. Quinn leads Grocery Move Towards Laser checkouts, *Irish Press*: 1st Aug ed.: 6; Kelly, D. 1983. Supermarkets Ponder Little Black Bars, *Irish Times* Nov 9th ed.: 11
- ³²² 1983. Revolution at the Checkout, *Irish Independent*, 9th Dec ed.: 4
- ³²³ 1983. Sweda Retail Systems Advertisement. *Checkout Yearbook & Buyers Guide*: p.155; 1983. Revolution at the Checkout, *Irish Independent*, 9th Dec ed.: 4
- ³²⁴ Which could be applied to controlling gross profit and stock control
- ³²⁵ 1989. Digi Systems are the Largest Most Successful Retail Equipment Company in Ireland, *Kerryman*, 11th Aug ed.: 7

³²⁶ Suppliers were also selling electronic cash registers and some offered microcomputers. In 1984 Sweda launched a micro computer for retailers. 1983. Services Guide. **Checkout Ireland Yearbook & Buyer's Guide**: 121-135; Mercator. 1984. Supermarket Sweethearting Soon be a Thing of the Past: People in Business, *Irish Times* Jan 16th ed.: 12..

³²⁷ Stockouts were a lost revenue opportunity and a disappointment to customers, in 1993 Superquinn were considering using the EPOS for automated reordering of stock. *'the system could automatically reorder each item as it goes through the scanner'* At the time it was up to each store manager to decide when depleted stock should be reordered. Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34.

³²⁸ There had been a practice of suppliers convincing retailers to take extra stock when they were delivering

³²⁹ In 1991 Quinns were using their EPOS for *'stock updates and reordering facilities'* Giblin, M. 1991. **The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport**. Unpublished Masters, Dublin City University

³³⁰ Personal interview with **John Prendergast**; Quinn, F. 2016. **Quinntessential Fergal: A Memoir**. Dublin: The O'Brien Press. Fergal Quinn had a habit of monitoring key competitors prices and then rushing to change prices to match or beat them. If a competitor's prices were cheaper they might be a rush to change prices of a product to match or beat the competitors price, this involved manually removing the old price ticket from each individual product packet and replacing it with a new price ticket Quinn, F. 2016. **Quinntessential Fergal: A Memoir**. Dublin: The O'Brien Press.

³³¹ E.g. Quinns leveraged the technology for efficiently and easily implementing new offers, updating prices of products to checkouts across their stores, from Quinns headquarters. 1993. Ban Sought on Advertising by Quinns, *The Irish Times*, Mar 12th ed.: 7; Giblin, M. 1991. **The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport**

³³² Collated from: 1983. Revolution at the Checkout, *Irish Independent*, 9th Dec ed.: 4; 1983. Sweda Retail Systems Advertisement. **Checkout Yearbook & Buyers Guide**:155; 1984. New Quinns Superstore will Enter the Computer Age, *Irish Times*, Nov 14th ed.: 17; Mercator. 1984. Supermarket Sweethearting Soon be a Thing of the Past: People in Business, *Irish Times* Jan 16th ed.: 12; 1990. Business: Tough On The Streets. *The Economist* (Feb 24th): 69; 1999. The Dynamics of the Retail Sector in Ireland. *Forfús.*; 2015. February 1984: L. & N. Enters Computer World At Ballincollig. **Checkout**, 41(1): 37; Kelly, D. 1983. Supermarkets Ponder Little Black Bars, *Irish Times* Nov 9th ed.: 11; Lindsay, P. 1988. Watch out: Eftpos is Coming, *The Irish Times*, May 26 ed.: 17; Quinn, F. 2016. **Quinntessential Fergal: A Memoir**. Dublin: The O'Brien Press; Wynne-Jones, S. 2015. Those Were The Days. **Checkout**, 41(1): 32, 33. (Sweethearting is where the cashier inputs a lower price than the real sales price for a good at the resister for her friends and/or family)

³³³ At an estimated cost of IR£100,000. 1980. End in Sight to Those Supermarket Checkout Blues, *Irish Independent*, May 5th ed.: 4

³³⁴ As insufficient products were barcoded

³³⁵ Registers were: D. T. S 540. Each Thrift product had an EAN barcode as scanning was anticipated to become widespread throughout the industry. *'I would like to stress the importance and urgency to all manufacturers in having their products bar-coded'*. The method used to capture the sales movement - gross margin data on Thrift was incorporated in the barcode by underlining three digits of the article number. *'The checkout operator simply keys in '156; and the register automatically displays the description and price of the Thrift product and prints the same information onto customer receipts . The headoffice computer prints out at the end of the week, or day, the amount [of the product] (156s) we sold, its value and gross margin. This is done by product, by branch and head office total. As a result of all this data we can control the effects of changes in that product mix'*. Carolan, D. 1983. Generics - The Celebration of Austerity. **Checkout: Yearbook & Buyers Guide 1983**: 33,35

³³⁶ 1980. End in Sight to Those Supermarket Checkout Blues, *Irish Independent*, May 5th ed.: 4; Carolan, D. 1983. Generics - The Celebration of Austerity. **Checkout: Yearbook & Buyers Guide 1983**: 33,35.

³³⁷ Their adapted application of a barcode system was sufficient for them to print a series of weekly reports (some daily) displaying the volume, the price and the gross margin earned, by product (for own brands and high volume sellers), by store and in total. Carolan, D. 1983. Generics - The Celebration of Austerity. **Checkout: Yearbook & Buyers Guide 1983**: 33,35

³³⁸ Carolan, D. 1983. Generics - The Celebration of Austerity. **Checkout: Yearbook & Buyers Guide 1983**: 33,35

³³⁹ 1980. End in Sight to Those Supermarket Checkout Blues, *Irish Independent*, May 5th ed.: 4.

³⁴⁰ Kelly, D. 1983. Supermarkets Ponder Little Black Bars, *Irish Times* Nov 9th ed.: 11.

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- ³⁴¹ Each checkout could cost up to IR£24,000 so careful consideration was required. Ibid
- ³⁴² Overall almost 60% of the packaged products stocked in Quinnsnorth were barcoded. According to Maurice Pratt The Marketing Director, and public face of Quinnsnorth. Kelly, D. 1983. Supermarkets Ponder Little Black Bars, *Irish Times* Nov 9th ed.: 11
- ³⁴³ London & Newcastle Tea Co.
- ³⁴⁴ A. Sloan's Super Spar in Antrim (Northern Ireland) was the first grocery in Ireland to get a scanning EPOS. Mercator. 1984. Supermarket Sweethearting Soon be a Thing of the Past: People in Business, *Irish Times* Jan 16th ed.: 12
- ³⁴⁵ 1983. Revolution at the Checkout, *Irish Independent*, 9th Dec ed.: 4; 2015. February 1984: L. & N. Enters Computer World At Ballincollig. *Checkout*, 41(1): 37
- ³⁴⁶ 2015. February 1984: L. & N. Enters Computer World At Ballincollig. *Checkout*, 41(1): 37
- ³⁴⁷ 1983. Revolution at the Checkout, *Irish Independent*, 9th Dec ed.: 4
- ³⁴⁸ Collated from: 1978. 1978. Dutch Retailer for Grocery Conference, *Irish Independent*, 14th Feb ed.: 4; 1980. Quinn leads Grocery Move towards Laser checkouts, *Irish Press*, 1st Aug ed.: 6; 1980. UK Manufacturers Claim Little Benefit From Article Numbering, All Gains for Retailers *Checkout*(June): 26, 27, 29; 1983. Revolution at the Checkout, *Irish Independent*, 9th Dec ed.: 4; 1984. New Quinnsnorth Superstore will Enter the Computer Age, *Irish Times* Nov 14th ed.: 17; 1988. New store to provide 40 Jobs, *Nationalist and Leinster Times*, 9th Sept ed.: 5. 1989. Digi Systems are the Largest Most Successful Retail Equipment Company in Ireland, *Kerryman*, 11th Aug ed.: 7; 1990. Information Technology, *Irish Times*: 1. 1990. Suir Thing! *Checkout*, 16(1): 17,19; 1990. SuperValu: Scanning Installation Team, *Sunday Independent* Dec 23rd ed.: 21; 1992. Company Announcement: Musgrave Information Technology Director, *Irish Times*, 1st May ed.: 17; 1992. Ireland: Always Right the Customer and the Service, *Irish Times*, 21st Oct ed.: 7; 1993. Digital wins £3million contract, *Irish Times*: May 18th ed.: 15; 1996. Action Men, *Irish Times* Aug 30th ed.: A18; 1996. Technology: Information and Control In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 42-51: RGDATA; 2014. The Future of Retail. *Checkout*, 40(6): 2; Cortada, J. W. 2004. *The Digital Hand...*; Giblin, M. 1991. *The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport*; Mercator. 1984. Supermarket Sweethearting Soon be a Thing of the Past: People in Business, *Irish Times* Jan 16th ed.: 12; McGrath, B. 1997. Market potential Lures Safeway: Brendan McGrath listens to chief ... *Irish Times* Jun 20th ed.: A2; Mooney, A. 1986. Roches Stores Gets a New Look, *Irish Examiner*, 28th Nov ed.: 4; Ruddy, J. 2009. Dunne Deal? Not quite. *Checkout*(November): 24-26; Ruddy, J. 2010. 50 More Years. *Checkout*., 36(11): 4; Taylor, S. 1986. Quinnsnorth's Profits Rise, *Irish Times* June 3rd ed.: 14; Taylor, S. 1990. AB Foods optimistic on Quinnsnorth Growth, *Irish Times* Jun 2nd ed.: 10; Taylor, S. 1993. Quinnsnorth's Policy Remains Unchanged, *Irish Times*: Nov 25th ed.: 16; Wall, V. 1998. Top man at Londis a Retailer in a Hurry, *Irish Independent* 10th Sept ed.: 48
- ³⁴⁹ Frequently there was a significant lapse in time before full rollout occurred
- ³⁵⁰ Their 68th Store in Greystones had an area of 22,000 sq ft., and was anchoring a shopping centre costing IR£1.5million. 1984. New Quinnsnorth Superstore will Enter the Computer Age, *Irish Times* Nov 14th ed.: 17. Such supermarket financed shopping centres were becoming a new trend, and stores were also growing in size
- ³⁵¹ Taylor, S. 1986. Quinnsnorth's Profits Rise, *Irish Times* June 3rd ed.: 14
- ³⁵² 1989. Digi Systems are the Largest Most Successful Retail Equipment Company in Ireland, *Kerryman*, 11th Aug ed.: 7
- ³⁵³ 'Their 59 stores [..were] fully checkout automated with bar-code readers'. 1990. Information Technology, *Irish Times*, Jul 20th ed.: A.9; Giblin, M. 1991. *The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport*; Taylor, S. 1990. AB Foods optimistic on Quinnsnorth growth, *Irish Times* Jun 2nd ed.: 10
- ³⁵⁴ From less than 200 in 1985 to more than 350 by the end of 1986. Glacken, B. 1987. Technology Race in Grocery Trade: Marketing Forum, *Irish Times* Mar 24th ed.: 12
- ³⁵⁵ Including three Quinnsnorth and three L&N stores. Ibid
- ³⁵⁶ Almost half the price, an estimated saving of IR£5,000.
- ³⁵⁷ Glacken, B. 1987. Technology Race in Grocery Trade: Marketing Forum, *Irish Times* Mar 24th ed.: 12.
- ³⁵⁸ Kevin Barry of Hughin Sweda in Lindsay, P. 1988. Watch out: Eftpos is Coming, *Irish Times*, May 26 ed.: 17.
- ³⁵⁹ Fynes, B., & Ennis, S. 1993. The Impact of Electronic data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29

- ³⁶⁰ 1999. The Dynamics of the Retail Sector in Ireland. *Forfús*; Fynes, B., & Ennis, S. 1993. The Impact of Electronic data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29
- ³⁶¹ However if Dunnes Stores figures were excluded the figure rose to 45%. 30%. 1999. The Dynamics of the Retail Sector in Ireland. *Forfús*; Hardiman, C. 1995. Food Chief Shreds Report on Irish Industry, *Irish Independent*, Nov 9th ed.: 32.
- ³⁶² 1999. The Dynamics of the Retail Sector in Ireland. *Forfús*.
- ³⁶³ Fynes, B., & Ennis, S. 1993. The Impact of Electronic data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29
- ³⁶⁴ 1996. Technology: Information and Control In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 42-51: RGDATA
- ³⁶⁵ Dermot McCarthy MD of Retail Integration, cited in Skelly, B. 2005. Digital Ireland, *Irish Independent*, Jun 29th ed.: 5
- ³⁶⁶ 1990. Suir Thing! *Checkout*, 16(1): 17,19
- ³⁶⁷ Lindsay, P. 1991. Scanning the Pros and the Cons: In The Shops, *The Irish Times*, Mar 21st ed.: 10. Similar to when scanning was initially adopted in the US.
- ³⁶⁸ E.g. customers being charged IR£4.50 for a head of lettuce' Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34
- ³⁶⁹ The Musgraves director of technology Brian O'Mahony. Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34
- ³⁷⁰ Some Sterling on the shelves but that the tills were charging the 'correct' and higher Irish pound price. Holmquist, K. 1999. Tesco's Betrayal of the Consumer's Trust, *The Irish Times* Mar 27th ed.: C.9; Mills, K., & O'Reilly, M. 1999. My Job: A Juggler Happy to be in a Tough Business, *The Examiner*, Apr 16th ed.: 2
- ³⁷¹ . In 1968 Power Supermarkets had been the first multiple grocery shop to accept cheques from customers. Having a maximum value of up to IR£10. 1992. *Talking Shop...1942-1992*: RGDATA.
- ³⁷² Mercator. 1984. Supermarket Sweethearting Soon be a Thing of the Past: People in Business, *Irish Times* Jan 16th ed.: 12; In 1989 it was said of EFTPOS 'The technology is the easy bit', with both banks and retailers being keen to adopt it, but in disagreement in regard to who should pay for it's implementation. There were concerns there would be slow uptake by consumers. Stanley, J. 1989. Technology in Financial Battle for Customer, *Irish Times*, May 16th ed.: 18
- ³⁷³ The purchase amounts were debited from the customers current accounts. By 1996 the use of smart cards was seen as well established in the US and Europe. Trintech an Irish company produced terminals and software to process smart cards, they were the sole Irish supplier and had good success in the UK and Europe with their products. 1996. Trintech Terminals and Software, *Irish Examiner* 10th April ed.: 21
- ³⁷⁴ 2014. Changing Times *ShelfLife*, Sept 16th ed. <http://www.shelflife.ie/changing-times/>. [Accessed 13th Nov 2015]
- ³⁷⁵ 1996. Trintech Terminals and Software, *Irish Examiner* 10th April ed.: 21
- ³⁷⁶ Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34; Lindsay, P. 1988. Watch out: Eftpos is Coming, *Irish Times*, May 26 ed.: 17
- ³⁷⁷ Lindsay, P. 1988. Watch out: Eftpos is Coming, *The Irish Times*, May 26 ed.: 17
- ³⁷⁸ 1996a. Counting Your Costs. In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd ed.: 59, 61-63: RGDATA.
- ³⁷⁹ 1999. The Dynamics of the Retail Sector in Ireland, November 1999 ed. *Forfús*
- ³⁸⁰ McGrath, B. 1997. Market potential Lures Safeway: Brendan McGrath Listens to Chief ... *Irish Times* Jun 20th ed.: A2.
- ³⁸¹ In Lucan. Lyons, M. 1998. Superquinn Cuts the Queue with Self-Scanning: Retail, *Irish Times* Mar 27th ed.: A12
- ³⁸² To 'ensure customers ...[used] the technology correctly' Ibid
- ³⁸³ As goods did not have to be taken out of the basket and then repacked at checkout
- ³⁸⁴ Lyons, M. 1998. Superquinn Cuts the Queue with Self-Scanning: Retail, *Irish Times* Mar 27th ed.: A12
- ³⁸⁵ Associated Marketing Services a consortium of 10 Grocery retailers in Europe. Safeway in the UK is also a member. Dooley, C. 1997. European Counter Culture Rings in Radical Changes at Superquinn, *Irish Times*, 30th Dec ed.: 14
- ³⁸⁶ Otherwise they estimated it would have involved 4 to 5 years of R&D for Superquinn to introduce it. Some adjustments were required to be made to make the technology compatible with the Superquinn Barcode technology. Dooley, C. 1997. European Counter Culture Rings in Radical Changes at

- Superquinn, *Irish Times*, 30th Dec ed.: 14; Lyons, M. 1998. Superquinn Cuts the Queue with Self Scanning: Retail, *Irish Times*, Mar 27th ed.: A12
- ³⁸⁷ Daft, R. L., Murphy, J., & Willmott, H. 2014. *Organization Theory and Design: An International Perspective* (2nd ed.); McGrath, B. 1997. Market potential Lures Safeway: Brendan McGrath Listens to Chief ... *Irish Times*, Jun 20th ed.: A2; O'Keefe, B. 1997. Tesco to Bring in Loyalty Card Scheme Within Six Months, *Irish Times*, Jul 29th ed.: 15; Taylor, C., & O'Murchandha, N. 1997. Dunnes Steps up Fight for Customers: *Irish Times*, Jun 14th ed.: 16
- ³⁸⁸ Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34; O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ... Conference Proceedings*. ESADE, Barcelona
- ³⁸⁹ O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14; O'Keefe, B. 1997. Tesco to Bring in Loyalty Card Scheme Within Six Months, *Irish Times*, Jul 29th ed.: 15
- ³⁹⁰ O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD... Conference Proceedings*. ESADE, Barcelona
- ³⁹¹ Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34; Personal interview with **Frank Murphy**; O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ... Conference Proceedings*. ESADE, Barcelona
- ³⁹² By 2000 Superquinn had linked the scheme to 24 different partners enabling Superclub members to gain rewards from more than 250 outlets. O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ... Conference Proceedings*. ESADE Barcelona; By 2002 Tesco had developed partnership schemes where loyalty points could also be earned through spending in companies which included LifeStyle Sports, Esso, Budget Travel Shop, ESAT Clear and ESAT Digifone. O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
- ³⁹³ Superquinn to Texaco, Tesco to Esso and Dunnes to Shell. 1998. Tesco Joins Esso in Card Scheme: Bonus Points, *Irish Times*, Sep 25th ed.: B3
- ³⁹⁴ Data integration with the schemes partners had initially proved to be a technical challenge. O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ... Proceedings*. ESADE, Barcelona
- ³⁹⁵ 1999. The Dynamics of the Retail Sector in Ireland, November 1999 ed. *Forfás*; Taylor, C., & O'Murchandha, N. 1997. Dunnes Steps up Fight for Customers: *Irish Times*, Jun 14th ed.: 16
- ³⁹⁶ Superquinn along with Ukrop had become involved in an international Loyalty group that met to discuss developments and Ideas for Loyalty schemes. Fergal Quinn had pondered upon the air miles he was receiving by flying with British air ways, and had sought a solution for use in retail grocery. Leveraging Ukrop's (a US supermarket) experience in developing their 'Valued Customer System'. Collated from: Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press; Ruddy, J. 2010. 50 More Years. *Checkout* 36(11): 12-15; Schaeffer, L., P. 1995. Where the Customer is King, *Progressive Grocer*, Vol. 74: 2. p.73; Taylor, C., & O'Murchandha, N. 1997. Dunnes Steps up Fight for Customers: *Irish Times*, Jun 14th ed.: 16
- ³⁹⁷ Pre approval of the scheme was sought from the Director of Consumer Affairs in Ireland. Personal interview with **Frank Murphy**
- ³⁹⁸ Superclub points were initially redeemable against selected special goods like holidays, and some in the industry labeled it the return of Green Shields Stamps. Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34
- ³⁹⁹ Personal interview with **Frank Murphy**
- ⁴⁰⁰ Using double points for a year in the scheme as an enticement
- ⁴⁰¹ They found that other supermarkets had similar data.
- ⁴⁰² They used digital mapping data, with the help of a technology company
- ⁴⁰³ Their collection of data meant they could measure how effective initiatives were
- ⁴⁰⁴ Problems such as the display of out of date food. The Goof scheme - turned customers 'into quality control inspectors, and customers appreciated it and we'd great fun with it. ... It was part of their budget, we solved the wobbly trolleys and basically it worked very very well, ...what we were doing was turning a problem into an opportunity, we had fun with customers'. Personal interview with **Frank Murphy**.
- ⁴⁰⁵ Ibid
- ⁴⁰⁶ Superquinn reallocated funding from marketing into the scheme and 'achieved an almost 10% increase in sales which is phenomenal in supermarket terms' Personal interview **Frank Murphy**

⁴⁰⁷ It helped shift the company mindset from selling products to serving customers. 'we were doing the same we were selling products we weren't serving customers, and you had to completely change mindset, if you're selling products you're motivated by maximizing the product margin in each case, if you're serving customers the products will look after themselves,.... it took a really a long time, this concept of looking after customers better of treating some customers differently from others didn't come easy'. Personal interview with **Frank Murphy**

⁴⁰⁸ Such as Tesco and Sainsbury's and others. Quinn, F. 2016. **Quinntessential Feargal: A Memoir**. Dublin: The O'Brien Press.

⁴⁰⁹ By 1997 they had 9million Clubcard members in the UK with all their shopping habits captured via the EPOS. 2007. Getting an Edge: Standing Out From Your Competitors is Harder Than Ever, but Analytics May be the Way to Steal in Front, **Irish Times**, Oct 8th ed.: B20-21; Leonard, N. 1997. Change of Pitch Brings New Sales Fortune to Tesco, **Sunday Independent**, Mar 23rd ed.: 30

⁴¹⁰ Taylor, C., & O'Murchandha, N. 1997. Dunnes Steps up Fight for Customers: **Irish Times**, Jun 14th ed.: 16

⁴¹¹ McGrath, B. 1997. Market potential Lures Safeway: Brendan McGrath Listens to Chief ... **Irish Times** Jun 20th ed.: A2

⁴¹² By 2002 Dunnes claimed to have 900,000 customers who used the card regularly. O'Callaghan, E. and M. Wilcox, 2002. Multiple and Symbol Operators: the Battle for Market Leadership in the Irish Grocery Market. Case Study. **Irish Marketing Review**. Vol,14

⁴¹³ 1999. The Dynamics of the Retail Sector in Ireland, November 1999 ed. **Forfás**

⁴¹⁴ O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, **EAERCD ...Conference Proceedings**. ESADE, Barcelona

⁴¹⁵ 1999. The Dynamics of the Retail Sector in Ireland, November 1999 ed. **Forfás**

⁴¹⁶ Oram, H. 1990. The Quick Way to get the Message, **Irish Times** Feb 21st ed.: 22

⁴¹⁷ Not all Technology flourishes, when Minitel launched in Ireland in 1992 within three months there were 2000 terminals in use and 120 businesses online, and there was an expectation that one of the Irish multiples would join the service imminently. 1992. A Trinity of Electronic Services, **Irish Times** Jan 24th ed.: 23; Minitel was superseded by the internet and the World Wide Web. In the early 1990's Minitel provided a potential channel for consumers to order grocery shopping. Kelly, F. 1993. Smart Stores, **Irish Independent**, Sept 8 ed.: 34; but this never took off, unlike France, where it's success delayed the take-off in online

⁴¹⁸ 1992. A Trinity of Electronic Services, **Irish Times** Jan 24th ed.: 23

⁴¹⁹ Fynes, B., & Ennis, S. 1993. The Impact of Electronic data Interchange (EDI) on Competitiveness in Retail Supply Chains. **IBAR**, 14(2): 16-29

⁴²⁰ Fynes, B., & Ennis, S. 1993. The Impact of Electronic Data Interchange (EDI) on Competitiveness in Retail Supply Chains. **IBAR**, 14(2): 16-29; Igoe, L. 1995. **Food Retailing in the Republic of Ireland, Research**: Goodbody

⁴²¹ Igoe, L. 1995. **Food Retailing in the Republic of Ireland, Research**: Goodbody Stockbrokers.

⁴²² Fynes, B., & Ennis, S. 1993. The Impact of Electronic data Interchange (EDI) on Competitiveness in Retail Supply Chains. **IBAR**, 14(2): 16-29

⁴²³ EDI was offered in accordance with the UK standard and the international standard EDIFACT. IBM offered EDI to their customers and GEIS (General Electric Information Services) facilitated EDI between Irish companies to international locations but not within Ireland. Giblin, M. 1991. **The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport**

⁴²⁴ Ibid

⁴²⁵ Major suppliers who were early adopters included Lyon's tea, Barry's Tea, Batchelors, Kerry foods and Kerry Gold. Foley, C. 1992. Taking away the Drudgery, **Irish Times**, Nov 3rd ed.: A.8

⁴²⁶ Giblin, M. 1991. **The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport**

⁴²⁷ Oram, H. 1992. Panning Out an Electronic Structure for Europe, **Irish Times** Nov 3rd ed.: A.8

⁴²⁸ Ibid

⁴²⁹ In 1992 EDI software was estimated to cost around Ir£6,000. Foley, C. 1992. Taking Away the Drudgery, **Irish Times**, Nov 3rd ed.: A.8

⁴³⁰ Paper documentation was sent in parallel to EDI during the trial

⁴³¹ This differed from the UK experience. Giblin, M. 1991. **The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport**

⁴³² Ibid

⁴³³ Ibid

⁴³⁴ Personal interview with **Declan Carolan**

- ⁴³⁵ 1992. A Trinity of Electronic Services, *Irish Times* Jan 24th ed.: 23. Dunnes were also reported as using EDI via the PostGEM network. 1992. Spreading the Gospel of EDI, *Irish Times*, Nov 24th ed.: 27
- ⁴³⁶ 1989. Injunction Against Dunnes Stores, *Irish Examiner*, 19th Dec ed.: 7
- ⁴³⁷ 1992. Spreading the Gospel of EDI, *Irish Times*, Nov 24th ed.: 27
- ⁴³⁸ Conversation with Jim Quinn who worked for suppliers to Dunnes Stores
- ⁴³⁹ 2012. The Barry Group Case Study: 3.
http://www.celtrino.com/about_celtrino/media_centre/case_studies/celtrino-express-barry-group-case-study.pdf: *Celtrino* [Accessed 9th Jun 2016]
- ⁴⁴⁰ In the UK the multiple retailers had been ‘prime movers in compelling their suppliers to use EDI’ and it increased their power in the retailer/supplier relationship. ‘such as Sainsburys, Marks and Spencer, ASDA and Tesco. Fynes, B., & Ennis, S. 1993. The Impact of Electronic Data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29. The UK Retailers such as Tesco were also putting Irish suppliers under pressure to adopt EDI. Foley, C. 1992. Taking Away the Drudgery, *Irish times*, Nov 3rd ed.: A.8; Fynes, B., & Ennis, S. 1993. The Impact of Electronic Data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29
- ⁴⁴¹ A requirement for automated stock reordering. Fynes, B., & Ennis, S. 1993. The Impact of Electronic data Interchange (EDI) on Competitiveness in Retail Supply Chains. *IBAR*, 14(2): 16-29
- ⁴⁴² 1993. *How To Manage Your Shop* (1st edition ed.): RGDATA.
- ⁴⁴³ 1996. Managing Time. In M. Campbell (Ed.), *How to Manage Your Shop*: 24,25,27,29: RGDATA.
- ⁴⁴⁴ Personal interview with *Frank Murphy*
- ⁴⁴⁵ Frank Muphy commenting in relation to his proposal to create the Superclub loyalty scheme in Superquinn. Personal Interview with *Frank Murphy*. This attitude was also reflected in a personal interview with *Declan Carolan* where he recounted trialing measuring returns from positioning stock on different shelves and also different approaches to receiving deliveries in store etc.
- ⁴⁴⁶ Managers were encouraged to try out initiatives in their stores. They were exposed to global ideas because Superquinn subscribed to all the international grocery magazines
- ⁴⁴⁷ “As much of the action as possible is local, with the discreet safety-net operating at the center...” Fitzgerald, K. 1996. *Dunnes at the Crossroads*; Schaeffer, L., P. 1995. Where the Customer is King, *Progressive Grocer*, Vol. 74: 2 p.73
- ⁴⁴⁸ O'Hanlon, E. 1993. Retailing the Good News to the Customers, *Irish Times*, Jun 22nd ed.: A.4
- ⁴⁴⁹ O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ...Conference Proceedings*. ESADE, Barcelona;
- O'Hanlon, E. 1993. Retailing the Good News to the Customers, *Irish Times*, Jun 22nd ed.: A.4
- ⁴⁵⁰ Giblin, M. 1991. *The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport*.
- ⁴⁵¹ Ibid
- ⁴⁵² Offered to customers who were ill or incapacitated, and were considering its potential for wider rollout. Shopping by fax had become popular in the US where people faxed in their order to stores and the stores had the products bagged and ready for the customers to collect later that day. Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34
- ⁴⁵³ Kelly, F. 1993. Smart Stores, *Irish Independent*, Sept 8 ed.: 34
- ⁴⁵⁴ 1992. *Talking Shop... 1942-1992*: RGDATA
- ⁴⁵⁵ Ibid
- ⁴⁵⁶ Wall, V. 1998. Top man at Londis a Retailer in a Hurry, *Irish Independent* 10th Sept ed.: 48
- ⁴⁵⁷ An example of industrial action within the decade that reputedly cost the company IR£50 million in lost sales was Dunnes decision in 1994 to open a number of their stores on Sundays, without any prior negotiation with unions or staff and without offering staff any additional incentives. Predictably the move resulted in strike action. Dunnes were imitating M&S who had begun opening their flagship store in Dublin on Sundays. Fitzgerald, K. 1996. *Dunnes at the Crossroads*
- ⁴⁵⁸ ‘Quinnsworth/Crazy prices, Superquinn and some of the Super Valu/Centra had been moving to invest in new technology, an area where Dunnes had begun to lag’. Fitzgerald, K. 1996. *Dunnes at the Crossroads*; Igoe, L. 1995. *Food Retailing in the Republic of Ireland, Research*: Goodbody Stockbrokers
- ⁴⁵⁹ 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26; Fitzgerald, K. 1996. *Dunnes at the Crossroads*
- ⁴⁶⁰ Staff wages increased based on years of service so the high turnover provide a way of keeping labour costs down (e.g. a Dublin cashier would earn an hourly rate of £3.77 in their first year versus £5.96 after 6 years service). Dunnes Stores also ‘has based its strategy on casualisation with a high

proportion of very young workers hired in flexi-hour contracts being expected to work unsocial hours'. Fitzgerald, K. 1996. *Dunnes at the Crossroads* p.5

⁴⁶¹ In 1995 40% of their revenue was grocery. Igoe, L. 1995. *Food Retailing in the Republic of Ireland, Research*: Goodbody Stockbrokers.

⁴⁶² Sources: Fitzgerald, K. 1996. *Dunnes at the Crossroads* 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26.

⁴⁶³ Despite Dunnes lack of investment in EPOS they had managed for a while to obtain alleged 'unfair' advantages over their competitors through ICT in a novel way for a short time. In a 1989 court case it emerged that Dunnes were delaying payment to suppliers for up to an additional 36 days beyond the invoiced payment period, Dunnes blamed the late payments on invoices being received being incompatible with their accounting system 1989. Injunction Against Dunnes Stores, *Irish Examiner*, 19th Dec ed.: 7; 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26.

⁴⁶⁴ [paraphrased] A review by Anderson consulting in 1995 had recommended investing in an 'information technology system' that would cost an estimated £25million to implement. 1996. Action Men, *The Irish Times* Aug 30th ed.: A18; 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26; 1996. Technology Update may Follow Dunnes Appointment, *Irish Times* Jul 17th ed.: 15

⁴⁶⁵ 1996. Action Men, *Irish Times*, Aug 30th ed.: A18

⁴⁶⁶ 1996. Technology Update may Follow Dunnes Appointment, *Irish Times* Jul 17th ed.: 15

⁴⁶⁷ 1996. Action Men, *Irish Times* Aug 30th ed.: A18; 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26; 1996. Technology Update may Follow Dunnes Appointment, *Irish Times* Jul 17th ed.: 15

⁴⁶⁸ 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26

⁴⁶⁹ 1996. Action Men, *Irish Times* Aug 30th ed.: A18

⁴⁷⁰ 1996. Action Men, *Irish Times* Aug 30th ed.: A18; 1996. Technology Update may Follow Dunnes Appointment, *Irish Times* Jul 17th ed.: 15

⁴⁷¹ Boots was recognised for their forward and effective use of technology

⁴⁷² The family owned company was led by Ms. Margerate Heffernan and Mr. Frank Dunne who had a reputation for brooking no interference with how they ran the company. The appointment of 2 non family directors Andrew Street (IT) and Dick Reeves who had been poached from Quinnsworth and appointed as Food director, was a departure from historic form.

⁴⁷³ 1996. Action Men, *Irish Times* Aug 30th ed.: A18

⁴⁷⁴ Ibid

⁴⁷⁵ Dunnes touted that they would be using 'leading edge technologies' to build 'Ireland's most advanced retailing IT infrastructure'. 1997. We See New Horizons: Dunnes Stores, *Sunday Independent*, 19th Jan ed.: 22

⁴⁷⁶ Ibid

⁴⁷⁷ The food retailing subsidiary of Associated British Foods

⁴⁷⁸ Giblin, M. 1991. *The Impact of Electronic Data Interchange - EDI on Irish Foreign Trade and Transport*

⁴⁷⁹ 1990. Information Technology, *Irish Times*, Jul 20th ed.: A.9

⁴⁸⁰ Investing IR£3 million. This facilitated swifter scanning, scanning of their full product range, more detailed receipts, and linked the data from the more than 75 stores portfolio to Quinnsworth's central office. 1993: Digital Wins £3million Contract, *Irish Times*, 18th May ed.: 15; Taylor, S. 1993.

Quinnsworth's Policy Remains Unchanged, *Irish Times*, Nov 25th ed.: 16

⁴⁸¹ Expectation IR50million investment. Igoe, L. 1995. *Food Retailing in the Republic of Ireland, Research*: Goodbody Stockbrokers

⁴⁸² 1990. Management Services Controller, *Irish Times*, Aug 31st ed.: A.7

⁴⁸³ Decision making was centralized at Tesco (Personal interview with John Prendergast) at a time when there was a call in the Irish industry to give store managers more autonomy, Wal-Mart was cited as an exemplar which allowed their store managers to make purchasing decisions and rewarded them for resulting positive sales impacts figures. Technology had enabled centralization of decisions, but the checkout article argued that this did not make autonomy old fashioned. 1997. Service - the Key Element for 2000. *Checkout Yearbook & Buyer's Guide*: 2

⁴⁸⁴ Igoe, L. 1995. *Food Retailing in the Republic of Ireland, Research*: Goodbody Stockbrokers p.2

⁴⁸⁵ Examples include: Quinnsworth in 1982 where a pay increase was negotiated 'in return for a five year commitment to new technology'. McEldowney, E. 1981. Quinnsworth Group Faces Strike Threat, *Irish Times*, Dec 9th ed.: 5; McEldowney, E. 1982. Quinnsworth Strike, *The Irish Times*, Jan 15th ed.: 11; and in 1996 in Dunnes Stores the Mandate union offered compliance with the introduction of scanning in return for a 3% pay increase⁴⁸⁵. The 3% pay increase had already been implemented by

other chains it was part of a national wage agreement with a performance related stipulations. 1996. Dunnes Strike Gameplan, *Irish Independent* Sept 5th ed.: 26

⁴⁸⁶ Mangan, T. 1983. The Role of the Modern Symbol Group Wholesaler. *Checkout: Yearbook & Buyers Guide 1983*: 28, 29, 31 p. 31

⁴⁸⁷ Mangan, T. 1983. The Role of the Modern Symbol Group Wholesaler. *Checkout: Yearbook & Buyers Guide 1983*: 28, 29, 31; Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*.

⁴⁸⁸ In 1984 Musgraves' also invested in an Irish software company Intelligence Ireland Ltd, appropriating almost a 1/3 share of it. Hardman, C. 1984. Musgraves Takes 25.9pc Stake in Computer Firm, *Irish Independent*, Jul 5th ed.: 4.

⁴⁸⁹ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁴⁹⁰ For 500-600 lines of stock 1990 an independent in Galway that had converted to a Centra. They were also less likely to forget to order an item. 1990. "Siopa an Phobail" Sceal Eile ar Fad! *Checkout*, 16(7): 10,11,13

⁴⁹¹ 1992. Company Announcement: Musgrave Information Technology Director, *The Irish Times*, 1st May ed.: 17

⁴⁹² After trialing EPOS in 2 of their symbol group stores The stores were in Cork (Togher and Ballincollig). They had established a head office team to implement EPOS across the SuperValu stores in 1990. 1990. SuperValu: Scanning Installation Team, *Sunday Independent* Dec 23rd ed.: 21. Interestingly also in 1990, Musgraves director of cash and carry operation Harry McAfee, believed that scanning technology was not sufficiently developed to be utilized in their cash and carry operations saying 'The kind of computerisation we're seeing in cash and carry today is not good enough. It slows up the checkout operation, ties up staff and upset customers'. 1990. A Big Man ...With a Big Vision. *Checkout*, 16(4): 8-9 p.9. Potentially this might have communicated mixed messages to Musgrave's clients.

⁴⁹³ 1992. Company Announcement: Musgrave Information Technology Director, *Irish Times*, 1st May ed.: 17

⁴⁹⁴ They were looking for EDI – analyst/programmer. 1995. Musgrave Ltd.- Analyst/Programmer EDI, *Irish Times*, Jun 23rd ed.: A8

⁴⁹⁵ BWG were a subsidiary of Irish Distillers in 1988

⁴⁹⁶ 1988. Sabre Win Computer Contract *Irish Examiner*, Jan 12th ed.: 6

⁴⁹⁷ Quinn, J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*

⁴⁹⁸ Siemens Nixdorf POS 2000/10 was selected for their stores, the POS linked with a computer which enabled up to date information on sales, easy price changes including the automatic printing of a shelf edge label. 1992. Ireland: Always Right the Customer and the Service, *Irish Times*, 21st Oct ed.: 7

⁴⁹⁹ 1997. £2m Plan to Grow Value Centre, *Irish Times*, Apr 2nd ed.: 16

⁵⁰⁰ Willie O'Byrne the director of BWG's Value Centre's cash & carries cited in - 1997. £2m Plan to Grow Value Centre, *Irish Times*, Apr 2nd ed.: 16

⁵⁰¹ 1993. The Essence of Business! *How To Manage Your Shop*: 13,15,17

⁵⁰² RGDATA warned retailers that '[w]ithout the sales breakdown, you will not know where your profit is coming from or even being lost...' 1993. The Essence of Business! *How To Manage Your Shop*: 13,15,17 p.15

⁵⁰³ 1993. Sweet Route to Sales. *How To Manage Your Shop*: 73,75,77

⁵⁰⁴ 1995. Wellworth plans £30m Store Revamp and Expansion, *Irish Independent*, 25th May ed.: 29

⁵⁰⁵ '[W]hen used efficiently, [computing] will increase your knowledge of your business in terms of sales, purchases, stock and your customers' 1996. Technology: Information and Control In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 42-51: RGDATA

⁵⁰⁶ The representative body for independent retailers in Ireland

⁵⁰⁷ 1996. Should I Join a Group? In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 6-8:p.7

⁵⁰⁸ RGDATA advising retailers to consider if the cost (installation (£20k-30k) and maintenance fee) is justifiable and recoverable (through savings, and increased margins) for their store

⁵⁰⁹ 1996. Technology: Information and Control In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 42-51: RGDATA

⁵¹⁰ 1996. Should I Join a Group? In M. Campbell (Ed.), *How to Manage Your Shop*, 3rd Edition ed.: 6-8

⁵¹¹ IR£259,000 for a 25% stake in (venture Capital). Ahistrom, D. 1986. Intelligence Takeover Highlights Failings of Software Industry: Computer World, *Irish Times*, August 15th ed.: 14; Cahill, D. 1985. Computer Company Wins BT Contract, *Irish Times*, Aug 17th ed.: 20.

- ⁵¹² VAN Trials were occurring in the UK. Cahill, D. 1985. Computer Company Wins BT contract, *Irish Times*, Aug 17th ed.: 20
- ⁵¹³ The company was called 'Intelligence Ireland'. Technologically the company was successful. The company had won several contracts in the UK. Cahill, D. 1985. Computer Company Wins BT Contract, *Irish Times*, Aug 17th ed.: 20. However, cash-flow problems resulted in the company being acquired in 1986. Ahistrom, D. 1986. Intelligence Takeover Highlights Failings of Software Industry: Computer World, *Irish Times*, August 15th ed.: 14
- ⁵¹⁴ Suitable for Punch&co retail clients. MTL made agreements with TEC (Japanese POS terminal manufacturers) and Digital (who manufactured computers and equipment for accounts etc.) to enable the supply of complete solutions for retail grocers. Kelly, V. 1989. Local Firm's Rapid Growth, *Cork Examiner*, Jan 11th ed.: 6
- ⁵¹⁵ Instigated by Michael Hughes a grocery and hardware retailer in Galway, who had been disappointed with the computer based EPOS he had invested in, during the 1980's. It was developed in a 'live' retail environment over a period of 4 years
- ⁵¹⁶ The integration encompassed stock ordering, the purchase order process control goods inwards' through to sales and to the production of accounts and key management reports, such as customer buying patterns, product statistics, peak and low shopping periods and stock levels, VAT calculation, gross margin and sales reports. 1994. Galway Firms Computer Package to Make Life Easier for Shopkeepers, *Connacht Sentinel*, 3rd May ed.: 11; 1994. Unique New Galway System That Makes Life Easier for Shopkeepers Goes on Show, *City Tribune*, Oct 21st ed.: 7
- ⁵¹⁷ Using 'Checkline' EFT software which was approved by Bank of Ireland and major UK players. 1994. Galway Firms Computer Package to Make Life Easier for Shopkeepers, *Connacht Sentinel*, 3rd May ed.: 11
- ⁵¹⁸ The only other loyalty scheme in Europe was run by British Airlines and this was paper based. A paper-based scheme was unfeasible for Superquinn it would be too costly to run as it would be very labour intensive. Personal interview with *Frank Murphy*
- ⁵¹⁹ 1994. Irish Winners, *Irish Times*, Dec 5th ed.: 17; Personal interview with *Frank Murphy*
- ⁵²⁰ It had an estimated 11.2% share of the retail grocery market. 1991. Report of the Review of the Restrictive Practices (Groceries) Order 1987. In P. M. L. (Chairman) (Ed.). Dublin: *Fair Trade Commission*.
- ⁵²¹ Across Europe the adoption of scanning or EPOS continued to spread but even by the end of the 1990's it was by no means ubiquitous. 1999. The Dynamics of the Retail Sector in Ireland. *Forfás*.
- ⁵²² Ibid
- ⁵²³ Forfás also urged suppliers to augment their ICT capabilities for supply chain and logistics management and urged to develop EDI capabilities to improve the efficiency of the supply chain and to explore the potential of Internet/Extranet systems. 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*
- ⁵²⁴ 1997. The Year of the Scan *Checkout Yearbook & Buyer's Guide*: 3.
- ⁵²⁵ 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*
- ⁵²⁶ Fitzgerald, K. 1996. *Dunnes at the Crossroads* p.17
- ⁵²⁷ 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*. p.1. Forfás were Ireland's National Policy and Advisory Board for Enterprise, Trade, Science, Technology and Innovation
- ⁵²⁸ 2007. The Discounter Impact. *Checkout*, 33(12): 40-43 p.42 - Noel Darcy of Spar in Greenpark Co.Limerick
- ⁵²⁹ Hygiene ranked highest for most shoppers. 2000. Face to Face. *Checkout Yearbook & Buyers Guide*: 6-8
- ⁵³⁰ O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14.
- ⁵³¹ News stories compared grocery prices in Ireland unfavourably with European averages and prices in Northern Ireland.
- ⁵³² E.g. data leaked in 2009 revealed that Tesco were achieving a profit margin of 9.3% in Ireland whilst their operation in the UK earned 6%. Cullen, P. 2009. Tesco Makes Much Higher Profit Margin in Ireland, Plan Shows, *Irish Times*, May 11th ed.; Cullen, P. 2009. Tesco to Shed 140 HQ jobs after shift to UK products, *Irish Times*, 14th May ed.
- ⁵³³ Even the consumer authority gave up on trying to compare prices of goods across the retailers. Whilst in the UK the existence of mysupermarket.co.uk website allows consumers to compare real-time prices from supermarkets, no similar site exists in Ireland. Ireland is by no means the only country to lack transparent price comparisons for grocery, in Australia Christopher Zinn representing 'Choice' commented 'It seems a lot of their commercial advantage happens with small changes of small

- amounts over a lot of prices...lack of transparency can be profitable'. Pope, C. 2010. Lack of price information costing consumers a packet, *Irish Times*, Mar 22nd ed.: 21
- ⁵³⁴ Response of Sir Terry Leahy CEO of Tesco plc. when questioned about the anticipated impact of the economic downturn on Tesco activity in Ireland in Beesley, A. 2008. Talking shop, *Irish Times*, Jan 18th ed.: A4
- ⁵³⁵ Personal interview with **Richard McKeown**
- ⁵³⁶ Hancock, C. 2011. Driver of Hard Bargains, *Irish Times*, 8th July ed.: A4
- ⁵³⁷ Sales volume growth exceeded sales value growth (2008-2014)
- ⁵³⁸ Power, J. 2016. Local Heros II. *RGDATA*
- ⁵³⁹ Pope, C. 2013. Emerald Aisles, *The Irish Times* Aug 10th ed.: B.1
- ⁵⁴⁰ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
- ⁵⁴¹ Aldi and Lidl own brands were not recognizable as the own brands Irish consumers had been used to, packaging was deliberately similar to well recognized manufacturer's brands.
- ⁵⁴² Pope, C. 2010. Lack of price information costing consumers a packet, *Irish Times*, Mar 22nd ed.: 21; Pope, C. 2013. Emerald Aisles, *Irish Times* Aug 10th ed.: B.1; Pope, C. 2015. Store Wars: The Big Three V The Little Two: Supermarkets Changed Dramatically in the Recession, but so did Consumers and their Shopping Habits, *Irish Times*, Nov 21st ed.: 5
- ⁵⁴³ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan..
- ⁵⁴⁴ Clifford, M. 1997. Consumers' Pose Challenge, *Irish Independent*, Dec 2nd ed.: 17. It didn't improve retailer/supplier relationships 'R&D on a supplier's part means investment, R&D for a retailer means rip-off and delisting. a senior executive from a multinational supplier cited in Ruddy, J. 2009. David Vs Goliath? *Checkout*, 35(2): 4
- ⁵⁴⁵ Counselling by retailers following the introduction of digital technologies such as 'chip n pin' and the swift uptake of self-scanning by consumers. Personal interview with **Tara Buckley**
- ⁵⁴⁶ Mobile phone ownership in Ireland is almost ubiquitous. Kennedy, J. 2015. Tech Nation: 70pc of Irish Population Now Owns a Smartphone, *Siliconrepublic*, Nov 10th ed.
<https://http://www.siliconrepublic.com/comms/tech-nation-irish-population-smartphone> [Accessed 16th Nov 2016]
- ⁵⁴⁷ David McNamara, client retail manager of IBM cited in Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7.
- ⁵⁴⁸ Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7.
- ⁵⁴⁹ Ibid
- ⁵⁵⁰ Personal interview with **Tara Buckley**
- ⁵⁵¹ Est. Market Shares 1998: 1999. The Dynamics of the Retail Sector in Ireland. *Forfás* Source: KPMG/Attwood 1998. p.43
Est Shares 2016: source **Kantar** world (<http://www.kantarworldpanel.com/ie/grocery-market/share/ireland/snapshot/03.01.16/>) [Accessed 20th July 2016]
- ⁵⁵² Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan
- ⁵⁵³ Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press.
- ⁵⁵⁴ Pope, C. 2014. Supermarket Shifts: 10 Big Changes in 20 Years: From the Rise of ... *Irish Times* Apr 28th ed.: 12; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan
- ⁵⁵⁵ At the time the company was worth more as a property portfolio than as a business. Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press.
- ⁵⁵⁶ Collated from: 2007. *Tesco Ireland: Celebrating 10 Years*.
<http://www.tesco.ie/press/10YEARANNIVERSARYTS19102007.PDF>. [Accessed 12th May 2016]; 2015. April 2008: BWG Acquires Mangans Wholesale Business. *Checkout*, 41(2); 2015. June 2002: Esso 'On The Run' To Convenience. *Checkout*, 41(2): 1; 2017. The History of Tesco Ireland, *OurTesco*, Vol. 2017. https://http://www.ourtesco.ie/our-business/child_page-2/. [Accessed 17th May 2017]; Burke-Kennedy, E. 2015. Competition body approves_BWG's [euro]23m purchase of Londis,

- Irish Times*, 16 June 2015 ed.: 1; Carolan, F. 2012. The Real Dealz, *ShelfLife*, Apr 12th ed; McCaughren, S. 2004. ADM Londis moves from co-op to be unlisted plc, *The Independent*, 4th Oct ed; McGrath, B. 1998. Roches Stores links up with Musgrave's SuperValu chain, *The Irish Times*, Thu, Sept 17th ed; Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press; Quinn, J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*; Ruddy, J. 2010. 50 More Years. *Checkout*, 36(11): 4; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D.O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan
- ⁵⁵⁷ For example Londis lost 40 retail members after reviewing credit risk, but were left with a strong core group, 'it was a difficult process, but we have taken the right decisions'. Londis CEO Stephen O'Riordan, 2010. Boom-time Convenience Sales May Never Return -Londis: But CEO Still Plans for Store Growth in 2010. *Checkout*, 36(3): 1
- ⁵⁵⁸ Serious problems with computer systems when the second phase of central distribution launched meant that stores were unable to order stock and were left with empty shelves. This is considered to have done lasting damage to Superquinn's market share. Personal interview with *Declan Carolan*. Superquinn was a tricky size, CD did not operate to the firm's advantage, it needed to expand to leverage economies of scale. Possibly Superquinn's investment in central distribution (CD) was never really justified given the limited number of stores it operated. The SRH group pursued expansion.
- ⁵⁵⁹ O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan
- ⁵⁶⁰ O'Riordan, D. 2012. Heritage Retail Brands in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: Gill & Macmillan; Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press.
- ⁵⁶¹ Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press.
- ⁵⁶² McCaughren, S. 2004. ADM Londis moves from co-op to be unlisted plc, *The Independent*, 4th Oct ed
- ⁵⁶³ Carolan, F. 2012. Catching Up With Londis, *ShelfLife*, Mar 12th ed
- ⁵⁶⁴ Burke-Kennedy, E. 2015. Competition Body Approves BWG's [euro]23m Purchase of Londis, *Irish Times*, Jun 16th ed.: 3.
- ⁵⁶⁵ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁵⁶⁶ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.
- ⁵⁶⁷ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁵⁶⁸ Collated from: 1969. Census of Distribution and services 1966, Preliminary Results. Published by the Stationery Office: *Central Statistics Office Dublin*; 2005. Interim Report on the Impact of..., *Joint Committee on Enterprise and Small Business*; Igoe, L. 1995. Food Retailing in the Republic of Ireland, *Research: Goodbody Stockbrokers*; Power, J. 2016. Local Heros II. *RGDATA*.
- ⁵⁶⁹ 2007. The Discounter Impact. *Checkout*, 33(12): 40-43
- ⁵⁷⁰ They had been opening stores at a rapid rate e.g. 25 and 26 new stores respectively within a year. Other players in the market were also expanding and there was competition for suitable sites. RGDATA launched planning objections against the establishment of new Aldi and Lidl stores, striving to impede their expansion. 2007. The Discounter Impact. *Checkout*, 33(12): 40-43
- ⁵⁷¹ They have made special adaptations to the Irish market. They provide baskets and trolleys. They monitor and add the must have brands that the majority of Irish consumers will go to other retailers for. E.g. Barry's Tea, Tayto crisps, and they now stock a limited number of newspapers
- ⁵⁷² Harrington, G. 2016. From Coupons to Convenience Foods: 10 Trends Every Irish Retailer Needs to Know to Make an Impact in a Competitive Industry, *Independent.ie*, 28th Feb ed.
- ⁵⁷³ Kantar <http://www.kantarworldpanel.com/grocery-market-share/ireland>; 2007. The Discounter Impact. *Checkout*, 33(12): 40-43; Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*.
- ⁵⁷⁴ 2015. Payzone Deepens value Proposition for Local retailers, *RGDATA Annual 2015/16*. https://issuu.com/sheilamoran/docs/rgdata_annual_2015-16 [Accessed 7th Sep 2016]
- ⁵⁷⁵ Tesco were particularly active in this regard, over the period they moved into financial services: insurance. 2007. *Tesco Ireland: Celebrating 10 Years*. <http://www.tesco.ie/press/10YEARANNIVERSARYTS19102007.PDF> [Accessed 12th May 2016]
- ⁵⁷⁶ SuperValu have begun to sell insurance products which are underwritten by AIG, beginning with Travel insurance in 2014

- ⁵⁷⁷ In 1999 Superquinn had launched instore banking in association with PTSB. Tyson, B. 2001. Shoppers Coming Down on Tiny Tusa, *Independent.ie*, Nov 2nd ed. They did not gain sufficient customers and it was wound down
- ⁵⁷⁸ First under Esat digifone. 2000. Esat and Tesco join forces, *Irish Times* Feb 4th ed.: B2; and then under Tesco mobile from 2007 using the O2 network O2 which has now merged with 3 Ireland, was previously Esat digifone. 2007. *Tesco Ireland: Celebrating 10 Years*
- ⁵⁷⁹ Ibid
- ⁵⁸⁰ Competition Authority. 2008. A Description of ... *Grocery Monitor: Report No. 1*
- ⁵⁸¹ ECR Ireland - *Efficient Consumer Response*, Vol. 2016
<https://http://www.ecrireland.ie/about> [Accessed 23rd Apr 2016]
- ⁵⁸² It is a not for profit organization. Ibid
- ⁵⁸³ In 1998 it was estimated that application of ECR via EDI across Europe by Royal Ahold of Holland was reducing costs by 7%. 1998 High Tech Link Enables Retailers to Respond to Consumer Needs, *Irish Examiner*, Apr 22nd ed.: 22; Keane, C. 1998 TV Shopping a Threat to Retailers, *Irish Examiner*, Jun 1st ed.: 36
- ⁵⁸⁴ 1998 Home Shopping Threat to Retail Outlets, *Irish Times*, May 29th ed.: 61
- ⁵⁸⁵ ECR Ireland - *Efficient Consumer Response*, Vol. 2016; 1998. Business Executive ECR Ireland, *Irish Independent*, Nov 19th ed.: 36; 1998 High Tech Link Enables Retailers to Respond to Consumer Needs, *Irish Examiner*, Apr 22nd ed.: 22; Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38
- ⁵⁸⁶ Clifford, M. 1997. Consumers' Pose Challenge, *Irish Independent*, Dec 2nd ed.: 17
- ⁵⁸⁷ Personal interview with *Declan Carolan*
- ⁵⁸⁸ 1998 Home Shopping Threat to Retail Outlets, *Irish Times*, May 29th ed.: 61; Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain ... Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38
- ⁵⁸⁹ Personal interview with *Declan Carolan*
- ⁵⁹⁰ Due to its enablement to link suppliers, distributors and retailers. 1998 Home Shopping Threat to Retail Outlets, *Irish Times*, May 29th ed.: 61; Keane, C. 1998 TV Shopping a Threat to Retailers, *Irish Examiner*, Jun 1st ed.: 36
- ⁵⁹¹ Collins, J. 2005. Retailers Expect Real Benefits from technology, *Irish Independent*, Jun 29th ed.: 5
- ⁵⁹² 2016. *The Retail Industry, EDI Basics: Tour Resource for Learning about EDI*, Vol. 2016.
<http://www.edibasics.com/edi-by-industry/the-retail-industry/> [Accessed 21st Jun 2016]
- ⁵⁹³ 2015. The Supply Chain Summit for the FMCG grocery sector, *3rd ECR Ireland Supply Chain Summit: Driving Growth*. https://http://www.ecrireland.ie/supply_chain_summit_2015: ECR Ireland: Efficient consumer Response [Accessed 27th Jun 2017]
- ⁵⁹⁴ Lynch, D.F., Keller S. B. and Ozment, J. 2000, The Effects of Logistics capabilities and Strategy on Firm Performance. *Journal of Business Logistics*, 21(2): 47-68. P.53
- ⁵⁹⁵ Cooper, J., Browne M. and Peters M. 1994, *European Logistics Markets, Management and Strategy* (2nd edn), Blackwell Business, Oxford; Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁵⁹⁶ Dawson, J. 2000, Retailing at Century End, *International Review of Retail Distribution and Consumer Research*, 10(2); Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁵⁹⁷ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁵⁹⁸ Ibid
- ⁵⁹⁹ Amounting to a value equal to 6.8% of turnover versus 5.2% in the UK and 5.8 on average in Europe. 1999. The Dynamics of the Retail Sector in Ireland. *Forfús*, p. 57; Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁶⁰⁰ Ibid
- ⁶⁰¹ The industry was characterized by dispersed regional stores of generally small average size, making it difficult to realize supply chain economies. The planning prohibition which limited store size in Ireland was also a deterrent to multiples implementing central distribution. The wholesalers for symbol groups had more challenging delivery logistics than the multiples who were usually located in areas of high population with better road infrastructure. The symbol group stores were more dispersed geographically and many were in more rural areas. Keegan, J., O'Callaghan, & Wilcox, M. 2001.

Facilitators and Inhibitors of Supply Chain Innovation ... Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38

⁶⁰² Ibid.

⁶⁰³ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc. p.112

⁶⁰⁴ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁶⁰⁵ From a huge warehouse in Dublin, Keelings were again awarded the distribution contract. In 1998 Keelings of Dublin were appointed to supply fruit and vegetables to Tesco's chain of 78 stores, albeit with Tesco dealing directly with the produce growers. In 1999 Tesco began operating central distribution for chilled, fresh and frozen products (From a huge warehouse in Dublin, Keelings were again awarded the distribution contract). Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38. By 2002 up to two thirds of all products in Tesco Ireland stores were centrally distributed from 5 depots. O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14.

⁶⁰⁶ BWG acknowledged that many of its franchisees bought products from local suppliers. Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38

⁶⁰⁷ Collated from: Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38; in association with Donnelly Fruit and Veg. 2012. BWG Launches New Ambient Central Distribution Facility, *ShelfLife*, Jul 9th e; After a 2 year trial. The implementation meant a vast reduction in the number of deliveries that had to be processed by stores, thus providing efficiency gains for the stores, 'in terms of merchandising, in terms of back office paperwork, following up credit claims etc.' CD would take costs out of the supply chain, allowing cost savings to be passed on to the Londis retailers. Digital information technology in the form of the ISIS system was essential to make central distribution workable. Carolan, F. 2012. Catching Up With Londis, *ShelfLife*, Mar 12th ed; Utilizing 3rd part logistic operators and a number of redistribution centres (RDC); Ruddy, J. 2009. Dunne Deal? Not quite. *Checkout*(November): 24-26

⁶⁰⁸ 2005. Interim Report on the Impact of..., *Joint Committee on Enterprise and Small Business*

⁶⁰⁹ Suppliers would be under pressure to rationalize their sales forces. 2009. Dunnes Makes New Moves Towards Central Distribution? *Checkout*. 35(5): 1

⁶¹⁰ It was expected that manufacturers would outsource distribution to firms who specialized in logistics management 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*; Ruddy, J. 2009. David Vs Goliath? *Checkout*. 35(2): 4

⁶¹¹ Although in general most multiples and voluntary groups allow stores to buy directly from local suppliers, the allowance is limited to a small proportion of overall purchases. 2005. Interim Report on the Impact of..., *Joint Committee on Enterprise and Small Business*.

⁶¹² i.e. Dunnes Stores

⁶¹³ After Dunnes moved to CD. Ruddy, J. 2009. Dunne Deal? Not quite. *Checkout* (November): 24-26

⁶¹⁴ MSVC Musgraves symbol group management company.

⁶¹⁵ The group had always operated a central distribution model for ambient/dry goods

⁶¹⁶ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38

⁶¹⁷ It also created 350 jobs, Musgraves had built two specially designed state of the art new warehouses one near Liffey Valley in Dublin and one on Tramore road in Cork), that operated on a 24 hours basis. Suppliers were allocated time slots for delivering goods to the warehouse. Received retailers order's were prepared in the warehouse overnight. The first deliveries left the warehouses from 5:00am and the last deliveries of the day were scheduled to be received by stores by 10:30 am. Frozen orders were cross-docked at the warehouse and a 3rd party managed the interim storage of the products. When all deliveries were dispatched the warehouse was empty (with the exception of a small range of products). Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish Grocery Sector. *Irish Marketing Review*, 14(2): 26-38; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁶¹⁸ The fleet comprised 60 trucks and 80 trailers Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38

⁶¹⁹ All SuperValu and Centra stores received a minimum of 3 deliveries a week. Ibid

- 620 Ibid
- 621 Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.
- 622 The contract for this distribution was awarded to Allied logistics, the move led to a big reduction in the number of deliveries their stores had to receive. Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38; Lewis, L. 1999. Climate for Change. *Progressive Grocer*, 78(7): 93-95; Murphy, D. 1999. Superquinn will Deliver New Distribution System, *Independent.ie*, Mar 25th ed.
- 623 O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
- 624 White, D., & Comerford, J. 2010. A Superquinn Dilemma, *ShelfLife*, Aug 12th ed.
- 625 Cited in O'Halloran, B. 2005. Challenge for Superquinn is to Find Room to Expand, *Irish Times*, 10th Jan ed.: 16
- 626 Ruddy, J. 2009. Dunne Deal? Not Quite. *Checkout*(November): 24-26
- 627 Such as Sam Dennigans and DCC
- 628 Murphy, D. 1999. Superquinn will Deliver New Distribution System, *Independent.ie*, Mar 25th ed.
- 629 2011. All Change at Dunnes. *Checkout*, 37(2): 14-16
- 630 Ibid
- 631 Utilizing 3rd part logistic operators and a number of redistribution centres (RDC) Ruddy, J. 2009. Dunne Deal? Not quite. *Checkout*(November): 24-26
- 632 making some suppliers were unhappy with Dunnes: e.g. '.. why on earth would we move to a system where we couldn't trust them to get availability or ordering right?... either do it right or you leave it to suppliers to do it for you' 2011. All Change at Dunnes. *Checkout*, 37(2): 14-16, p.16
- 633 Dunnes had hired expertise into the company, however a senior executive from Tesco said 'It took us a full year with everyone working around the clock to get it right - and that was with all our experience from the UK'. 2011. All Change at Dunnes. *Checkout*, 37(2): 14-16, p.16
- 634 2014. Guide to Retail for Small Food Producers, Food Business Guide. <http://www.bordbia.vantage.ie/wp-content/uploads/sites/5/2015/01/BordBia-Retail-Guide-compressed-20141.pdf>: *BordBia - Irish Food Board* [Accessed 1st Aug 2016]
- 635 Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- 636 Ibid
- 637 Ibid
- 638 1999. The Dynamics of the Retail Sector in Ireland, *Forfás*; Fitzgerald, K. 1996. *Dunnes at the Crossroads*
- 639 'Using databases, customer-centric processes and online tools (such as the internet), firms began a historic shift from being merchandise-oriented to being customer-centric' this is still an emerging process. Cortada, J. W. 2004. *The Digital Hand*...p.308
- 640 Cortada, J. W. 2004. *The Digital Hand*... p.307
- 641 Cortada, J. W. 2004. *The Digital Hand*...
- 642 By mid 2002, Walmart (US) had migrated their EDI communications with the majority of their suppliers (98%) from dial up modem via telephone lines or VAN's to the internet. Zimmerman, A. 2003. Internet 2.0: To Sell Goods To Wal-Mart, Get on the Net, *Wall Street Journal* (Eastern edition), Nov 21, 2003. ed.: B1
- 643 2016. The Retail Industry, EDI Basics: Tour resource for learning about EDI, Vol. 2016. <http://www.edibasics.com/edi-by-industry/the-retail-industry/> [access 21st Jun 2016]
- 644 Collins, J. 2005. Retailers Expect Real Benefits from Technology, *Irish Independent*, Jun 29 ed.: 5
- 645 O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
- 646 Ibid
- 647 And thereby increase efficiency and decrease costs in the supply chain, and improve the service offering to consumers
- 648 O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
- 649 Darragh Fanning of Celtech an Irish Retail system provider, cited in Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7
- 650 2012b. Thinking Outside the Box, *ShelfLife*, 18th Oct ed.
- 651 2014. The Future of Retail. *Checkout*, 40(6): 28

- ⁶⁵² 2004. Voice-Driven Warehouse Solutions on the Way. *Retail News*(July/August)
- ⁶⁵³ Seth, A., & Randall, G. 2001. *The Grocers: the Rise and Rise of the Supermarket Chains* (2nd edition ed.): Kogan Page
- ⁶⁵⁴ Even though Quinnsnorth had a good reputation for utilizing ICT. Innovation is part of Tesco's DNA. Mills, K., & O'Reilly, M. 1999. My Job: A Juggler Happy to be in a Tough Business, *The Examiner*, Apr 16th ed.: 2; Personal interview with **John Prendergast**
- ⁶⁵⁵ The currency difference and different tax laws etc. added complexity to total integration. Personal interview with **John Prendergast**
- ⁶⁵⁶ Systems included scanning and back - office systems. Migration and integration cost €20 million
- ⁶⁵⁷ This was a reversal in Quinnsnorth practice. Personal Interview with **John Prendergast**
- ⁶⁵⁸ Circa 2002. Ibid
- ⁶⁵⁹ Staff reduction was 50 according to **John Prendergast**, and 140 according to Cullen, P. 2009. Tesco to Shed 140 HQ jobs after shift to UK products, *Irish Times*, 14th May ed. Tesco had 130 Irish stores in 2009.
- ⁶⁶⁰ Cullen, P. 2009. Tesco Makes Much Higher Profit Margin in Ireland, Plan Shows, *Irish Times*, May 11th ed; Cullen, P. 2009. Tesco to Shed 140 HQ Jobs After Shift to UK Products, *Irish Times*, 14th May ed.
- ⁶⁶¹ Cullen, P. 2009. Tesco Makes Much Higher Profit Margin in Ireland, Plan Shows, *Irish Times*, 11th May ed.
- ⁶⁶² According to Eamonn Quinn MD of Superquinn cited in Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, 25th Sep ed.: 11
- ⁶⁶³ Enterprise Resource Planning (ERP) systems are designed to manage processes from end-to-end and even beyond firm boundaries. 2003. Leading Irish Retailer Superquinn Selects SAP For Success, *SAP Press Release*. <https://news.sap.com/uk/2003/05/12/leading-irish-retailer-superquinn-selects-sap-for-success/amp/> [Accessed 2nd Feb 2017]; Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11; Smith, G. 2003. Superquinn Scores First with SAP System, *SiliconRepublic*, 19th May ed. <https://http://www.siliconrepublic.com/companies/superquinn-scores-first-with-sap-system>. [2nd Feb 2017]
- ⁶⁶⁴ The planned go live date was mid 2004. 2003. Leading Irish Retailer Superquinn Selects SAP For Success, *SAP Press Release*; Smith, G. 2003. Superquinn Scores First with SAP System, *SiliconRepublic*, 19th May ed.
- ⁶⁶⁵ Fergal Quinn Cited. This reflects the strategic importance of ICT investment. The Superquinn adoption was also important for SAP as Superquinn would provide a reference site of the application of SAP technology 'fully demonstrating SAP capabilities in the challenging world of retail'. 2003. Leading Irish Retailer Superquinn Selects SAP For Success, *SAP Press Release*.
- ⁶⁶⁶ Spanning '[o]rdering and supply chain, inventory and warehousing [and] back office financials'. Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11. 2003. Leading Irish Retailer Superquinn Selects SAP For Success, *SAP Press Release*; Smith, G. 2003. Superquinn Scores First with SAP System, *SiliconRepublic*, 19th May ed.
- ⁶⁶⁷ 2003. Leading Irish Retailer Superquinn Selects SAP For Success, *SAP Press Release*; Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11; Smith, G. 2003. Superquinn Scores First with SAP System, *SiliconRepublic*, 19th May ed.
- ⁶⁶⁸ Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11
- ⁶⁶⁹ Ibid
- ⁶⁷⁰ Ibid
- ⁶⁷¹ Goldbach, B. 2004. Harnessing Technology to Social Needs, *Irish Examiner*, Oct 8th ed.: 7
- ⁶⁷² Personal interview with **Declan Carolan**; Hancock, C. 2004. Shake-up at Superquinn as Hanan Quits Company, *The Sunday Times*, Jul 25th ed.
- ⁶⁷³ Hancock, C. 2004. Shake-up at Superquinn as Hanan Quits Company, *The Sunday Times*, Jul 25th ed.
- ⁶⁷⁴ Personal interview with **Declan Carolan**
- ⁶⁷⁵ 'There were problems on the operations side, at the distribution centre and changes were made to the computer systems and the pricing structure. Simon Burke Chair of Select retail holdings who purchased Superquinn, cited in Creaton, S. 2006. Superquinn to Remodel, Expand Chain, *Irish Times* 7th Sept ed.: 21.
- ⁶⁷⁶ Ruddy, J. 2009. Dunne Deal? Not quite. *Checkout*(November): 24-26

- ⁶⁷⁷ The system is from Irish company Psion Teklogix / Heavey RF. 2007. *Superquinn Invest in New Voice Picking System*, Feb 1st ed. <http://www.logisticsit.com/articles/2007/02/01/2568-superquinn-invest-in-new-voice-picking>. [Accessed 5th Jan 2017]
- ⁶⁷⁸ It replaced a manual stock picking by labels system. The solution was integrated with their SAP ERP system operated via a wireless network, with forklift mounted and handheld devices. 2007. *Superquinn Invest in New Voice Picking System*, Feb 1st ed.
- ⁶⁷⁹ Across Superquinn's 21 stores. The system was expected to have paid for itself within a year, through improved 'worker productivity, accuracy, savings in stationery costs', it also improved the visibility of stock trends in shops. Using the system required a rework of locations and lot sizes of stock throughout the warehouse, however staff required very little training and the go-live went very smoothly. 2007. *Superquinn Invest in New Voice Picking System*, Feb 1st ed.
- ⁶⁸⁰ By 2007 Musgraves had implemented voice picking. O'Callaghan, J. 2007. Technology Know-How. *Checkout*. 33(October): 28, 29.
- ⁶⁸¹ John O'Callaghan, IT Director Musgraves. O'Callaghan, J. 2007. Technology Know-How. *Checkout*. 33(October): 28, 29.
- ⁶⁸² Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁶⁸³ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc. p.117
- ⁶⁸⁴ Quinn, J. J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*
- ⁶⁸⁵ Personal interview with *Tara Buckley*
- ⁶⁸⁶ E.g. an initiative 'Musgraves Simplifies Retail' (MSR), was estimated to involve an investment of €50 million across the operation including the symbol group stores. O'Callaghan, J. 2007. Technology Know-How. *Checkout*. 33(October): 28, 29
- ⁶⁸⁷ O'Callaghan, J. 2007. Technology Know-How. *Checkout*. 33(October): 28, 29.
- ⁶⁸⁸ Aldata Gold replacing their buying and information systems, it was a solution used by several top retailers across Europe. O'Callaghan, J. 2007. Technology Know-How. *Checkout*. 33(October): 28, 29
- ⁶⁸⁹ Thus informing staff rostering
- ⁶⁹⁰ Personal interview with *Veronica Sullivan*
- ⁶⁹¹ Collins, J. 2005. Retailers Expect Real Benefits from Technology, *Irish Independent*, 29th June ed.: 5.
- ⁶⁹² Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7; Goldbach, B. 2004. Harnessing Technology to Social Needs, *Irish Examiner*, Oct 8th ed.: 7
- ⁶⁹³ Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7; Goldbach, B. 2004. Harnessing Technology to Social Needs, *Irish Examiner*, Oct 8th ed.: 7
- ⁶⁹⁴ Bob semple of PWC cited in Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7
- ⁶⁹⁵ Paul Dixon Senior Project Manager, cited in Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11
- ⁶⁹⁶ 'The last mile' is the most expensive in the stock process (taking delivery of goods, storing them and packing them onto shop shelves). At this time in Superquinn their stock ordering system was so sophisticated that products were loaded on to trucks from the warehouse in the order that they would need to go on shelves within the individual stores, making the entire stock intake process incredibly efficient for stores. Personal interview with *Declan, Carolan*.
- ⁶⁹⁷ Ultimately the ordering to stocking process was not really tested before go-live
- ⁶⁹⁸ At go live shelves were left empty as store managers could not order stock through the system. Personal interview with *Declan Carolan*
- ⁶⁹⁹ Wincor Nixdorf was commissioned in 2014 to deliver a point-of-sale system to Musgraves, however the contract was cancelled in 2016. O'Loughlin, A. 2016. IT system row for Commercial Court, *Irish Examiner*, Oct 25th ed. <http://www.irishexaminer.com/ireland/it-system-row-for-commercial-court-427362.html>. [Accessed 30th Mar 2017]
- ⁷⁰⁰ Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7
- ⁷⁰¹ 2009 Epos-sibility, *ShelfLife*, 12th Mar ed. <http://www.shelflife.ie/epos-sibility/>. Faughnan, L. 2003. Smart Shopping Comes of Age, *Irish Independent*, Aug 28th ed.: 7
- ⁷⁰² Goldbach, B. 2004. Harnessing Technology to Social Needs, *Irish Examiner*, Oct 8th ed.: 7; Personal interview with *Frank Murphy*
- ⁷⁰³ Personal interview with *Tara Buckley*
- ⁷⁰⁴ Superquinn were the first in Ireland to trial ESL (electronic shelf-edge labeling) in 2002, they ultimately decided against adopting it. It's use was already fairly widespread in France, the Netherlands and Germany. 1997. The Year of the Scan *Checkout Yearbook & Buyer's Guide*: 3; O'Callaghan, E.,

& Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14. and the United States. It was very expensive and not really suited to the sales of products with only small shelf space. Personal interview with **Declan Carolan**. Whilst Tesco use ESL in some of their stores in the UK, it is not used in Ireland. However an independent retailer in Galway has adopted it to aid in managing price changes across the 30, 000 lines of stock carried in the shop. Personal interview with **Tara Buckley**

⁷⁰⁵ Dermot McCarthy MD of Retail Integration cited in Skelly, B. 2005. Digital Ireland, *Irish Independent*, Jun 29th ed.: 5.

⁷⁰⁶ White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁷⁰⁷ 2009 Epos-sibility, *ShelfLife*, 12th Mar ed. <http://www.shelflife.ie/epos-sibility/> [Accessed 3rd Dec 2015]

⁷⁰⁸ Positives financial figures were focused on rather than negatives, so whilst 'wastage' is generally a key measurement in fresh fruit and Veg departments, Superquinn focused on other figures instead like sales, margin or profit in that area. O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ... Conference Proceedings*. ESADE, Barcelona.

⁷⁰⁹ O'Callaghan, J. 2007. Technology Know-How. *Checkout.*, 33(October): 28, 29.

⁷¹⁰ 2009 Epos-sibility, *ShelfLife*, 12th Mar ed. <http://www.shelflife.ie/epos-sibility/>.

⁷¹¹ Ibid

⁷¹² For example the Microsoft RMS (Retail management system) includes a :Card reader, Cash drawer, Check reader, Line display, Pin pad, Printer, Scanner and Signature capture. The system is compatible with other software applications to enable inventory mangement etc. Other retail mangement systems such as the cloud based Revel Ipad Pos have even wider functionality, it includes 'integrated payroll mangement, and inventory tracking' and CRM

⁷¹³ Live link from handheld terminal and live stock. 2009 Epos-sibility, *ShelfLife*, 12th Mar ed. <http://www.shelflife.ie/epos-sibility/> [Accessed 3rd Dec 2015]

⁷¹⁴ Ibid

⁷¹⁵ 2014. Changing Times *ShelfLife*, Sept 16th ed. <http://www.shelflife.ie/changing-times/>. [Accessed 13th Nov 2015]

⁷¹⁶ Collated from: 1997. The Year of the Scan *Checkout Yearbook & Buyer's Guide*: 3; 2009 Epos-sibility, *ShelfLife*, 12th Mar ed.; 2011. Switched On, 4th Feb ed. <http://www.shelflife.ie/switched-on/>: *Shelflife* [Accessed 4th Feb 2016]; 2014. Changing Times *ShelfLife*, Sept 16th ed.; 2014. Power at your fingertips, *ShelfLife*, 22nd Apr ed. <http://www.shelflife.ie/power-at-your-fingertips/> [Accessed 6th Feb 2016]; Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11; O'Callaghan, J. 2007. Technology Know-How. *Checkout.* 33(October): 28, 29; White, D. 2001. *The First 125 Years: A History of Musgrave*: Musgrave Group plc.

⁷¹⁷ Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11. Such as RFID implementations.

⁷¹⁸ In 2013 its use began to be extended, a SuperValu store in Cork introduced the self-scan technology. The Musgrave's group felt that customers would value the ease of being able to control their total spend in stores enabled by the self-scan technology, and it would aid in building customer loyalty 2013. SuperValu introduces self-scanning for customers, *ShelfLife*, 16th May ed. <http://www.shelflife.ie/supervalu-introduces-self-scanning-for-customers/>.

⁷¹⁹ Hamill, G. 2014. Driving Online Shopping Forwards, *ShelfLife*, 19th March ed. <http://www.shelflife.ie/driving-online-shopping-forwards/>. [Accessed 3rd Sept 2016]

⁷²⁰ Trialing it in one store (their Bloomfields store in Dun Laoghaire, Dublin). The store installed 2 self-checkout stations for trolleys, and 2 for baskets. 2015. May 2004: Self-Service Checks Into Tesco. *Checkout.* 41(2): 1

⁷²¹ Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed. <http://www.shelflife.ie/selfie-nation/>. [Accessed 7th Feb 2016]

⁷²² Technology suppliers offered simulated digital pilots of adoption, to better inform the investment decision and the installation. Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed. <http://www.shelflife.ie/selfie-nation/>. [Accessed 7th Feb 2016]

⁷²³ Berger, W. 1988. What's New In Computerized Customer Service; Automated Cashiers to Cut Waiting and Mistakes, *The New York Times*, Nov 27th ed; McGrath, B. 1997. Market potential Lures Safeway: Brendan McGrath listens to chief ... *The Irish Times* Jun 20th ed.: A2; A Centra in Cork, 4 self-scan checkouts were installed as part of a refurbishment Donnellan, F. 2012. Towering to New Heights, *ShelfLife*, 18th Dec ed. Choosing Leaders Enterprises and NCR technology. A Eurospar in Kilkenny was the 1st BWG franchisee. 2013. SuperValu Introduces Self-scanning for Customers,

- ShelfLife*, 16th May ed; Burke, R. 2013. Rise of the Machines Irish Examiner, Oct 20 ed.; Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed; Mulligan, J. 2013. Dunnes Plays Catch-up with Self-scan Tills, *Irish Independent*, Dec 17th ed.
- ⁷²⁴ For a few items or a small basket of goods Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed.
- ⁷²⁵ Several self-checkout stations can be managed by one staff member.
- ⁷²⁶ Hamill, G. 2014. Selfie nation, *ShelfLife*, 15th July ed; Personal interview with *Tara Buckley*
- ⁷²⁷ Hamill, G. 2014. Selfie nation, *ShelfLife*, 15th July ed.
- ⁷²⁸ 42% of shrinkage is via staff. An IDC study reported that 100% of retailers saw no shrink or reduced shrink after self-checkout was installed Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed. However reports from the UK suggest otherwise. Lately there have been reports suggesting some consumers skip scan more expensive products as cheaper products In the UK some supermarkets are selling more carrots than they ever had in stock. Knapton, S. 2016. Self-service Checkouts Turn Honest Shoppers into Thieves, Warn Criminologists *The Telegraph*, 2nd Aug ed.
- ⁷²⁹ 2009 Epos-sibility, *ShelfLife*, 12th Mar ed.; Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed.
- ⁷³⁰ In 2014 the average spend via convenience self-checkout was €11. 2014. Power at Your Fingertips, *ShelfLife*, 22nd Apr ed. <http://www.shelflife.ie/power-at-your-fingertips/>, Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed.
- ⁷³¹ Bank note recycler module on NCR's SelfServ checkout. Hamill, G. 2014. Selfie Nation, *ShelfLife*, 15th July ed.
- ⁷³² After first becoming established on the European continent. Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11
- ⁷³³ 2007. PIN Codes Mandatory from St. Patrick's Day, *Retail News*, Jan/Feb ed.: 6-7.
- ⁷³⁴ 2015/16. BOI Payment Acceptance, *RGDATA Annual 2015/16*
- ⁷³⁵ 2016. Visa Contactless Payments, Vol. 2016. <https://http://www.visa.ie/pay-with-visa/contactless-payments>: *Visa* [Accessed 13th Oct 2016]. Including - Lidl, SuperValu, Centra, M&S, SPAR, Mace, Dunnes Stores and Aldi
- ⁷³⁶ 2015/16. BOI Payment Acceptance, *RGDATA Annual 2015/16*
- ⁷³⁷ 2016. "Android Pay" Launches for Ireland Visa Cardholders, *ShelfLife*, 8th Dec ed; In the UK the Morrisons supermarket chain introduced contactless payment in 2015 and recorded that 21% of transactions under UK£30 were processed via this method 2016. Innovation in Digital Grocery Retail, 18th Aug ed.: *Clickz Intelligence*
- ⁷³⁸ The product is available to AIB Visa customers. The product of a joint project between visa and Android. 2016. "Android Pay" Launches for Ireland Visa Cardholders, *ShelfLife*, 8th Dec ed.
- ⁷³⁹ The ap updates their debit/credit card accounts with the purchase transaction details. "Android Pay" Launches for Ireland Visa Cardholders, *ShelfLife*, 8th Dec ed. Apple Pay became available in Ireland in 2017. Apple pay was available in US 2 years earlier. Duffy, R. 2017. Apple Pay is Now Available in Ireland, *The Journal*, Mar 7th ed. <http://www.thejournal.ie/apple-pay-ireland-3274316-Mar2017/>. [Accessed 7th July 2018]
- ⁷⁴⁰ 2016. "Android Pay" Launches for Ireland Visa Cardholders, *ShelfLife*, 8th Dec ed.
- ⁷⁴¹ Personal interview with *Richard McKeown*
- ⁷⁴² Daft, R. L., Murphy, J., & Willmott, H. 2014. *Organization Theory and Design: An International Perspective* (2nd ed.)
- ⁷⁴³ Ibid
- ⁷⁴⁴ Collins, J. 2005. Retailers Expect Real Benefits from technology, *Irish Independent*, 29th June 2005 ed.: 5. Personal interview with *Frank Murphy*.
- ⁷⁴⁵ Fergal Quinn has reflected that '...some .. innovations took time to refine, with others requiring a pretty major shift in our thinking before they really made an impact' Quinn, F. 2016. *Quinntessential Feargal: A Memoir*. Dublin: The O'Brien Press: p.17. Personal interview with *Frank Murphy* reflected that Superquinn needed to change their thinking to leverage the loyalty card.
- ⁷⁴⁶ Personal interview with *Frank Murphy*.
- ⁷⁴⁷ Faughnan, L. 2003a. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11
- ⁷⁴⁸ O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ...Conference Proceedings*. ESADE, Barcelona
- ⁷⁴⁹ With the co-operation of SuperClub Target Marketing (STM Ltd.),
- ⁷⁵⁰ E.g. sales are down on Thursdays nights, sales in a product category are down
- ⁷⁵¹ Personal interview with *Richard McKeown*
- ⁷⁵² Ibid

- ⁷⁵³ Collins, J. 2005. Retailers Expect Real Benefits from Technology, *Irish Independent*, 29th June 2005 ed.: 5.
- ⁷⁵⁴ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ...Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁷⁵⁵ Prior to 2005 'insight' for Ireland came from the UK, given the comparative size of the UK versus Irish markets, the Irish market was not a high priority. Personal interview with **Richard McKeown**. More recently they were viewed as making less use of their data 'Tesco used to do it because they have Dunhumby, they're using very little data analysis at the moment'. Personal interview with **Frank Murphy**
- ⁷⁵⁶ Across the years Dunhumby staff has grown from 2 to 30 people which reflects the importance of their work to Tesco. 2016. About Dunhumby Ireland, Vol. 2017. <https://http://www.dunhumby.com/dunhumby-ireland>. [Accessed 1st Feb 2017]
- ⁷⁵⁷ 2016. Loyalty Performance Index: 15. *Amarach* <http://www.amarach.com/assets/files/EconomicRecoveryIndex/LoyaltyPerformanceIndex.pdf> [Accessed 28th May 2016]
- ⁷⁵⁸ Personal interview with **Frank Murphy**
- ⁷⁵⁹ Ibid
- ⁷⁶⁰ A 2 dimensional barcode, capable of storing more/richer data like product ingredients etc.
- ⁷⁶¹ Personal interview with **Declan Carolan**
- ⁷⁶² If RFID was on individual product packages, it would deliver precise information on the location of all products in a store. Collins, J. 2005. Retailers Expect Real Benefits from Technology, *Irish Independent*, Jun 29th ed.: 5; Långström, H. 2013. Item-level Tagging in the Grocery Industry – Are We There yet?, RFID Arena, 2nd April ed. <http://www.rfidarena.com/2013/4/2/item-level-tagging-in-the-grocery-industry-are-we-there-yet.aspx>: *NordicID*. [Accessed 14th Jun 2017]. There would be no requirement for checkout queues, and reduced incidents of stock outs, 2004. Shelf Life. *Retail News*(July/August): 56; Collins, J. 2005. Retailers Expect Real Benefits from Technology, *Irish Independent*, Jun 29th ed.: 5; Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11; Skelly, B. 2005. Irish Food Companies to Lead RFID Charge, *SiliconRepublic*, 25th Apr ed. <https://www.siliconrepublic.com/enterprise/irish-food-companies-to-lead-rfid-charge>. Deliveries to warehouses and shops and checkout would become incredibly efficient as there would be no need to check the delivery accuracy and record updates could also be automatic Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11. RFID can have wide application including in the use of food monitoring and traceability thus enhancing food safety, and improvements in supply chain efficiency. RFID works like the barcode but uses radio waves to read product data, which enables scanning of goods at distance and the reading of multiple items simultaneously. Like barcodes, RFID tags are incorporated within product packaging. 2004. Shelf Life. *Retail News*(July/August): 56; In the mid 2000s RFID was viewed as being 'only at the Commodore 64 stage in terms of sophistication' Collins, J. 2005. Retailers Expect Real Benefits from technology, *Irish Independent*, Jun 29th ed.: 5; Skelly, B. 2005. Irish Food Companies to Lead RFID Charge, *SiliconRepublic*, 25th Apr ed.; In 2004 GSI released an EPC standard to overcome interoperability challenges. O'Sullivan, J. 2017. RFID adoption: Is this the year?, May 17th ed. <https://http://www.gsl.ie.org/Blog/Retail-CPG-Blog/Apparel/RFID-adoption-is-this-the-year.html>: *GSI Ireland* [Accessed 14th Jun 2017]. EPC's are passive RFIDs. Långström, H. 2013. Item-level tagging in the grocery industry - Are We There Yet?, RFID Arena, 2nd April ed. *NordicID*
- ⁷⁶³ 2004. Shelf Life. *Retail News*(July/August): 56; Wal-Mart had issued a mandate requiring its top 100 suppliers to use RFID tags on all cases and pallets entering its distribution centers by 2005, and they were committed to continually expand the adoption across their suppliers over the long-term. Brody, A. L., Bugusu, B., Han, J. H., Sand, C. K., & McHugh, T. H. 2008. Innovative Food Packaging Solutions, *Institute of Food Technologies*. http://www.ift.org/~media/KnowledgeCenter/ScienceReports/ScientificStatusSummaries/InnovFoodPkg_1008.pdf. [Accessed 14th Sept 2016]. Zimmerman, A. 2003. Internet 2.0: To Sell Goods To Wal-Mart, Get on the Net, *Wall Street Journal (Eastern edition)*, Nov 21, 2003. ed.: B1. and M&S were pushing adoption, by 2008 'Albertsons, Target, Tesco, and Marks & Spencer' encouraged the adoption of RFID. Brody, A. L., Bugusu, B., Han, J. H., Sand, C. K., & McHugh, T. H. 2008. Innovative Food Packaging Solutions, *Institute of Food Technologies*. http://www.ift.org/~media/KnowledgeCenter/ScienceReports/ScientificStatusSummaries/InnovFoodPkg_1008.pdf. [Accessed 14th Sept 2016]
- ⁷⁶⁴ O'Sullivan, J. 2017. RFID Adoption: Is this the Year?, May 17th ed. <https://http://www.gsl.ie.org/Blog/Retail-CPG-Blog/Apparel/RFID-adoption-is-this-the-year.html>: *GSI Ireland* [Accessed 14th Jun 2017]

- ⁷⁶⁵ Prior to and alongside the advent of online grocery services, some retailers in Europe facilitated home delivery and ordering of groceries through fax and or phone shopping Seth, A., & Randall, G. 2001. *The Grocers: the Rise and Rise of the Supermarket Chains* (2nd edition ed.): Kogan Page.
- ⁷⁶⁶ 1997. The Year of the Scan *Checkout Yearbook & Buyer's Guide*: 3; Seth, A., & Randall, G. 2001. *The Grocers: the Rise and Rise of the Supermarket Chains* (2nd edition ed.): Kogan Page; Tedeschi, B. 2002. E-Commerce Report; The History of Online Grocery Shopping: First as Web Farce, Now a Lucrative Field for Older Companies., The New York Times, May 6th ed.
- ⁷⁶⁷ 2001. Grocery Shoppers Swap Wonky Trolleys for Online Ordering, *Irish Times*, Jul 4th ed.: 32.
- ⁷⁶⁸ Rather than setting up a separate infrastructure. Tedeschi, B. 2002. E-Commerce Report; The History of Online Grocery Shopping: First as Web Farce, Now a Lucrative Field for Older Companies., *The New York Times*, May 6th ed.
- ⁷⁶⁹ Monaghan, P. 2000. Supermarkets Become Cybermarkets Superquinn and Tesco Have Just Introduced Online Shopping. with no more struggling in crowded aisles and the weekly groceries delivered to your door, it should be a boon to time-strapped families. but the service is in its infancy. will it catch on, and what happens if things go wrong?, *The Irish times*, 19th Oct ed.: 15.
- ⁷⁷⁰ Offering 'an enhanced shopping experience' Dixon, H. 2012. Internet Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 85-95: Gill & MacMillan.
- ⁷⁷¹ 2016. Innovation in Digital Grocery Retail, 18th Aug ed. *Clickz Intelligence*.
- ⁷⁷² Ocada is an online only grocery retailer that was founded in 2000 and went public in 2010, in 2014 they also began providing deliveries for the Morrisons chain in the UK, with sales of UK£1.1 billion and profit of UK£11 million. 2016. The Evolution of Shopping, Vol. 2016. <http://www.ocadogroup.com/who-we-are/our-story-so-far.aspx>: **Ocado** [Accessed 15th Sep 2016]
- ⁷⁷³ Ocado made a profit for the first time in 2014. 2015. Ocado's results: Finally in the Money, *The Economist*, Feb 3rd ed. <http://www.economist.com/news/business-and-finance/21641994-online-grocer-has-announced-its-first-ever-profit->. [Accessed 7th Dec 2016]. Ocado also acted as online partners for UK bricks and mortar retail grocers Waitrose
- ⁷⁷⁴ Dixon, H. 2012. Internet Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 85-95: Gill & MacMillan, Monaghan, P. 2000. Supermarkets Become Cybermarkets..., *The Irish times*, 19th Oct ed.: 15.
- ⁷⁷⁵ Monaghan, P. 2000. Supermarkets Become Cybermarkets ...?, *The Irish Times*, 19th Oct ed.: 15.
- ⁷⁷⁶ By 1997 numerous US companies providing online grocery had failed, Peapod was cited as a sole survivor. The issue was how to provide home delivery cost effectively, it was seen as "using 10\$ people to do 5\$ work". 1997. The Year of the Scan, *Checkout Yearbook & Buyer's Guide*: 3
- ⁷⁷⁷ Murfitt, N. 2014. Supermarket Giants 'Lose £100million a Year From Online Delivery Services': Cost of Delivery Means They Are Effectively Paying Customers to Shop With Them, *Daily Mail*, 27th July ed.
- ⁷⁷⁸ 2015. Ocado's results: Finally in the Money, *The Economist*, Feb 3rd ed.
- ⁷⁷⁹ Monaghan, P. 2000. Supermarkets Become Cybermarkets ...?, *The Irish Times*, 19th Oct ed.: 15.
- ⁷⁸⁰ Personal interview with *Georgieann Harrington*; Wynne-Jones, S. 2016. Leadership Position. *Checkout*, 42(4): 2
- ⁷⁸¹ 2016. Irish Market, *Bord Bia* Vantage...online resource for small food businesses. <http://www.bordbiavantage.ie/market-information/irish-market/>. [Accessed 16th Oct 2017]
- ⁷⁸² Other leading grocery retailers, such as Dunnes, Lidl and Aldi, did not offer online grocery sales. Dixon, H. 2012. Internet Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 85-95: Gill & MacMillan; Personal interview with *Georgieann Harrington*
- ⁷⁸³ They had also been the first Irish grocery retailer to establish a web site. O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, *EAERCD ...Conference Proceedings*. ESADE, Barcelona
- ⁷⁸⁴ A shopping portal. Dixon, H. 2012. Internet Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 85-95: Gill & MacMillan. Personal interview with *Georgieann Harrington*.
- ⁷⁸⁵ 2001. Grocery Shoppers Swap Wonky Trolleys for Online Ordering, *Irish Times*, Jul 4th ed.: 32
- ⁷⁸⁶ ITS were the 3rd party, who were associated with Buy4Now, and the information technology expertise was provided by Unipower. 2001. Grocery Shoppers Swap..., *Irish Times*, Jul 4th ed.: 32
- ⁷⁸⁷ O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14

- ⁷⁸⁸ Customers ordered online and then collected their selected and packed groceries from a Superquinn store. Ruddy, J. 2010. 50 More Years. *Checkout* 36(11): 12-15
- ⁷⁸⁹ 2015. May 2004: Self-Service Checks Into Tesco. *Checkout*, 41(2): 1
- ⁷⁹⁰ Tesco invested IR£1.5 million in the service in the year it was launched. O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Vol. 14
- ⁷⁹¹ Cork City and South Dublin. Ibid
- ⁷⁹² Ibid
- ⁷⁹³ This was an increase of 24% on the previous year. 2015. May 2006: Online Grocery Sales Booming. *Checkout*, 41(2)
- ⁷⁹⁴ Hamill, G. 2014. Driving Online Shopping Forwards, *ShelfLife*, 19th Mar ed. <http://www.shelflife.ie/driving-online-shopping-forwards/>. [Accessed 6th Oct 2018]
- ⁷⁹⁵ 2014. Shopping on the move – Tesco now delivering to a Luas near you!, *Tesco: Media Centre*, 26th Nov ed. <https://http://www.tesco.ie/media/news/2014/26112014.aspx>. [30th Jun 2017]
- ⁷⁹⁶ In Deansgrange in Dublin. They had previously offered a fax order delivery service. The service continued to be offered until 2010 when Musgraves announced they were rolling out their online grocery shopping system. At that time there were only about a dozen customer using the service weekly 2010. Virtual Growth, *ShelfLife*, 12th Aug ed. <http://www.shelflife.ie/virtual-growth/>. [Accessed 20th May 2016]
- ⁷⁹⁷ 2011. SuperValu Closer to Online Shopping. *Checkout*, 37(4): 8; Hamill, G. 2014. Driving Online Shopping Forwards, *ShelfLife*, 19th Mar ed.
- ⁷⁹⁸ Hamill, G. 2014. Driving Online Shopping Forwards, *ShelfLife*, 19th Mar ed.
- ⁷⁹⁹ This is one reason why Musgraves refrain from owning SuperValu stores directly.
- ⁸⁰⁰ 2013. SuperValu Launches Ireland's First Grocery Shopping App, 3rd Jan ed. <http://www.musgravegroup.com/2013/01/03/supervalu-launches-irelands-first-grocery-shopping-app/>: *Musgrave Group*. [Accessed 28th Jul 2016]
- ⁸⁰¹ App features online shopping, detailed product information ingredients and nutritional data. A recipe App with meal planner. Ibid
- ⁸⁰² In one of their stores in Cork. Hamill, G. 2014. Driving Online Shopping Forwards, *ShelfLife*, 19th Mar ed;
- ⁸⁰³ SuperValu believe the service augments the convenience of shopping online. 2014. SuperValu Launches First 'Drive Through' Shopping Service in Ireland, Feb 18th ed. <http://www.musgravegroup.com/2014/02/18/supervalu-launches-first-drive-through-shopping-service-in-ireland/>: *Musgrave Group*. [Accessed 28th Jul 2106]
- ⁸⁰⁴ Personal interview with *Tara Buckley*
- ⁸⁰⁵ Located in Carrick-on-suir. Delivery services operated Thursday, Friday and Saturday 1990. Suir Thing! *Checkout*, 16(1): 17,19
- ⁸⁰⁶ 1-3 shops, they are also growing their physical business presence i.e. opening new stores
- ⁸⁰⁷ 2010. Virtual Growth, *ShelfLife*, 12th Aug ed.
- ⁸⁰⁸ Buymie is a convenience service, consumers, shopping 3-4 times a week, are spending from 15 to 45 minutes (74%) in a grocery store when they shop, so can save time through ordering online. Buymie expect the 'addressable' Dublin market to be €630mill. 2015. Will this App Change the Way we Shop for Groceries?, *ThinkBusiness.ie*. <https://http://www.thinkbusiness.ie/articles/buymie-mobile-shopping-app/>: Bank of Ireland [Accessed 8th Jun 2017]; Keogh, O. 2017. Buymie Gets your Groceries to You When you Need Them, *The Irish Times*, 30th Mar ed.; Woods, K. 2016. The Irish Startup that's Taking on Tesco and Super Valu at Online Shopping, *Fora*, Mar 30th ed.
- ⁸⁰⁹ The service is only offered in Dublin. Fees are scaled based on delivery time parameters of - within an hour, 2 hours or 3 hours. Keogh, O. 2017. Buymie Gets your Groceries to You When you Need Them, *Irish Times*, 30th Mar ed; Woods, K. 2016. The Irish Startup that's Taking on Tesco and Super Valu at Online Shopping, *Fora*, Mar 30th ed.; The major grocery retailers generally offer next day delivery for online orders. 2015. Will this App Change the Way we Shop for Groceries? *ThinkBusiness.ie*.
- ⁸¹⁰ Buymie is also building a network of 'preferred retailers'. 'A big part of what we do is to partner with small boutique stores, butchers, bakeries, and off-licenses. Retailers that had no ability to provide online, mobile shopping for the customers can now do so'. 2015. Will this App Change the Way we Shop for Groceries?, *ThinkBusiness.ie*.; Keogh, O. 2017. Buymie Gets your Groceries to You When you Need Them, *Irish Times*, 30th Mar ed.
- ⁸¹¹ Around 20% of the 50 Dublin retailers included in the app are subscribers. Keogh, O. 2017. Buymie Gets your Groceries to You When you Need Them, *The Irish Times*, 30th Mar ed.

- ⁸¹² Buymie hopes that in the future it will be part funded by retailers subscribing to be included in the service offering.
- ⁸¹³ Woods, K. 2016. The Irish Startup that's Taking on Tesco and Super Valu at Online Shopping, *Fora*, Mar 30th ed. <https://fora.ie/buymie-online-grocery-shopping-2592273-Feb2016/>. [Accessed 21st May 2106]
- ⁸¹⁴ Dixon, H. 2012. Internet Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 85-95: Gill & MacMillan
- ⁸¹⁵ Personal interview with **Tara Buckley**; 'Fundamentally for retailers, it is less profitable to delve into online that it is to open a store'. McMahan, C. 2018. Why online-only supermarkets haven't come to Ireland... yet, *thejournal.ie*, Jul 8th ed. <http://www.thejournal.ie/ocado-online-supermarket-ireland-3-4126444-Jul2018/>. [Accessed 18th July 2018]
- ⁸¹⁶ Dispersed population, delivery could mean a 50mile round trip. Personal interview with **Tara Buckley**; 'The distances are greater and that just adds to the cost of delivering groceries'. McKevitt of Kantar cited in McMahan, 2018.
- ⁸¹⁷ O'Keefe, B. 2015. The Chosen One, *Fortune*, 15th Jun ed., Vol. 171; 2014. The Future of Retail. *Checkout*, 40(6): 28
- ⁸¹⁸ 2014. The Future of Retail. *Checkout*, 40(6): 28
- ⁸¹⁹ 2016. Innovation in Digital Grocery Retail, 18th Aug ed: *Clickz Intelligence*
- ⁸²⁰ Including offering free ice creams via social media to the local childrens GAA teams for winning matches. Donnybrook fair have also captured food sales for events through their online activities. Personal interview with **Tara Buckley**
- ⁸²¹ 2016. Innovation in Digital Grocery Retail, 18th Aug ed. *Clickz Intelligence*
- ⁸²² Ibid
- ⁸²³ Ibid
- ⁸²⁴ Whelan, J. 2015. Coca Cola And Talysis Win ECR Shopper And Category Marketing Awards, *Checkout*, 17th Nov ed.
- ⁸²⁵ Suppliers also reaped these benefits, EDI via the internet meant managing the communication process required less time from less staff and so staff could be allocated more productively. Zimmerman, A. 2003. Internet 2.0: To Sell Goods To Wal-Mart, Get on the Net, *Wall Street Journal (Eastern edition)*, Nov 21, 2003. ed.: B1
- ⁸²⁶ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁸²⁷ Particularly Tesco, Aldi and Lidl
- ⁸²⁸ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁸²⁹ Ibid
- ⁸³⁰ Ibid
- ⁸³¹ Collated from: 1996. Taking Care of Business. In M. Campbell (Ed.), How to Manage Your Shop, 3rd ed.: 56,57: *RGDATA*; 2009. Dunnes EDI Push Irks Suppliers, *ShelfLife*, 9th Mar ed.; 2010. ADM Londis Case Study. http://www.celtrino.com/about_celtrino/media_centre/case_studies/adm-londis_case_study.pdf: *Celtrino*. [Accessed 9th Jun 2016]; 2012. The Barry Group Case Study. http://www.celtrino.com/about_celtrino/media_centre/case_studies/celtrino-express-barry_group-case_study.pdf: *Celtrino*. [Accessed 9th Jun 2016]; Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11; Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38. Eamonn Quinn cited in Smith, G. 2003. Superquinn Scores First with SAP System, *SiliconRepublic*, 19th May ed.; O'Callaghan, J. 2007. Technology Know-How. *Checkout*. 33(October): 28, 29; Personal interview with **Veronica Sullivan**; O'Callaghan, E., & Wilcox, M. 2002. Multiple and Symbol Operators: The Battle for Market Leadership in the Irish Grocery Market. Case Study, *Irish Marketing Review* Jan ed., Vol. 14; Wilcox, M. 2012. The Evolution of Grocery Retailing in Ireland. In E. O'Callaghan, & D. O'Riordan (Eds.), *Retailing in Ireland: Contemporary Perspectives*: 21-32: Gill & MacMillan
- ⁸³² Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38. In 2009 yet again it was bemoaned that between the multiples suppliers had to comply with different EDI standards and suppliers, thus adding unnecessary costs to supplier operations. 2009. Dunnes EDI Push Irks Suppliers, *ShelfLife*, 9th Mar ed.; Compatibility issues persisted, as indicated by one interviewee's comment in 2013, regarding P&G's lack of compatibility with their EDI. Personal interview with **Veronica Sullivan**

- ⁸³³ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁸³⁴ In 2000 Superquinn adopted it in order to implement Central Distribution, and they used it for the communication of Purchase Orders (PO's) to their suppliers. The suppliers are cited as exhibiting significant administration difficulties in complying with Superquinn's EDI requirements, with lots of teething problems such as EDI forms having to be sent and resent numerous times to contain the required data. Personal interview with *Declan Carolan*
- ⁸³⁵ Cited in Faughnan, L. 2003. Sector Report: Retail Part Two: the Trick of the Grocery Trade, *Irish Independent*, Sep 25th ed.: 11; Personal interview with *Declan Carolan*
- ⁸³⁶ Anonymous source
- ⁸³⁷ Additionally suppliers were required to match their prices with Dunnes regularly, to achieve a '100% price match'. 2009. Dunnes EDI Push Irks Suppliers, *ShelfLife*, 9th Mar ed.
- ⁸³⁸ 2009. Dunnes EDI Push Irks Suppliers, *ShelfLife*, 9th Mar ed.; Dunnes are cited as 'the classic "late adopter" of technology' Ruddy, J. 2009. Dunne Deal? Not Quite. *Checkout*(November): 24-26.
- ⁸³⁹ Whilst some suppliers expressed their unhappiness e.g. The Irish Times who had been asked to pay €2,500, suspended delivery to Dunnes Stores outlets. Dunnes Stores responded by cancelling automated payments to the Irish Times in favour of monthly cheques based on the number of newspapers scanned in their stores. 2009. Dunnes EDI Push Irks Suppliers, *ShelfLife*, 9th Mar ed.
- ⁸⁴⁰ At the time mismatching invoices etc, could 'be very irksome to investigate and could on occasion require renegotiation between the parties' ... 'Whether we screw up or they screw up, we pay up' e.g. if due to a clerical error Dunnes never update a renegotiated price 2009. Dunnes EDI Push Irks Suppliers, *ShelfLife*, 9th Mar ed
- ⁸⁴¹ It was seen as a move that outsourced a non-core activity. 2010. ADM Londis Case Study. *Celtrino*.
- ⁸⁴² Londis, Musgraves, BWG, Gala Retail Services and the Barry group Collated from: 2010. Celerity re-brands to Celtrino, *ShelfLife*, 19th June ed; 2012. The Barry Group Case Study. http://www.celtrino.com/about_celtrino/media_centre/case_studies/celtrino-express-barry_group-case_study.pdf: *Celtrino* [Accessed 9th Jun 2016]
- ⁸⁴³ They could just log onto the system to view invoices etc. 2010. ADM Londis Case Study. *Celtrino*; 2012. The Barry Group Case Study. *Celtrino*; 2010. Celtrino to Double Workforce to 50, *The Irish Times* June 11th ed.: A.8
- ⁸⁴⁴ 2010. Celtrino to Double Workforce to 50, *The Irish Times* June 11th ed.
- ⁸⁴⁵ 2012. The Barry Group Case Study. *Celtrino*
- ⁸⁴⁶ 2012. Thinking Outside the Box, *ShelfLife*, 18th Oct ed.
- ⁸⁴⁷ O'Callaghan, J. 2007. Technology Know-How. *Checkout*. 33(October): 28, 29
- ⁸⁴⁸ 2012. The Barry Group Case Study. *Celtrino*
- ⁸⁴⁹ 2009. Dunnes EDI Push Irks Suppliers, *ShelfLife*, 9th Mar ed.
- ⁸⁵⁰ Keegan, J., O'Callaghan, & Wilcox, M. 2001. Facilitators and Inhibitors of Supply Chain Innovation ... Irish grocery sector. *Irish Marketing Review*, 14(2): 26-38
- ⁸⁵¹ BWG operate the Value Centre cash and carry chain, and SPAR franchise etc. Their Value Centre customers include independent retailers (as well as the licensed trade, and the hospitality and foodservice industry)
- ⁸⁵² Moane, J. 2006. Building For The Future. *Checkout*, 42(1): 2
- ⁸⁵³ Retailers who already used the BWG Foods E-Order scanning device in store, were more likely to order online. It was viewed as inevitable that there would be significant growth in the use of the online ordering platform. Moane, J. 2006. Building For The Future. *Checkout*, 42(1): 2
- ⁸⁵⁴ Personal interview with *Veronica Sullivan*
- ⁸⁵⁵ 2012. Thinking Outside the Box, *ShelfLife*, 18th Oct ed.
- ⁸⁵⁶ *Forfús Report* 2010. Future Skills Requirements of the Retail & Wholesale Sector to 2016. www.skillsireland.ie: Expert Group on Future skill needs.
- ⁸⁵⁷ 1999. The Dynamics of the Retail Sector in Ireland, *Forfús*
- ⁸⁵⁸ (paraphrased) 1999. The Dynamics of the Retail Sector in Ireland, *Forfús*
- ⁸⁵⁹ E.g. Ben Dunne was inspired by what he observed on visits to the US to launch supermarkets in Ireland in the 1960's. Fitzgerald, K. 1996. *Dunnes at the Crossroads*
- ⁸⁶⁰ Notable entries include Tesco, M&S and Iceland from the UK and Aldi and Lidl from Germany. The major Irish players Dunnes and Musgraves have also both expanded abroad.
- ⁸⁶¹ Pettit, T. 2003. Balance of Food Power Shifts, *Irish Examiner* Feb 6th ed.: 99
- ⁸⁶² 1999. The Dynamics of the Retail Sector in Ireland, November 1999 ed. *Forfús*; Ruddy, J. 2009. David Vs Goliath? *Checkout*. 35(2): 4

⁸⁶³ In conjunction with retailers increasing power, there are claims by suppliers that retailer margin has grown from 16 -17% in the 1980s to 25%-30% by the late noughties. Ruddy, J. 2009. David Vs Goliath? *Checkout*, 35(2): 4

⁸⁶⁴ 1999. The Dynamics of the Retail Sector in Ireland, November 1999 ed. *Forfús*; Personal interview with *Declan Carolan*

⁸⁶⁵ Personal interview with *Tara Buckley*.

CHAPTER 6 CROSS CASE ANALYSIS

6.1 INTRODUCTION

This chapter presents the within and cross case analysis of the Irish advertising and retail grocery industries. It explores and compares the results of analyzing the empirical case data for the purpose of building an understanding of the influence of ICT on the evolution of industries. The chapter derives its structure from the conceptual framework (first presented in Chapter 2), which has been updated to reflect the results of the analysis (see Figure 6.1 below).

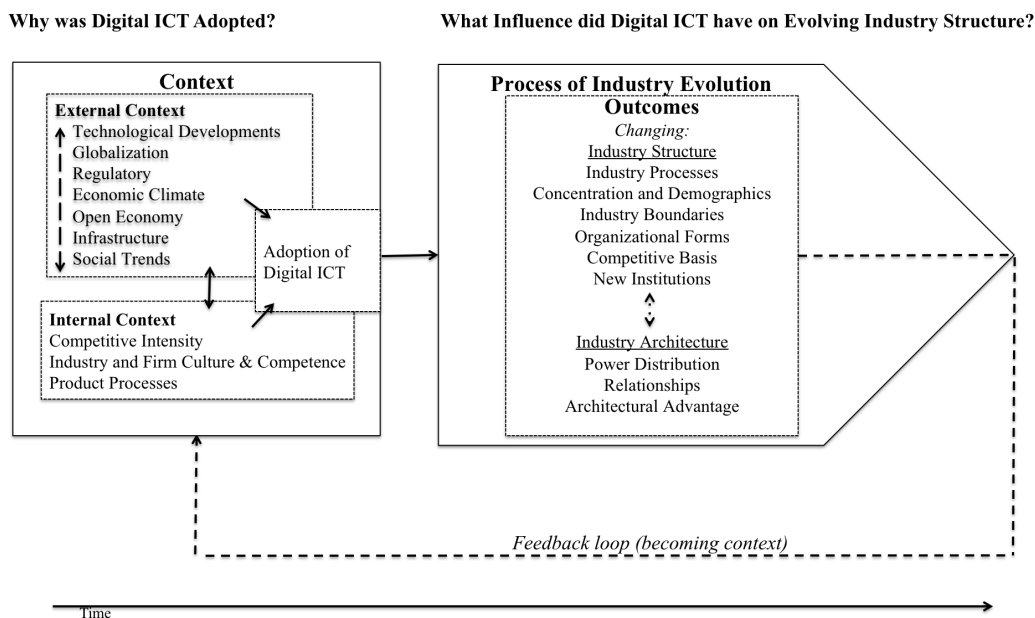


Figure 6-1: Conceptual Framework

The Chapter establishes how the case data speaks to addressing the overarching research question: How has digital ICT influenced industry evolution?

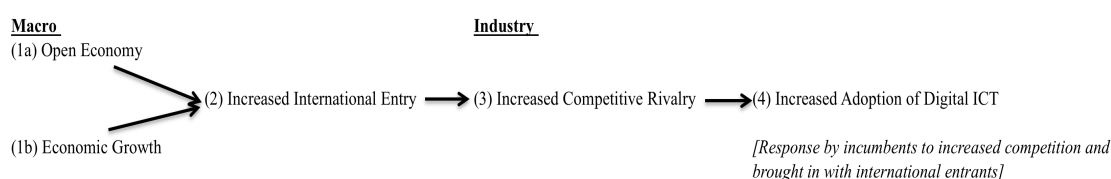
The Chapter is structured in two sections, addressing in sequence:

- Why was ICT adopted in the industries? Section 6.2 explores the influence of contextual factors in driving the adoption of ICT. This section is structured according to the major phases of diffusion of ICT in the industries echoing the chronology of the case studies.
- What influence did the adoption of ICT have on the industries? Section 6.3 addresses the key similarities and differences in patterns of the ICT influenced industry evolution outcomes.

The Chapter concludes with a summary reflection on the analysis.

6.2 THE ROLE OF CONTEXT IN DRIVING ICT ADOPTION

The external context encompasses the macro structure that the industry operates within, whilst internal context represents the structure and forces at play within the industry. External and internal contextual factors provided incentives to firms to adopt, extend and escalate their application of ICT. The analysis identified several common contextual factors, although there were differences in their degree and sometimes in their timing and manner of influence (e.g. direct or indirect). The boundaries between internal and external context are mutable. The interaction, combined impact and direct and indirect influence of contextual factors was evident in both industries (see Figure 6-2 example and [Appendix M](#) and [Appendix N](#)).



The combination of Economic Growth (1b) and Ireland's Open Economy (1a), attracted increased entry by International Entrants (2) to the industries, which increased Competitive Rivalry (3). Incumbents responded by adopting digital ICT to increase their competitive capabilities, additionally international entrants frequently brought superior digital ICT solutions with them. E.g. Tesco in retail grocery, and the multinational agency groups in the ad industry.

Figure 6-2: Example Interaction of Contextual Factors

Developments in ICT and the benefits and opportunities it offered was a key driver of its adoption in both industries. Other contextual factors such as regulations, the economic climate, Ireland's open economy, increasing internationalization, and social factors also influenced the propensity of players to adopt ICT solutions. These factors influenced the intensity of competitive rivalry in the industries and hence motivation for firms to adopt ICT. ICT was applied to processes, and some processes were more amenable for leveraging ICT solutions than others. Industry and firm culture and competencies also influenced the adoption and application of ICT in the industries.

ICT has continued to develop rapidly across the case period with new applications of technology emerging, along with significant improvements in its capabilities. There were three major phases of ICT diffusion identified in the case studies for each industry (see [Appendix O](#) and [Appendix P](#) for highlights of the process of diffusion in the advertising and retail grocery industry respectively). The timing of diffusion and key contextual factors driving the adoption of ICT in the industries are captured in a series of tables: Table 6.1, 6.2 and 6.3 representing each of the phases. Each table denotes key features of the phase for each industry and highlights comparisons and contrasts. The phase tables are presented and discussed in sequence below.

6.2.1 Phase 1: Back Office

Phase & Timeline	Advertising Industry:1972-1986	Retail Grocery: Late 1969 – 1980	Cross Case Comparison	
			Advertising Contrast	Grocery Contrast
Digital ICT Form	Computers: Mini Computers, PCs, Computer Bureau services, Databases, Ad Agency software.	Computers (Mainframe, Mini, PCs), Computer Bureau Services, Databases, Software.	General computing adoption.	
Applied to	Finance, accounting, administration functions and media analysis.	Accounting, wages, personnel, administration, stock control, goods inwards records, product pricing decisions and monitoring profitability status.	Back Office Tasks. Inform decisions particularly stock related (media in advertising). Improve management of profitability.	
Contextual Triggers	Increased accessibility and utility of ICT solutions. Recession and high inflation. Increased media supply. International entrants.	Increasing accessibility and known exemplars and advantages of ICT. International players. Price-based competition. Facilitation of self-service model and growth.	<p>Advertising Economic environment, increased need to manage profitability; Increased complexity of supply environment.</p> <p>Grocery Regulatory changes and self-service model increased competitive intensity. Pursuit of growth strategies.</p>	Increasing accessibility and utility of ICT. International players.
Instigated by	Accounts department. The two largest agencies are earliest adopters.	H. Williams a plc, and new breed of retailers associated with self-service multiples e.g. Superquinn	Large players/those ambitious to grow.	
Main Features and Outcomes	Process innovations, Product innovation (media services), Emergence of Media independents. International trend emerges. Financialization of industry begins.	Process innovations. Facilitate increased industry consolidation. Improve retailer bargaining power through information and growth. Increased capabilities. Expanded range of products sold.	<p>Advertising: Adoption instigated by functional area.</p> <p>Process Innovations —increased automation of and information from processes: Accounting, Payroll, stock management etc. Facilitated population changes (indirectly).</p>	<p>Grocery: Young firms with growth ambitions.</p>
			<p>Advertising: New types of agencies - beginning of structural fracture and financialization of industry. International entrants.</p>	<p>Grocery Increased consolidation and retailer bargaining power and competitive intensity. Expanded offering.</p>

Table 6-1: Phase 1 Context for ICT Adoption

6.2.1.1 Digital ICT Developments and Knowledge of Digital ICT Potential

Ireland being an island with a relatively low population, provided a level of protection to industry players from overseas competition. Industry trends, including the adoption of ICT, usually emerged later in Ireland⁸³ than in countries such as the US and the UK. Advertising agencies and retailers were influenced by the use of ICT solutions by players in other countries. Thus firms in Ireland could benefit from adopting 'proven-in-use' digital solutions, which had fallen in cost and improved in their fitness for purpose. They could avail of a growing and more confident technology knowledge base, including supplier support, making ICT a more attractive investment.

The awareness of the potential advantages gained through the application of ICT solutions encouraged firms to adopt them, this was common across all phases of diffusion. Across the researched period increased globalization and online ICT reduced the time gap between adoption of ICT elsewhere and Ireland (see [Appendix Q](#)).

The industries also influenced the development of ICT solutions, making ICT more effective. In the advertising industry, global solutions such as DDS and Telmar were initiated by ex-industry players. In the Irish advertising industry, Wilson Hartnell were involved in developing tailored software to support industry functions. The emergence of 'off-the-shelf' ICT solutions designed specifically for the industry e.g. Adpack, escalated the adoption of ICT in Irish advertising agencies in the 1st phase of ICT adoption in the industry.

In the retail grocery industry the development and selection of the barcode and development of related technologies⁸⁴ instigated by US retailers was a key ICT development which ultimately resulted in widespread application of ICT in industry processes. Barcode related solutions were not adopted in retail grocery in Ireland in the 1st phase of ICT adoption.

The first wave of diffusion delineated as 1972-1986 for advertising and 1969-1980 for retail grocery, began with firms applying computers to mainly generic business processes⁸⁵. In phase 1 ICT offered retailers and agencies opportunities to improve their information management capabilities, reduce costs, increase operational efficiency, and improve the effectiveness of processes. Both industries applied ICT to back office processes, such as finance, accounting, payroll and inventory management (media selection in advertising, i.e. activities characterized by high transaction numbers and costs). There was increased 'automation' of these processes, improving their efficiency. Tighter management of profitability was a key perceived benefit of ICT application for this period. In advertising this was achieved through more efficient issuing of invoices (especially for prefunded media buying) and tighter management of client accounts:

⁸³ A key exception to this was Superquinn's early pioneering position in loyalty cards in retail grocery. Superquinn were also a very early adopter of ERP (SAP).

⁸⁴ EPOS integrated with stock records etc.

⁸⁵ Processes that are common in all industries

'[ICT] made us profitable and it made us well run and well organized' (Frank Young of Wilson Hartnell). In retail grocery the use of ICT in this period enabled improved inventory management, and more informed price negotiations and price setting. In both industries the earliest adopters were larger firms with growth strategies.

6.2.1.2 Technological Developments, Globalization and an Open Economy

Globalization reflects the coalescing of several contextual factors, particularly technological and political. In the advertising industry globalization trends resulted in clients becoming increasingly multinational in focus, and agencies in-turn became multinational to pursue growth opportunities through servicing multinational clients. Globalization was both enabled by ICT and an incentive for the adoption and further development of ICT. Ireland's EU membership and open economy policy led to a trend of multinational acquisition of Irish agencies. International agencies brought a range of ICT systems with them, increasing the use of ICT in the industry. This necessitated increased engagement with ICT by incumbent Irish agencies.

There had always been a UK presence in the retail grocery industry; however, in phase 1 Power's Supermarkets (ABF) acquired Quinns, and Gubay brought his discount format to Ireland by launching 3 Guys. As in the advertising industry the retail 'international' players raised ICT capabilities in the Irish industry. 3 Guys' computers were feted for being central to enabling their inventory efficiency and low cost model. ABF had scale and experience advantages from the UK, and Quinns became noted for their effective use of computers.

6.2.1.3 Deviating Influences

Economic Climate

While the advertising industry can be viewed as the bellwether for the economy, the retail grocery industry is generally more immune to economic shocks. Harsh economic conditions acted as a catalyst for ad agencies to engage with ICT. In the early years of the case, recession and soaring inflation⁸⁶ encouraged ad agencies' initial adoption of computers, to achieve improved financial control and cost awareness as efficient cash-flow management became an imperative. The demise of O'Donnell Earle in 1974 provided a cautionary tale, and computer use offered increased transparency and timeliness of the availability of information. Media costs rocketed providing impetus for ad agencies to use computers in media analysis, as clients judged agencies on the effectiveness of their media spend. No strong evidence emerged linking economic recession with ICT adoption in the retail grocery industry for this phase.

⁸⁶ E.g. Inflation in Ireland for 1974 was 20%, but media inflation actually exceeded this. Inflation remained high in Ireland until the mid 1980s, only dropping below 5% in 1985. The intervening period had several years of double digit inflation.

Media Supply Complexity Increases

Across the case period technological developments along with deregulation (phase 2 & 3) of the media environment resulted in an ever-increasing media supply (see [Appendix J](#)), and hence audience fragmentation. Although the media supply increase for phase 1 was minimal relative to phase 2 and phase 3 (when media supply exploded thanks to online), a second television channel, a new newspaper and pirate radio stations represented a significant increase in media complexity at the time. A more complex media environment, a growing supply of media research, and increasingly accessible ICT solutions (e.g. via computer bureau) prompted ad agencies to adopt computers for use in their media services. ICT was applied in media research, analysis, buying and performance measurement.

The Regulatory Environment and a New Business Model

A series of regulations from 1955-1958 ([Appendix L](#)) were enablers of price-based competition in the retail grocery industry. This encouraged the proliferation of the self-service model and the operation of multiples, in turn providing further momentum for price-based competition. Co-ops and symbol groups were created in response to these trends. The self-service model was more complex but achieved higher turnover than counter service. Social/demographic trends such as population shifts to the suburbs provided growth opportunities for multiples. ICT offered opportunities to aid in reducing costs and in managing multiples and scale, imperatives to price-based strategies. Computing enabled growth strategies and could realize superior cost benefits for larger firms.

6.2.2 Phase 2: Production

Phase & Timeline	Advertising Industry 1986-1994	Retail Grocery Industry 1980 – 1999	Cross Case Comparison	
			Advertising	Retail grocery
Digital ICT Tools	Computer aided design (CAD – Apple Mac), Digital Printing: Media software solutions. (CRM-clients)	Electronic Point of Sale (EPOS) with Scanning. Loyalty Cards, Databases (data mining and analytics), Nascent EDI and self-scan.	Industry specific adoption.	
Applied to	Typesetting and Image Creative Process and Print Production and their integration. Increased use for media selection through data analysis. CRM databases were leveraged for direct marketing.	Integration of checkout with back-office records. Checkout process, cash management, product pricing, data mining, stock control, monitoring individual store performance, profitability and impact of innovations, CRM. Direct marketing. Informing retail strategy. MIS. Nascent Communications with Suppliers.	Computerization and Integration of production process. ICT improving 'production' or product offering. Data analytics. Decision making.	
Contextual Triggers	ICT solutions. Increasing breadth of competition and competitive rivalry (internationalization and marcoms). Increased media supply (through deregulation and technology developments).	Developments and exemplars and advantages of ICT implementations including barcode standard. Establishment of ANAI. Network effects - Sufficient number of products with barcodes. Multiples, self-service model and increasing number of products stocked. International entrants. Increased competitive rivalry. Grocery Order - Regulations to curb price based competition.	Potential for ICT application based on ICT development. Provides growth opportunities. Increased complexity of supply environment. Internationalization and increased competitive rivalry. Customer expectations. Regulatory influences.	
Instigators of Adoption	Creatives (CAD - Medium sized rather than largest agencies- Agencies with strong creative reputations: Des O'Meara's, Peter Owens, Irish International). Media Departments/Independents.	<ul style="list-style-type: none"> Article Numbering Association of Ireland (ANAI) established EPOS – Growing multiples: L&N, Quinnsworth, Superquinn and some independents (Dunnes an exception) EDI trials – Quinnsworth, Superquinn, and Dunnes Stores Loyalty cards scheme leveraging EPOS data - Superquinn Self-scan hand-held – Superquinn 	Advertising Functional areas	Retail Grocery Industry association created by leading retailers. Large and growing multiples with propensity for innovation. Superquinn a pioneer.
			Advertising:	Retail Grocery: Bar code Standard and network effects.

Phase & Timeline	Advertising Industry 1986-1994	Retail Grocery Industry 1980 – 1999	Cross Case Comparison	
			Advertising	Retail grocery
Main Features and Outcomes	<p>Product and process innovations. Changing skillsets. Media independents growing trend. Ad agencies become marketing communications agencies (acquisition activities due to growing competition from below the line activities particularly direct marketing). Relationship changing, client dependency reducing and agency power diminishing. Escalating internationalization, ownership of industry has changed. Financialization continues.</p>	<p>Process and product innovations. Facilitates increased industry consolidation. Increases retailer bargaining power through superior information and increasing scale. Increased capabilities. Changing skillsets. Expanded range of products sold.</p>	<p>Process and product innovations – transformation and increased automation and information. Expanded range of products. Changing industry jobs and skillsets, increased capabilities. Shifts in power. Growth ops for alternative organizational forms (media agencies, symbol groups). Increased internationalization.</p>	

Table 6-2: Phase 2 ICT Adoption

6.2.2.1 *The Development of ICT*

ICT solutions such as CAD and digital printing in advertising, and EPOS with scanning in retail grocery, enabled the application of ICT in industry 'production' processes. ICT was applied to enhance and extend capabilities in both industries. Irish players were aware of the potential advantages of adopting the technologies. In the advertising industry '*the creative guys when they heard about Apple Macs ..[said] we must have this*' (Barry Dooley). Specialist software solutions were regularly discussed and became '*part of the language of the agency media business...*' (Mandese & Kalish, 1989). EPOS was a regular topic in the retail grocery industry at conferences and in trade magazines.

CAD and digital printing were applied to image production in advertising. They speeded up processes and extended the creative possibilities (what was technically possible) and market for image based advertising.

In retail grocery the barcode enabled this phase, EPOS with scanning systems had improved and had fallen in cost and were applied in checkout and inventory management processes. EPOS provided opportunities for retailers to gain information advantages, reduce costs, improve the efficiency of operations, manage more extensive product ranges and improve in-store stock availability, and hence their 'product', and also enabled growth strategies. Computer use became visible in stores. Loyalty card schemes and self-scan shopping emerged from and were enabled by the application of EPOS. Loyalty schemes linked to EPOS enabled data mining and analytics informing direct marketing and retail strategies. The industry began to shift to managing by customer rather than product.

Significant investments in ICT were made by players in both industries, as ICT capability became a threshold competence. ICT application became embedded in service provision.

6.2.2.2 *Pursuit of Competitive Advantage*

In this period ICT was evidently applied in the pursuit of competitive advantages in both industries. In retail grocery Quinnsworth and Dunnes had become the largest players and operated nationwide. Superquinn sought to circumvent the major players' scale advantages. Superquinn had already switched from price to quality as their USP, and during this period gained a reputation for ICT innovation, through pioneering EPOS enabled loyalty schemes, and hand-held self-scan in their stores.

Retailers adopted ICT as a competitive response to other retailers. For example by 1996 Dunnes Stores had lost grocery market share to Quinnsworth and other retailers and were advised to make significant investments in ICT. Dunnes responded by appointing a Director of Information

Technology and Logistics and escalating their application of ICT. The wholesalers particularly Musgraves applied ICT in the operation of the symbol groups and encouraged and supported their retailers in use of ICT, e.g. Musgraves supplied their associated retailers with hand-held computers for use in stock ordering.

In the advertising industry agencies sought to use ICT as a source of differentiation. In full service agencies proprietary systems were flaunted for this purpose: *'this was a mixture of technology and hocus pocus, superior "ways in which we find the universal truth" versus other agencies'* (Breandan O'Broin, CDP). The early adoption of Apple Macs by an agency is likely to have provided short-term advantages, by enhancing the image of the agency in terms of its perceived coolness and its creative reputation. In media services the application of ICT was positioned as offering clients superior efficiency and effectiveness in media buying. Agencies announced their investments in computers. Clients were attracted by the potential for more cost effective media buying, and having sophisticated ICT systems conveyed a professional agency image. This combination aided the growth of the media agency model.

Multinational Players

Again in this period in both industries multinational players brought superior ICT solutions and prompted Irish players to seek to enhance their ICT capabilities. In the grocery industry when Tesco entered they were acknowledged as having superior systems to Quinns. Irish retailers had been preparing for an international entrant for a number of years, and this included improving their ICT capabilities. In the advertising industry agencies who had become part of multinational agencies leveraged their parent's ICT resources, indeed access to ICT became a driver of the internationalization of the Irish industry.

Regulatory Context

Regulatory changes influenced the adoption of ICT in both industries. In the retail grocery industry, when the Groceries Order of 1987 banned below cost selling, this reduced the intensity of price based competition, and encouraged retailers to distinguish themselves across a wider array of features including through leveraging ICT (e.g. as per Superquinn mentioned above).

In the advertising industry the deregulation of the media environment coupled with improvements in media related technology (printing, cable/satellite) increased media supply and audience fragmentation. The application of ICT was required to manage the growing complexity of the media environment.

6.2.2.3 Contrasts in Diffusion

In retail grocery the rising key multiple players (except Dunnes) and some independents, those with propensities for ICT were the earliest adopters of EPOS with scanning. Whilst, in the advertising

industry it was medium sized agencies, agencies with strong creative reputations who were the earliest adopters of CAD. Creatives in those agencies instigated its adoption. Whilst media agencies and media department staff championed more sophisticated use of ICT for media services in this phase.

There was quite a contrast in the duration of the diffusion of EPOS and CAD (the core industry specific ICT of this period) in the industries. The degree of adaptation required for respective implementation contributes to explaining this variance. Leveraging EPOS required integration (e.g. linking EPOS to stock systems and MIS) and had more endemic impact on processes, it required more complex adaptations. Retailers generally trialed EPOS in one store before proceeding with further rollout. Even by the end of the case retailers varied in their abilities to leverage their EPOS. In contrast, the impact of adopting CAD was isolated to creative and production processes and departments. Cost and the speed of development of the technologies was also a consideration. The functionality of EPOS systems improved throughout the period, and diffusion escalated towards the ends of the 1990s, as systems became more affordable and more suitable for smaller businesses.

Culture and Competence

In this phase the influence of culture and competence on ICT adoption became apparent at different levels in the industries: functional in advertising and firm level in retail grocery. Generally advertising agencies viewed the application of ICT as peripheral. Technology, was perceived as conflicting with creativity. However, the more quantitative inclined media departments saw ICT as becoming fundamental in the provision of media services. Media departments championed the application of ICT. However, it could be difficult to get funding for ICT within agencies⁸⁷, and several media independents emerged across this period.

In the retail grocery industry individual firm culture had a considerable impact on the adoption of ICT in the industry. Some retailers developed a reputation for early adoption, they constantly had their radar attuned to emerging trends, looking for opportunities to improve their business: the Superquinn management team '*effectively robbed any good idea that we could find anywhere in the world*' (Frank Murphy, Superquinn). There was deliberate development of a culture which encouraged innovation, and this in turn increased their capabilities to adopt ICT. A proportion of independent retailers also had a reputation for being early adopters of new trends and ICT. Some retailers were involved in ICT development.

Dunnes were labeled as digital laggards. However, Dunnes had resources that countered the earlier application of ICT by their competitors. Their primary business was the textile trade which delivered overall business margin advantages over grocers. Operating as a family owned unlimited

⁸⁷ 'The answer's no, now what was the question?' (an interviewee) was an attitude ascribed to agency finance departments.

company gave them strategic freedom. Dunnes had a reputation for being obsessed with costs. For example in the mid 1990's they were achieving lower labour costs than their competitors. Additionally their technophobia was not universal in application as they were early users of EDI with key suppliers, which provided opportunities to reduce administration costs.

Industry Institutions

In the retail grocery industry institutions were created to manage and to encourage the adoption of ICT related standards. 'ANAI⁸⁸' was created to promote the adoption of barcoding, as retailers required a minimum proportion of their suppliers' products to be barcoded to make scanning solutions viable. EAN were responsible for issuing EDI standards. ECR was created to reduce costs and increase efficiency along the supply chain, and ICT was considered to be a key enabler for these strategies. No equivalent advertising institutions emerged during this phase.

⁸⁸ Later it became GS1. EAN was the European version of ANAI.

6.2.3 Phase 3: Online and Communications along Supply Chain

Phase & Timeline	Advertising Industry 1994 - 2016	Retail Grocery Industry 2000 onwards	Cross Case Comparison	
			Advertising Variance	Retail Grocery Variance
Digital ICT Tools	Email, Internet and Web, Intranets. Digital engineering, data mining and analytics. Programmatic. <i>Market features:</i> Wi-Fi, mobile devices, applications, social networks etc.	Electronic Data Interchange (EDI), Internet and Web, Cloud Computing, Mobile devices, Self-scanning, Financial technology.	Communication tools.	
Applied to	Communications with clients and suppliers, and within agency groups. Research. Provision of extensive array of online marcoms services including media services.	Co-ordination of supply chains: Logistics, Integrated communication with suppliers. Increased automation of stock delivery and intake. Online grocery services. Customer service and communications.	Communication & co-ordination. Escalation in Analytics use. New channel – online services.	Grocery Extend span of control to distribution.
Contextual Triggers	ICT developments. Increased media supply. The multinationals. Demographics/infrastructure (decelerates). Economic climate. Social trends (audience online). New entrants, widened scope of competitive rivalry.	Development and exemplars of ICT implementations - Online technologies. Recessionary environment. Response to competitors including international hard discounter entrants. Social trends. Demographics decelerated online growth.	ICT developments particularly communications potential. Multinational presence. Recession. Demographics/infrastructure and social trends. New entrants.	
Instigators of Adoption	<ul style="list-style-type: none"> Online Services - Individual enthusiasts e.g. AFA's Stewart Fogarty. New entrants (Digital agencies), Media agencies. Online for communication and research (email & Internet): Arks medium to large agencies. 	<ul style="list-style-type: none"> Online Grocery services: Superquinn, Tesco and some independents. EDI for central distribution: Musgraves (Wholesalers, symbol group operators), Superquinn, Tesco. Self-scan Checkout – Tesco. 	Advertising Increasingly complex media supply environment and relationship with consumers. Economic boom delayed online service provision.	Advertising Online services: New players, Media agencies.
			Supply chain communications – Established players.	Grocery Online Services: Established players and new entrants seeking expanded access to market beyond physical presence.

Phase & Timeline	Advertising Industry 1994 - 2016	Retail Grocery Industry 2000 onwards	Cross Case Comparison	
			Advertising Variance	Retail Grocery Variance
Main Features and Outcomes	<p>Process innovations. Product innovations – Online Advertising. New types of firm enter the industry.</p> <p>Financialization leads to a change in the basis of ad agency remuneration. Relationship changed, clients hold balance of power in relationships. Internationalization and Media Independents an industry norm. Online advertising grows to challenge advertising via ‘traditional’ media. Change in skill profiles. Acquisitions of digital agencies by incumbents.</p>	<p>Process and Product innovations. Changes range of products sold. Facilitates increased industry consolidation. Retailers extend vertical scope (CD). Increases retailer bargaining power and control of supply chain. Increased capabilities. Changing skillsets. New channel – Online.</p>	<p>Process innovations (transformation, and increased automation and information) and Product innovations. Scope expanded. Power shifts</p> <p>Increased consolidation</p> <p>Jobs and skills change.</p> <p>Advertising</p> <p>Online ‘product’ challenges traditional services. New types of entrant. M&A activities. Clients and consumers gain power.</p>	<p>Online ‘product’ peripheral. Increased capabilities. Vertical scope extended.</p> <p>Grocery</p>

Table 6-3: Phase 3 ICT Adoption

6.2.3.1 ICT Developments

Larger established players were the instigators of the application of ICT to facilitate communications along the supply chain in both industries. In the advertising industry email was applied to communication with suppliers and clients (and also caused a stir in the direct marketing domain). In the grocery industry EDI and or/online was applied to communications along the supply chain. EDI was applied to enable central distribution (CD), this required extensive process adjustments representing a significant strategic move for industry players⁸⁹. Managing EDI became an online service which could be outsourced to third parties. EDI and CD in retail grocery and the use of email in advertising reduced costs and timescales and increased the efficiency of industry processes.

Online ICT led to the emergence of online advertising⁹⁰, and online retail grocery services. In both industries infrastructure issues delayed the growth of demand for online services. Inadequate online access slowed consumer adoption of online technologies and the growth of online markets. Increased consumer access to online through mobile devices, and hence market opportunities, increased online engagement by retail grocers and advertising agencies. However, in both industries it was more costly for incumbents to provide online services than traditional services.

Economic Climate

During the Celtic Tiger era a thriving economy meant that advertising spend was growing and this reduced the need for ad agencies to engage with the emerging online sector. However, as a result of the recession which hit Ireland in 2008 overall advertising spend fell. Financial reasons (the pursuit of growing online spend whilst spend on traditional services was dwindling), drove real escalation in providing online services to clients: *'...they had to do something because otherwise they just don't have a business it's as simple as that, it's do or die'* (Michael Cullen, interviewee).

The 2008 recession was harsh on retailers and caused them to seek economizing solutions. Retailers sought to leverage more from their existing technologies, and also increased their consideration of cost saving technology such as self-scanning, which became widely diffused. Investments in online escalated (including use of social media) as retailers pursued all potential avenues of revenue.

⁸⁹ Dunnes quasi form of CD required significantly less investment than full CD implementations.

⁹⁰ Also, frequently called digital advertising or interactive advertising.

6.2.3.2 *Contrasts*

Social Trends

Advertising needs to follow the audience (consumers), and the inexorable growth of consumers' use of online media increased the impetus for agencies to engage with online advertising services. Conversely consumers have generally been slower to use online grocery services. Consumer inertia contributed to this, they require a little proactivity to engage online grocery services. Other factors that slowed the growth of online grocery include: charges for the service; consumers preferring to select their own grocery products; and delivery options not congruent with consumers expectations. Ireland's relatively low population and dispersed population increased the challenges of physical delivery in regard to economic viability. In the advertising industry the online market grew to almost equal traditional revenue streams⁹¹, whilst in retail grocery it has remained peripheral. Hence whilst all the advertising agencies have scrambled to gain credibility in providing online services for clients, Tesco and some Supervalue⁹² were the only major players offering online grocery services in the Irish market.

Profile of Early Providers of Online Services

The provision of online services began later in retail grocery than in advertising. In the advertising industry it was generally new players and then media agencies who engaged with and promoted the growth of online advertising services⁹³. Established creative agencies were generally slower to engage, and frequently pursued building online competence through acquisition strategies (buying digital competence). The business model for online advertising was uncertain and required new capabilities.

The retail grocers had an online business model to copy which built on existing capabilities. Large incumbent players, Tesco and Superquinn along with some independents⁹⁴ in retail grocery were the early adopters of online grocery.

Whilst online service provision is widespread in advertising, in retail grocery three of the major players eschewed engaging with the online model. The increased cost of providing online services and the lack of market scale was not a good fit for the hard discounters. Ireland's demographics reduced the likelihood of an online only entrant in retail grocery. Delivery of the new product represented by online in both industries required process innovations.

⁹¹ Online accounted for 47.1% of the market in 2016, (2017. Digital Poised to Overtake Traditional Media Ad Spending in Ireland).

⁹² Superquinn had offered online services before their demise.

⁹³ AFA appear to be the exception to this.

⁹⁴ Particularly to extend their market beyond their limited physical presence (e.g. The Organic Supermarket)

The growth of online accelerated significantly in the advertising industry after 2008 and online spend grew to match 'traditional' advertising spend. Developments in online technology caused an explosion in online media supply and changed consumers media consumption habits, resulting in a very complex online media environment⁹⁵. Media agencies made significant investment in up-skilling for the provision of online services. Many incumbents more fully adopted online through the acquisition of digital agencies, this represented a form of ICT diffusion for the industry. Although online grew significantly year on year in retail grocery it started from a very low base and failed to challenge the traditional self-service business model. Retailers used online including social media to communicate with consumers.

Culture and Competence

Cultural attitudes and competencies influenced the adoption of ICT in both of the industries. Creative agencies lacked ICT based capabilities⁹⁶. Many initially outsourced their clients' online related requirements to third parties. They were perceived as lacking the capabilities to provide online services to clients. Media agencies who relied heavily on ICT for the provision of their core services, and new digital agencies, were generally perceived as engaging in and successfully building better proficiency in online advertising.

Incumbent 'creative' agencies struggled to successfully integrate online advertising into their services. There is evidence of a bias within the creative industry against technology. Senior creatives within agencies could obstruct online application. The Irish advertising industry has been accused of lacking confidence and being inherently conservative⁹⁷. Agencies have traditionally had linear processes⁹⁸, whilst online advertising requires a different approach. Online spans the domains of BOE (bought, owned, earned) marcoms, but traditional agencies are structured to specialize within each stream not across them. Generally, the internationalization of the industry increased the impetus of ICT adoption; however, Irish based scions of multinational agencies may have been waiting for their parents to up-skill in online advertising before they engaged with it. Online marcoms requires a highly technical and evolving skillset that was challenging for agencies to develop, particularly as there were skill shortages in the area. All of these factors acted as barriers to creative agencies building competencies in online advertising. Crucially, it is far less challenging to apply ICT to well defined processes/routines, than to 'black box' processes such as 'creativity'.

⁹⁵ Although programmatic buying has been developed to tame the environment, the online media environment has not been mastered.

⁹⁶ Digital ICT was seen as supporting processes and the running of the agency but was not core to the agency product - 'creativity'.

⁹⁷ The global industry was perceived as incredibly slow to engage with the new media of TV when it emerged as a media channel. Additionally the industry appears to be extraordinarily self-critical, agencies denigrate other players' understanding of online and the quality of work emerging.

⁹⁸ The 'product' progresses as it is passed on from one section to another within the agencies.

The influence of culture and competence were apparent at firm level in retail grocery. The early providers of online retail grocery services and/or central distribution were the players perceived as having a culture of innovation and strong ICT competence e.g. Superquinn, Tesco and Musgraves. However, retailers did not need to be early adopters of ICT to be successful: neither Aldi nor Lidl are recognized as early adopters. Proficient application of ICT along with opportune timing appeared to be more important to success. While late adoption strategies had risks, they could also deliver advantages, as retailers benefitted from lower investment costs, more mature and therefore useful technologies, and a high degree of industry expertise, which increased the likelihood of a successful ICT implementation. During this phase the Dunnes family directors were described as technophobic, and they were still perceived as lacking strong ICT capabilities: e.g. *'Dunnes don't have and never had the ability to analyse their data'* (Frank, Murphy, Superquinn). They did not adopt ICT for online grocery, or adopt true central distribution, despite repeatedly exploring these opportunities.

Trade Associations

The trade association IAB was established in Ireland during this phase, however, it did not emerge as having played a defining role in driving or aiding the adoption of online advertising. Although, it has the potential to inform agencies and encourage improvements in the provision of online advertising services. Grocery related trade associations played a more influential role in promoting the adoption of ICT in the industry, including in this phase the widespread use of EDI along supply chains. EDI use could fulfill ECR aims of increasing efficiency reducing cost and improving service.

6.2.3.3 Industry 'Product' Characteristics

Characteristics of the industries' products/services influenced the adoption of ICT. Processes capable of being highly routinized and those involving high numbers of transactions were attractive candidates for ICT application e.g. the production of accounts and payroll in both industries, stock management in retail grocery, and media services in advertising. The potential specificity of information requirements to enable processes correlated with opportunities to leverage ICT. Although online is an enabler of myriad creative communication opportunities, the processes required for effective creativity in advertising remained opaque and therefore resistant to routinization. This contributed to creative agencies' hesitancy in engaging with online advertising⁹⁹. The fast pace of evolution in the online environment made it difficult for agencies to keep pace with its potential.

⁹⁹ ICT is applied in the production of creative messages e.g. CAD has been applied to rendering creative images. However neither CAD nor other digital ICT solutions directly produce the creative idea/inspiration that advertisements communicate.

6.2.4 Context Analysis Conclusion.

The cases illustrate that the phases of adoption of ICT were not neat discrete episodes. They were more representative of gradual shifts in emphasis, particularly in retail grocery where diffusion of previous phase ICT solutions continued within new phases. The delineated phase time-periods do not capture this late adoption, they focus on the application of key ICT solutions by significant industry players and diffusion tipping points.

All phases in both industries included a deepening use of ICT from previous phases. New developments in existing applications resulted in increasing sophistication and potentially expanded application of the technologies in further processes and products in later phases. Integration between ICT solutions increased across the phases and was key to the increasing utility gained through its application¹⁰⁰. Whilst contextual factors are generally discussed separately, they acted and reacted in confluence across levels, and their various influences cannot actually be disaggregated. There were concurrent contextual influences and iterative relationships between contextual factors (structure) and firm's responses (action).

ICT solutions were generally used in a small number of processes before being applied more extensively (e.g. general computing, EDI in retail, and in online services in advertising where ICT developments kept extending opportunities). Phased adoption is particularly evident in the retail grocery industry where customer-facing solutions in grocery were generally trialed in one store before full rollout occurred. There could be a lapse of years between initial trial and further rollout (e.g. scanning, EDI). There was co-development of ICT solutions and industry applications of it. Indeed, some industry participants were involved in the development of and improvement of ICT solutions for their industries.

Several commonalities were observed between the industries with regard to diffusion processes. Across the phases the industries applied ICT for similar purposes despite industry differences. Large firms in both industries were early adopters of ICT that enabled growth strategies and/or simplified the management of scale. There was mirroring between the application of ICT to stock management in grocery and the provision of media services in advertising, including ICT enabling the management of scale to achieve improved bargaining power, and the use of data mining and analytics for more effective selection of stock/media.

In both industries the regulatory context influenced the adoption of ICT. Regulatory changes which encouraged price based competition in retail grocery, and deregulation which encouraged a more complex media environment, increased the impetus for ICT adoption.

¹⁰⁰ The barcode in retail grocery was a crucial enabler of integration of systems along the supply chain.

The prevailing economic climate influenced the adoption and leverage of ICT solutions. Harsh economic climates reduced industry revenue and increased competitive rivalry and hence players interest in leveraging ICT solutions. This influence was more pronounced in the advertising industry than in retail grocery. In periods of economic growth, market growth coupled with Ireland's open economy attracted international entrants, and this increased propensities for the application of ICT in the industries.

The influence of demand conditions were again apparent in the outcome of the contrast in social trends between online media adoption and online grocery shopping. All agencies offer an array of online advertising services whilst the provision of online grocery service was very far from universal.

Across the case the struggle for survival has prompted firms to apply ICT to improve the operation of their businesses. In both industries firms adopted ICT to improve their competitive and adaptive capabilities in response to contextual change. Firms application of ICT to improve their competitive capabilities, prompted competitors to utilize ICT to gain these benefits and remain viable.

The adoption of ICT enabled firms to improve their capabilities in terms of information management and production (including: creative production potentialities and media buying and analysis in advertising; and product range and availability, and logistics in grocery), leading to greater efficiency and in many cases the effectiveness of processes, as had been evident in other industries and/or in their industry globally.

Firms adopted ICT to improve their financial management, to differentiate their service capabilities, to pursue growth strategies and revenue opportunities in the online domain. Firms applied ICT to reduce costs and increase efficiency. The application of ICT enabled agencies to reduce head count and thus reduce labour costs¹⁰¹ and enabled retailers to eschew individually price labelling products¹⁰². Advertising agencies also adopted ICT to qualify as contenders in pitching for clients, and to appear as cool and modern. Particularly in the retail grocery industry and for media independents, ICT enabled the management of increasing complexity and the realization of economies of scale. In retail grocery it also enabled economies of scope through enabling the management of a wider product range allowing retailers to benefit from improved overall margin. In advertising, it enabled expanded geographic and service scope, easing administration overheads through shared resources. It enabled agencies to compete in the wider marcoms industry and increasingly with new types of entrants to the industry.

¹⁰¹ In certain areas jobs disappeared (typesetting), or required staff numbers were greatly reduced (secretarial and production) or jobs were outsourced (photography).

¹⁰² A laborious and time consuming task.

The nature of the industry products and processes influenced ICT adoption. Processes where the application of ICT could bring evident advantages, such as those featuring high transaction numbers, encouraged ICT adoption. These were processes where the information requirements for success could be specified. In advertising the strategic importance of ICT has generally been largely overlooked, except for in the media independents and in the latter part of the case with the emergence of online advertising.

Cultural and competence characteristics influenced the adoption of ICT in both industries. This is apparent across sectors in advertising whilst it manifests at firm level in retail grocery. In advertising, a cultural attitude of skepticism towards technology, coupled with conservatism, particularly within creative agencies, contributed to incumbents' reluctance to fully engage with online advertising services until forced by a hostile competitive environment. However, ICT has been a core resource for media agencies to deliver their services, and media agencies were generally deemed more proactive in engaging with online¹⁰³.

In retail grocery there was relative consistency in early adopter cohorts, suggesting that these companies had a culture which promoted innovation through ICT. Superquinn and Tesco exemplified digital enthusiasm in contrast to Dunnes. In advertising the firms who were early adopters varied solution by solution, and the locus of impetus within agencies also shifted e.g. accountants instigated the initial adoption of computers, whilst creative departments drove the adoption of Apple Macs.

The adoption pattern across industry players was determined by resources and capabilities¹⁰⁴. Larger players had the resources to invest in technologies such as computing and often would derive increased ROI due to scale efficiencies. In grocery, Superquinn were an habitual early adopter to enable growth and to enable them to overcome scale disadvantages relative to larger competitors. Advertising agencies with strong creative reputations were the earliest adopters of CAD. The diffusion pattern of ICT across all phases in retail grocery suggests that ICT has been an evolutionary technology, whilst in advertising the diffusion pattern related to online advertising suggests that it is a revolutionary technology and competence destroying for the industry. Agencies were challenged to leverage the relentless developments in the online landscape: online potential exceeded the capabilities of agencies.

¹⁰³ Product characteristics also plays a role here.

¹⁰⁴ Joining symbol groups gave independents access to the resources and capabilities that enabled them to adopt ICT solutions.

6.3 INDUSTRY OUTCOMES AS INFLUENCED BY DIGITAL ICT

Outcomes	Advertising Industry	Retail Grocery Industry
<i>Structural Indicators</i>		
Industry Processes	ICT endemic in processes – changed routines & capabilities	ICT endemic in processes – changed routines & capabilities
Industry Concentration	Consolidated	Consolidated
Industry Boundaries	Expanded	Expanded
Industry Population	Turbulence	Turbulence
Competitive Basis	Rules changed – emergence of price-based competition. Increased threshold capabilities.	Increased price-based and service-based competition and threshold capabilities.
<i>Architectural Indicators</i>		
Industry Scope	Expanded	Expanded
Bargaining Power	Weakened	Strengthened
Relationship with other actors	Increasingly Transactional	Transactional
Architectural Advantage	Diminished	Strengthened

Table 6-4: Comparison of ICT Influenced Industry Evolution Outcomes

The Table 6-4 captures a high-level comparison of ICT influenced industry outcomes. Several common patterns were observed, including:

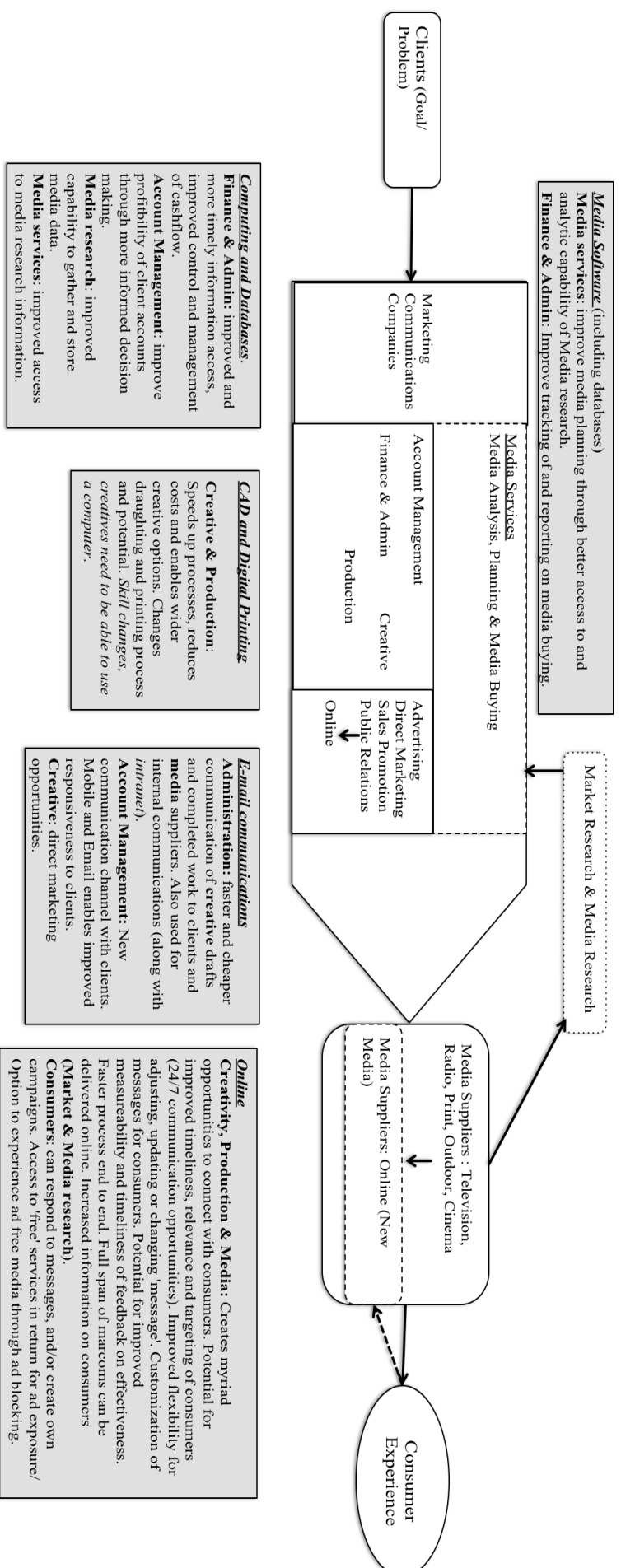
- processes changed - significantly changing industry routines
- changing capabilities
- increasing consolidation
- expanding industry scope and boundaries
- changing the nature of competition
- shifting bargaining power and architectural advantage

While there is high-level congruence in patterns there were differences in degree and direction within these patterns. Retailers acquired increased bargaining power and architectural advantages through the application of ICT, while ICT influences resulted in reduced architectural advantage for advertising agencies, and weakened relationships and bargaining power with their clients. In both industries power and architectural advantage shifted from suppliers¹⁰⁵. In retail grocery there was a gradual changing and increasing of industry standards and capabilities, whilst in the advertising industry new rules of competition emerged and agencies required new capabilities which did not appear to naturally complement their ‘traditional’ abilities. The online channel grew to prominence in the advertising industry whilst it remained peripheral¹⁰⁶ in the retail grocery industry.

¹⁰⁵ I.e. shifting from manufacturers/suppliers to retailers in retail grocery, and from media suppliers to agencies and from ad agencies to their clients in the ad industry. The shift is in the same direction.

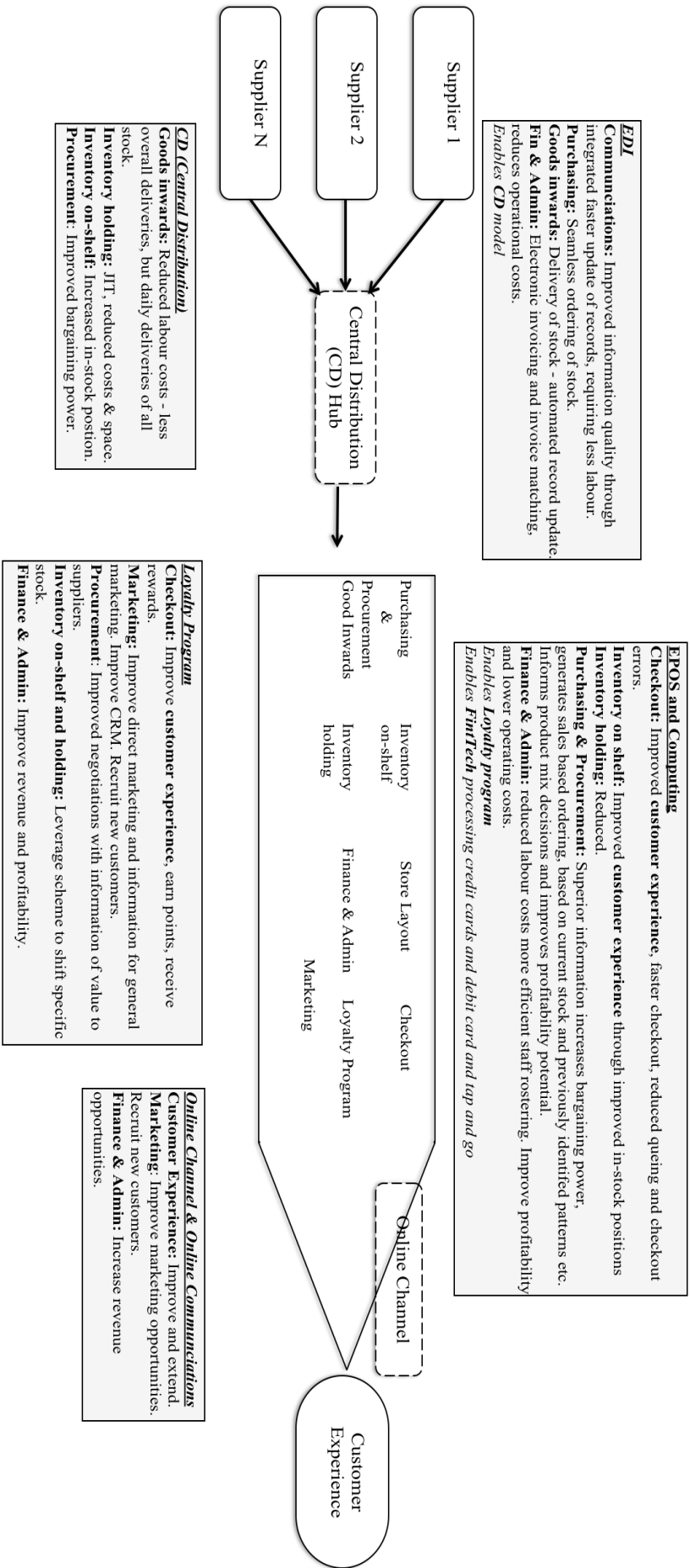
¹⁰⁶ However, online grocery is growing fast (25% in 2015 (McLoughlin, 2016, independent.ie 2nd Oct)), and expectations are that it will become very significant for the industry.

6.3.1 Industry Processes



The central white arrowed box displays key functions in the industry and that firms in the advertising industry provide an array of marketing communication services. The partially dashed line around the media function represents the disaggregation of this function from within agencies during the case. The grey boxes list applied ICT and potential advantages for agency functions. The dashed line around media and market research indicates that specialist firms create a significant amount of this function, however agencies also do this to an extent. The dotted arrows to and from Consumer Experience indicate this is a new channel of communication to consumers and that consumers have substantial opportunities to be proactive rather than merely passive in this channel.

Figure 6-3: Advertising Industry Functions and Potential Advantages of ICT Adoption



The white boxes are representative of simplified functions in the industry. The grey boxes list applied ICT and potential advantages for functions listed in the central arrow. Central Distribution and Online are in dashed edged boxes indicating that these are new functions. CD represents vertical integration, whilst online represents a new channel which spans the stores physical boundary to interface with consumers. Ultimately all activities cumulatively create the customer experience

Figure 6-4: Retail Grocery Industry Functions and Potential Advantages of ICT Adoption

Strategies and tactics including growth, low cost and differentiation strategies, were implemented through the application of ICT to processes. Across the case periods ICT was applied to an increasing number of work processes, changing how work was done.

The two diagrams Figure 6.3 for the advertising industry and Figure 6.4 for the retail grocery industry display major functions and key ICT linked with potential benefits of adoption of ICT within the industries. ICT was applied in processes for these functions, and process changes enhanced firm and industry capabilities, and cumulatively influenced structural and architectural changes.

6.3.1.1 Competencies: Jobs & Skills

The use of ICT in industry processes changed competence and skillset requirements in the industries. Digital literacy became a requirement. In the advertising industry several roles became defunct or were greatly reduced as ICT enabled other existing personnel to up-skill or as ICT itself performed the work in lieu¹⁰⁷. Through the use of CAD, a craft was deemed to have become a technical skill. The early periods of agency use of computers coincided with a reduction in agency staff numbers. The emergence of online advertising led to such significant changes in ‘how’ work was done that it changed the profile of agency staff. It created new departments and roles in the agencies, of a very definite technological bent causing the industry to hire staff with very different skill profiles. Providing online related services was very labour intensive, and the growth of jobs in the industry since the 2008 recession, was related to online services, particularly in media agencies.

In the retail grocery industry there were constant fears of ICT replacing jobs; however, the number of jobs in the industry increased as more ICT was deployed and the services provided by retailers expanded. There was a significant increase in the number of employees and in worker productivity as measured by revenue. Employees were expected to adapt to using new technologies in delivering services e.g. checkout workers had to adapt to scanning, processing credit and debit card payments, updating loyalty cards, managing self-scan checkouts, and contactless payment transactions. There has been evolution in the competencies/roles/tasks within traditional departments like finance and accounting, human resources and procurement. Also, new departments emerged such as those related to managing IT, loyalty schemes, providing online grocery services and online relationship management. The need for more specialized staff also increased as retailers increased in size and complexity.

6.3.1.2 Faster Paced Industries

ICT use significantly increased the speed of many processes and reduced their cost. The advertising business speeded up. The use of ICT invariably and progressively shortened lead times and

¹⁰⁷ E.g. Finished Artists, Typists and Secretaries, Porters

consequently increased time pressures within agencies. The increased pace and connectivity enabled by ICT raised the expectation of clients for faster turnaround and immediate responses from agencies. In retail grocery the pace and frequency of industry processes changed e.g. JIT inventory in stores.

6.3.1.3 Power Shifts

Power shifts emerged as new work practises emerged within and through ICT enabled process changes. In advertising the adoption of software imposed structure on agency processes and gave power to the accountants in the agencies. E.g. approval from finance was now required before expenses were incurred by creatives and account managers. The adoption of CAD and digital printing caused a shift in the importance of images in the creative process and resulted in a power shift from copywriters (verbal) to art directors (visual) within the creative departments.

In retail grocery the pervasiveness of ICT influenced the level of autonomy of staff. Depending on proclivities of top management, it either increased or decreased a store manager's responsibilities, through decentralization or centralization of tasks.

6.3.1.4 Capabilities and Competition

The application of ICT increased player's capabilities to manage their resources, pursue strategies, operate more effectively, profitably and be more responsive to market changes and hence aided their survival. ICT increased the efficiency and in many cases the effectiveness of services and cumulatively benefited clients/customers. ICT could be applied to deliver advantages along the industry value chain.

Processes entailed in the 'creation' of advertising changed including: the production processes for media; the communication processes via media; how media is booked etc. How outputs are produced has changed, and the outputs have changed in terms of style, sophistication, format and scope. ICT was an enabler of expanded creative opportunities and for media agencies to manage scale and a far more complex media environment. However, no ICT has been developed/could be applied to ensure that the creative process produced effective advertising. ICT was a key enabler in the growth, operation and expanded scope of the multiples and the symbol groups, and in aiding the improvement of symbol members' capabilities.

Achieving long-term competitive advantages solely through the application of ICT was unlikely, as other industry competitors could adopt or develop similar systems. Over time most applications of ICT in the industries became ubiquitous, an indication that agencies and retailers required the ICT to remain viable. However, firms varied in their effective leveraging of ICT. The characteristics, resources, capabilities and strategies of individual companies impacted the benefits firms achieved through the implementation of ICT, e.g. the utility retailers gained from their EPOS systems varied:

‘some retailers use it in 5th gear, some in 1st’ (Buckley, 2017), as did advertising agencies’ proficiency in deliver of online services.

The superior application of ICT in delivering media services had the potential to bring competitive advantage to media agencies by delivering superior services to clients i.e. being a better media agency. A reputation for capabilities in the online arena could provide agencies with competitive advantages. Clients craved direction in regard to online as the ‘rules’ of the game were still emerging. In retail grocery not all retailers adopted loyalty schemes, and there were variances in retailers’ leveraging of their loyalty scheme data and consequent development of retailers related marketing capabilities. ICT became a threshold resource; however, it was possible to achieve long-term advantages through the superior use of ICT resources.

The application of ICT resulted in ad agencies facing wider competition, and in price-based competition becoming a constituent in winning clients. There were concerns that the legacy structures of ad agencies were not appropriate in the ‘new’ environment and globally there was experimentation in new structures of ‘ad’ agencies. The established global marcom groups expanded their portfolios and made serious investments in digital technology and technology companies, and were intent on morphing/restructuring.

ICT altered and created new industry processes, changing how work was done, i.e. industry routines. ICT increased and expanded capabilities in both industries and enabled more effective management of resources. The cumulative impact of process changes was significant. It contracted timescales and changed industry services and the costs of providing and managing them. It reduced labour content in many tasks, but also created new tasks and increased the overall complexity of services, leading to a greater need for administrative functions. The autonomy of workers was impacted. Required skillsets changed in both industries, but to a more significant extent in advertising. ICT enabled the implementation of strategies through changing processes and the superior application of ICT solutions could achieve competitive advantages for firms.

Bottom up change is evident, the ICT driven process changes enabled increased industry concentration, expanded and changed firms and industry boundaries, and changed relationships and architectural advantage.

6.3.2 Industry Consolidation

Consolidation of both industries increased; however, the shift was greater in retail grocery than in advertising. The grocery industry went from being highly fragmented to highly consolidated (as at 2016 the 3 largest players in the industry had captured 74% of the market). The application of ICT was an enabler for growth in terms of the number and size of stores managed and the number of product lines stocked, thus enabling the emergence of a highly concentrated industry. In both

industries increasing scale delivered improved bargaining power with suppliers. Symbol groups allowed independent retailers to access scale advantages. The significant market share gained by symbol groups in Ireland is an unusual phenomenon, enabled by the combination of ICT and a favorable regulatory environment. In advertising, media services became completely dominated by the large players. No new media agency emerged (besides for online) in the latter period of the case, as scale had become essential. Although the creative side of the industry is also highly consolidated, the inability to automate creativity, along with clients sometimes perceiving smaller/newer agencies as having superior creative capabilities was a limiting factor to scale advantages delivered through ICT.

6.3.3 Firm and Industry Boundaries

ICT influenced changes in firm and industry boundaries. The scope of services/products provided expanded in both industries, e.g. the provision of online services. The extent of change was so significant it influenced the identity of the industries. The advertising industry became the marketing communications industry with agencies providing services across the spectrum of marcoms. However, media services were disaggregated through the emergence of media agencies (a new group) reflecting a key change in firm boundaries within the industry. Retailers expanded their scope horizontally through the assortment of products/services provided, far beyond their concentration on ambient goods at the beginning of the case, and vertically through central distribution (CD).

ICT enabled both disintermediation and an increase in intermediaries in the industries. In the advertising industry clients may deal directly with such online media giants as Google (disintermediation). However, a range of new intermediaries have emerged, distributors for CD and online in retail, and for the provision of online services in the advertising industry. The changes in industry boundaries and in the scope of activities, reflect structural and architectural change.

6.3.3.1 Expanded Scope

The Advertising Industry becomes the Marketing Communications Industry

Advertising was subsumed into the marcoms industry, reflecting an industry 'boundary' change. The influence of ICT is evident in:

- The financialization of business: As the application of ICT spread across industries, improved financial information and control led clients to increasingly seek quantifiable effects from their marcoms investments. Activities such as sales promotion and direct marketing produced more immediate and measureable returns than advertising. This made them attractive options for marketing managers who came under increasing 'accountability' pressure as finance gained greater prominence in their companies.

- ICT enabled increased media supply resulting in audience fragmentation. This reduced the perceived effectiveness of advertising spend, and led to client's increased consideration of wider marcoms options.
- ICT was a key enabler for the significant growth of direct marketing through databases, data processing and telecommunications developments, thus challenging the dominance of advertising in the marcoms mix.
- Online spans BOE and hence blurs distinctions between various marcoms 'disciplines'.

Mergers and takeovers with/of established below the line service providers occurred as advertising agencies rebranded themselves as marcoms agencies in response to changes in client spending. The agency client pitch became *'integrated marketing communications'*¹⁰⁸ and brand management. Also, in response to the reduced dominance of advertising¹⁰⁹ in the marcoms mix and hence diminishing agency revenue agencies pitched 'account planning' as the USP of advertising agencies. So, ICT had an indirect influence in changing the perceived role of agencies from making ads to developing brands.

Advertising agencies aggregated services to become marcoms agencies, and online services have now been included in the array of services provided by them. For a time during the case, after the emergence of media independents, media services were considered as a separate industry; however, due in part to the tight integration required for the provision of online marcoms services and 'media' independents providing online creative services, media service providers identify themselves as being in the marcoms industry. A variety of sectors emerged in the industry, spanning multinational marcoms groups with their associated 'independent' media agencies, Irish agencies and digital agencies, adtech companies and management consultants¹¹⁰ and variations in between.

Retail Grocery Range Expands

ICT application enabled retailers to identify the most profitable categories and products. It informed category management decisions including the selection of retailer own brand product categories (another extension in retailer scope). Coupled with decision-support and modeling capabilities the adoption of scanning enabled retailers to vastly increase the assortment of stock

¹⁰⁸ In practice siloed approaches to marketing communications dominated in agencies, which were generally structured to have separate companies for each marketing communications specialty, to diminish the impact of the non-competing client rules.

¹⁰⁹ It is suggested that the industry really needs to stop differentiating advertising from other forms of creative marketing communications, and stop structuring agencies across these 'manufactured' differences in specialties, across BOE dimensions. The demarcations are hindering agency adaptability and a disservice to clients who more than ever require holistic communications.

¹¹⁰ Rothco was recently acquired by Accenture (Taylor and Slattery, 2017)

carried. ICT also enabled retailers to provide ancillary services to consumers. Industry revenue from non-grocery products had grown significantly¹¹¹.

Reconfigured Supply Chains

In the advertising industry the separation of the provision of creative and media services for clients, was an important change with unintended consequences (see Competitive Basis section). ICT was a significant enabler of the emergence of media independents, through media fragmentation and the availability of media research and management software. ICT capabilities gave media agencies legitimacy.

Retailers took over the responsibility for product delivery from manufacturers, extending their upstream vertical scope. Central distribution (CD) required retailers to ramp up their adoption of EDI and ERP systems. Direct store delivery became the exception and CD or hybrids of CD accounted for over 90% of supply chain volume. Suppliers had less opportunity to influence store orders and CD made it harder for smaller suppliers to participate in the industry. CD extended competition between retailers vertically.

Relocating and Outsourcing Work

ICT was used to outsource or relocate work. In retail grocery Tesco migrated ICT support services and head office services out of Ireland and moved much of the buying responsibility to the UK thus reducing support headcount in Ireland and realizing cost savings. The adoption of ICT could change or create new processes and retailers made decisions whether to outsource or operate these in-house e.g. Dunnes contracted the operation of their implementation of hybrid CD to several logistics companies.

In the advertising industry incumbent agencies initially outsourced online related services for their clients, and many online specialist contractors have continued to thrive. Some of the agencies also outsourced their IT departments e.g. Ogilvy and Mather.

New Channel - Online Services

The emergence of online represented a new market channel for the industries and new infrastructure and processes emerged to support it. Online extended the scope of retailer services beyond the boundaries of retail physical properties. As a business model, online remained peripheral in retail grocery. Cost effectiveness was challenging in its provision. So far in retail grocery, online ICT had more significant influence in business-to-business, internal processes, and marcoms.

In the advertising industry new ad agencies (digital agencies) and media agencies were generally

¹¹¹ It was 30% by 2006 (Competition Authority, 2008)

deemed more successful in developing digital advertising capabilities. Providing online marcoms required new skillsets and processes. As online media took increasing amounts of marketing spend, incumbent advertising agencies acquired or merged with digital advertising agencies to boost their online credentials and capabilities.

6.3.3.2 Industry Population

Entry

There was significant population turbulence across the period studied in both industries. ICT made industry boundaries more porous, and new types of players entered the industries.

ICT and in particular online provided the opportunity for new types of competitors to enter the advertising industry: digital agencies, data led agencies, and management consultants. Digital media providers such as Google and Facebook work with advertising agencies but they also work directly with the clients of ad agencies. Globally several clients established in-house agencies¹¹², although they will still use outside agencies for some services. Thus agencies faced a wider array of competition.

In retail grocery the threshold capabilities required became more extensive, and consumers' expectations increased. The widespread adoption of CD changed the supply landscape and industry entry barriers. It became challenging for a new entrant to establish a viable supply chain, unless entering at significant scale or via a symbol group. However, compliance with required standards was eased through ICT solutions and entry via a symbol group which provided access to retail and ICT expertise and product supply.

There was potential for new entrants in online as occurred in the UK; however, incumbent retail grocers had advantages in establishing online services and Ireland's demographics created viability challenges. 'Buymie' a new intermediary type emerged offering online grocery services from local grocery stores, in Dublin where there was high population concentration.

Internationalization

The use of ICT increased the ease of geographic expansion enabling increased internationalization of the industries. The advertising industry became dominated by the giant multinational marcoms groups. By 2016 international grocery retailers had more than 40% of the Irish market. ICT enabled

¹¹² In Ireland Ryanair is amongst the clients who are using the in-house agency structure. Clients are also taking more of their digital marketing communications in-house. A HBR article investigated this trend in 2015 and found Clients thought agencies were too slow because of their structures, too focused on advertising, there were questions regarding their digital competence also clients wanted to be closer to the data and their consumers and 'continuity has become more important than campaigns' (Schaefer, M. W. 2015. 6 Reasons Marketing Is Moving In-House, Harvard Business Review, July 30th ed. [https://hbr.org/2015/07/6-reasons-marketing-is-moving-in-house.](https://hbr.org/2015/07/6-reasons-marketing-is-moving-in-house))

retailers to manage multiple geographic markets and there were economies of scale available in buying, in administration and in the application of ICT.

Access to ICT was a spur in driving Irish agencies to consider forming international alliances¹¹³, *'owners were thinking, it will take a big investment, we don't really know about it, and income is shrinking'* (O'Broin, 2014). There is concomitance between the increasing internationalization of the Irish advertising industry and the increased embedding of ICT in both Irish and global agency processes. Scale-based competition (buying power) and the need for significant ICT investments to provide services to clients for a more complex media environment made international affiliations particularly attractive for media agencies¹¹⁴.

Exits

ICT led to tougher competition in both industries and several firms exited, including some key players through acquisition. There was a significant reduction in the number of grocery retailers across the period. The vast majority (89%) of remaining independent grocers joined symbol groups. The number of IAPI agencies and industry employees¹¹⁵ increased, largely due to media separation and online advertising. However, at the beginning of the case the industry was characterized as being both Irish and family owned, however, none of the large or medium sized agencies survived. Many of them were acquired by the multinational marcom groups. The change in the basis of agency remuneration also encouraged agencies to exit the industry¹¹⁶ e.g. Doherty Advertising collapsed and CDP sold out.

In retail grocery Dunnes Stores were the only major multiple to survive intact across the period. ICT was a driver of increasing standards and competitive intensity. Some retailers were better than others at keeping up with trends, and those who failed to adopt ICT or left the adoption of ICT too late may not have survived as more digitally competent competitors benefited from ICT enabled advantages.

Not all ICT adoption was successful. ICT investments represent strategic decisions and carry consequences for the companies. H. William's early adoption of computers was not a success. Superquinn's adoption of SAP for its ERP in 2002 was initially a disaster for the business, and resulted in lost sales and customers, from which some believe it never fully recovered. Superquinn's ultimate exit was connected to the recession, lack of scale, a very tough competitive environment and over leverage by its owner's SRH, but continued issues with the SAP ERP also hindered the company.

¹¹³ Growth opportunities was a key driver of the internationalization trend.

¹¹⁴ The Irish media buying sector is dominated by global media groups, the biggest three being Core Media, Group M and Dentsu Aegis.

¹¹⁵ Employee numbers initially fell due to the application of ICT.

¹¹⁶ Some through acquisition. By 2000 in Ireland large clients such as Diageo, Nestle, Bank of Ireland and Allied Irish Banks had moved from commission basis.

6.3.4 Competitive Basis

ICT influenced the nature of competition in both industries. Price-based competition was a key driver of the adoption of ICT in retail grocery, and in turn intensified price-based competition in the industry. ICT extended the scope of competition between retail industry players: ‘supply chain versus supply chain’ and also through enabling differentiation initiatives¹¹⁷. ICT enabled the myriad of back-office and supply chain process changes that delivered improved retail grocery experiences. ICT increased competencies, but also increased complexity, which required increased competencies which were enabled by ICT, ad infinitum. Threshold competencies increased throughout the period and ICT enabled retailers to meet these new standards.

In advertising price-based competition was an important indirect outcome of the application of ICT. ICT influenced the emergence of media independents which largely commoditized media services, this coupled with the increasing financialization of business, contributed to cost becoming a factor in all industry services. The change in the remuneration basis of the Irish agencies from ‘media commission’ based to ‘fee’ based, had a significant impact on the industry. It changed both the rules of competition, and industry architecture. ICT influenced the change in the basis of remuneration through:

- Enabling the emergence of media independents, which is cited as a leading factor in driving the reassessment of agency remuneration.
- The emergence of online media with its radically different structure for media ‘buying’. Media commission was deemed unsuitable as a basis for paying digital agencies or for online media related services.
- The use of ICT in client firms led to an increasing financial focus within companies, and a proclivity to use cost as a primary measure for assessing suppliers. This encouraged the emergence of professional procurement practices and a reassessment of the basis for paying agencies.
- The reuse of creative work across multinational agency groups prompted consideration of the suitability of media commission as a basis for remunerating agencies.

The challenge of remuneration changes for agencies was compounded by changes in their own cost structures¹¹⁸. There has been a rise in indirect costs in agencies relating to ‘*ongoing investments in hardware and software technology*’ (McGonigle, 2008). Price became increasingly important in agency selection and pitching processes¹¹⁹. This in turn impacted the client-agency relationship. Advertising was an investment, and agencies needed to prove that they were offering value for money to clients, but this remained problematic.

¹¹⁷ Wider ranges of products, Loyalty cards, ancillary in store services such as Lottery and phone top-ups.

¹¹⁸ Capital costs had increased.

¹¹⁹ A significant proportion of marks (35-50%) are now awarded on the basis of costs.

As media agencies grew in scale and media choice escalated, their bargaining power with media suppliers increased, (an attraction for clients). Media agencies bemoaned that cost seemed to have become the only selection criteria. Disaggregation commoditized media services, and led clients to reassess remuneration. Media commission is still paid to media independent companies, but clients have aggressively renegotiated the percentage that agencies retain.

Leveraging ICT became part of the competitive basis of the industries. ICT has changed and raised threshold capabilities for players in both industries, and clients and consumers have higher expectations¹²⁰. However, ICT has been ineffectual in ensuring the production of effective creative communications.

6.3.5 Relationships and Power Shifts

Ad agencies lost architectural advantage to clients, as evidenced by the shifts in remuneration basis and vastly reduced commission levels retained by media agencies. Retailers gained architectural advantages through leveraging ICT to expand scope, gain information advantages and increased bargaining power.

Power Shift from Ad Agencies to Clients

Across the case ICT played a role in driving significant power shifts along the supply chain and within the ad agencies. ICT influenced the relationship between the clients and the agencies, and between consumers and advertising. The dynamic of the client/agency relationship changed: *'...clients are now completely dominant ... and the agencies have been subordinated to a lesser role'* (Frank Young). Power shifted as clients developed their own marketing expertise. ICT influenced this shift:

- The emergence of effective wider marcoms options for clients reduced their reliance on advertising and on any one advertising agency. During the case period advertising agencies came particularly under threat from the prospect of better measurability/certainty in the form of direct marketing agencies, later digital agencies and as the case ended management consultants¹²¹. Many clients moved to co-ordinate their own marcoms mix, selecting agencies on an 'a la carte' basis.
- CRM emerged through client databases, and clients gained increasing information advantages over agencies¹²². Online further enabled information asymmetry, and websites and social media tools could empower clients to manage more of their marcoms.
- Leveraging the abundance of data that became available required data analytic skills which agencies did not necessarily have. This opened the market to different types of organization

¹²⁰ In retail these include in-stock positions, range, cleanliness, layout, queuing time, food safety and additional services.

¹²¹ They had credibility in data analytics and the provision of solutions for clients.

¹²² E.g. Superquinn shifted funding from advertising to their loyalty scheme.

such as management consultants and online media providers¹²³.

- Finance systems influenced decision-making by clients. This resulted in an increased cost focus in agency selection, along with formal procurement procedures, shifting the client agency relationship from potential partnership to transactional. This deleveraged the power of ‘personality’ in winning client accounts and reduced agency power in the client/agency relationship¹²⁴.
- Electronic communications supplanted face time between agency representatives and clients and impaired the quality of relationships and agencies’ power to influence clients.

Consumers and the Power of Advertising

ICT increased consumer power in the consumer/advertising relationship. Although ICT increased consumers exposure to marcoms, the vast increase in media supply led to consumers having increased choice and control in media consumption e.g. ad skipping through recorded content on TV, and ad blocking software for online. Consumers could also begin their own online campaigns, and respond to or criticize what they saw as inaccurate or inappropriate advertising.

Power Shifts in Retail Grocery

Competition occurred along the entire supply chain to corral value. ICT, particularly EPOS gave retailers informational advantages over suppliers, through vastly increased and more accurate information regarding stock turnover. Orders and negotiations became increasingly data driven. Loyalty scheme data provided even richer information, including data that could be valuable to suppliers.

The largest retail operators became key clients for suppliers. CD gave retailers greater control of the supply chain and additional negotiation leverage (charging suppliers for managing the distribution of their products). To enter or remain participants in the Irish retail grocery industry, suppliers had to comply with retailer demands that they adopt technology e.g. EDI based communications. Retailers have gained superior power in the supplier/retailer relationship.

Despite this vertical competition, there was scope for retailers to benefit from co-operation with suppliers, to lower overall costs and optimize revenue for all parties, through the collaborative application of knowledge. ECR encouraged data driven initiatives of co-operation between retailers and suppliers, and some level of VMI (Vendor Managed Inventory) emerged in the Irish industry. ICT, particularly online solutions were an enabler of these initiatives and/or relationships. However, generally the relationships remained transactional and somewhat adversarial.

¹²³ E.g. Google and Facebook

¹²⁴ And the power of the marketing function within client companies

Retailer/Wholesaler Relationship Boundaries

Within the wholesaler led franchise models (symbol groups) ICT has to an extent blurred the boundaries of wholesaler and retailer scope. Wholesalers have access to retailers' sales data and influence innovative activities in the symbol retailers through their rollout and support of ICT solutions. The symbols operate as virtual multiples.

6.3.6 Process Model of Digital ICT Influenced Industry Evolution

Table (6-5) draws the results of the analysis together, ascribing generic headings to the three key phases of ICT adoption:

1. General Absorption
2. Customization
3. Expansion & Reconfiguration

Although there were key commonalities in the patterns between the two highly contrasting industries, there were also important differences that are related to the key characteristics of products provided. There are timing differences in ICT denoted industry phases. Common or equivalent and industry specific applications, influential contextual factors and industry outcomes are identified.

6.4 CROSS CASE ANALYSIS SUMMARY

ICT influenced the evolution of both industries resulting in structural and architectural change. It enabled firms to adapt to a changing environment. It was a factor in driving change in industry environments that organizations then needed to adapt to. The evolution of ICT was influenced by industry needs and by opportunities envisioned by industry players.

ICT has been a strategic enabler for firms in both industries. Its application has enabled more effective and profitable management of industry operations. Architectural advantage moved in congruence with ICT enabled information advantages in the industries. While the barcode has been a central enabler to supercharging the application and effectiveness available through ICT in retail grocery across all processes, there was no equivalent in the advertising industry. Although ICT has richly enabled creative techniques and potential in the advertising industry it failed to provide a panacea for producing effective creativity.

Phase Description and Duration	Phase 1: General Absorption - Adoption of Computing. AD Industry 1972-1986 Grocery Industry 1969-1980	Phase 2: Customization - Industry Specific Uses. AD Industry 1986 -1994 Grocery Industry 1980-2000	Phase 3: Systemic Expansion & Reconfiguration - Communications along Supply Chain and the Emergence of Online Channels. AD Industry 1994-2016 Grocery Industry 2000-2016
Phase Characteristics			
Digital ICT Solutions	Computers, Computer Bureau services, Databases, Software	Ad Industry: CAD and Digital Printing Grocery Industry: EPOS with scanning	Web, Internet, Intranets, Mobile devices, Broadband, Wi-Fi Ad industry: Email, programmatic buying Grocery: EDI
Applied to	Finance and Administration and tasks characterized by high transaction numbers.	Production tasks – Creative images in Ad industry. Checkout Process in Grocery. Integration of processes. Data analytics.	Online services, data analytics. Communications and coordination of activities along the supply chain.
Common Contextual Triggers	Increased accessibility, utility and knowledge of digital ICT solutions.	Digital ICT solutions developments. International entrants. Increased competitive rivalry.	Digital ICT solutions developments. Multinational players Increased competitive rivalry. Society's increased access to online. Recessionary environment from 2008.
Industry Specific Contextual Triggers	Grocery – Price-based competition and self-service model. Advertising - Increased media supply and research data. International entrants. High inflation.	Grocery – Barcode standard. Sufficient number of products with barcodes. GSI. Advertising – Increased media supply.	Grocery – GSI and ECR promoting EDI, pursuit of CD. Advertising – Increased media supply, and society's shift to online media consumption (audience). New entrants to industry.
Common: Main Features and Outcomes	Process innovations. Increased capabilities.	Process and product innovations, Increased capabilities, Changing skillsets, Facilitates increased industry consolidation. Increased internationalization. Expanded products/services and industry boundaries. Shifts in power.	Process and product innovations, Increased capabilities, Changing skillsets, Facilitates increased industry consolidation. Expanded products and services and industry boundary
Industry Specific: Features and Outcomes	Grocery – Increased industry consolidation. Enhanced retailer bargaining power. Expanded product range. Advertising – Emergence of media independents, international entrants and below the line specialists. Financialization of the industry begins.	Grocery – Retailers increase power in retail/supplier relationship. Advertising – Growth of media independents. Financialization continues. Clients gaining power in the client/agency relationship.	Grocery – Retailers increase power in retail/supplier relationship - Vertical aggregation. Advertising – New types of entrant. Financialization and commoditization of services. Price-based competition emerges. Clients increased power in client/agency relationship. Trend in acquisition of digital agencies. Online grows to challenge 'traditional' advertising.

Table 6-5: Process Model of ICT Influenced Industry Evolution

CHAPTER 7 DISCUSSION AND CONCLUSIONS

7.1 INTRODUCTION

The analysis chapter identified, key contextual drivers in the adoption and influence of ICT, patterns of diffusion of key ICT in the industries, and the most significant industry changes influenced by ICT. These findings are now considered in light of the reviewed literature. This research explored the influence that ICT had on the evolution of two contrasting industries, and sought to contribute to knowledge of IE. This chapter examines the research conclusions and contributions, and identifies avenues for further research to progress the field.

There were several matching patterns in industry change observed, albeit to different degrees. The observed disparities led the researcher to postulate that the degree of routinizability of core processes in the industries was worthy of consideration in this regard. The researcher concludes that the social complexity of processes determines their routinizability. The ability to leverage ICT to routinize processes is dependent on the specificity of information required to enable the process. ICT is deployed through the routinization of processes, and process impacts create opportunities, enable strategies and ultimately drive ICT influenced industry change. Hence the routinizability of industry processes is a crucial factor in ICT influenced industry evolution. Through linking to the literature this addresses the overarching research question: How does ICT influence the process of IE?

The resource-based view (RBV), transaction cost economics (TCE), resource dependency theory (RDT), neo-institutional theory (NIT) and population ecology (PE) were considered in exploring and explaining the adoption and the outcomes of ICT influenced IE. RBV is not a prevalent perspective in the IE literature and its inclusion broadens and thus enriches the literature. Crowston & Myers (2004) criticized an over-reliance on economic perspectives and an under engagement with sociological perspectives in the IS literature. A sociological heritage informs RDT, NIT and PE theories.

The chapter is structured as follows. Section (7.2) explores selected elements of the 'why' of ICT adoption and diffusion of ICT in the industries. Section (7.3) addresses the question 'How has ICT influenced IE in the Irish advertising and Irish retail grocery industry?' and outcomes of the case analysis are linked to the literature and theoretical explanations are explored. Subsequently in section (7.4) the overall contributions of the research are presented, along with suggested avenues for future research.

7.2 ADOPTION AND DIFFUSION OF DIGITAL ICT

7.2.1 Why Digital ICT was Adopted in Industries?

Firms adopted ICT to improve the design and operation of their business models and hence their competitive capabilities. In agreement with Cortada (2004, 2006a, 2006b), the case data indicates that ICT was frequently applied to improve the efficiency and profitability of existing operations. The pursuit of increased revenue as a driver for the adoption of ICT is also evident in both industries. The provision of online services increases revenue opportunities, but to date is more expensive operationally and potentially less profitable than traditional services.

7.2.1.1 Conceptual Drivers of the Adoption of Digital ICT

Digital ICT Solution	Industry	TCE	RDT	RBV	NIT	PE
Computing	Both	X		X	x	
EPOS with Scanning (Barcode)	Retail Grocery	X		X	x	
CAD	Advertising			X	X	
Loyalty Schemes	Retail Grocery			X	x	
EDI	Retail Grocery	X		X	x	
Email	Both	X		X	x	
Online for operations (including Cloud services)	Both	X		X	x	
Online Services	Both			X	x*	

Small x means a secondary or eventual driver e.g. For late adopters NIT has relevance across all solutions
**Legitimacy requirement in advertising, but not yet in retail grocery*

Table 7-1: Theoretical Drivers and the Adoption of Key ICT Solutions

Table (7-1) presents a synopsis of theoretical explanations for the adoption of ICT in the industries. The table illustrates that opportunities to increase competitive capabilities (RBV) was persistently a factor in the adoption of the varied ICT applications in both industries. The adoption of ICT has been an ongoing and in some ways relentless process as firms sought to stay ahead, and apply ICT 'to enhance even further' their capabilities (Cortada, 2004:31). ICT was applied to increase operational efficiencies and reduce costs, but it was also adopted to enable strategic differentiation. Examples include Superquinn's loyalty program and the provision of online grocery in retail, and the early adoption of CAD and online service provision in advertising.

Dynamic capabilities are enablers for firms to adapt to changing circumstances (Teece, 2018a), and ICT offered the potential to enhance firms' adaptive capacities, and adjust and redesign their business models.

Reducing Transaction Costs

Under a transaction cost perspective a firm is viewed as a governance structure not a productive system, transaction costs are concerned with the costs incurred in 'governing' activities (Williamson, 1999). Mooney et al. (1996) recognised that the application of ICT could reduce governance costs. The cases provide evidence of ICT application to reduce transaction costs, including the application of ICT in finance and admin in both industries. In addition to increasing

operational efficiencies and enabling increased responsiveness (RBV), the adoption of email by advertising agencies and EDI in retail reduced costs and simplified communications along the supply chain, thus reducing governance costs (TCE). In media buying the transaction is the service, and the adoption of ICT enabled media independents to manage high volumes of transactions in an increasingly complex media environment.

The make or buy vertical structural decision is described as the ‘prototypical’ transaction cost decision by Williamson (1999:1088). In retail grocery a central distribution (CD) model enabled the achievement of vastly reduced delivery administration costs for stores. Ambitions to implement CD, which represented an extension in vertical firm boundaries was a key driver of the adoption of EDI by retailers.

Legitimacy and Coercive Pressure

Legitimacy (NIT) (DiMaggio & Powell, 1983) features in the provision of online services in the advertising industry but not in the grocery industry. Institutional pressure can emerge from demand conditions (Aldrich & Ruef, 2006) and there is variance between the industries in this regard. Consumer’s mass selection of a broad array of online media drove demand for online advertising services, whilst demand for online grocery remained relatively low. Legitimacy pressure also features in the adoption of ICT solutions when the diffusion of the technologies reached tipping points e.g. Clients expected agencies to use CAD. There was also mimetic (DiMaggio & Powell, 1983) adoption of ICT as competitors copied leaders who appeared to be using ICT solutions effectively and successfully.

Coercive isomorphism (DiMaggio & Powell, 1983; Moyon & Lecocq, 2010) was evident in the adoption of ICT in both industries. It became necessary for agencies to have software that was compatible with clients accounting systems to be eligible to tender for client accounts. In retail grocery suppliers were pressurized to adopt barcodes and later EDI to be eligible to trade with key retailers. Institutional pressure was not a key feature in the early adoption of the technologies.

Institutional Norms, Culture and Identity

Institutional forces could also delay ICT adoption. The general reluctance in the advertising industry to engage with providing online services was influenced by a level of cultural disdain for ‘technology’ and hence a conflict with agency identities. Embracing online ICT required a break with industry cultural norms. Similar behaviour has been noted in previous research such as: the Polaroid Corporation’s failure to leverage digital image capture because of its cognitive dissonance with existing business models (Tripsas & Gavetti, 2000), and the delayed entry of IBM into the PC market and their use of external alliances to do so (Malerba et. al 1999). Resistance and difficulties

related to adapting to revolutionary technologies can emerge from lack of capabilities but also through challenging cognitive frameworks.

More recent literature suggests that strategic vehicles such as acquisitions provide a solution for incumbents to engage with revolutionary technology e.g. Buensdorf (2016). The trend to acquire digital agencies and related technology companies observed in the advertising industry reflects this. Do these acquisitions signal cognitive acceptance and can acquisitions overcome cultural resistance? More time is needed for industry developments to unfold and more research is required in this area.

Firms adoption of ICT and the pursuit of ICT enabled strategies were prompted by contextual factors, including external factors such as the economic environment and the availability of ICT solutions, and industry factors such as increased competitive rivalry, new industry entrants and the imitation of competitor strategies.

7.2.1.2 'Make' or 'Buy' Decisions in the Adoption of Digital ICT

Teece (2018a) has called for more empirical evidence supporting the changing business models of firms. 'Make' versus 'buy' activities for organizations are key components of firms' business models. A selection of boundary decisions relating to ICT adoption are discussed below, providing empirical evidence of changing transaction costs and business models.

Adoption of Computing in Retail Grocery

In the early days of the retail case most retailers used computer bureau services as they lacked both the capital resources to buy a computer and the capabilities to manage their computing needs¹²⁵. This endorses that boundary decisions of firms depend not only on transaction costs factors but also on capabilities (RBV and dynamic capabilities) (Jacobides & Winter, 2005; Winter, 2015): '*the resource bases of firms*' needs to be considered in understanding an organization's scope (Jacobides & Winter, 2005:396).

Retailers brought computing in-house as ICT became more accessible, and resource and capability barriers to ownership decreased. Firms seek to in-source activities that may be strategically significant (Barney, 1999; Teece, 2018a), and computing and ICT became an engine for increasing operational efficiencies in retail, and refining and adjusting business models.

The Provision of Online Advertising Services

¹²⁵ Computers were expensive. They were also far less user friendly as evidenced by H. Williams switching to computer bureau services after struggling to leverage the computers they had invested in.

When online advertising emerged most incumbent agencies outsourced their clients' online service requirements. Capabilities (RBV) and environmental uncertainty (TCE) were factors in this boundary decision. There was uncertainty about the potential growth of the online market, and what capabilities would be required to compete in it.

Research outcomes relating to TCE and uncertainty have been ambivalent, and thus requires attention, including consideration of contingent relationships with the level of asset specificity in boundary decisions (David & Han, 2004). There is a requirement to distinguish between technological and behavioural uncertainty for TCE considerations (David & Han, 2004; Santos & Eisenhardt, 2005). Within advertising agencies, online advertising skills can be considered as having relatively high asset specificity. Outsourcing services reduced risk and costs¹²⁶ for advertising agencies, in the new online domain.

As the online advertising market grew (removing one source of uncertainty), the dynamic online technological environment continued to be a source of uncertainty. In uncertain environments, firms may pursue alliance strategies where strategic flexibility concerns trump transaction cost considerations (Delmas, 1999; Dosi & Marengo 2007), and a number of incumbent advertising agencies formed collaborative arrangements with digital agencies. According to Delmas (1999) such arrangements may have high transaction costs but firms gain flexibility and access to capabilities.

'[F]irms find it hard to change their orientations quickly and drastically' (Malerba & Orsenigo, 2015:666), if routines do not exist within organizations for doing an activity, and there is no routine for creating the required routines, then firms cannot perform the activity (Nelson, 1991). Outsourcing strategies can enable a firm to swiftly adapt in a dynamic environment, where they lack appropriate in-house skillsets to build required capabilities.

Over time the incumbent agencies have generally acquired or merged with their collaborative digital agencies. Online service capabilities became strategically important in the advertising industry due to the size of the market and as an indicator of legitimacy. Insourcing previously outsourced activities indicates its potential strategic importance and special opportunities for value capture (Teece, 2018a). Incumbent agencies have made significant investments in up-skilling, which frequently included acquisitions of digital agencies.

Technological Developments Influence Transaction Costs

Where firms shift from 'make' to 'buy', this indicates that this is viewed as a commodity-like activity (Teece, 2018a). A pattern of outsourcing EDI requirements has emerged in the retail grocery industry, e.g. Dunnes and Musgraves who initially managed their own EDI activities have

¹²⁶ Risk of technology obsolescence and acquiring staff with the wrong digital skillsets

outsourced them. Over recent years some advertising agencies have outsourced their operational ICT requirements e.g. Ogilvy & Mather. TCE studies have been cross-sectional, and neglect the potential impact of external changes to transaction costs (David & Han, 2004). ICT developments have reduced transaction costs. Online and cloud computing have been a key enabler of the seamless and cost efficient provision of third party ICT service provision.

Their resources and capabilities and their perspective of the potential strategic importance of activities, inform a firm's boundary decisions (Barney, 1991; Teece, 2018a) in addition to governance costs (Williamson, 1999).

7.2.1.3 Contextual Factors in the Adoption of Digital ICT

Macro environment factors were influential in both industries as evidenced in case data and highlighted in the analysis chapter. Incentivized by changing context, firms in both industries have pursued cost advantages, differentiation strategies, and frequently imitative strategies in their adoption of ICT.

Digital ICT as a Contextual Influence in Driving its Adoption

ICT's influence on the external environment has been a more pronounced driver of the adoption of ICT in the advertising industry. Players in the advertising industry can be viewed as responding to ICT driven external environmental changes: ICT's influence on media supply and its impact on consumer's media consumption have been a major driver of the adoption of ICT.

Conversely in the retail grocery industry, retailers have actively envisioned opportunities for the application of ICT to enhance business operations, and their capabilities. Enhancing the operation of the self-service business model has been a key internal contextual driver of the adoption of ICT. Industries differ (Lenox et al. 2006; Porter, 1980) as indicated by this differential contextual impact of ICT between the two industries. The observation also supports the suggestions in the literature that there is a need to determine what industry characteristics cause key differences in the adoption and impact of ICT e.g. Jacobsson et al. (2017) and Müller et al. (2018).

In prior research the influence of an entrepreneurial culture was found to be positively correlated with the adoption of ICT, whilst complex processes have been negatively correlated with the adoption and diffusion of ICT (Arvanitis, Kyriakou, & Loukis, 2017; Cortada, 2013; Loch 1999). In this regard, advantages were more easily envisioned in the provision of media services and retail grocery through the application of ICT. The contrast in external/internal or responsive/proactive driven adoption between the advertising and retail grocery industries reflects demand conditions, cultural differences and product differences. Firm's resources and capabilities (including culture) impacted the timing of the adoption of each ICT solution and how effectively it was used.

7.2.2 Diffusion of Digital ICT

The analysis identified three main periods of ICT diffusion in both industries, Table 7-2 displays these alongside sample periods of diffusion identified in the IS literature. Although Phase 1 in generalized firm level IS literature is defined as the mainframe era, in the Irish industries mainframes were not a key feature. They were used in computer bureaus, but were not generally cost justifiable for individual firm ownership, and most firms initially invested in mini or micro computers. The literature recognises that patterns in ICT diffusion differ by country (Cortada, 2012; Dalum et al., 1999) and by industry (Cortada, 2004, 2006; Jacobsson et al., 2017; Müller et al., 2018), and a need for more empirical evidence to explain this (Cortada, 2004, 2006, 2012, 2013). The case studies indicate country and industry differences in the diffusion of ICT, and from a country perspective market size (demand-side factors) and infrastructure have been key influences on ICT diffusion trends and timing in the industries.

Phases	Generalized Firm Diffusion Pattern		US Wholesale & Retail Industry Pattern		Irish Advertising and Retail Grocery Pattern		Pattern Generalized by Country	
	Phase 1	Mainframe era	1960s – early 1980s	Arrival of digital	1950s – mid 1970s	<i>General Absorption</i>	<i>Late 1960s – Mid 1980s</i>	Digital applied to existing work
Phase 2	Distributed era	Late 1970s – mid 1990s	Growth and the UPC revolution	Mid 1970s - 1980s	<i>Customization</i>	<i>1980-2000s</i>	Extensive use in services	Early 2000s on
Phase 3	Web-based era	Mid - 1990s on	The Networked Age: The Internet	The 1990s on	<i>Expansion & Reconfiguration</i>	<i>Mid 1990s on</i>		

Sources: Cortada, 2004:287, 296, 306; Cortada, 2012; Dempsey, 2014; Ross & Feeny, 2000

Table 7-2: ICT Diffusion Perspectives

Industry differences are reflected in the quite different patterns of diffusion in relation to online ICT, and industry products, complexity and socio-cognitive characteristics featured in this regard. Variances in industry products manifests in the routinizability of industry processes. This is discussed under section 7.3. Online services in grocery are an extension of retailers existing capabilities, whilst online in advertising required the development of new capabilities.

‘[A] lack of knowledge or familiarity with a technology is a major barrier to adoption, and ultimately industry change’ (Allen & Kim, 2005:234). Traditional advertising agencies not only lacked the ICT skillsets to provide online advertising services to clients, they also lacked in-house capabilities to build them. The situation aligns with the requirement for what Teece (2018a:41) identifies as *‘extreme business model transitions’*¹²⁷, which *‘within a business are unlikely to succeed without major financial resources and steely commitment’*. This offers an explanation for

¹²⁷ Teece (2018) includes a new field of technology and organizational re-engineering as examples of requirements for extreme business model transitions – both of which feature in online advertising

why incumbent creative agencies only began to earnestly pursue this sector in coincidence with the latest recession (and consequent falling industry revenue) and the growing proportion of marcoms spend allocated to the online sector. The efforts in the adoption of online advertising by incumbents in the Irish advertising industry is also reflective of, how ‘*organizational inertia and stable industry constellations may prohibit significant innovations for long periods until change is forced by a crisis*’ (Loch & Huberman, 1999:160). Cultural tendencies may hinder diffusion of change (Loch & Huberman, 1999) and the traditional denigration of technology¹²⁸ in advertising agencies, was also a factor in the difficulties in the diffusion of online advertising capabilities in the Irish industry. This is a manifestation of institutional forces through existing industry norms (DiMaggio & Powell, 1983) curtailing industry change.

The general-purpose nature of ICT (Basu & Fernald, 2007; Castaldi & Dosi, 2008; Cortada, 2012), which is evident in the range and multipurpose applications of it in the industries, and its continued development frequently through use, has been a significant source of variation for the industries. ‘*The higher the frequency of variations, whatever their source, the greater the opportunities for change*’ (Aldrich & Ruef, 2006:18), and the diffusion of ICT solutions created momentum for industry change.

ICT became increasingly embedded in firms and in industry processes throughout the researched period, i.e. it diffused widely. Just as Cortada (2006a) observed in his US based industry studies, ICT was continuously, incrementally and cumulatively implemented by firms in both industries. Diffusion of ICT impacted industry processes, it changed how work was done. Application of ICT required adaptations in firms and this changed organizations’ routines and the skillsets required by workers, and drove industry change. The diffusion of ICT and the accompanied impact on industry routines has emerged as a core aspect in the influence of ICT in the evolution of the industries.

7.2.2.1 Diffusion Timings

The importance and power of differing diffusion factors and their interaction will change depending on technology and industry context¹²⁹. The pace of diffusion has been found to be ‘*highly industry-specific*’ (Loch & Huberman, 1999:161). Diffusion periods varied by ICT solution. A reason for this is the degree and breadth of adaptation required across existing firm and industry processes. Interdependencies between component technologies and complexity in required integration of technologies can delay diffusion (Arvanitis et al., 2017; Loch & Huberman, 1999).

¹²⁸ Their Macs being a potential exception with creatives, however industry wise the term ‘mac monkey’ is suggestive

¹²⁹ The contextual analysis in the previous chapter contributes knowledge as to why and when various digital ICT solutions were adopted in the industries.

Hence CAD, which had quite isolated implementation requirements and impact within agencies¹³⁰ had a very short diffusion period in the advertising industry.

ICT solutions that required firms to reengineer ICT and work processes and had wider adaptation implications in terms of impact across a number of firm departments, exhibited far more protracted diffusion time-periods. Implementing EDI in the retail grocery chain required changes in retailers' and suppliers' processes. In the retail grocery industry although product codes superior to the barcode have been developed, they have not been widely adopted as that would require systemic change across the industry supply chain (complex interdependencies). In agreement with the literature (e.g. Malerba & Orsenigo, 1996; Malerba, 2006) this example also provides further evidence of path dependency in IE and the process of evolution not necessarily resulting in optimal outcomes. Standards can also constrain progress (Nelson, 2018). Inertia is increased because there are legitimacy obstacles (Hannan & Freeman, 1984) to be overcome to establish a new standard.

Symbiotic Evolution of Digital ICT and Industry Needs.

Although technology is a key driver of industry change, industries also play a role in the evolution of technology. Technologies continue to develop throughout the diffusion process (Geroski, 2000), technologies coevolve with such factors as knowledge, demand, firms' strategies, and industry structure (Malerba, 2006). Data from both case studies supports this assertion, e.g. the involvement of retailers in the continued improvements in EPOS with scanning across the case period, and agency involvement in the development of ad agency software. There is a symbiotic relationship between ICT providing business opportunities and supporting industry functions, and industry needs and players driving further developments in ICT.

The diffusion of ICT drove industry change through enabling firm strategies, and also through the impact of the adaptations required for firms to successfully leverage the ICT solutions i.e. changing routines. The process of diffusion represents selection, and retention of selected variations. However, technologies continue to be developed throughout the process of diffusion and new variations emerged during the diffusion and indeed retention processes.

7.2.2.2 Diffusion a Process of Variation, Selection and Retention

The case data and analysis revealed that the IE process was multilevel, intricate, non-facsimile and iterative. Variations emerged from the inner and outer context and from different levels. The selection of certain variations resulted in further variations, (including entirely new variations, variations in the selected variations, and variations at different levels). For example the adoption of EPOS with scanning required widespread adoption of the barcode by suppliers, changed the

¹³⁰ i.e. did not need to be integrated with or require changes to be made in existing digital ICT systems, and the impact was centred in the creative and production departments, not systemic.

checkout process (for shop staff and for customers), the product pricing process (from individual item to shelf pricing) and stock control and eventually stock ordering processes (across iterations of variations in EPOS). In turn EPOS increased retailers' capabilities and their power in the retailer/supplier relationship. EPOS also improved retailers' capabilities in regard to improved in-stock positions, thus improving their service to customers. The impact of the adoption of ICT can have a rippling effect across and beyond the industry and the results of those ripples can echo back with further variations. The diffusion of ICT solutions built momentum for further changes.

The successful adoption of ICT solutions requires adaptations by firms, so the selection of a new ICT solution (a variation) causes further variations, i.e. variations in routines (as per EPOS discussed above). These variations in routines reflect changes in firm capabilities. Changes in firm capabilities can influence strategy and impact competition, for example in the retail grocery industry the cumulative application of ICT, firm adaptations and strategies, and reactions and counter strategies across the industry population, has extended competition, such that supply chains are competing against supply chains in the Irish industry, not just store versus store. Firms '*both adapt to change and cause it*' (Winter, 2015). Effective strategies of firms can alter industry structure and the changing industry structure alters which strategies are effective (Lenox et al., 2006)¹³¹.

Appendix R provides some examples of variation, selection and retention across multi-levels from both cases. Evolution theory provides an alternative perspective on the interrelationships between context (variations emerge from context), process (the selection process embeds variations and adaptations, selected variations are captured in routines) and outcomes (are indicative of retention).

7.3 THE INFLUENCE OF DIGITAL ICT ON INDUSTRY EVOLUTION

7.3.1 'How has Digital ICT Influenced Industry Evolution in the Irish Advertising and Irish Retail Grocery Industry?'

The literature proposed that ICT had (and is having) a profound impact on IE. ICT has changed how things are done in firms and reconfigured industry value and supply chains (Cortada, 2006a; Porter & Millar, 1985). ICT changes industry structures: '*transforming the nature of products, processes, companies, industries and even competition itself*' (Porter & Millar, 1985:129). In confirmation of the strategic importance of ICT identified in the literature, the research revealed a number of significant structural and architectural changes for the industries, linked to the influence of ICT (see Table 7-3 for summary).

¹³¹ Superquinn may be considered an exemplar of this phenomenon, they had successfully mitigated scale disadvantages to compete with the major industry players, however the entry and growth of the hard discounters caused concern and was a factor in the family selling the business.

Outcomes	Advertising Industry	Retail Grocery Industry
<i>Structural Indicators</i>		
Industry Processes	ICT endemic in processes – changed routines & capabilities	ICT endemic in processes – changed routines & capabilities
Industry Concentration	Increased Consolidation	Consolidated
Industry Boundaries	Expanded	Expanded
Industry Population	Turbulence	Turbulence
Industry Recipe	Rules changed – emergence of price-based competition. Increased threshold capabilities.	Increased price-based and service-based competition and threshold capabilities.
<i>Architectural Indicators</i>		
Industry Scope	Expanded	Expanded
Bargaining Power	Weakened	Strengthened
Relationship with other actors	Increasingly Transactional	Transactional
Architectural Advantage	Diminished	Strengthened

Table 7-3: Summary Industry Outcomes

There were similarities and variances in the patterns of ICT influenced IE between the industries. Given the strongly contrasting characteristics of the researched industries, common patterns that emerged are potential general patterns, at least in service industries.

- Significant industry evolution emerged through ICT enabled processes increasing firm capabilities, thus:
 - facilitating increased consolidation and internationalization through enabling management of scale and multiple locations
 - enabling expansion of firm and industry boundaries
 - influencing shifts in power, relationships and architectural advantages
 - changing industry recipes

Industry specific (divergent) patterns may highlight important industry characteristics for consideration in future studies seeking to understand the variety of paths in IE.

The next section explores the ICT influenced industry outcomes revealed in the cases. It starts with consideration of changes in industry processes, as other industry changes were enabled/resulted through process changes. The successful implementation of ICT requires adaptation (i.e. changes in social technologies), it requires process changes. This leads to consideration of variances in the routinizability of processes and how this might influence IE. Subsequently there is deliberation of other industry outcomes: the influence of ICT on competition and strategy, increased consolidation, population turbulence, changes in boundaries and industry recipes, and lastly power shifts and changing relationships.

7.3.2 Industry Processes

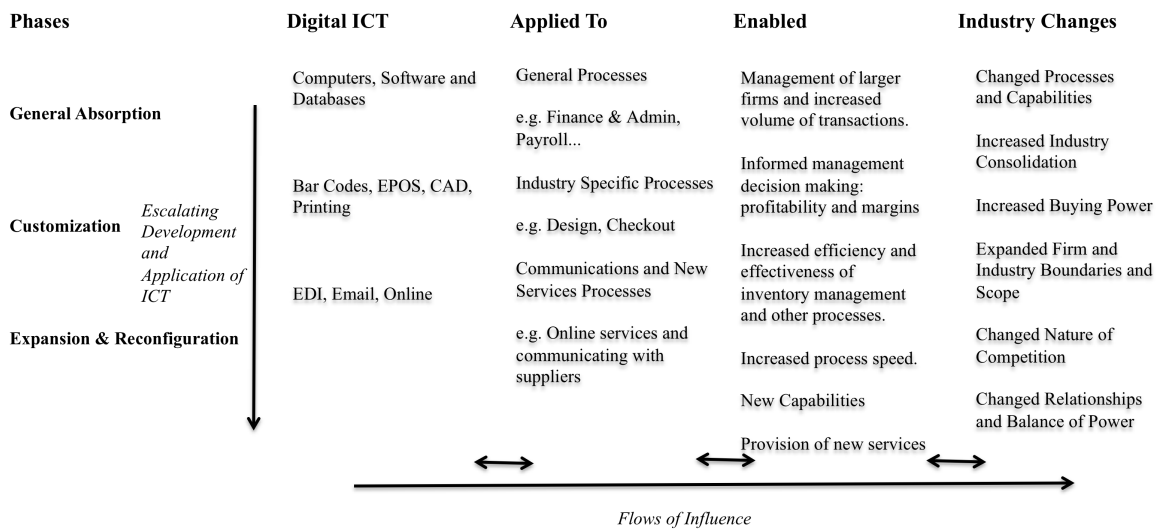


Figure 7-1: Process Influenced Industry Change

Processes encapsulate how work is done. The application of ICT resulted in new ways of doing things, and in doing new things. It required both the adaptation of processes and the creation of new processes. Fitting with ‘routines as genes’ (Nelson & Winter 1982) and industry evolution emerging from changes in routines, ICT influenced the evolution of the industries through changing processes. The environment including ICT provided incentives and opportunities for change (variations). Firms adapted through applying ICT to processes (creating variations), and ICT enabled processes were selected in industries and retained. Cumulatively the ICT enabled processes enabled further variations, selections and retentions at other levels including firm, inter-firm and industry level (see Figure 7-1).

The application of ICT to processes changed capabilities, it enabled operation at scale in retail and in media services, and hence influenced scope and power. It encouraged specialization in media services, and expansion of horizontal and vertical scope in retail. It enabled the growth of non-traditional advertising marcoms and hence the expanded provision of services in the industry etc.

Barcodes deserve special mention in retail grocery as they are embedded in much of the mass adoption of ICT and in particular the interconnectivity of product data along the supply chain. Barcodes became a standard that provided a basis for the development of ICT solutions that ultimately have been an enabler for process solutions and improvements in the industry, from

EPOS with scanning, to self-scanning, perpetual inventory, EDI¹³², online grocery services and ECR initiatives etc. (NIT, RBV). Higher frequency transactions deserve focus from firms in regard to maximising the efficiency of the transaction relationship (Aldrich & Ruef, 2006), and TCE motives featured in the adoption of the barcode. Barcodes enabled solutions that significantly improved the efficiency, and effectiveness of service across the industry. This reflects the literature which acknowledges that the emergence of standards can provide an impetus for accelerated innovation and diffusion of ICT (Dalum et al., 1999; Nelson, 2005).

7.3.2.1 Leveraging Digital ICT Requires Social Technology Adaptations

Physical and social technologies coevolve, and it is this coevolution that drives development (Nelson, 2005), and the realisation of technologies' potential. Adaptations in social technologies are required to enable physical technologies (Nelson, 2005; North & Wallis, 1994). Effective use of ICT '*often requires adaptation of work practices, invention, reorientation, and organisational change far beyond what is initially apparent*' (Dempsey, 2014:54). As much or more attention needs to be paid to the requirements for 'social' change as to the technical changes when implementing ICT solutions, the application of ICT requires '*whole system change i.e. the co-evolution of culture, processes and technology*' (Phillips & Wright, 2009:1079). The cases provide evidence of social technology changes required by firms in order to leverage ICT, they capture the coevolution of physical and social technologies. Additionally, as ICT solutions became available to all firms, the cases illustrate that it is the social technology adaptations that accompany the adoption of physical technology that enable firms to achieve competitive advantages through the application of ICT.

The information systems (IS) literature acknowledges a significant level of ICT implementation failure (Dempsey, 2014; Mata et al., 1995). In both industries firms had difficulties in adapting ICT solutions to enable their business strategies, e.g. Superquinn's major teething problems and long term dis-satisfaction with their SAP ERP implementation.

In the advertising industry the entwined nature of ICT and creativity for online advertising has been problematic. There has been under estimation of the investment, skill development and structural changes required to facilitate online advertising competence in the agencies. '*[S]ome of our most difficult problems involve discovering, inventing, and developing the social technologies needed to make new physical technologies effective*' (Nelson, 2005:208). Online advertising represents an apposite example of this, the advertising industry is struggling to figure out how to leverage online effectively for their clients.

¹³² A boundary spanning device aiding governance of supply chain relationships

7.3.2.2 Ability to Routinize Processes Influences Patterns of Industry Evolution

The specificity of information requirements for a process was a key criteria for routinization of processes through ICT. This determined the degree to which ICT could be leveraged in processes and hence the potential influence of the application of ICT for firms and the industries.

There is unevenness in the development of 'know-how' across different fields (Nelson, 2005, 2012). This is not due to the level of investment and or effort applied but is because '*progress is more difficult*' in some domains (Nelson, 2012). Domains that are '*hardest to advance very often have a large element of the social, and a limited role of the physical*' (Nelson, 2005:207). At first the researcher considered that key variations in ICT related IE patterns were caused by the variances in the proportional 'physical' content of the services of the industry. However, further consideration suggested that it was the complexity of the 'social technology' required to deliver the service, and the feasibility of routinizing processes to get consistent 'product' results, that is responsible for differences within patterns in the evolution of the industries. The case data, suggests that patterns of IE and the effect of the adoption of ICT for industries is influenced by the extent/degree of the routinizability versus the unroutinizable 'social' element in the industry 'product'.

Characteristics which enable vast improvements in activities/domains include an ability to:

- Specify '*criteria for good and better performance*'
- Learn from experience (perceiving what worked and what did not and why)
- Learn from simple models (Nelson, 2012)

These characteristics enable the development of effective routines. Routines and competencies are embedded in technologies (Aldrich & Ruef, 2006), but for this to happen rules of behaviour must exist. These traits are present in a large proportion of retail grocery and in the media services sector of the advertising industry, but to a lesser extent in the provision of 'creative' advertising services¹³³. The potential to routinize is at the core of the implementation and influence of ICT.

'Where artefacts can be substituted for 'aspects of the social', 'significant advances have been achieved' (Nelson, 2005:208). As the management of inventory processes in retail and media services have been increasingly routinized through ICT, significant improvements in efficiency and effectiveness have emerged. Matching patterns in the influence of ICT have emerged in these sectors, including: scale, a shift in power from suppliers, and the leveraging of capabilities to move into the online sector.

¹³³ Direct marketing grew because effectiveness was measurable and it was easily trialed and adjusted based on results.

The degree of non-routinizable activity involved in the production of the service, matters. Complex social processes resist routinization, and are a limiting factor in the successful implementation of ICT, thus influencing the application of ICT and its effects. In certain fields *'tight routinization often hinder good performance'* (Nelson, 2012), the researcher suggests that 'creativity' in advertising represents such a domain. Indeed Feldwick (2015) suggests that ascribing rules to creativity hampers it. ICT has resulted in vastly improved production efficiencies {reduced time and costs, (including rendering creative output)}, and support activities in agencies (e.g. accounting and finance, communication and distribution of creative output) in creative advertising, but it has had limited impact on the assured effectiveness of creative advertising output¹³⁴ i.e. an advertising message that works. The process for creating advertising has uncertain outcomes and lacks an apparent best approach to implementation. These features match with two characteristics identified by Bessant & Francis (2005) as reasons why the social technology 'Continuous Innovation' is challenging to develop. These characteristics mean that information requirements for the 'creative' process are not specifiable, and so ICT cannot effectively be applied to routinize 'creativity'. Adjusting Nelson (2005:208) to reflect this, it becomes *'where ICT cannot be substituted for aspects of the social', 'significant advances have not been achieved'*.

It is proposed that variations in the potential to routinize and hence vastly improve core sector processes have given rise to key differences within patterns of ICT influenced IE between the two industries. Such as:

- The shift in power from ad agencies to their clients, whilst retail grocers augmented their power. Players along the supply chain that leveraged ICT to improve their capabilities augmented their power in their relationships along the supply chain. So whilst clients could benefit from much enhanced customer information (a valuable resource), and improved production efficiencies etc., advertising agencies could not effectively apply ICT to spectacularly improve the effectiveness of their creative output.¹³⁵
- The structural splitting of the two core component services of advertising i.e. the creation of the message and the communication of the message (creative agencies and media agencies). This concept is discussed in the section on firm and industry boundaries.
- Online advertising requires new skill sets. Incumbent creative agencies are finding it difficult to develop appropriate skill sets for delivering effective online advertising¹³⁶, partly because the criteria/components for good performance are difficult to perceive. There are no predefined

¹³⁴ N.b. Digital ICT has broadened creative communication opportunities and has enabled and extended the execution opportunities for creative output.

¹³⁵ Advised techniques and guidelines for 'good' advertising have emerged, but they still require the 'magic' component of 'creativity'. Digital ICT doesn't do 'magic'. There were key conceptual advances such as brand management and the emergence of the role of account manager, and the ideal of holistic marketing communications. Again digital ICT has little impact of ensuring the effectiveness of these functions.

¹³⁶ In addition to institutional barriers within agencies, and characteristics of a hyper dynamic market (as described by Eisenhardt & Martin (2000))

rules that result in great online creative output. The domain appears to require the tight coupling of ICT knowledge with creative ability, and an appetite for persistent learning and experimentation, characteristics that are particularly challenging to nurture in established agencies. Online in advertising is reflective of what Eisenhardt and Martin (2000) label a hyper dynamic market, characterized by non-linear change. Thus new digital agencies have been more successful in this domain to date. This contrasts with online grocery where the criteria for 'good' service are evident, and in online media services where although the business model is still evolving there is a level of acceptance regarding criteria for evaluating online media service performance.

Hence the researcher proposes that the inherent routinizability of core industry processes deserves consideration in future IE studies. The consideration of the degree of routinizability of products is also relevant to the IS literature. Information requirements need to be specifiable to leverage ICT in processes. This concept can inform the limits of what can be encapsulated in artefacts, and is worthy of consideration in IS failure literature.

7.3.3 Capabilities and Strategy

ICT is recognized as inspiring and enabling firm strategies, including cost leadership, differentiation and focused strategies (McFarlan, 1984) and '*strategic alliance strategies, diversification strategies, and vertical integration strategies*' (Mata et al., 1995: 496). The application of ICT increased the efficiency of processes in both industries, and retailers retained benefits from their process innovations. However, value capture (Teece, 2018a) in the advertising industry has accrued to clients particularly in regard to the media independents business model. Media separation commoditized media services, media agencies have failed to sufficiently differentiate their services from each other, and price criteria predominates in clients' agency selection. This phenomena in the advertising industry corresponds with Segars and Grover's (1995) findings on the long-term influence of ICT in the drug wholesaling industry, where intensity of competition increased and benefits accrued to other players along the value chain, rather than the competing firms. The power of buyers contributes to explaining these effects.

Reflecting the 'Red Queen' effect (Barnett & Hansen, 1996; Ghemawat, 2002) firms in both industries have struggled to maintain competitive advantages as other players copied their ICT enabled strategies. According to Cortada (2004), it is this phenomena that accounts for the profound impact of ICT on industries, as firms continued to seek new opportunities to leverage ICT to gain new competitive advantages. The cases support DiMaggio & Powell's (1983) proposal of firms responding to changes in the environment and to other firms' responses to changes in the environment, ad nauseam. This is evident in the ubiquitous diffusion of the key ICT solutions and

the common patterns in structural changes within the industries¹³⁷ i.e. new industry norms have emerged.

Organizations' actions are a driver of industry change. Firms in the industries responded to encroachment or threats of encroachment on their territory by increasing their capabilities through the application of ICT. As per the resource-based view and dynamic capabilities (Eisenhardt & Martin, 2000), firms endeavoured to build and maintain strategic advantage.

7.3.3.1 *Differential Resources and Use of Resources*

In both industries ICT has inspired and been applied to enable business strategies and in imitative strategies. Useful applications of ICT by firms, diffused across the industries, as Cortada (2006a:760) had noted in his studies '*everyone within an industry used computers in the same way to perform the same functions*'. However, supporting the IS literature the research reveals that access to ICT is not sufficient to reap the potential benefits from it, adaptation is required (Allen & Kim, 2005; Howard, 2005; Segars & Grover, 1995). There were differences in firms' abilities to recognize opportunities and their willingness and ability to reconfigure resources to leverage opportunities and thus enable ICT to support business strategies.

Firms' adaptive capacities can be path dependent, influenced by internal structures and interdependencies between processes, therefore firms are limited in their available responses to environment changes and competitive incursions (Lenox et al., 2006)¹³⁸. Firm heterogeneity persists; firms pursue different strategies, and there is variation in firm sizes within industries (Dosi, Gaffard, & Nesta, 2008; Malerba & Orsenigo, 1996). There are evident resource differences across the major players in the Irish retail grocery industry, e.g. Dunnes Stores being a family owned unlimited company, and having a substantial homeware and clothes business which leverages from and complements their grocery offering. 'Me too' strategies are not feasible for other retailers. This suggests that Dunnes' idiosyncratic resources reflect Barney's (1991) proposed VRIN attributes. It is postulated that Dunnes' resources have enabled them to survive and thrive as laggards in adoption of customer facing ICT. Indeed, as late adopters they benefitted from established standards, improved systems and lessons learned by their competitors.

RGDATA perceive the deep discounters' business model as a threat to the independents. The independents can only compete based on a differentiation strategy, given their structures and resources (including locations)¹³⁹ and the application of ICT forms part of their strategy¹⁴⁰. In the

¹³⁷ E.g. Increased consolidation, internationalization, boundary and scope changes, including changes in vertical scope.

¹³⁸ Indeed it is these characteristics that enable some firms to develop VRIN resources and achieve long-term competitive advantages.

¹³⁹ Dunnes stores and Tesco are also adjusting their strategies in response to the success of the hard discounters. According to Dave Lewis Tesco's CEO amongst other initiatives, 'any outperformance on

advertising industry new agencies are unencumbered by existing structures and norms and have been more successful in developing online advertising capabilities, whilst incumbent agencies have struggled¹⁴¹.

'[E]ffective exploitation of knowledge can provide competitive advantage and sustain success' (Phillips & Wright, 2009:1079) and *'management's understanding of the potential for IT to be a source of competitive advantage'* really matters (Mata et al., 1995:499). North & Wallis (1994) also drew attention to the role of management in leveraging technologies. This aligns with Teece (2007, 2018a) who identifies management competences in sensing, seizing and implementing opportunities as key elements of a firm's dynamic capabilities. Firms differ in their capabilities in regard to implementing and leveraging ICT and in recognising the opportunities that ICT solutions enable, e.g. the variations in retailers leverage of EPOS solutions. Another example is Superquinn's innovation in launching and leveraging their loyalty scheme in Ireland. They saw it as a source of revenue and used it as a catalyst to become customer-centric.

Superior capabilities in managing, innovating with, and leveraging ICT can be a sustainable source of competitive advantage (Dempsey, 2014; Mata et al., 1995; Ross, et. al 1996; Sambamurthy et al., 2003). In the cases, over time firms had access to similar ICT solutions, so longer term advantages achieved through ICT were due to firms superior capabilities in leveraging ICT, i.e. social technology rather than physical technology.

Dynamic capabilities enable firms to adjust and adapt their business models (Teece, 2018a), and the case data suggests that superior abilities to recognise and utilize the opportunities provided/enabled through ICT could be a dynamic capability. There has been some consideration of dynamic capabilities as 'routines'. There is a distinction made between 'micro-foundations' and 'higher-order' dynamic capabilities (Teece, 2018a; Winter, 2003). Micro-foundations dynamic capabilities are *'highly patterned and 'routine'* and enable the firm's adaptation to the usual changes that occur (Winter, 2003:992): The multiples' routines associated with opening new stores represent dynamic capabilities. In retail grocery and in the advertising industry acquisition skills could be dynamic capabilities for certain firms (e.g. Musgraves and WPP). Advertising agencies' creation of new campaigns would be considered as ordinary capabilities, as per specification in Winter (2003) and Teece, (2018a) it is the agencies' normal work. Within the resistant to routinizable process of creating advertising there are patterned practices and frequently 'continuity of personnel' that are repeated within the improvisation required to create new advertising ideas.

profit will be reinvested to try to make Tesco more competitive on price with rivals such as German discounters Aldi and Lidl' (Felsted, 2016). Whilst Dunnes have been building market share through cash back vouchers 'shop & save', and also appear to be repositioning themselves, stressing quality.

¹⁴⁰ E.g self-service checkouts, and electronic services such as lotto, and phone top-ups. multiples and independents have higher relative staff numbers than the hard discounters. Self-service checkouts also offer opportunities to reduce headcount.

¹⁴¹ The global ownership structure of most major players in the Irish industries may also stifle real experimentation in structure and investing in digital.

Lower-order dynamic capabilities are not applicable to competence destroying change, they are useful for ordinary changes (Winter, 2003). Hence although advertising agencies are ‘routinely’ required to be creative, they have reputations for being conservative, and have found it difficult to respond to competence destroying change. Higher-order dynamic capabilities are associated with investments in organizational learning, which are more applicable when change is competence destroying (Winter, 2004). Winter (2003:993) questioned higher-order dynamic capabilities¹⁴² benefits vis-à-vis firm’s ‘ad hoc problem solving’ responses and posited the danger of trying to routinize them potentially resulting in a firm’s ‘*aggressive search for*’ opportunities to apply them. Superquinn’s cultivation of innovation may potentially apply here, as they overreached themselves in their early adoption of ERP for their implementation of CD, which potentially was not a suitable model for the size of their company. Alternatively, they actually lacked the higher-order dynamic capabilities to sufficiently redesign their business model to leverage the capabilities of the SAP system and CD.

Managers require creativity to deal with uncertainty (Spender, 1989). Higher-order dynamic capabilities are ‘*the sensing, seizing, and transforming competencies*’ that leverage ordinary capabilities and lower level dynamic capabilities (Teece, 2018a:41). Higher-level dynamic capabilities require art as well as science (Teece, 2018a) therefore routinizable elements will be insufficient to create them. Building from Nelson’s (2005, 2012) work, higher-order dynamic capabilities would appear to represent complex social technologies, that are resistant to routinization.

7.3.3.2 *Dynamic Capabilities and Technological Regimes*

The online era in the advertising case represents the hyper dynamic market conditions as described by Eisenhardt & Martin (2000)¹⁴³, where they suggest the boundary conditions of dynamic capabilities and the RBV are reached. In the era of online advertising, change is not linear, and it appears that existing structures, competencies and culture of incumbent agencies (institutional forces) have acted as a barrier to their adapting to the new market place. New firms and new entrants from adjacent fields (e.g. consultants) have developed a superior reputation in the online domain. Online advertising requires new skillsets as evidenced by the competency profile of staff hired in digital agencies and in the media agencies that are winning online business.

¹⁴² If they are feasible to be routinized (patterned), beyond Eisenhardt & Martin’s (2000) proposal of the development of simple rules and structural principles to be adhered to in highly dynamic environments.

¹⁴³ Highly dynamic markets - changes are non linear and unpredictable ‘*market boundaries are blurred, successful business models are unclear and market players (i.e. buyers, suppliers, competitors, complementors) are ambiguous and shifting*’ existing knowledge in this environment is less valuable (and indeed can be a liability) (Eisenhardt, & Martin, 2000:1111). This seems to be reflective of the marketing communications environment particularly in terms of online communications where ‘new knowledge creation’ is required.

Linking to the literature on how industries are characterised by technological regimes (Audretsch, 1997; Breschi et al., 2000; Malerba & Orsenigo, 1996), online advertising represents an ‘entrepreneurial’ regime. It is a disruptive (and competence destroying) technology for the advertising industry. In the retail grocery industry ICT including online have been ‘competence enhancing’ reflecting a ‘routinized’ technological regime¹⁴⁴, based on the application and diffusion pattern of ICT solutions to date.

The characteristics of the online advertising arena differ from the online retail grocery sector. In the retail grocery online sector the existing rules of the game of retail grocery generally still apply, and incumbents have been able to leverage existing business models and extend their existing capabilities into this domain i.e. a manifestation of dynamic capabilities. Whereas the rules of the game in online appear to be different from ‘traditional’ advertising¹⁴⁵. It is a domain which matches Schumpeter’s ‘creative destruction’ (Evans, 2009), and this fits with the success of new agencies in this area and the difficulties incumbent agencies have experienced in adapting (unlearning is required before relearning can occur). In hyper dynamic markets exemplifying ‘creative destruction’, capabilities *‘rely much less on existing knowledge and much more on rapidly creating situation-specific new knowledge’* (Eisenhardt & Martin, 2000:1111).

The extreme dynamism of the online advertising sector fits with Eisenhardt & Martin’s (paraphrased, 2000) scenario, where the adaptation needs of firms shifts from ‘learning before doing’ (i.e. reasoned from existing knowledge) to learning by doing (creating new knowledge). New knowledge needs to be created, new ‘ways of doing things’ needs to be fashioned. Incumbent agencies realise this, but knowing about, is different from knowing how and actually doing.

Changes in the industry environment can impact the ‘value’ of a firm’s capabilities (Barney, 1991; Barney et al., 2001; Eisenhardt & Martin, 2000), and the traditional capabilities of agencies are insufficient for the online domain. This matters because online increasingly gained market share in the marcoms arena, and hence reduced the ‘traditional’ market. However, the acquisition skills (a potential dynamic capability (Barney et al, 2001)) of advertising agencies may enable them to improve their congruence with the new environment. Their acquisition of digital agencies endeavours to integrate digital thinking into their core, and represents the acquisition of capabilities. There are many harbingers of doom for the global agency structure, and the agency giants have been endeavouring to restructure; however, despite many challenges they remain profitable¹⁴⁶ (as at 2017). Perhaps agencies’ acquisition skills can overcome the limitations of the resource-based view.

¹⁴⁴ The self-service model represented an entrepreneurial regime, as indicated by the success of the new entrants in applying the model, and the failure of many incumbents to survive the business model conversion.

¹⁴⁵ No one is sure of the rules in relation to effective ‘creativity’ even in traditional advertising.

¹⁴⁶ Although, WPP issued several sales warnings in 2017 and it was noted that the marcom giants *‘are struggling to adapt to changing client spending patterns’*. Megaw, N. 2018. WPP shares tumble on warning

Buensdorf's (2016) research suggests that in industries that have been characterized by intense competition, incumbents are frequently the instigators of product innovations, whilst in industries with less competitive intensity, new entrants are more likely to be the product innovators. In the retail grocery industry which has mainly experienced fairly intense competition, incumbent firms have been product innovators e.g. Superquinn, and Tesco. Whilst in the advertising industry where the intensity of competitive rivalry has escalated more recently, it is new entrants¹⁴⁷ that grew the wider marcoms specialities and the online advertising industry.

7.3.4 Industry Consolidation

ICT enabled the management of increasing scale, and increased consolidation occurred in both industries. Increasing consolidation in the industries was encouraged through the availability of scale based power advantages (RDT) in bargaining with suppliers (retailers and media agencies). Thus after the advantages of the media independent business model (a variation) was proven in use, the multinationals aggregated their media functions into independent media agencies (selection). Large-scale operations became a dominant business model in the industries particularly as price based competition flourished, in retail and media services. Reflective of population ecology and being 'selected out', firms who could not obtain sufficient scale in retail or in media services, exited (frequently through acquisition). In retail grocery symbol group membership offered an alternative to exit. Franchising provides a strategy for addressing fragmentation in industries (Beere, 2015; Porter, 1980/2004) and the symbol group structure circumvented the scale requirements for individual retailers, as they benefitted from the scale and buying power of the overall group.

7.3.5 Industry Populations

ICT has been an enabler of new entrants, increased consolidation, internationalization, business complexity and competitive rivalry, thus influencing industry demographics. The literature suggests that in the main the turbulence in industry populations, is generally mainly due to new firms entering the industry and exiting shortly afterwards (revolving door analogy), rather than established firms being replaced by new firms (Barron, 2003; Dosi & Marengo, 2007). This study suggests that what is observed in this regard is dependent on the time-period studied. Over the longer term in both industries turbulence reflected the replacement of old firms by new firms. ICT contributed to the turbulence observed, particularly as an enabler of internationalization strategies, and hence the entry of new firms into Ireland. This occurred in the advertising industry in the main through acquisition strategies, and in retail grocery through acquisition and organic growth

of 'slow start' to new year, Financial Times. <https://http://www.ft.com/content/5b8da604-1d1f-11e8-956a-43db76e69936>. [Accessed 8th March 2019].

¹⁴⁷ Many media agencies who have more recognized competency in online services, can also be considered as relatively new entrants, in the industry. Additionally they have faced cost-based competition for longer than the creative agencies.

strategies¹⁴⁸. In both industries many firms exited through acquisition, rather than failure/bankruptcy, although there were also key exits via failure¹⁴⁹. A population level perspective can reveal drivers that could be concealed at other levels of analysis (Aldrich & Ruef, 2006; Hannan & Carroll, 1995), and the population and industry level perspective highlights that internationalization and merger and acquisition activity were significant features in population changes.

ICT has been both a source of external shock and an adaptive enabler. New technology can enable new firms, and new types of firms to enter industries and can cause incumbent firms to fail when they are unable to adapt to it (Christensen, 1997). The population ecology perspective (Hannan & Freeman, 1977; Hannan & Freeman, 1984), views exogenous change as being predominant and privileges selection over adaptation, in industry environments. Exogenous ICT developments influenced barriers to entry, and online is an example of this. Environmental change (i.e. online) enabled new types of organization (e.g. digital agencies), to enter the advertising industry, whilst incumbent organizations struggled to adapt to new industry requirements. A number of these new digital agencies have been acquired by traditional agencies, fitting with Buensdorf's (2016) suggestion that incumbents in industries provide exit strategies for pioneering start-ups. Management consultants have leveraged their data analytic and problem solving capabilities to enter the advertising industry: an example of the phenomena of 'related diversifiers', where established firms bring innovation to related industries (Agarwal et al., 2015; Buenstorf, 2016; Porter, 1980/2004). ICT enabled the entry of new intermediaries, distribution firms and potential substitute players to the grocery industry¹⁵⁰.

ICT in confluence with other factors have played a role in industry exits. Both industries experienced significant turbulence in industry populations across the researched period. Scale based price competition in retail grocery¹⁵¹ drove many independent firms from the market, including Superquinn (eventually), and others to adapt their structure and join symbol groups e.g. Petitts. However, ICT has also frequently increased firm's adaptive capabilities: in challenging environments firms have leveraged ICT to enhance their survival toolset (RBV and dynamic capabilities). The success of the symbol group business model represents an adaptation mechanism for many independent retailers, in an increasingly scale-based competitive environment.

Explaining the population changes from an evolutionary perspective through population ecology theory would reflect that new firms and new types of firms (variations) entered the industry enabled by exogenous changes such as ICT developments (variations). Firms that could not adapt

¹⁴⁸ E.g. Tesco through acquisition, Aldi and Lidl through organic growth.

¹⁴⁹ AFA/McConnells is the principal example in the advertising industry and H. Williams and Superquinn are key examples of bankruptcy in the retail grocery industry.

¹⁵⁰ E.g. Potential grocery spend substitutes include online delivery of pre-prepared meals or ingredients for meals (there are opportunities for established players here) etc.

¹⁵¹ Digital ICT solutions has been a key enabler of managing scale and of international entrants.

to the changed environment exited the industry (were selected-out). Firms that had the right fit thrived and survived (selected in and retained). The symbol groups in retail grocery and media independents in advertising are strategic groups (representing new niches which emerged in response to the environment changes (Hannan & Freeman, 1977)) these strategic groups are variations that have been selected as an appropriate fit with the environment.

7.3.6 Industry Boundaries

This section utilizes Marks' (2015) application of four industry boundaries, generally corresponding with the theoretical perspectives of TCE, RDT, RBV and NIT to aid in understanding the influence of ICT on the boundary changes of the industries.

7.3.6.1 Efficiency

Prior studies have highlighted efficiency as a key driver of IE (e.g. Crowston & Myers, 2004 and Quinn & Leavy, 2005). Efficiency as a conceptual driver is generally associated with transaction costs and the boundaries of firms in terms of activities undertaken within versus beyond firm boundaries. Transaction cost economics (TCE) offers an explanation of firm boundaries based on the selection criteria of efficiency of exchange activities (transactions) along a continuum of governance from hierarchical to market (Williamson, 1981; Williamson, 1999). In this regard North and Wallis (1994) argue that firms base boundary decisions on the efficiency of total costs i.e. transaction and transformation costs. Industry change emerges from organisation level boundary decisions, as firms assess and select the means of managing activities on the basis of overall efficiency (given limited rationality and satisficing).

Both industries experienced changes in vertical structure. ICT directly enabled significant change in firm boundaries in both industries e.g. retailers' vertical expansion into CD (aggregation) and the disaggregation of media services in the advertising industry (specialization). These boundary changes enhanced efficiency, and the high volume of transactions increased efficiency imperatives.

Transaction costs can and do change. Crowston & Myers (2004) proposed that ICT could reduce transaction costs through changing access to information. This occurred between firms along the supply chain in the industries e.g. email in advertising, and the adoption of the barcode, EDI and online ordering in retail grocery. In both industries firms extended their scope horizontally offering a wider array of services, in the pursuit of offering efficiency and more effective service to consumers and clients, and gaining from economies of scope. Although usually economies of scope are the assumed driver of horizontal boundaries, '*optimal horizontal boundaries depend upon governance costs*' (Santos & Eisenhardt, 2005:493), (reiterating Coase (1937)). There are efficiency gains from operating at scale, e.g. shared administration functions, technology solutions,

and access to greater revenue potential; however, as Coase (1937) recognised governance costs can increase.

TCE can also contribute to explaining the internal structures of firms (Williamson, 1981) such as organisation by departments and centralised versus decentralised structures (Santos & Eisenhardt, 2005). Superquinn decentralised decision making to store managers, as their application of ICT was designed to provide an efficient monitoring (governance) function. Tesco centralised decisions; however, their overall scale may have made oversight and monitoring of decentralized decisions inefficient. (Power considerations may also play a role in these configurations.) The overall efficiency of firms depends not only on what a firm selects to do but also in how it organises these activities/transactions and therefore the internal structure of firms influences firm boundaries. The indivisibility of activities can change over time. As per Jacobides (2005) internal firm structures eventually can impact the market place as departments/specialist functions set up as independent entities, in competition and/or co-operation with existing firms. The emergence of media independents supports this assertion.

Coase (1937) noted that the degree of vertical integration varies between industries and between firms. In both industries, decisions regarding outsourcing versus in-house management of IS have varied firm by firm. These boundary decisions are influenced by the resources and capabilities of the firms, which can influence which structure is more 'efficient' or indeed feasible for individual firms (RBV). Efficiency in access to capabilities is a key consideration in boundary decisions (Barney, 1999; Teece et al., 1997). This is discussed under competence boundaries below.

7.3.6.2 Power

Resource dependency theory (RDT) (Pfeffer and Salanik, 1978) highlights power motives as drivers of firm actions/strategy. In activities along industry supply/value chains players seek to reduce dependencies and increase control of the environment they operate in. Industry boundaries are influenced by power differentials in horizontal and vertical competition (e.g. Quinn & Leavy, (2005) identified power differentials as a driver of evolving industry structure). Power considerations are at play in the changes in levels of vertical integration in the industries, such as media separation, and retailers expansion into CD, (and in the increased scale of firms as discussed in consolidation above i.e. bargaining power).

The expansion of retail grocery boundaries to encompass CD which was enabled by ICT, augmented retailers' power in the retailer/supplier relationship, it increased suppliers' dependency on the large retail players. Intra-firm differential power can be viewed as influencing the original emergence of the independent media agencies. Resource-dependency (Pfeffer and Salanik, 1978) has relevance in explaining the media agencies entrepreneurial spin-offs. Media departments were not seen as being particularly strategically important within the agencies. They were undervalued

(Ingram, 2010) and had difficulty getting approval for investment in media related ICT solutions¹⁵². The perceived restriction of resources within advertising agencies, acted a driver for media department employees to create the media independent business model.

7.3.6.3 Competence

'Capabilities are ... seen as fundamental determinants of both the horizontal boundaries and of the vertical scope of firms' (Malerba & Orsenigo, 2015:666). Marks (2015) observed that branding competence allowed firms to stretch their boundaries in telecoms and grocery wholesaling. A firm's boundary decisions are influenced by their capabilities and resources (i.e. RBV) (Barney, 1991; Jacobides & Winter, 2005), these impact transaction and transformation costs e.g. in retail grocery Dunnes Stores use intermediaries to manage their CD whilst Tesco, Musgraves and BWG do not.

Coase (1937:397) citing the telephone and the telegraph, noted that *'inventions'* which decrease the costs of organising and those that enhance *'managerial technique'* will generally increase firm sizes. ICT based capabilities facilitated firms operating at scale, which enabled them to benefit from economies of scale and scope, thus extending firm and industry boundaries. Firms in both industries offer a wider array of products/services, and ICT was both a driver and an enabler of this expanded scope, enabling their participation in and creation of a more complex environment.

The increased internationalisation of the industry was enabled by ICT which facilitated co-ordination across widespread geographic scope. Firms are competing against the global resources and capabilities of firms operating in Ireland, e.g. Tesco (Ireland) ICT is supported from India, and Tesco's buying power is pooled across their global chain. This global structural competence is enabled by ICT.

A new online channel/sector has emerged in both industries. The provision of online services in the grocery industry has required firms to extend their competencies, whilst the provision of online services in the advertising industry has required agencies to build new competencies¹⁵³. It was easier and more efficient for new agencies to develop the capabilities required (PE) and initially many incumbent ad agencies outsourced their client's online advertising requirements to third parties. Firms may seek to retain or acquire capabilities that are strategically significant in their industry (Wernerfelt, 1984), and traditional ad agencies extended their scope and acquired digital

¹⁵² As per one interviewee *'there used to be a joke... go to any finance person, .. 'the answer is no, now what's the question'*.

¹⁵³ There were also other issues with traditional ad agencies building online capabilities, with existing structures, practices and capabilities impeding progress, thus making it inefficient. Building online capabilities in advertising is an expensive activity, it was hard for traditional agencies to justify sufficient investments in developing the new skillsets/competencies required by a nascent online market.

capabilities through acquisition¹⁵⁴ when they began losing significant revenue share to online agencies. The changing online advertising industry structure phenomenon supports Barney's (1991) criticism of TCE that it neglects the consideration of essential/strategic capabilities (core competencies) in boundary decisions. Additionally merger and acquisition activity in pursuit of enhanced capabilities and resources, in turn impacts industry population.

Firm activities often do not fit neatly into one industry (Stokes & Banken, 2015). Firms are likely to expand their vertical and horizontal boundaries to activities that leverage their capabilities (Santos & Eisenhardt, 2005), where opportunities are financially attractive. For example major global management consultancy firms have leveraged their data analysis capabilities to enter the marcoms industry. This boundary spanning is also evident in the broad scope of products offered by retail grocers, which has grown beyond the remit of any definition of 'grocery' goods. Advertising agencies offer a full spectrum of marcoms services, even though the industry and agencies perceive them as separate disciplines. ICT has both driven and enabled firms in both industries to provide a wider array of services, to the extent that it has influenced the identity of the industries.

7.3.6.4 Identity

Identity beliefs by organization managers have been found to delimit who are perceived as competitors and hence the industry boundaries (Porac et al. 1989). Marks (2015) study of the influence of brand on IE found that branding altered the perceived collective identities within the industries studied and expanded their industry boundaries. The boundary of identity links to NIT and the legitimacy of industry players (Marks, 2015). Identity beliefs, influenced by ICT enabled capabilities (RBV) and new potential competitors (PE) for industry revenue have expanded firm and industry boundaries. The advertising industry has come to be perceived as the marcoms industry, and retail grocery competition now extends across a much wider assortment of products than at the beginning of the case. The expansion of the major retail players' vertical scope to encompass CD, and advertising agencies horizontal expansion into providing across the board marcoms including online services, has become an industry norm and now has legitimacy connotations. The scope of services provided influences organization's and the industry identity and hence boundaries. Changes in industry population (PE) also impact perceived industry identity. New types of firms emerged, which are considered legitimate competitors and/or members of the value chain, and these in turn have driven firms to take responsive changes in scope, including the acquisition of these 'new' players.

¹⁵⁴ Tesco's acquisition of Quinnsnorth to enter the Irish grocery market (store location can be a VRIN) and the advertising agencies merger and acquisition of other marketing communications specialists and of digital agencies reflects this perspective.

7.3.6.5 Routinization Influence in Firm and Industry Boundaries

Vertical disaggregation in industries has been a neglected area of research (Jacobides, 2005), hence the significant vertical fracture in the advertising industry provides an empirical contribution. The vertical fragmentation of an industry can have radical impacts on *'the nature of the industry, its very definition, and its competitive dynamics' ... 'it changes the nature of the firms that can participate in an industry'* (Jacobides, 2005:466): The separation of the media function contributed to the change in the basis of remuneration of the creative agencies, and radically reduced media commission rates i.e. it significantly contributed to the emergence of price based competition in the advertising industry. Vertical disintegration enables new firms to enter an industry (Jacobides, 2005; Malerba et al., 2008) and in addition to the 'new' media agencies, several creative only agencies entered the industry as media independents emerged as an industry norm. Barriers to entry (Porter, 1979) have changed to such an extent that no new non-digital media agency has established itself in the industry since scale based media competition became established.

Before vertical disintegration can occur in an industry, intra-firm specialization must occur, enabling the simplification of the co-ordination of the activities (Jacobides, 2005). Thus media agencies could only emerge in the advertising industry after media departments had emerged within the ad agencies. The earliest media agencies in the Irish industry were set up by former agency media department employees i.e. spin-off entrepreneurship (Buenstorf, 2016). Entrepreneurial spin-offs have been noted for driving IE (Agarwal et al. 2015; Klepper, 2009), and the media agency phenomenon played a role in driving the change in the basis of remuneration of ad agencies, i.e. a change in the business model, which some ad agencies did not survive.

The separation of media from creative services in the advertising industry links back to routinizability, it represents the separation of services with a high element of routinizability (media services) from a service with limited routinizability potential (creative services). The contradiction in requirements in the management needs of these services meant that media services were viewed as under-resourced and neglected in advertising agencies.

Standardization of information and simplified co-ordination can enable new intermediary markets¹⁵⁵ to emerge in an industry (Jacobides, 2005). Several new intermediaries have emerged in the online advertising sector; however, this is due to complexity of the media environment hence demand side platforms (DSP) and supply side platforms (SSP) are required to co-ordinate and simplify the process of online media buying.

The establishment of standards accelerates innovation, diffusion and effectiveness of ICT (Cortada, 2004; Dalum et. al 1999; Nelson 2005) and can lead to significant industry change (Consoli, 2005;

¹⁵⁵ Dunnes Stores use distribution intermediaries to operate their central distribution structure.

Cortada, 2004). Barcodes (standard identifier) have acted as a powerhouse for ICT application in retail processes. Barcodes and then EDI (rule based communications) enabled simplified communications and transactions along the industry supply chain. In retail grocery these information standards and subsequent simplified co-ordination enabled the emergence of distributors between suppliers and retailers and ultimately enabled major players in retail to extend their vertical scope. This is reflective of institutions (i.e. barcodes and EDI) enabling IE.

Retailers extended their inventory capabilities into central distribution (CD) leveraging these ICT artefacts, enabling reduced transaction costs, improved retail capabilities and increased power over suppliers. These supply chain processes matched with Nelson's (2012) characteristics that enable vast improvements, i.e. they were inherently capable of being routinized: what good performance means could be specified, models could inform practice, and firms have also improved practice by learning from doing and incorporating 'learning' into their systems.

Beere (2015) found that ICT was a significant enabler of the emergence of franchising in the real estate and the fast food/quick service restaurant industries in Ireland. ICT has also been an enabler of the management and growth of the symbol groups (i.e. franchise operations) in retail grocery. The high level of routinizability of these operations has enabled ICT to influence the growth and management of the symbol group model in Ireland. The examples discussed in this section also support the view of the evolutionary economists Nelson and Winter, of IE emerging from changes in routines i.e. '*routines as genes*' (Nelson & Winter, 1982:30, 2002).

Overview Boundary Considerations

The changing boundaries of industries was an important empirical change identified as influenced by ICT. The theoretical perspectives TCE, RBV, RDT, NIT and PE were used to explain this empirical phenomenon i.e. changes in the horizontal and vertical scope of firms and the industries. Thus supporting the need for the consideration of multiple theoretical perspectives to achieve more comprehensive explanations of IE.

7.3.7 Industry Recipe

Industry recipes reflect industry participants '*business-specific world-views*', cognitive frameworks or overarching perspectives of how things are done and the industry rules which provide heuristics, that aid managers in dealing with incomplete information and uncertainty which characterize business environments (Spender, 1989:7). ICT application brought about changes in the accepted way of 'how things are done' in the industries. Cortada (2004.xi) noted for the US industries he studied that digital had become '*both ubiquitous and a part of almost all work*'. The same is true of the Irish grocery and advertising industries. ICT became embedded in industry processes, the application of ICT became an industry norm (NIT).

The emergence of price based competition across the advertising industry is a core feature of the new industry recipe. The changes in the basis of agency remuneration are to an extent driven by the increased weight of financial criteria in all business decisions, in turn enabled by increased access to financial data through ICT. Clients were seeking to align incentives with agency work performance, and the change in remuneration is an adjustment in market governance and hence also related to TCE.

New structural norms emerged in both of the industries with ICT being a key driver of these changes, such as the fragmentation of the supply chain in the advertising industry, and the backward integration of retailers. New standards emerged in both industries in regard to service levels, including tighter deadlines resulting in faster paced industries. New industry institutions: GS1 and ECR in retail grocery, and IAB in the advertising industry, emerged which promoted the adoption of ICT standards and best practices. These institutions represent social technology developments, consequent of ICT.

ICT has enabled the entry of multinational players and hence changed industry populations. Scale based competition came to dominate both industries, bargaining power became crucial for the major players in retail grocery, and for media agencies in advertising, global networks became necessary for the marcoms companies as clients awarded accounts on a global basis. These are representative of new industry recipes (NIT). Industry recipes have changed entry requirements in the industries, for example the prevalence of CD in retail has changed access to supply networks.

Firms reacted as the rules of the game were changing. Imitative isomorphism (DiMaggio & Powell, 1983) patterns emerged. The mass conversion of Irish ad agencies to become part of multinational agencies can be seen as a reaction to an increasingly challenging environment. In this regard ICT increased this uncertainty, and joining or being acquired by a multinational agency reduced uncertainty or eliminated it. Despite institutional norms where firms have adopted similar ICT solutions, differences remain in each firm's capacity to leverage the individual and collective ICT solutions. Imperfect imitation occurs, and this accounts for/contributes to differential performance and strategic trajectories of firms, as per RBV.

Coercive institutionalization (DiMaggio & Powell, 1983) is evident in the emergence of new industry recipes, and was discussed earlier in the adoption of ICT e.g. Barcodes, EDI and compatible accounting systems. Mimetic and normative isomorphism (DiMaggio & Powell, 1983) may overlap along a continuum, as late adopters of ICT, seek legitimacy in addition to gaining potential advantages and opportunities known to be available. Meyer and Rowan (1977) suggest that a point is reached where legitimacy concerns trumps efficiency as a driver of the adoption of innovations.

Whilst standards frequently promote developments, they can also constrain them (Nelson, 2018).

The QWERTY keyboard layout is a well established example of this kind (see David, 1985). The barcode illustrates how institutional norms and established standards can promote/enable change and also how they can also act as barriers to change. Barcodes as an industry standard (NIT) turbo charged retailers' abilities to leverage ICT. However, the barcode standard also provides an example of how institutionalised standards can delay progress/process improvements and diffusion of ICT. Hannan & Freeman (1984) recognised the selection process as a source of inertia. Superior digital based product codes have been developed but because barcodes are so embedded in industry processes, there is inertia in the industry to move to a new improved standard. The institutionalization of barcodes in retail industry processes has become a barrier to change, illustrating path dependency and the potential for non optimum outcomes.

Under institutional theory and population ecology theory firms can have inertial tendencies, '*...however, inertia is overcome by competition, which, by showing the direction of success, serves as a guide to best practice and as a survival threat to the laggards*' (Perez, 2009:198). Incumbent agencies creating digital 'departments', followed by the trend of acquiring a digital agency is a form of imitative institutionalisation, as agencies react to upheaval in the industry with online advertising garnering a significant share of marcoms spend. In times of uncertainty organisations can be more likely to copy strategies of other organisations that are perceived to be successful (DiMaggio & Powell, 1983:151). In the industries competition between firms including from new entrants provided impetus for firms to take action (frequently imitative), enabling new industry recipes to emerge.

7.3.8 Relationships and Power Shifts

RDT (Pfeffer & Salancik, 1978) can aid in understanding the significant power shifts that are evident in the outcomes of the adoption of ICT in the industries. The level of analysis is '*the external strategic relationships*' that influence value capture (Santos & Eisenhardt, 2005:496). Information is a resource and superior information enabled by ICT features in the changing relationships and power shifts that have occurred in the industries. In both industries power has shifted along the value chain in alignment with differential relative scale and access to information. In retail grocery power shifted from suppliers to retailers. In the advertising industry power shifted from advertising agencies to clients, from media suppliers to media agencies, and there were also power shifts within the advertising agencies.

Porter (1979) noted the following as factors that increase buyer power: buyers operating at scale, having the capability to integrate backwards, having a wider selection of alternative product choices, and buying products which are relatively undifferentiated. Retailers gained increasing control of the supply chain during the case period (RDT). In addition to pursuing increased scale, ICT enabled increased access to data (RBV), and integration upstream through CD (RBV, TCE).

Suppliers have increased dependency on the leading retailers and comply with their demands (RDT), e.g. their co-operation in the operation of CD. The case data supports Quinn's (2002:194) observation that the adoption of CD '*undermined manufacturers' distribution systems and reduced their power*'. Although ICT enabled co-operation across the supply chain, industry players have been reluctant to relinquish control and information (i.e. power). For example vendor managed inventory (VMI) appears to only operate with powerful suppliers such as Coca-Cola.

In the advertising industry, ICT enabled media agencies to operate at increased scale, it vastly increased media supply choices, and these factors enhanced media agencies bargaining power with media suppliers. However, online giants such as Google and Facebook have gained power advantages through their ubiquity (scale), information advantages and their potential to work directly with clients (integrate forwards). The independent media agencies gained power with the traditional media suppliers but lost power with their clients. The separation of the media service commoditized it i.e. their product became relatively undifferentiated.

Aided by the influence of ICT, clients' dependency on advertising agencies reduced across the period (RDT). ICT aided in professionalizing a wider array of marcoms options, providing an increased array of potential suppliers. Many clients have moved to co-ordinate their own marcoms mix, and online media increases opportunities for marketers to take aspects of marcoms in-house (RBV, RDT, TCE). i.e. reducing their external dependencies (Peffer, 2005). Despite the consolidation in the advertising industry, many clients have far superior scale to agencies.

Clients have leveraged their power to garner increased architectural value in the industry (RDT) e.g. media agency commission has been decimated. The new remuneration structures of 'fee for service' increases agencies' dependency on their clients. The shift in power is both a symptom and a cause of the change in the client/agency relationship from having qualities of a partnership¹⁵⁶ to becoming a supplier relationship.

7.3.8.1 Power Vis-à-Vis Consumers

ICT influenced access and control of information (a valuable resource) for both sides in the business/consumer relationship. Turner (2005) suggests that power over resources emerges from influence. Retailers sought to leverage their vastly augmented consumer data to influence consumer demand. Consumer access to retailer information has also increased through online technology, and this has somewhat increased their power in the retailer-consumer relationships.

ICT has increased advertising agencies' opportunities to communicate with, and hence influence consumer demand (RDT). However, ICT has also supplied consumers with tools to avoid

¹⁵⁶ In cases of very good relationships. This is still possible but has become far rarer. Also, marketing has been downgraded in strategic significance in companies as clients developed marketing competencies.

advertising communications, such as ad blocking, subscription viewing and the ability to skip ads in pre-recorded viewing. There is a traditional dependency between mass media being financed through marcoms; however, there are complex changes occurring in the relationship between consumers, media and marcoms which have consequences for advertising agencies. ICT has provided consumers with a platform to support or criticize brands, and influence other consumers.

Digital ICT Influenced Power Shift within the Advertising Agencies

There have been key shifts in power evident within the advertising agencies, which were not mirrored in the retail grocery industry data. Pfeffer and Salanik (1978) postulated RDTs relevance between subunits of organisations. RDT's application to intra-firm power struggles¹⁵⁷ has apparent relevance in the advertising industry. The initial adoption of ICT for finance and administration purposes increased the accounting/finance departments control within the agencies and enabled them according to one interviewee 'to put the creative department on a leash'. This manifested as an institutional power shift, the accountants changed the 'rules' (NIT). Procedures were changed and departments had to get prior approval before incurring expenses. Within the creative department the adoption of CAD and the increasing prevalence of image based communication also caused a power shift, from copywriters to art directors (a functional dependence).

The population ecologists Hannan & Freeman (1984) recognise internal politics as a cause of structural inertia, and posit that a firm's ability to adapt can be limited by internal power balances among players in an organisation. Power aspects influenced agency's development of 'new' competencies. Conscious or unconscious identity values held by an organizational elite may inhibit radical change (Santos & Eisenhardt, 2005), as new activities may be ill-aligned with identity beliefs, and so create coherence challenges. It is postulated that powerful players within ad agencies such as members of creative departments may have hindered ad agencies ability to adapt to the new online marcoms era. This provides further justification for consideration of the role of power (institutional and differential) within organizations, in IE. Turner (2005:19) suggests that in power considerations multiple potential type/sources of influence have been conflated '*into one relationship of resource dependencies*'.

7.3.8.2 Digital ICT Enabled the Increased Dominance of Finance

The growth in power of finance departments, which to a large extent is dependent on the improved availability and quality of accounting and finance information enabled through ICT, has generally influenced the strategic choices of organizations, and hence the evolution of industries.

¹⁵⁷ Units within firms are frequently in competition with other units of the organization for resources, such as budgets, and skills.

In the advertising industry looking across the value chain, accountants have gained greater control throughout. In many client firms the marketing department reports to the finance department and therefore accountability in terms of evident financial return on marketing investment is sought. Finance led criteria influenced the shift in the basis of remuneration for creative agencies in the advertising industry, and in vastly reducing media commission retained by media agencies. The rise in power of finance elements within client companies has changed the client/agency relationship, in general shifting it to a more transactional basis, and reducing agencies power to influence clients.

As access to financial data improved, it influenced retailers strategies as they were able to become more concerned with margin management and overall profitability, not just revenue. ICT solutions are assessed based on ROI, and must be cost justifiable, before an investment occurs. ICT influenced the rising dominance of finance criteria in company strategies and this influence on IE is worthy of further research.

7.3.9 Conceptual Analysis Insights.

What we see depends on where we stand (Pettigrew, 1985c), and through applying a multi-modal approach the researcher seeks to provide a more holistic understanding of ICT influenced IE. The key empirical industry outcomes identified in the analysis were explored conceptually, with the utility of theoretical perspectives being considered. A summary Table (7-4) maps industry outcomes against the theories with the strongest explanatory power.

Industry Outcomes	TCE	RDT	RBV	NIT	PE
Industry Processes	X		X		X
Increased Consolidation		X	X		
Industry Boundaries	X	X	X	X	x
Industry Recipe	X		X	X	
Power and Relationships		X	X	X	

Table 7-4: Summary Industry Outcomes and Theoretical Drivers

The various theoretical drivers grow and wane in power in regard to specific industry events, and the explanatory power of the theories conjoin, to provide more holistic understanding. Thus the five theories contribute to providing explanations of the changed boundaries of the industries. There is scope for the consideration of the power of additional theories in enriching these IE explanations.

The RBV highlights the variances in core capabilities between the industries, and prompts consideration of the import of ‘product’ differences in variances in patterns in evolution of different

industries. The pursuit of sustained competitive advantage or comparable capabilities (i.e. the struggle for survival) has been a core driver of the evolution of the industries through the application of ICT. The analysis of the case data suggests that a continuum exists between RBV (reflecting firms abilities to adapt) and PE where firms adaptive abilities reach their limit and to thrive they need to be made of the right stuff. Supporting the view that acquisition skills are important dynamic capabilities (Teece et al., 1997), the case suggests that M&A strategies may circumvent a firms 'internal' adaptive limitations. M&A provides exit strategies or survival and growth strategies for firms who may lack resources in strategically important areas (e.g. scale, online capabilities).

Additionally the case data supports that the application of TCE and RDT may be useful in intra-firm structural considerations. The case data provides empirical examples to support the various theoretical perspectives, this contributes value in particular to those explanations which are said to lack empirical evidence.

7.4 OVERVIEW OF RESEARCH FINDINGS

How has digital ICT influenced the evolution of the Irish retail grocery and Irish advertising industries?

ICT influenced the evolution of the industries through changing processes, industry evolution emerged through changes in routines. The routinizability of the processes determined the degree to which ICT could be leveraged and hence the potential influence of the application of ICT for firms and the industries. The environment including ICT provided incentives and opportunities to change (variations). Firms adapted through applying ICT to processes (variations), and ICT-enabled processes were selected in industries and retained. Cumulatively the ICT-enabled processes enabled further variations, selections and retentions at other levels including firm, inter-firm and industry level.

Whilst intra-firm process changes manifest ICT's influence emerging from a micro level, and inter-firm processes capture a meso-level influence, ICT's influence is also evident emerging from a macro level. ICT as an external context had significant influence on the advertising industry through its influence on the media environment and social patterns in media consumption. For retail grocery the barcode could be perceived as emerging at an industry level, but to influence the industry it needed to be utilized in processes. The outcomes of these 'macro' and 'meso' influences manifest in new or changed processes within new or existing firms and structures, and the influence of the ICT-influenced processes aggregate into industry outcomes.

The case data provides empirical evidence that ICT had significant influence on the industries, including: increased consolidation, internationalization, competitive rivalry and turbulence in

industry populations; changed firm and industry boundaries and firm and industry capabilities and hence barriers to entry; changed relationships and power distribution along the industry supply chains, and the creation of new industry institutions.

The data reveals both correspondence and divergence in patterns of evolution between the industries. The difference in the nature of the product of the industries in particular in regard to its social complexity contributes to explaining the diverging industry patterns, and is indicative of the value of studying contrasting industries and of the need to research a wider selection of industries. Both corresponding and diverging industry evolution patterns as influenced by ICT have a basis in the specificity of information requirements for industry product processes and hence the degree of routinizability of industry processes. The ability to specify information requirements for product processes relates to the identifiability of criteria for good performance for those processes. The correspondence in patterns in two such contrasting industries suggests that these patterns may be relevant across a wide range of industries.

In regard to contextual influences on the adoption of ICT in the industries, the strength of macro environmental factors influence varied between the industries. Harsh economic climates influence on demand prompted firms to augment their leverage of ICT. General political and regulatory factors influenced both industries in regard to increasing the internationalisation of the industries which in turn increased the use of ICT. However, regulations and their influence on price-based competition were an important factor in driving the adoption of ICT solutions in retail grocery, and through their impact on media supply had indirect impact in the adoption of ICT in the advertising industry. In regard to technological factors, the impact of ICT on the explosion of media supply (external context) had a crucial impact on the adoption of ICT in the advertising industry, whilst in the retail grocery industry the seeking, development and adoption of ICT in pursuit of industry improvements and opportunities (globally) was more significant. The advertising industry was generally more reactive in its adoption of ICT versus a more proactive adoption of ICT by key players in the retail grocery industry.

Social context has changed across the period, such as changing demographics, social trends and increased digital literacy of consumers, and ICT has been utilized in both industries to aid in responding to these changes. The explosion of media supply, changing media consumption trends, and consumer marcoms saturation, continue to be a challenge for the advertising industry. Competitive intensity (struggle) has been the key internal contextual factor driving the adoption of ICT in both industries. Business models were a driver of the adoption of ICT but were also driven by ICT in the industries: the multiple and symbol group business model in retail grocery and the media independent model in the advertising industry, (i.e. coevolution occurred). There were contrasts in the industries between culture and proclivities for innovation in their role in driving and inhibiting the adoption of ICT. This was evident at firm level in retail grocery and functional

level in advertising. Specific retail grocery players frequently showed proclivities for innovation through the application of ICT, whereas a creative cultural resistance to technology has been a barrier to building online advertising competencies by incumbent firms. Again the evident degree of routinizability of the industry products, contributes to explaining these differences.

In regard to the diffusion of ICT the phases of adoption are similar across both industries; however, they were more protracted in retail grocery than in the advertising industry. Diffusion timescales were influenced by the complexity and degree of adaptation required for the application of the ICT (e.g. EPOS versus CAD). For online services demand conditions were a key influence on diffusion, consumer acceptance is required for the growth of online grocery. In general the lapse between early adopters of ICT and laggards is more pronounced in retail grocery than in the advertising industry. Dunnes Stores a major player in the industry is a special example of this. They generally benefitted from a strategy of late adoption of ICT solutions; however, they had other resources that general industry competitors lacked. ICT solutions continued to develop throughout the diffusion process. Access to knowledge was a driver of diffusion and frequently Irish industry players adopted ICT solutions after they had been adopted and become established, elsewhere in their global industry. Competition and firm's endeavours to improve their competitive fitness (struggle for survival) was a key driver of the diffusion process of ICT solutions. The adoption of ICT solutions required and created further opportunities for change, and this was a core driver of the extent of structural and architectural change observed in the industries.

Figure 7-2 addresses the research question ‘How does ICT influence industry evolution?’ and sub-research questions, by presenting a very simplified general model of how ICT influences the evolving structure of industries. The model expands the conceptual model from Figure 6.1, it engages with displaying the process of ICT driven industry change which was represented by a large arrow in previous models. Figure 7-2 represents that the routinizability of product processes is a core determinant of the development of ICT solutions and a firm’s ability to leverage ICT in processes. This is represented by an oval shape indicating its importance in ICTs influence of industry evolution. The process of ICT influenced industry evolution is interpreted through the application of evolution theory, depicted by the key processes of: Variation, Selection and Retention. The numbered points below explain the numbered stages displayed on the diagram.

1. Influenced by the prevailing Macro and Industry environment (Context), and struggle for survival, the availability of ICT (Variation) is an enabler for implementing/escalating or inspiring firm’s strategy (Selection, Retention, Variation).
2. Firm Adopts ICT (Selection). Adaptations in social technologies are required to enable firm to leverage ICT (Variations): ICT is applied to processes and process changes are required, and potentially skill and job changes (Variations).
3. Firm’s abilities to leverage ICT are dependent on social technology capabilities, and are firm specific (Variations). Leveraging ICT changes a firm’s capabilities (Variations). Firm’s scale and/or scope opportunities are expanded and pursued by firm (Selection), ICT is embedded in firm processes (Retention).
4. Firms persist with strategy (Retention), which influences industry environment (Variation).
5. This prompts other firms to adopt ICT solution (Selection and Struggle), leading to a changed industry environment (Retention).
6. Firms assess further developments in ICT (new or improved) to improve utility for firms (Struggle). Firm’s/Industry use (and potential use) of ICT influences ICT developments.

The model also illustrates the centrality of strategy to IE as influenced by ICT. The research shows that ICT has frequently been adopted to enable new or existing strategies. However, ICT has also been a driver of strategy, inspired through firms’ search for competitive advantages or in reaction to a changing competitive environment. ‘Swings of the pendulum’ have been noted between the emphasis on external opportunities and threats and internal strengths and weaknesses in the development of strategic management (Hoskisson et al., 1999:418). The research emphasizes the need for holistic consideration of the conjoined importance of industry and firm effects.

7.5 CONTRIBUTION

The literature recognises a shortage of research addressing the full-blown structural evolution of industries, in particular this gap is even more acute beyond US and manufacturing industries. The case studies of two Irish service industries, contributes to addressing this gap. The literature proposes that the application of ICT has become endemic in all industries (Chatfield, 2011; Cortada, 2006a; Dalum et al., 1999; Friedrich et al., 2011), so in focusing on how ICT has influenced IE in the Irish industries, it provides empirical evidence of the diffusion and influence of a general-purpose technology (GPT), thus augmenting the potential applicability of the research findings. The multi-modal theoretical analysis of the case data, provides a theoretical and conceptual contribution. The industry case studies and supporting data collected, represent an empirical contribution. Suggested streams of future research are also products of the research process. These contributions are discussed in the sections below.

7.5.1 Empirical Contribution

The two IE case studies represent an empirical contribution to the literature. The research which explored the influence of ICT on the evolution of the Irish retail grocery and Irish advertising industry contributes to addressing the acknowledged lack of research into the structural evolution of industries: There is a *'lack of empirical evidence...about how industries evolve over time in terms of structure'* (Malerba & Orsenigo, 1996:54). The IS literature also identified the need for industry level studies (Kling & Lamb, 2000; Phillips & Wright, 2009). Much of the strategy and ICT related research has been criticized as being *'largely acontextual, ahistorical and cross sectional'* by (Kling & Lamb, 2000:319), echoing Pettigrew (1985a), and this research contributes to addressing this criticism.

Teece (2018a) called for more empirical evidence exploring business model change, and the industry case studies provide examples. They also provided the opportunity to explore vertical integration and vertical disintegration, which was identified by Jacobides (2005), as being under represented in the literature. Additionally they capture the coevolution of physical and social technology.

7.5.2 Conceptual Contribution

The research identified some corresponding patterns in ICT influenced IE between the Irish advertising and retail grocery industry. The strong contrasts in the industries suggests that these patterns and hence the research might be relevant to a wider selection of industries. Diverging evolution patterns were also observed, and the researcher builds on the work of Nelson (2005, 2012) in regard to social technology, and how progress has varied across differing fields. The researcher postulates that the differences in industry product characteristics (i.e. the output of the

industries) in regard to the proportional social technology element and social complexity contributes to explaining the variance in patterns in evolution. Specifically in regard to ICT the feasibility of specifying information requirements for successful product/service outcomes, determined the opportunities to leverage ICT in the product/service process. This contributes towards addressing the need identified by Jacobsson et al. (2017) and Müller et al., (2018) to expand our understanding of how specific industry characteristics influence the adoption and impact of ICT.

7.5.2.1 Key Insights from the Theoretical Analysis

The industry cases have provided rich material for theoretical analysis. The resource dependency perspective has been criticised as lacking empirical evidence (Aldrich & Ruef, 2006); however, this research provides empirical support for it. Additionally case data supports Pfeffer's (1978) suggestions that RDT has relevance intra-firm, not just inter-firm, and could profitably be considered paired with intra-firm institutional power considerations suggested by Hannan & Freeman (1984). It has been suggested that capabilities (RBV) need to be considered along with TCE in explaining firm's boundary decisions (Barney, 1999; Jacobides & Winter, 2005; Teece, et al., 1997; Winter, 2015) and the case data supports this. Additionally the role of power in entrepreneurial spin-off phenomena of the independent media agencies, shows the utility of considering RDT in vertical fragmentation, in addition to TCE and RBV.

The analysis of the case data drew attention to the relevance of considering economies of scope as influenced by firm capabilities, in understanding firms boundary decisions. The consideration of TCE in conjunction with RBV are suggestive in explaining firms participation in multiple industries: their activities spanning industry boundaries. The RBV analysis supports the view that firms have heterogeneous resources (Dosi et al., 2008; Malerba & Orsenigo, 1996). This was evident in variations in firms timing of adoption and their abilities to leverage ICT. The RBV also prompted consideration of the limits of dynamic capabilities, as suggested by Eisenhardt and Martin (2000:1111) who purport that in hyper dynamic markets exemplifying 'creative destruction', capabilities '*rely much less on existing knowledge and much more on rapidly creating situation-specific new knowledge*'. The online advertising sector appears to reflect these characteristics. The case data suggests consideration of a continuum between RBV, dynamic capabilities and the population ecology perspective, and the potential role of acquisition capabilities in circumventing a firm's adaptive limits.

The population ecology perspective allowed the researcher to recognize the high turbulence of the industry populations over the researched period, drew attention to the prevalence of M&A activities in both industries, and indicated the importance of selecting sufficiently long research time periods to allow patterns to be revealed. The case data also provided evidence of mimetic, coercive and

normative institutional forces at play in the evolution of the industries, in regard to the diffusion of ICT. The multi-modal approach contributes to revealing more holistic explanations of the IE patterns that were observed.

7.5.3 Contribution to Practise

The research can aid in the self understanding of industry participants, and interviewees have expressed an interest in the case studies and the research findings. Additionally, the study of the influence of ICT a GPT suggests scope for wider relevance of the research. The limitations in the application of ICT highlighted by the contrasts in the cases, regarding the requirement to establish rules for processes to enable ICT to deliver significant benefits, is useful to IS practitioners and business participants.

The case data suggests that CEOs and those driving change agendas need to be mindful of the potential for powerful factions within companies to inhibit change/adaptation. Where agendas challenge cognitive frameworks, inertia and existing institutional norms act as barriers to adaptation.

7.5.4 Future Research Agenda

The researcher echoing Cortada's (2004) reflections on his multiple industry studies feels that the thesis merely provides a path, a way through the woods, and that further and future research is required to build a motorway. Limitations of the research include the wide scope of the domain, which means that breadth has been sacrificed to depth to a certain degree, in the literature review and in the collection and use of case data.

There is scope for future use of collected data which had to be excluded given the limitations of a PhD thesis. There is potential for creating a contribution through turning the research question through 180 degrees, and examining how the industries influenced the development of ICT. Cortada (2013) has called for such research. Adding to data already gathered for the cases this can be explored and become a publication in the future. The case data also suggests that ICT has increased the influence of finance throughout industries and this is worthy of further consideration.

The case data, suggests that patterns of IE and the effect of the adoption of ICT for industries is influenced by the extent/degree of the routinizable versus unroutinizable 'social' element in the industry 'product'. This concept requires further exploration.

Given the contextualist design of the research there is scope to do a reanalysis of the data and create pure IE cases and conclusions, perhaps allowing different insights to be revealed. The ICT perspective taken means that to a certain degree other factors were reduced in focus. For example,

Quinn (2002:238) found that *'power-directed behaviour at firm and industry levels play[ed] a significant role in shaping the direction, pace and outcome of industry change*. The important political role that RGDATA played in shaping the Irish retail grocery industry as an enabler for a thriving symbol group sector, is not reflected in the thesis because it is not strongly correlated with ICT.

Although the research is valuable, one of its limitations is its restricted scope of two industries and one national context. Similar research is required in more industries and in more countries. ICT was a key enabler of the increased globalisation of the industries studied, and this influenced their evolution. Buensdorf (2016) has suggested a requirement for a more global focus and multi-country industry evolution studies. Globalisation has not been addressed in models of IE such as the LCM, or McGahan's (2000, 2004) 'Trajectories of Industry Change' or Quinn's (2002) 'Phase Pattern of Industry Evolution'. The research would indicate that globalisation is worthy of consideration in regard to existing models and future studies. When a sufficient research pool has been built, meta-analysis will be possible, to test the boundaries of relevance for these research findings.

7.5.5 Conclusion

The research revealed that ICT had a significant influence on the evolution of the industries, across such characteristics as: industry processes, industry consolidation, degree of internationalization, industry population, industry and firm boundaries (horizontal and vertical), supply chain structure, the basis of competition, capabilities and skillsets, and industry institutions. ICT influenced changes across each of Porter's Five Forces (1979) thus greatly influencing the industry landscape. ICT has been an enabler of firms' adaptive capabilities in both industries. The research has highlighted the continued relevance of Porter's Five forces, and the role of industry vis-à-vis RBV.

The case data, suggests that patterns of industry evolution and the effect of the adoption of ICT for industries is influenced by the extent/degree of the routinizable versus unroutinizable 'social' element in the industry 'product'. ICT was deployed through processes and at times significant process reengineering was required to leverage ICT. Process changes can be viewed as occurring at micro and meso levels (intra and inter-firms), and they are at the core of ICT influenced IE. The research indicates that exogenous ICT driven influences had a more significant influence on the advertising industry than the retail grocery industry, and that in general retail grocers have been more proactive in seeking opportunities to leverage ICT to improve efficiencies and revenue, (endogenous ICT influences were more important in the retail grocery industry).

The case data shows that information asymmetries emerged through the application of ICT and that power shifted along the industry value chain (including within firms) in alignment with these information advantages. Additionally as all firms eventually came to adopt comparable ICT

solutions, superior leveraging of ICT was required to maintain competitive advantages through its application i.e. superior social technology capabilities.

The consideration of the degree of routinizability of products is relevant to the IS literature. Routinizabilty through ICT has dependency on the specifiability of information requirements for a process. This concept can inform the limits of what can be encapsulated in artefacts, and can provide insight into IS influenced industry change and is worthy of consideration in IS failure literature.

APPENDIX A: REPRESENTING CORE INDUSTRY STRUCTURAL EVOLUTION ANALYSIS

Category	Data Includes	Sources	Note
Industry membership	Dynamics: Firm Entry and Exit Demographics: Industry concentration	Industry Associations, Industry Journals, Firm publications, Individual Industry representatives and other public documents including industry statistics.	The focal unit of the research is the Industry, all data is assessed in relation to its meaning for the Industry. Variations can emerge from any level. Changes are interconnected, research will seek to understand connections and root causes underlying the process and outcome of these industry changes.
Business system, Industry and Firm Boundaries	New Products, product developments and extensions Capabilities Vertical & horizontal Integration, mergers takeovers, New intermediaries		
Macro Environment	PEST Factors		
Themes	<p>Changing: How things are done, What things are done, Who are the customers, Who are the leading firms, Who/what are the instigators of change When? Why?</p> <p>Diffusion Business Models Products Services Value Chain Processes Relationships Regulations Dependencies Organizational Forms Skills Key performance indicators Competition Industry Leaders Strategic groups Challenges Customers Boundaries</p>		
Derived from Malerba & Orsenigo (1996)			

APPENDIX B: OUTLINE OF DIFFUSION MODELS

The epidemic model assumes that lack of knowledge is a primary blockage to technology adoption and diffusion in industries (Allen, 2000; Allen & Kim, 2005; Cortada, 2004). The epidemic model considers ‘common source’ and ‘word of mouth’ as the most frequent sources for information dissemination (Geroski, 2000). The persuasiveness of the information source impacts the speed of diffusion (Geroski, 2000).

‘The probit model argues that differences in adoption time reflect differences in the goals, needs and abilities of firms’ (Geroski, 2000:604). Firms themselves can be the cause of low diffusion of a technology in an industry, they may lack skills to adopt and adapt to the technology thereby being slow to respond to opportunities offered through the use of new technologies (Geroski, 2000). Firms will assess sunk costs for existing technology, switching costs, fit with competencies, and learning costs in deciding whether to adopt a new technology (Geroski, 2000). The density dependence diffusion model is informed by a population ecologists approach to organizations, it draws on the twin drivers of legitimation and competition as determinants of the diffusion process (Geroski, 2000; Geroski, 2001). Potentially the same influencing factor can have conflicting effects: high levels of competition can act as an accelerator or an impediment to technology diffusion (Geroski, 2000). The information cascade model highlights consideration of network externalities in the diffusion process (Geroski, 2000).

APPENDIX C: GENERAL AND CASE SPECIFIC KEY DIGITAL ICT DEVELOPMENTS

Year	Generic Technology	Advertising Industry	Retail Grocery
1943	Colossus calculating machine built in Britain for decoding German messages		
1946	US Military Build ENIAC general-purpose computer		
1951	The LEO (Lyons Electronic Office)		
1951	UNIVAC US commercial computer		
1952	UNIVAC comes to widespread public attention on TV when used for predicting outcome of Presidential election by CBS		
1955	Electronic transistors begin to replace valves, leading to the Mainframe computer		
1956			Burroughs supplying Computer equipment suitable for inventory control to Supermarkets
1959			IBM supplying a 'merchandise control system' to supermarkets
1961	IBM Electric Typewriter 'Selectric' with changeable fonts		NCR offering computer bureau services to small and medium
1962		Several US Ad agencies adopt computers	
1964	Xerox 1st commercial version of Fax (Facsimile) similar to current Faxes. Connected to telephone line in 1966		
1966			Computer Bureaus in US offering services including 'merchandising reports' to small and medium grocery stores. Including 'purchases, sales analysis, accounts payable and payroll'
1967		Donovan Data Systems - Media software	
1968		Telmar Media software launched	
1969	ARPANET US military precursor to the Internet		
1970	First Personal Computer -PC		
1972	Email 1st software		
1972		DDS TV buying software	
1972		DDS expands to the UK	
1973			American Grocery Industry selects barcode as Universal Product Code
1974	Intel produce the 8080 considered as the first commercial microprocessor		1 st product scanned in a supermarket. Wrigley's chewing gum, Marsh's Supermarket, Ohio

Year	Generic Technology	Advertising Industry	Retail Grocery
1974		DDS Print Buying software	
1975	Altair 8800 PC uses the Intel 8080		EPOS installed in 30 sites, 50% of supermarket products have barcodes in US
1975	Microsoft Founded, producing Altair BASIC programming language for the Altair		Electronic Funds Transfer System (EFTS) technology trialing in supermarkets in US, individual banks solutions.
1976	Apple Founded to sell PCs		EPOS in 36 stores in US
1976		DDS Production Software	
1977		DDS Accpak for accounting	
1977	Mass produced PCs -Apple II, Commodore Pet 2001 and Tandy TRS-80		
1977		Apple II with colour graphics, keyboard	
1978	1st email spam		Ahold in Holland 1 st European store to trial EPOS with scanning. Tesco 1 st store in UK to trial it.
1979	Mobile Phone 1st generation – analogue		
1979	Visicalc 1st spreadsheet launched on Apple II		
1980	Emergence of Standards for Fax, which became universal, leading to vastly increased usage		90% of US Supermarket Products had Barcodes
1981	IBM PCs using MS-DOS (Microsoft Disk Operating System) launched		
1981	First Laptop		
1982	Intel 80286 chip 2.7million operations per second installed on computers with 100 times more memory than the Altair 8800		Tradcoms an early EDI standard was superseded by 1995 but remained in use.
1983	Lotus 1-2-3 released		WalMart adopts EPOS in 1 st store
1984	Mac OS with Graphical User Interface (GUI)		WalMart adopt handheld scanners for reordering stock
1984		Apple Iic - the Apple Mac	
1985	Excel on Apple Macintosh		
1985	Microsoft Windows		
1988	Microsoft becomes the world's largest software company based on sales		
1987	Microsoft buy PowerPoint (which was originally designed for Macs)		WalMart complete private satellite communication installation to link stores and head office voice, data and 1 way video fro head office.

Year	Generic Technology	Advertising Industry	Retail Grocery
1987	Excel on Windows 2 release for PC's but windows not yet popular. Lotus 1-2-3 dominates. Excel displaced Lotus 1-2-3 in the 1990's as the popularity of windows increased.		
By 1988			EFTPOS was being trialed in the UK in 1988, and was in use in France and some Scandinavian countries
By 1989			US Supermarkets trialing Loyalty Schemes. Ukrop were trialing a Citicorp system.
By 1989			
1990	Microsoft PowerPoint launched		WalMart Scan goods in on delivery to stores based on container barcode labels
1990	Microsoft Windows 3.0 faster better tools. Intel 386 Processor. Starting to look like current software		
1990	First Internet Search engine 'Archie'		
1990	Internet - beginning of commercial phase, access by general public via dial-up		
1991	PowerBook Laptop by Apple		
1991	World Wide Web public availability		
1991	HTML (HyperText Markup Language) mark up language - web page display		
1991	Mobile Phones 2nd Generation		
1992	First text message (SMS) on Mobile		WalMart launch Retail Link between to communicate sales trends and inventory levels to their suppliers
1993	Microsoft Windows NT - 32 bit operating system		
1993	1st Web search engine - World Wide web Wanderer		
1993	Web analysis company - web analytics		
1994	WebCrawler a leap forward in web search functionality		
1994		Web1.0 First Banner Ad - US	
1994	Amazon.com launched online in 1995, 1st profit in 2001		
1994	Bluetooth technology launched by Ericsson. Wireless technology - Wi-Fi		
1995	Microsoft Windows 95 release. By now Microsoft dominated office software		EDI standards - EDIFACT and EANCOM to supersede tradcoms

Year	Generic Technology	Advertising Industry	Retail Grocery
1995	SSL (Secure Sockets Layer) security through encryption for transactions online - essential for ecommerce take off		
1995	eBay launch		
1995	Yahoo! Web directory		
1995	Microsoft Internet explorer - web browser		
1995	Email - webmail enabled e.g. Google Gmail		
1995	JavaScript, web page language - enables richer online experiences- dropdown menus, online forms		
1995	RealPlayer - based on streaming online rather than download	Start of on demand viewing listening	
1996		1st Ad-serving companies intermediaries between website owners and space buyers e.g. DoubleClick	WalMart use the Internet as a platform for Retail Link and EDI
1996	Broadband - meaning fast internet access rate. Cable rather than telephone wire access		
1996	Mobile phones with internet access		
1996	Adobe Flash - platform for developing and using rich internet applications (plug in)	Adobe Flash used in advertising for animation in online content	
1997	Start of 3rd Party Analytics		
1997	Demonstration of first Smartphone		
1998	Microsoft Windows 98. By now PCs are common at work and home.	Ad networks – enable advertisement on many websites through one dashboard. Reaction to enormous increase in online media supply	
1998	XML (Extensible Markup Language)standardizing web page encoding formats		
1998		Pay-per Click web advertising	
1998	Google incorporation (as at 2015 the global dominant search engine) PageRank algorithm key to usefulness		
1999	Web 2.0 change in Audience interaction with Web - beginnings of mass participation	Web 2.0 era of Interactive advertising	
1999	RSS feeds (Really Simple Syndication)		
1999	Napster founded		
2000	Mobile Phones 3rd Generation - wireless networks, Multi media Messaging (MMS), and Broadband capability		
2000		Google 'Adwords' Keyword Advertising – for a fragmented online landscape	

Year	Generic Technology	Advertising Industry	Retail Grocery
2000	Social Networking - Friends reunited is founded		Ocado launches (online only grocery service)
2001	Wikipedia launched -participation - universal information source database		
2001	Dotcom crash – Context		
2002	eBay buy PayPal		
2002	Friendster social network site	Web 2.0 created the potential of Viral spread of information - not push marketing as per traditional media	
2003	Apple's Safari web browser		
2003	Linked in Launched - Business social Networking		
2003		Google launches adserver service 'AdSense'	
2004	Facebook (TheFacebook.com launched) Social Network site		Walmart, Asda and Carrefour were using voice based stock picking technology.
2004	First Web 2.0 conference		
2005	Nielsen Local People Meter		
2005	YouTube Launched		
2005	Web Analytics - Google Analytics	Google analytics	
2005	AJAX (Asynchronous JavaScript and XML) enabling complex interactive content on webpages		
2006	Twitter - micro-blogging		
2006		DDS Time and Cost management platform	
2006		Mediabank founded digital media software	
2007	Apple launch iPhone		
2007	Microsoft Silverlight a challenger to Adobe Flash Platform (plug in)		
2008	Android Phones		
2008		Consolidation in Adserving Google buy DoubleClick	
2008	Spotify		
2008	Web 3.0 Behavioural Advertising		
2008	Mobile Phone 4th Generation standards specified		
2010	Microsoft launches Web apps for Office relates to cloud computing	Google launch 'mobile first' strategy	
2010	Apple launch iPad changing perceptions and expectations of personal mobile computing		
2012		Merger of DDS and Mediabank to form Mediaocean	
2012		Mediaocean PRISMA digital platform	

Year	Generic Technology	Advertising Industry	Retail Grocery
2014		Mediaocean Connect, platform for partner integration	Ocado (online only grocery) launched in 2000 makes a profit for the 1 st time.
2016			Ocado experimenting with robotic selection of products for their online service

APPENDIX D: DEFINITION OF GROCERY GOODS

Category No.	Description
1	Fresh fruit and vegetables
2	Meat and fish - not cooked or cured
3	Dairy products and bread: Bread, Breakfast cereals, Dairy products (milk, cheese etc.) and eggs, Butter, margarine and other oils
4	Household necessities (non-durables): Automatic washing powder/liquid, Dishwasher detergent, washing-up liquid, Household cleaning cream/liquid, Other cleaning materials, Toilet paper, soap, Shower gel, toothpaste, Shampoo, shaving foam, deodorant, Baby powder, disposable nappies. Sanitary towels, tissues
5	Other food products: Meat and fish – cooked, cured and frozen, Flour, Biscuits and cakes, Sugar, sweeteners and preserves, Sweets and chocolate, desserts and ice cream, Condiments and sauces, soups and miscellaneous items
6	Alcoholic drinks (consumed at home)
7	Non-alcoholic drinks

Source Competition Authority (2008)

APPENDIX E: ADVERTISING AGENCIES NAICS DEFINITION

NAICS:541810

The Advertising industry '*comprises establishments primarily engaged in creating advertising campaigns and placing such advertising in periodicals, newspapers, radio and television, or other media. These establishments are organized to provide a full range of services (i.e., through in-house capabilities or subcontracting), including advice, creative services, account management, production of advertising material, media planning, and buying (i.e., placing advertising)*'.

Source <http://www.naics.com/naics-code-description/?code=541810> [Accessed 15th Feb 2014].

APPENDIX F: INTERVIEWEES

Organization	Interviewee	Profile
Advertising Industry – Preliminary Interviews		
Ogilvy & Mather	Tommy Mac Donnell	Business Director
Ogilvy & Mather	Jo Wood	Strategic Planner
Ogilvy & Mather	Deirdre Riordan	Traffic Manager
Ogilvy & Mather	Suzanne Delaney	Director head of digital content, technology and development
Ogilvy & Mather	Diane Tangney	Planning director
Ogilvy & Mather	Barry Kennedy	Business Director
Ogilvy & Mather	Olive Fogarty	Business Director/Head of Redworks
Ogilvy & Mather	Olive Cronin	Financial Controller
Advertising Industry		
McConnell's	Dr. John Fanning	Industry Veteran. Former Managing Director of McConnells Advertising 1980 - 1999, and Chairman 2000-2005. Lecturer in Marketing and Branding at Smurfit Business School. Author and regular writer on Marketing.
Des O'Mearas, Saatchi & Saatchi, Ogilvy & Mather	Dr. Helen Marks	Industry Veteran. Experience on Client and Agency side. Account Director & Strategic Planning Director
Des O'Meara & Partners, Irish International, Arks Advertising, Refresh Digital Agency	Ciaran O'Reilly	Managing Director of Refresh Digital Communications, since 2007. Planning director, Account director. Account Manager.
n/a	Hugh Oram	Author of The Advertising Book: A history of the Irish Advertising Industry (published 1986), and newspaper correspondent for industry related articles
Marketing.ie	Michael Cullen	Editor of Marketing.ie since 1990 - over 20 years
IAPI, AFA, AFA O'Meara, McConnells, Streamabout.	Stuart Fogarty	Industry Veteran: Former President of IAPI, former MD of AFA, AFA O'Meara and McConnells, currently director of Streamabout
Inkerman Technologies (supplier to ad industry)	Patrick Casey	Digital technology: MD of Inkerman Technologies: Builds Web sites, Aps, Online Ads
Numerous agencies and freelance	Nick McGivney	Lecturer in Copywriting and Creativity DIT . In industry since 1990. Has worked for several agencies and been freelance.
The Media Bureau, Saatchi & Saatchi, Irish International, All Ireland Media, Carat, Aegis Media Group, Dentsu Aegis Ireland	Liam McDonnell	Media Expert: CEO Dentsu Aegis Ireland.
Company of Words. Arks, Youngs, CDP and Burnett (Dublin)	Breandan O'Broin	Lecturer in Creativity & Copywriting. MD of Company of Words. Copywriter and Creative Director in other agency. Client side experience in London
DDFH&B. Client Companies	Miriam Hughes	Client & Agency side since 1988. CEO of DDFH&B
Wilson Hartnell	Frank Young	Industry Veteran. MD of Wilson Hartnell.
Core Media Group. Bell Advertising, The Network, Carat	Alan Cox	Media Expert: CEO Core Media
AAI, Wilson Hartnell, Brian Cronin & associates, Irish International, Saatchi &	Barry Dooley	CEO of Association of Advertisers in Ireland (AAI). Formerly account director, board director in a range of agencies, and

Organization	Interviewee	Profile
Saatchi BBDO, Chemistry, Newworld associates. Showerings (Client side)		Product Group Manager for Showerings (Client side).
The Research Centre	Colm Carey	Market Research. Consumer Psychologist
Retail Grocery Industry – Preliminary Interview		
BWG (Wholesaler Group)	Veronica Sullivan	Head of IT 2004-2014
Retail Grocery Industry		
BWG (Wholesaler Group)	Veronica Sullivan	Head of IT 2004-2014
Quinnsworth and Tesco (Ireland)	John Prendergast	Formerly Tesco Retail Trade and Marketing Manager. Tesco Manager of Change initiatives. General Manager of a Tesco Extra Store. Manager of Quinnsworth Fruit & Veg in Store.
Tesco (Ireland)	Richard McKeown	Tesco (Ireland) Head of Loyalty and Local Marketing 2005-2015. Clubcard Implementation and Use.
Kantar World Panel, formerly Jacobs and Irish Distillers (Retail Suppliers).	Georgieann Harrington	Kantar - Consumer Insight Director – Shopper Behaviour expert. Former Category manager Jacobs and Irish Distillers
ECR Ireland, GS1, and Superquinn	Declan Carolan	Director of ECR Ireland and Co-chair of ECR Community (Europe). Former director of GS1. Supply Chain manager Superquinn 1986-2005.
Superquinn	Frank Murphy	Former Finance Director Superquinn 1979-2008, Managing Director STM ltd 1993-2005, Buy4Now Chairman 1999-2013
RGDATA	Tara Buckley	Director General RGDATA

APPENDIX G: DATA ANALYSIS EXAMPLE - PHASE 1

Phase 1: Excerpt of Timeline Event Analysis Filtered by ‘Context Regulatory’

This table reflects the operationalization of a temporal bracketing strategy. The table was created and maintained in Excel, to capture the timing of relevant contextual, industry and ICT events. The excerpt displays the table contents filtered by ‘Activity/Category’ = Context Regulatory. Other Activity/Category entries in the table included: Economic, Entry, Exit, Wholesalers, Technology Adopted...

Year	Activity/Category	Store/Player/ Event	Location/Notes
1952	Context Regulatory	Restrictive Trade Practices Bill	Fair trading rules introduced, calls for establishment of Fair Trade Commission (FT)
1952	Context Regulatory	Food hygiene regulations	Food rationing ends
1955	Context Regulatory	Retail Prices (display) Order	
1956	Context Regulatory	Groceries Order	Abolition of resale price maintenance. This encouraged price based competition
			FTC to ensure manufacturers relate prices of products based on quantity
			purchased rather than function, wholesalers and retailers should not be treated
1958	Context Regulatory	MNC to be granted full wholesale terms.	differently
1958	Context Regulatory	The Restrictive Trade Practices (Groceries	Encouraged economies fo scale for buying
1978	Context Regulatory	Groceries Order	Amended to exclude Meat & Veg
1973	Context Regulatory	Griceries Order	Introduce curtailment of below cost selling. can't advertise product price at below c
		New planning directive introduced to	
		protect the future of Ireland's independent	
		grocers	Maximum store size
1981	Context Regulatory		
1987	Context Regulatory	1987 Groceries Order	Banned below cost selling
		Minimum wage for grocery employees is	
		introduced	
1992	Context Regulatory		
2005	Context Regulatory	Groceries order revoked	

APPENDIX H: DATA ANALYSIS EXAMPLE PHASE - 2

Phase 2: Excerpt of an Interview Transcript with Preliminary Comments

The added comments reflect initial interpretations and sensemaking of interview data. These excerpts supported the recognition of the rising power of Finance throughout the Advertising industry, which in turn influenced the increased focus on measurability. These factors contributed to changing the basis of agency remuneration.

Ais: FMCG's under pressure to do sales promotions rather than investing in Brands

█ Yes vicious circle. you can't afford to do both**and if you're reporting to a finance committee and say I really need to build my brand I'm going to stay out of Dunnes, the finance committee will look at you and say you're fired.** (Ais client impact, finance ruling clients)

Ais It's all about sales figures

█ : yes a lot of the client companies are under a lot of pressure to deliver by month, not just by quarter but by month, and if they tick the box this month in terms of delivery they might get a certain proportion of money to get them through the next month, but that money will never be given to say you've 300k now to go off and build your brand over the next 12 months ..more importantly what's missing is no one can tell you if I spend 300k or 400k over the next 12 months on brand what it's going to deliver, no one is in a position, and this is a thing we've been trying to promote here in AAI it **RALLY, return on marketing investment**, no one seems to know what that model is about here in Ireland or in the UK or the states, they say it's very big in the states, big in the UK and not so big in Ireland, but if I was able to go into a boardroom and say, if you give me 750grand to invest in brand advertising ..I'll guarantee you we'll get x amount back over a period of time, I don't know anyone who would go into a room and say that

Aisling Clarke 7/8/2017 15:06

Comment [24]: Marketing reporting to finance in client companies and Finance want short term returns, long term strategies , don't fly. Client companies are under pressure to deliver by month not by quarter - short- term focus - so sales promotions instead of longterm ad campaigns

Aisling Clarke 7/8/2017 15:09

Comment [25]: The predictive return on investment from marketing is still elusive - return on marketing investment - an issue in the industry

Increased focus on measurability - still a challenge in marketing spend

APPENDIX I: MEDIA DEREGULATION - KEY LEGISLATION

Deregulation of the media environment in Ireland (see table below) and across Europe, increased media supply in Ireland, and this created a more complex media environment which increased the requirement for the application of digital ICT by advertising agencies, in order to provide effective media services to clients.

Year	Legislation	Influence
1988	Radio and Television Act	Allowed provision for the set up of privately funded TV and Radio stations in Ireland
1989	‘European Directive, ‘Television Without Frontiers’	
2000	Legal decision - Sky were allowed to broadcast ‘Ireland only’ advertising in Ireland.	‘Sky Digital’ - BSkyB Satellite rollout took off in Ireland as they began to offer free installation of their service.

References: (Shaw, Picard, & Spain, 2010)

Key Legislation related to deregulation of the broadcasting environment

APPENDIX J: TIMELINE OF GROWING MEDIA SUPPLY IRELAND

Year	Media	Event	Comments
1859	Newspaper	The Irish Times first Published	
1905	Newspaper	The Irish Independent	
1906	Newspaper	The Sunday Independent	
1909	Cinema	The Volta the first dedicated cinema in Ireland was set up in Dublin by James Joyce	
1926	Radio	1 st Radio broadcast in Ireland on Radio Eireann	
1927	Radio	first radio commercial on RTE	
1931	Newspaper	The Irish Press was established	Ended publication in 1995
1960	Legislation	The broadcasting Act	
1961	Television	1 st broadcast by Telefis Eireann, Republic of Ireland's first television channel	Telefis Eireann (later to be called RTÉ Radio Telefis Eireann)
1962	TAM	Television Audience Measurement. Media Research launched	Monthly figures to be provided
1962	Newspaper	News paper 1 st Colour Ad in Irish Times	Fighting back against the new media of TV, the Irish Times ran it's first ever colour advertisement for Jacob's biscuits, followed swiftly by other Irish Paper Irish Press and the Irish Independent
1970	Television - technology	RTE Relays established – cable TV	Set up to give perfect BBC and UTV reception to Dublin, later it became Cablelink
1973	Newspaper	Sunday World launched	
1974	Television - technology	1 st Colour TV Ad on RTE	
1978	Television	RTE2 Launched, Ireland's 2 nd TV station	Later RTE2 was rebranded as Network 2
1982	Television	Channel 4 first broadcast	Another UK station being received in Ireland
1982	Radio	Pirate Radio stations present at IAPI Media conference	RTE Boycott the conference. The Pirate Radio stations Nova and sunshine present
1986	Television- technology	Satellite TV	1986 satellite television programmes began
1988	Legislation	1988 Radio and Television Act -	

Year	Media	Event	Comments
		deregulation	Provision for private (commercial) radio and TV. Local radio began to grow after the act.
1989	Television	Government commence campaign to extend cable to rural Ireland	
1989	Legislation	EU Directive 'Television Without Frontiers'	
1989	Radio	Commercial radio launch: Century Radio	National broadcast in competition to RTE
1990	Television	Setanta sport	2 nd commercial channel in Ireland
1990	Legislation	The 1990 Broadcasting act	Capping of advertisement on RTE
1991	Radio	Century Radio closed	RTE now only competing with local radio again. Failure of century slowed the development of commercial radio in Ireland
1993	Radio	1 st year of radio advertising awards	
1996	Television	TNAG Irish language television station launched by RTE	Later called TG4
1997	Radio	Commercial Radio station – Radio Ireland	National broadcast in competition to RTE relaunched as TodayFM in 1998
1998	Television	1 st Commercial television station launched in Ireland - TV3	TV3 launched in 2000
1998	Cinema	1 st showing of Digital Feature Film in cinema in the US	
2000	Television	BSkyB Satellite Rollout	
2000	Cinema	1 st cinema ad in Europe in Dolby Surround Sound	Agency Chemistry, Client The Mortgage Store
2002	Legislation	The Communications Act 2002, establishes ComReg	Act established the Commission for Communications Regulation, ComReg, which regulates the infrastructure of communications, including broadcasting. In charge of frequency allocation
2005	Online radio	Near FM – Podcasting	A local radio station lead with podcasting in Ireland
2006	Online Radio	RTE Radio - Podcasting	Impressive growth 1million

Year	Media	Event	Comments
			downloads in 6 months
2009	Radio	Newstalk 106 extends to quasi-national broadcast	
2009	Radio	4FM – Multi city broadcast	
2009	Legislation	The broadcasting Act 2009	Created BAI the broadcasting authority of Ireland – which has responsibility for Public, Independent commercial and the community broadcasting
2009	Online TV	RTE Player launched (RTE Player , a live and catch-up web TV service from RTE)	Viewers can't avoid advertisements on the Player
2010	Television Regulatory	BAI directive -Increased allowable Advertising minutes for Irish commercial TV Channels	Case raised by TV3. Allowed minutes increased from 10 to 12 minutes per hour. Interestingly advertising agencies opposed the increase.
2010	Cinema	1 st 3D cinema advertisement	Ad was for Cushelle Toilet rolls
2011	Regulatory	BAI permit product placement on Irish Television	Restrictions apply e.g. not allowed in children's TV programs. Product placement must be announced in advance of the program.
2012	TV	TV Broadcast in Ireland goes fully digital. Analogue transmission ceases	
2014	Cinema	Digital print used in all Cinemas in Ireland	Digital replaced 35mm film
2015	TV	UTV Ireland launched	

Sources: 1962. Telefis Eireann to use measurement service, *Irish Times*: March 1st ed.:3; 1995. "1982 was the year ...". *IMJ* 21(12 December): 28; 2010. 3D ad showing at a cinema near you, *Irish Independent*; 1991. AAI keeping an eye on effects of the ACT, *IMJ*; Barry, 1982. How RTE Missed the Best in Years. *Irish Marketing & Advertising* (April/May); Cunningham, 2015. 2015: More Choice and Growth for 2015 Media Forecast: *Carat*; 2000, First Dolby surround ad in Ireland, *IMJ*; 1993, First Radio Advertising awards, *IMJ*; Hayes, 1974. How Mass Are The Media? *IMJ&A*, 2(September): 11-13; History of Multichannel Broadcasting in Ireland, *Irish Cable & Digital Guide*, http://myhome.iolfree.ie/~icdg/feature_history.htm [Accessed 22 May 2015]; <http://www.independent.ie/entertainment/books/review-media-independent-newspapers-a-history-edited-by-mark-obrien-and-kevin-rafter-28813071.html> *Independent.ie* [Accessed 22nd May 2015]; <http://www.independent.ie/lifestyle/joyces-picturehouse-flop-28951351.html> *Independent.ie* [Accessed 16th June 2015]; <http://www.irishnewsarchive.com/> *Irish News Archive* [Accessed 27th May 2015]; O'Brien, 2008. *The Irish Times: A History*. <http://markobrien.ie/titles/the-irish-times-a-history/>: Four Courts Press; O'Hara, 2015. Ireland's Love Affair With Cinema Endures How We Went to the Cinema in

2014, *Media Street*. <http://www.mediastreet.ie/blog/2015/01/29/ireland%E2%80%99s-love-affair-cinema-endures-cinema-2014/>: Wide Eye Media; Oram, 1986. *The Advertising Book: The History of Advertising in Ireland*. Dublin: MO Books; Radio Eireann <http://www.rte.ie/archives/exhibitions/681-history-of-rte/> : *RTÉ* [Accessed 10th Feb 2015]; Shanahan, 2000. Shark Hunting in Kinsale. *IMJ* 26(9 September): 28; Shaw, Picard & Spain, 2010. *Irish Broadcasting Landscape: Economic and Environmental Review for the Broadcasting Authority of Ireland (BAI)*: Athena Media. [Accessed 20th April 2015]; Slevin, A. 1998. The Wow factor *IMJ* (October)

APPENDIX K: CLASSIFICATIONS OF GROCERY RETAILERS

Grocery retailers in Ireland are generally grouped into 3 classifications. These classifications are primarily based on the retailers supply chain structures.

1. Multiples have vertically integrated structures i.e. They have absorbed the wholesaling function into their operations, and buy direct from food manufacturers. These retailers generally operate a number of outlets, hence the nomenclature multiples. Within this category Discounters can be viewed as a distinct strategic group. They concentrate on no frills, limited stock range and products without big brand status
2. Symbol Group retailers are affiliated to wholesaler operated franchises. The stores are generally run by their independent owners, under a wholesaler fascia/'symbol' and tied to a wholesaler support system.
3. Independents are grocery retailers utilizing wholesale services but operating without fixed ties to them. Independents operate as convenience shops or supermarkets (e.g. JC's Supermarket in Swords in Dublin), as TSN's or as specialist food providers such as fruit and vegetable shops and butchers etc.

Reference: *A Description of the Structure and Operation of Grocery Retailing and Wholesaling in Ireland: 2001 to 2006* in *Grocery Monitor: Report No. 1* 2008, The Competition Authority:

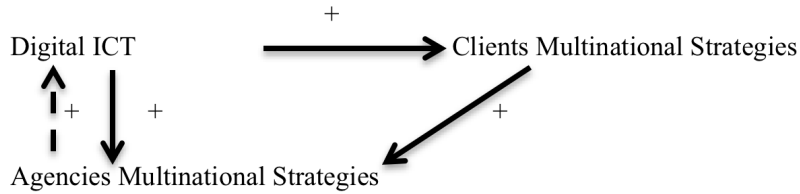
http://www.ccpc.ie/sites/default/files/documents/grocery_monitor_report_1.pdf.

APPENDIX L: LEGISLATION AND THE GROCERIES ORDERS

Year	Legislation	Influence
1955	Retail Prices (display) Order	Prices of many grocery commodities had to be displayed. Price display encouraged price comparison and hence price based competition
1956	Groceries Order	Abolition of resale price maintenance. This encouraged price based competition
1958	Amendment to Groceries Order	Suppliers are allowed to provide different trading terms to different classes of buyer. Encouraged multiple model and wholesaler consolidation to benefit from economies of scale, and encouraged price based competition.
1973	Groceries Order	Introduction of a ban on below cost selling in regard to advertising products below cost. Not effective in curtailing price based competition.
1978	Amendment to Groceries Order	Excludes meat and vegetables from the order. A factor encouraging retailers to expand their product range, although retailers have generally earned high margins on meat and vegetables products.
1987	Groceries Order	Introduced ban on below cost selling (not just advertising). Reduced impetus of price based competition.
2006	Competition (amendment) act	Groceries Order repealed in full, ending the ban on below cost selling.

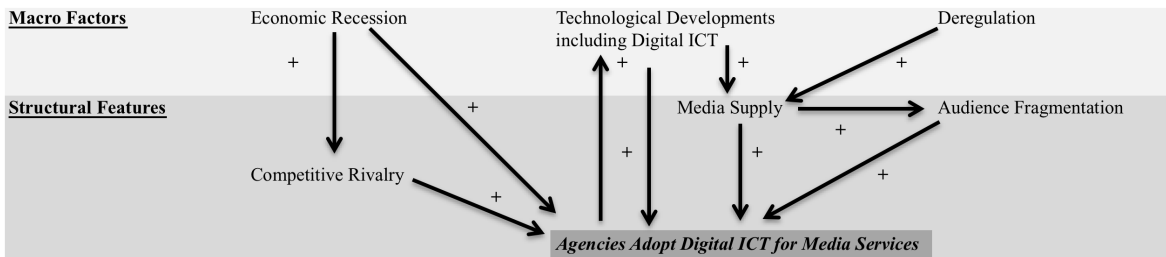
Sources: 1992 *Talking shop: 50 Years of the Irish Grocery Trade: 1942-1992*, RGDATA; Donnelly, G., 2005/2006. 'The impact of the Restrictive Practices (Groceries) Order on Competition in the Irish Grocery Trade'. *Journal of the Statistical and Social Inquiry Society of Ireland*, XXXV: p. 151-178; Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*. Doctoral Thesis. Trinity College Dublin..

APPENDIX M: SIMPLE REPRESENTATIONS OF CONTEXTUAL FACTORS INTERACTIONS ADVERTISING INDUSTRY



Digital ICT Industry Influences and Increased Globalization

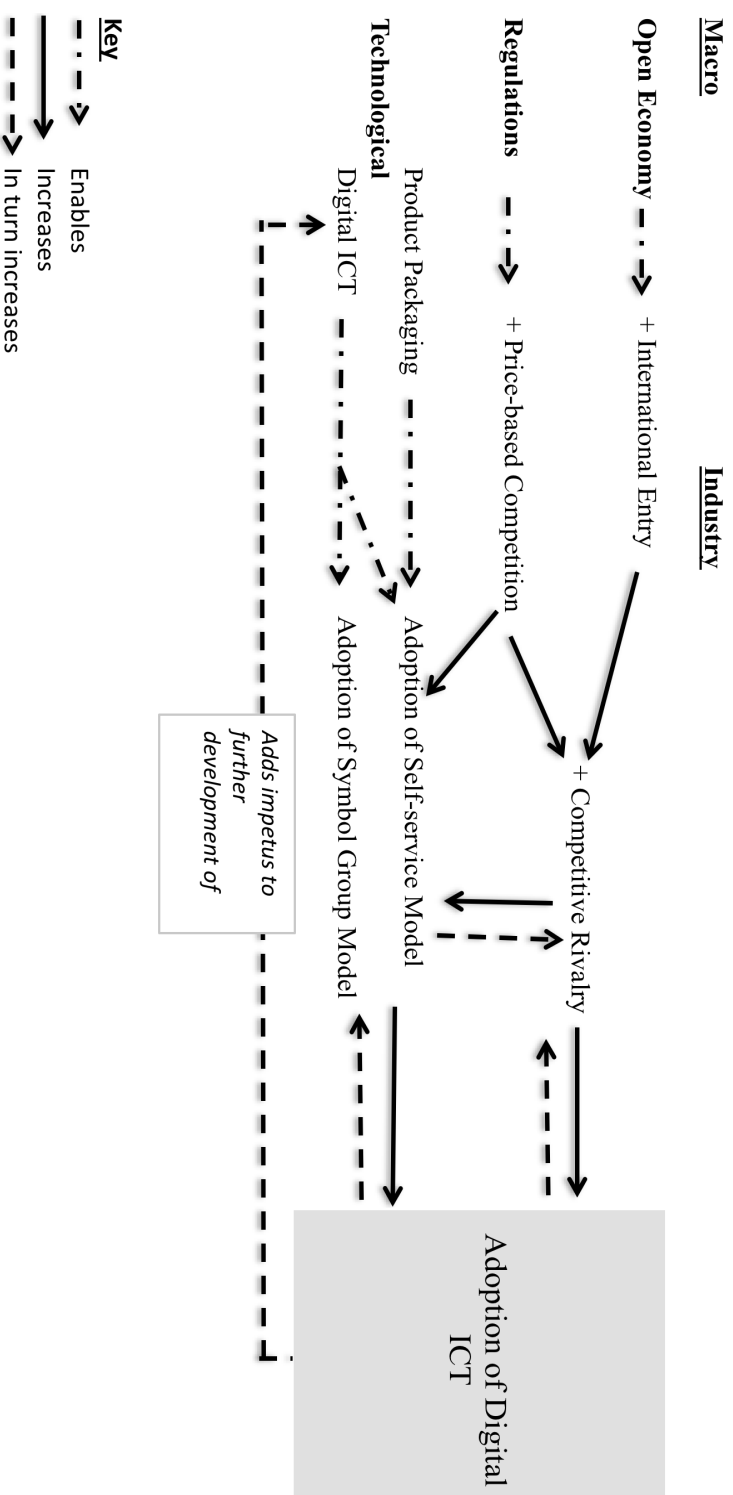
Digital ICT enables Clients growth strategies through multi-nationalization. Multinational clients encourage agencies to become multinationals to service multinational clients. Digital ICT enables ad agencies to operate as multinationals, but also the operation of multinational ad agencies (and clients) encourages further developments in digital ICT.



Macro factors directly and indirectly through their impact on structural features of the industry provide impetus for the adoption of digital ICT. Developments of digital ICT itself enable the adoption of digital ICT. The adoption of digital ICT for media services encourages further developments in digital ICT media services solutions. In the diagram '+' indicates propensity increases, i.e. Economic recession increased competitive rivalry.

Simple Representation of Contextual Factors Influencing ICT Adoption in Media Services

APPENDIX N: SIMPLE REPRESENTATIONS OF CONTEXTUAL FACTORS INTERACTIONS RETAIL GROCERY



An explanation of the top and bottom lines of the diagram: Ireland's open economy encouraged entry by international retailers, which increased competitive rivalry and the impetus to adopt ICT to improve players capabilities. (ICT also increased the capabilities for retailers' multinational expansion, not shown on the diagram). ICT improved retailers' capabilities, increased competitive rivalry and business complexity and the impetus and requirement for further ICT developments.

Sample Representation of Interaction of Contextual Factors and ICT Adoption

APPENDIX O: ICT DIFFUSION OVERVIEW IRISH ADVERTISING INDUSTRY

Timeline	Phase 1: 1972-1986	Phase 2: 1986-1994	Phase 3: 1994-2016
<p>Finance & Administration, and nascent use in Media Services</p>	<ul style="list-style-type: none"> ▪ 1972 1st computer - McConnell's the largest agency in Ireland ▪ 1973 4 Computer Bureau offering media analysis ▪ 1975 McConnell's Media TV analysis ▪ 1977 McConnell's offering computer bureau services ▪ 1978 Wilson Hartnell (large agency) 2nd to get a computer ▪ 1978-1982 Development of 'ADPACK' advertising agency software: Wilson Hartnell in conjunction with Eukon software company. ▪ 1982 A number of agencies adopt agency software 	<p>Creative Production and Media Services</p> <ul style="list-style-type: none"> ▪ CAD adopted first by medium sized agencies with strong creative reputations e.g. Irish International, Des O'Meara's, Peter Owens ▪ Larger agencies such as McConnell's and Wilson Hartnell were considered to be followers ▪ By the early 1990s ICT seen as essential in provision of media services ▪ By 1994 digital printing had emerged. Impacting creativity and production. 	<p>Communications along Supply Chain and nascent Online Advertising</p> <ul style="list-style-type: none"> ▪ 1997 Arks Advertising, Des O'Meara's early users of email and the Internet in processes: Increased speed, reduced cost. Newspapers accept 'copy' via email. Poster space can be booked online. ▪ Nascent Online advertising emerging. 1997 Web support services advertised in IMI. AFA (incumbent) were positioning themselves as web specialists. New 'digital' agencies enter the industry e.g. ICAN and Cybercom. ▪ Many incumbent agencies outsource online related work. ▪ 1999 DDS Media management system (most prevalent global system) now available in Ireland, adopted by AIM. ▪ After 2000 explosion in email use by ad agencies. Email used to send 'copy' to radio ▪ Early 2000s Traditional advertising dominates focus of agencies, although incumbent agencies are 'talking the talk' and setting up digital agencies. ▪ By 2008 the biggest digital agencies were 'new' entrants to the industry, along with 2 digital media agencies ▪ Incumbent agencies begin to increase their 'digital staff' and to take their online work in-house, due to income pressure. E.g. 2008 McConnell's launch McConnell's Interactive. ▪ By 2012 Digital media agencies are moving into digital creative space e.g. Core Media's 'Radical' agency. ▪ M&A trend emerges from 2013: incumbent agencies begin buying digital agencies ▪ New agency type: 2014 Epsilon (US) a data led agency take over Acorn. ▪ Global marketing groups have been acquiring 'Adtech' firms.
<p>Highlights of the Process of Digital ICT Diffusion</p> <p>1972 – 2016</p>			

Summary Timing of Key ICT Diffusion and Advertising Industry Changes

ICT Adoption Trend	Emergence	Momentum Built	Industry Norm
Initial adoption of Computers and agency software by agencies	1972	1982	1994
Computer Aided Design		1986 - 1992	
Online technology in agency processes			1997 onwards
Online Advertising services to clients	1994	2008	still evolving
<i><u>Industry Structural Trends</u></i>			
Expansion in agency services	1975	1988	1990's
Media Separation	1976	1992	1996 onwards
Internationalization of the industry	1979	1984	1997
Digital Advertising Industry	1994	2008	still considered immature

APPENDIX P: ICT DIFFUSION OVERVIEW RETAIL GROCERY

Reasons for the Adoption of ICT Retail Grocery

Technology	Applied to	Key Reasons for Adoption
<p>Computing: Mainframe, Computer Bureau services, Mini computers, PC's</p>	<p>Finance and accounting functions, such as payroll and accounts production. Use quickly expanded into other areas such as management information, sales and profit analysis, stock control and then pricing decisions and use continued to be applied to an increasing number of processes and functions.</p>	<p>Improve efficiency, improve timeliness and accessibility of information. An enabler for the management of multiple stores. Over time the use of computing vastly expanded the information available to retailers, creating a powerful management tool: for assessing store performance and for informing decisions.</p>
<p>EPOS with Scanning – Electronic Point of Sale</p>	<p>Capture price and product information at checkout. Hence revenue and stock movement. Some retailers used hand held scanners for ordering stock prior to the adoption of EPOS with scanning. EPOS were linked to computers and this provided a leap forwards in information available to retailers</p>	<p><i>Adopted as Process Innovations</i> <i>Improve customer service:</i> reduce queuing time for customers, provision of an itemized receipt, increased accuracy at checkout. <i>Reduce Costs and increase efficiency of store processes:</i> Scanning meant that shelf pricing could be used which meant the labour intensive, time consuming costly individual pricing of products was no longer required. Implementing product price changes became a far more efficient process. Faster checkout process. Reduced shrinkage. <i>Improved Information:</i> EPOS were integrated with computer systems and thus retailers experienced a leap forward in information regarding stock movement, daily revenue, and the margins they were achieving. Information was available re till usage so busy and slack times could be easily identified, and staff rostering improved. Improved stock information informed stock ordering and reduced stock-outs and also over stocking, and enabled retailers to improve return on stock. Enabled retailers to be more responsive to, and more capable of identifying market changes.</p>
<p>Fintech</p>	<p>Financial technology to enable consumers to pay electronically by credit card, then debit card, then more securely through chip n pin, then contactless payment and most recently via apps on android and apple mobile devices</p>	<p><i>Adopted as a Product and Process Innovation</i> <i>Efficiency, Security and Differentiation, increase revenue:</i> Credit card payments were more secure and retailers received their money faster than cheque payments. Also, once technology matured credit and debit card payments processed automatically and don't have the same security issues associated with handling cash, (wrong change and depositing to bank). Consumers tend to spend more using plastic than cash thus offering electronic payment methods can/could boost revenue.</p>

Technology	Applied to	Key Reasons for Adoption
Loyalty Cards	<p>Data captured via EPOS and stored on databases. Multiple queries and reports were run against customer data collected. Increased management information and informed direct marketing.</p>	<p><i>Adopted as a Product and Process Innovation</i></p> <p><i>Competitive advantage through differentiation</i> in customer offering and through <i>increased information</i>. Leveraging customer data collected through the scheme. As more retailers launched loyalty schemes, loyalty card's power as a differentiator in attracting and retaining customers lessened. However, differential use of data collected provided scope for achieving competitive advantages through superior use of information.</p> <p><i>Improved Customer Service</i>: Customers liked being rewarded for grocery shopping.</p> <p><i>Increased effectiveness and Revenue</i>: Information gathered enabled retailers to run their businesses more effectively e.g. they could identify their most valuable customers. Enabled retailers to increase revenue, initially new customers were attracted by loyalty schemes, and on an ongoing basis retailers could increase revenue by running point events and special point promotions, and tailored reward offers etc. Very effective use of direct marketing.</p>
Electronic Data Interchange (EDI)	<p>Exchange information with suppliers: orders, invoices, delivery notes, credit notes etc. This technology has become more seamless since EDI services moved online.</p>	<p><i>Adopted as a Product Innovation</i></p> <p><i>Increase efficiency, reduce costs, increase timeliness and accuracy of information, enable backward integration</i>. Reduced labour and materials required, EDI communicated documents were formatted to automatically update system records, saving time rekeying data and thus resulting in increased accuracy of information. It reduced costs by reducing the amount of labour required, and through savings on paper and postage etc. EDI a requirement for operating Central Distribution structure.</p>
Self-scanning	<p><i>Self-scan at checkout</i>: Consumer operated checkout process</p> <p><i>Self-scan handheld</i>: Consumer scan and packs products as they shop and pay at checkout based on handheld scanner records.</p>	<p><i>Adopted as a Process Innovation</i></p> <p><i>Improved Customer service, potential differentiator</i>: Reduced queuing, faster checkout, consumer more control, no interaction required with shop staff (in theory).</p> <p><i>Cost Savings</i>: Self-scan checkouts require less staff. 1 staff member can manage a number of self-scan checkouts. Handheld self-scan requires far less time at the till, so less tills need to be open, again saving on labour.</p>

Technology	Applied to	Key Reasons for Adoption
Online Communication : Websites and Social Media	Retailers created websites as showcases of the store, including location and opening times and special offers etc. Retailers joined social media, creating Facebook pages and twitter accounts etc. communicate with potential consumers	<p><i>Adopted as a Product and Process Innovation</i></p> <p><i>Potential Differentiator</i>: Opportunity to engage with consumers online and improve relationship with consumers. Marketing tool. <i>Potential to create additional revenue.</i></p>
Online grocery	Another channel for selling groceries	<p><i>Adopted as a Process Innovation</i></p> <p><i>Potential Differentiator - Increase revenue</i>: Gain new customers through offering the service. Online spend generally greater than in-store spend, consumers do 'big' shop online. Specialist stores can expand catchment area significantly e.g. Organic Supermarket</p> <p><i>Improve customer service</i>: A new service for customers</p> <p><i>Adopted as a Product Innovation</i></p>

ICT Diffusion Overview Retail Grocery Industry

Timeline	Phase 1: Late 1960s – 1980.	Phase 2: 1980 -2000	Phase 3: 2000-2016
<p>Finance & Administration, Stock control, Margins and Product pricing</p>	<ul style="list-style-type: none"> ▪ 1969 H. Williams 1st retail grocer to buy computer. Superquinn using computer bureau services. ▪ 1971 ADM (co-op) get computer for finance and profit margin analysis. ▪ 1974 Kut-prices apply computer to calculating sales prices for products for their hard discounter format. ▪ 1976 Quinnsworth apply computing to accounts. ▪ 1977 3 Guys computing used for price setting and stock control. ▪ 1979 H. Williams abandon own computer to use computer bureau services. Superquinn buy a computer. 	<p>EPOS with Scanning, and launch of loyalty schemes, and tentative introduction of EDI</p> <ul style="list-style-type: none"> ▪ 1980 ANAI established. ▪ 1983 L&N 1st to pilot EPOS with scanning ▪ 1983 H. Williams invest IR£1/4 m in computer. ▪ 1984 Quinnsworth pilot EPOS in 1 store. A few independents adopt scanning. ▪ 1986 Quinnsworth adopt scanning in 2nd store. Superquinn and Roches Stores each pilot scanning. ▪ 1989 Quinnsworth rolls out scanning to 39 stores ▪ 1990 Musgraves create a scanning installation team for Supervalu ▪ 1989 -1991 Launch of Irish based EDI services. Trialed by Superquinn, Quinnsworth and Dunnes Stores ▪ 1992 SPAR select a scanning solution. ▪ 1993 Quinnsworth upgrade EPOS system ▪ 1993 Superquinn launch Loyalty scheme ▪ 1995 Musgraves hire staff to implement EDI ▪ By 1996 140 symbol group, and 60 other independents have adopted. ▪ 1996 Dunnes begin EPOS adoption. ▪ 1996 Independents advised they require computer literacy by BWG wholesalers ▪ 1997 Superquinn trial hand held <i>self-scan</i> 1 store ▪ 1997 Dunnes and Tesco launch loyalty scheme ▪ 1997 ECR Ireland Established ▪ 1999 Superquinn implementing EDI for Frozen foods 	<p>Communications along supply chain and nascent online grocery. Comprising EDI, further scanning developments and loyalty scheme rollout, and use of online in services and operations.</p> <ul style="list-style-type: none"> ▪ 2000 Superquinn and Tesco launch online grocery services ▪ 2001 Aldi begin to adopt scanning ▪ 2002 Musgraves supplier must be EDI compatible. Some independent retailers offering online grocery. Superquinn extend online to stores outside Dublin. Tesco online grocery available to 75% of population. ▪ 2003 Superquinn extend EDI to >200 suppliers. Superquinn offer online click and collect service ▪ 2004 Dunnes Stores complete their 1996 roll out of EPOS ▪ 2004 Tesco introduce <i>self-scan</i> in 1 store ▪ By2007 Musgraves have extended use of EDI to E-DN with suppliers, and for ordering, delivery and invoices from Symbol group members. ▪ 2009 Dunnes implement cloud-based EDI. Supervalu launch loyalty scheme ▪ 2010 The Organic Supermarket offer online grocery ▪ 2011 Supervalu pilot online grocery in 2 stores ▪ 2012 A Centra adopts <i>self-scan</i> checkout. Spar launch rewards scheme ▪ 2013 Eurospar pilot self-scan checkout. Dunnes introduce self-scan checkouts. Supervalu launch mobile app for online grocery ▪ By 2014 Supervalu trial online drive through service. Supervalu 17 store with hand held self scan, several others with self-scan checkout ▪ 2016 Supervalu re-launch loyalty/reward scheme. Buymie launch new online grocery model
<p>Highlights of the Process of Digital ICT Diffusion 1969 - 2016</p>			

Timing Highlights of Diffusion and Retail Grocery Industry Changes

ICT Adoption Trend	Emergence	Momentum Built	Industry Norm
Initial adoption of Computers	Late 1960s	1980s	late 1990s
EPOS	Early 1980s	mid to late 1990s	2000 onwards
EDI	1989 (trials), mid 1990s	early 2000s onwards	
Loyalty Schemes	1993	late 1990s	
Online Grocery services	2000	Still evolving	

Note: Trends became industry norms for the larger players earlier than for the many smaller independents

Industry Structural changes Trend

Expansion in Retail Services	1970s	1980s	Mid-late 1990s
Symbol Group Growth	1960	By 2005	By 2015
Vertical Integration	Mid to late 1990s	Early 2000s onwards	
Internationalization*	1977 (Gubays)	Late 1990s to early 2000	
Online Grocery Sector	2000	still considered immature	

**Note: In regard to internationalization there had always been UK grocery stores in Ireland but Gubays was treated by retailers and the Irish public as being significant. E.g. In 1972 Quinnsworth was acquired by Associated British Foods (they rebranded their Powers supermarkets, this was an Irishizing strategy, that worked)*

**APPENDIX Q: ADOPTION TIMING COMPARISON - EARLIEST COUNTRIES
VERSUS IRELAND**

Digital ICT Solution Type	Ad Industry	Ad industry Ireland	Retail Grocery Industry	Retail Grocery Industry Ireland
Computing	1962 Several agencies in the US - Main frame	1972 Mini Computer, and Computer Bureau 1974	Early 1950s Main Frames, 1960s Computer Bureau for small and medium stores	1969 Mainframe Computer and Computer Bureau
Industry Specific	Computer Aided Design By 1983 US said to be predicted to 'drastically alter the world of advertising'	CAD 1986	EPOS with Scanning 1974 US EDI early 1980s	EPOS with Scanning 1983. EDI Trials 1989
Communications and Online Services	1994 US 1 st Web Banner Ad in 2004 had est. 3.6% of media spend amounting to US\$9.86billion	1997 Online advertising	ECR Europe 1994 1996 Tesco UK pioneers store based model for online grocery	1998 ECR launched EDI for Central Distribution 2000s 2000 Online Grocery
Online gains increasing significance, challenging traditional channels.		2008	Has not yet emerged. Although online grocery is more significant in the UK having a 6.9% ¹⁵⁸ share of the market, and is growing fast in Ireland.	

Sources: Condon, J. C. 1983. Charts on Computer Graphics Are Trending Upwards, *The New York Times* 27th March 1983 ed.; Video: GS1 Documentary: GS1 40th Anniversary Film in GS1 - the global language of business since 1973.2013: <http://www.gs1ie.org/About/What-We-Do/GS1-Documentary.html>.

¹⁵⁸3rd in the world behind South Korea 16.5% and Japan 7.25% (Dunning, 2017, 'The UK is named the world's third largest online grocery market' <https://www.brandbank.com/blog/uk-third-largest-online-grocery-market/> ed. 4th May 2017 [Accessed 25th April 2018])

APPENDIX R: VSR INDUSTRY EXAMPLES

Variations – opportunities for change	Retail Grocery Industry	Advertising Industry	Theoretical Perspective
<p>Industry Data Standards related to Digital ICT</p> <ul style="list-style-type: none"> Data standards supporting various processes and the emergence of variations. Technical specification standards 	<ul style="list-style-type: none"> Bar Code – product identifier code. Adopted in US Grocery industry 1st, before diffusing to other countries. Irish grocery industry instrumental in setting up GS1 (new institution – a variation). RFID and Data Matrix Code are new potential alternative and or supplementary product identification codes. EDI communication standards (many different ones). Technical solution and standards developed outside of the industry and internal industry standards also emerged [Barcode an enabler for EDI application in Retail grocery]. Multiple EDI standards still exist. 	<ul style="list-style-type: none"> Online advertising technical specifications – still emerging as good practice, a stream of developments. Standards are emerging from industry organisations such as IAB, and beginning to emerge from key media players e.g. Facebook and Google 	<p>NIT – Industry Standards</p>
<p>Digital ICT Solutions (New technologies)</p> <ul style="list-style-type: none"> Technical solutions – tech suppliers, sometimes in collaboration with industry players or driven by industry players. Emerge from external and internal context. Adoption caused variations in routines in firms and across supply chains. 	<ul style="list-style-type: none"> Accounting & Admin systems EPOS with scanning systems – new checkout process – over time continued to develop (further variations) to become an integrated retail management system Loyalty schemes and data mining/analysis MIS, ERP systems Online grocery solutions. 	<ul style="list-style-type: none"> Accounting & admin systems CAD –process for drafting and rendering creative images; evolved in conjunction with printing and communication processes to radically change production process for ads Media analysis systems, packages focussed on elements in advertising agencies processes Communication systems – email, mobile. Programmatic buying solutions 	<p>RBV – enable improved competitive capabilities</p>
<p>Routines</p> <p>Internal processes and inter-firm processes</p>	<ul style="list-style-type: none"> EPOS changed checkout processes, pricing processes, stock control and stock ordering processes. Enhanced efficiency and accuracy EDI changed supply chain and logistics routines Loyalty schemes altered routines Provision of online services requires new routines. 	<ul style="list-style-type: none"> Accounting & Admin software changed internal agency processes, e.g. Job bag process, expenses approved in advance rather than after job. Enhanced financial health of agency. Changed incurring of expense billing process between agency and client. CAD and digital printing changed creative ‘routines’ in agencies. Provision of online services requires new processes 	<p>RBV – increased capabilities</p>

Variations – opportunities for change	Retail Grocery Industry	Advertising Industry	Theoretical Perspective
Business Practice Variations creating the opportunity for and requirement for other variations Inter-firm level	Central distribution -internal and inter-firm supply chain level - encompasses a multitude of variations in processes to adopt.	<ul style="list-style-type: none"> • Independent media agencies. • Remuneration basis for advertising agencies – several variations have emerged • Basis for paying for online media ‘space’ – several variations CPC, CPM, CPA 	Retail grocery TCE boundary decisions RDT power motives
Industry Population Digital ICT an enabler for new types of firms to enter the industry. Changing industry demographic	<ul style="list-style-type: none"> • International Entrants e.g. Tesco • Hard discounters e.g. Gubay 	<ul style="list-style-type: none"> • Media Independents • Direct marketing agencies • International entrants • Digital agencies • Consultancy firms 	Population Ecology – New firms / new types of firm enter the industry

Selection of Variations	Retail Grocery Industry	Advertising Industry	Theoretical Perspective
Industry Digital Data Standards	<ul style="list-style-type: none"> The Barcode product identification, becomes embedded identifier in many digital ICT solutions and processes in the retail grocery industry. Limited application of RFID. Not much traction on Data Matrix Code (barcode is too embedded in industry processes). Costs associated with adoption particularly in terms of multitude and systemic changes required is slowing or preventing diffusion. EDI based communications across the supply chain 	<ul style="list-style-type: none"> Online technical standards continue to emerge, but adherence to at least minimum standards expected (still a long way to go). Compatibility with client accounting systems becomes a tender requirement for agencies 	NIT – new industry norms have emerged.
Digital ICT systems	<ul style="list-style-type: none"> Accounting and administration systems EPOS replaced the electronic cash register. EPOS integrated with supply chain and management systems Loyalty schemes solutions integrated with EPOS. All of the above can be integrated in a retail management system (software solution), ERPs Online grocery solutions in use by several retailers (development continues) 	<ul style="list-style-type: none"> Accounting and Administration systems, Agency software CAD use replacing magic markers and typesetters etc. Linked to production systems replaced intensive manual processes. CAD and Email, designs can be communicated electronically, replacing porters and courier deliveries. Media analysis systems invested in by media agencies e.g. Media Ocean (previously DDS almost ubiquitous in use by media agencies). Replacing manually created schedules and printed media research schedules. Includes Programmatic solution for online since Oct 2016. 	RBV enabled improved capabilities. Firms adopt to improve competitive capabilities.
Routines	<ul style="list-style-type: none"> Firms adapted processes to utilise Digital ICT systems. EPOS with scanning checkout process, shelf pricing replaces item pricing etc. Loyalty schemes processes for data mining and data analytics informing direct marketing EDI changed ordering, delivery and supply chain routines, enabled new routines for Central Distribution Routines for online grocery services continue to evolve. 	<ul style="list-style-type: none"> CAD faster and more professional for presentations and for production use, than magic markers and paper. Digital printing new production routines. Finance & Admin systems, improved financial control and financial management of agency. E.g. Job bag process. Faster invoicing of clients. 	<ul style="list-style-type: none"> RBV – enabled improved competitive capabilities. Ad Industry – RDT – internal power shifts.

Selection of Variations	Retail Grocery Industry	Advertising Industry	Theoretical Perspective
Business models – Types of firm Intra- firm, Inter-firm, Industry population Digital ICT a key enabler for operation of these models	<ul style="list-style-type: none"> Self-service Multiple model - replaces counter service Symbol Groups – alternative format to multiples (digital ICT solutions a factor in their growth and management) Hard discounters challenging multiple and symbol group models Multi-national retail grocers – replace and winning market share from ‘Irish’ companies Central distribution – replaces direct to store delivery – all major players have selected this model 	<ul style="list-style-type: none"> Media Independents – new model of separate creative and media agencies Global agencies – replace dominance by Irish family owned agencies Direct marketing services – win increased share of marketing communication spend Digital agencies and online advertising – win increased share of marketing communications spend Definite shift in the remuneration basis for creative agencies, and in level of media commission retained by media agencies 	<ul style="list-style-type: none"> PE – firms best fit for the environment. TCE – boundaries for efficiency (Media agencies, global agencies, Multi-national grocers, Central distribution) RDT – central distribution, media agencies Retail Central Distribution and Advertising industry Media separation. <ul style="list-style-type: none"> RBV – increases capabilities RDT – increases power Vis-a-vis suppliers TCE – boundary decisions, increases efficiency of operations
Competition Inter population Substitutes	<ul style="list-style-type: none"> Price-based competition – digital ICT an enabler of this through an enabler of scale economies and efficiencies of operations Differentiation strategies – Loyalty, product ranges, in-store experience (e.g. self-service checkout) and ancillary services, enabled by digital ICT systems. 	<ul style="list-style-type: none"> Price based-competition became an increasing criteria in agency selection across media and creative – enabled by variation of media agencies, online advertising and finance systems. Increased competition between various mar com elements e.g. advertising versus sales promotion versus direct marketing versus online advertising etc. 	RBV – competencies and capabilities Population Ecology, RBV
Industry Population – Growth of New Entrants	Certain International entrants have gained significant market share. E.g. Tesco, Aldi and Lidl	<ul style="list-style-type: none"> Industry dominated by global marketing communications groups. Digital agencies have gained mar com spend and credibility, some remain e.g. Company of Huskies, whilst others were ‘selected’ for acquisition by incumbent agencies e.g. Blue Cube (a variation in itself). Entry by management consultants. 	Population Ecology, RBV

Retention – selected variations embedded	Retail Grocery Industry	Advertising Industry	Theoretical Perspective
<p>Industry standards</p> <p>Industry institutions play a role in the selection and retention of industry standards.</p>	<ul style="list-style-type: none"> Barcode Identifier embedded in computer programs and communications along the supply chain. Better codes now exist but systems and routines are built around barcodes. Sunk costs a retention mechanism. A variety of EDI standards are still used, however, online and cloud computing, and EDI as a service etc. has made the use of multiple standards easier. GSI playing a role in retention of barcode, but are also likely to play a role if a new identifier is to become widely acceptable. 	<ul style="list-style-type: none"> Online advertising standards still emerging - repeated use a form of retention IAB, MRC and others institutions deriving and approving standards re cost of online media space – CPM, CPC and CPA. 	<p>NIT – both an enabler and a barrier to progress.</p>
<p>Digital ICT solutions</p> <p>Investments in upgrades</p> <p>Solutions are embedded in routines</p> <p>Off-the shelf solutions applied in firms in both industries</p>	<ul style="list-style-type: none"> EPOS with scanning retention via routines and further developments and investment in the technology, and widespread integration with other solutions. EDI embedded in central distribution processes Loyalty schemes, provide wealth of data, whether it is leveraged or not (dependent on players). Consumers expectation of continuance of schemes. ERP integration of systems. Provision of retail management systems by technology suppliers. 	<ul style="list-style-type: none"> CAD retention via routines and enhanced capabilities of the technology. Email retention via routines, and efficiencies and cost savings. Media analysis and buying processes embedded in digital ICT solutions Complete software solutions like Media Ocean products 	<p>RBV seen as enabler of improved capabilities</p> <p>NIT – taken for granted ‘device’ in performing industry processes</p>
<p>Routines</p>	<p>Routines have emerged built around EPOS, self-scan solutions, central distribution, and online grocery processes</p>	<ul style="list-style-type: none"> Media analysis and buying processes Programmatic for online media buying CAD for design of ads Communication of ads to media 	<p>NIT – accepted business norms</p>
<p>Business Models</p>	<ul style="list-style-type: none"> Central Distribution Symbol group model (Operators continue to invest in the model and supportive digital ICT solutions and independent membership is substantial) Online grocery models, players continue to tweak and trial variations. 	<ul style="list-style-type: none"> Media Independents – continued investments in digital ICT and acquiring staff with relevant skillsets. Price per service remunerations of agencies – client procurement teams, agency selection criteria. Online advertising – gained substantial market share. 	<ul style="list-style-type: none"> RBV – enhanced competitive capabilities RDT – CD enhances power in retail Vis-a-vis power relationship TCE – acquisition of digital agencies.
<p>Industry Population</p>	<ul style="list-style-type: none"> Substantial market share of international entrants i.e. Tesco, Aldi, Lidl 	<ul style="list-style-type: none"> Global marketing communications firms dominate the industry. 	<p>PE – firms a fit for the market</p>

Retention – selected variations embedded	Retail Grocery Industry	Advertising Industry	Theoretical Perspective
Market share	<ul style="list-style-type: none"> Substantial market share – Supervalu symbol group. 	<ul style="list-style-type: none"> Acquisition strategies to fill out competency gaps (adaptation) Large global media independents dominate media services 	

REFERENCES

- Abatecola, G. 2014. Research in Organizational Evolution. What Comes Next? *European Management Journal*, 32(3): 434-443.
- Afuah, A. N., & Utterback, J. M. 1997. Responding to Structural Industry Changes: A Technological Evolution Perspective. *Industrial and Corporate Change*, 6(1): 183-202.
- Agarwal, R., Buenstorf, G., Cohen W. M., & Malerba, F. 2015. The Legacy of Steven Klepper: Industry Evolution, Entrepreneurship, and Geography. *Industrial and Corporate Change*, 24(4): 739-753.
- Aldrich, H., & Ruef, M. 2006. *Organizations Evolving* (2nd ed.). London: SAGE.
- Allen, J. P. 2000. Information Systems as Technological Innovation. *Information Technology & People*, 13(3): 210–221.
- Allen, J. P., & Kim, J. 2005. IT and the Video Game Industry: Tensions and Mutual Shaping. *Journal of Information Technology*: 234-244.
- Anonymous. 2012. The Third Industrial Revolution. *The Economist*, 403(8781): 3-4.
- Archer, M., Bhaskar, R., Collier, A., Lawson, T., & Norrie, A. (Eds.). 1998. *Critical Realism: Essential Readings*. London: Routledge.
- Arthur, W. B. 2009. *The Nature of Technology*: Penguin.
- Arvanitis, S., Kyriakou, N., & Loukis, E. N. 2017. Why Do Firms Adopt Cloud Computing? A Comparative Analysis Based on South and North Europe Firm Data, *Telematics and Informatics*, (34): 1322-1332.
- Astley, G. W., & Zajac, J. 1990. Beyond Dyadic Exchange: Functional Interdependence and Sub-unit Power. *Organization Studies*, 11: 481-501.
- Atkeson, A., & Kehoe, P. J. 2007. Modeling the Transition to a New Economy: Lessons from Two Technological Revolutions. *The American Economic Review*, 97(1): 1-88.
- Atkinson, R. D., & McKay, A. S. 2007. *Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution*. Available at SSRN: <http://ssrn.com/abstract=1004516> or <http://dx.doi.org/10.2139/ssrn.1004516>. [Accessed 12th Apr 2012]
- Audi, R. 1998. *Epistemology: A Contemporary Introduction to the Theory of Knowledge*:. Routledge.
- Audretsch, D. B. 1997. Technological Regimes, Industrial Demography and the Evolution of Industrial Structures. *Industrial and Corporate Change*, 6(1): 49-82.
- Audretsch, D. B., Klomp, L., & Thurik, R. 1997. *Do Services Differ from Manufacturing? : The Post-entry Performance of Firms in Dutch Services*. London: Centre for Economic Policy Research.
- Barnett, W. P., & Burgelman, R. A. 1996. Evolutionary Perspectives on Strategy. *Strategic Management Journal*, 17(S1): 5-19.

- Barnett, W. P., & Hansen, M. T. 1996. The Red Queen in Organizational Evolution. *Strategic Management Journal*, 17 (Special issue: Evolutionary Perspectives on Strategy (Summer, 1996)): 139-157.
- Barnett, W. P., & Pontikes, E. G. 2008. The Red Queen, Success Bias, and Organizational Inertia. *Management Science*, 54(7): 1237-1251.
- Barney, J. B. 1991. Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1): 99-120.
- Barney, J. B. 1999. How a Firm's Capabilities Affect Boundary Decisions. *Sloan Management Review*, 40(3): 137-145.
- Barney, J. B. 2001. Resource-based Theories of Competitive Advantage: A Ten-year Retrospective on the Resource-based View. *Journal of Management*, 27: 643-650.
- Barney, J. B., Wright, M., & Ketchen, J. J. 2001. The Resource-based View of the Firm: Ten years after 1991. *Journal of Management*, 27(December): 625-641.
- Barras, R. 1986. Towards a Theory of Innovation in Services. *Research Policy*, 15: 161-173.
- Barron, D. 2003. Evolutionary Theory. In D. Faulkner, & A. Campbell (Eds.), *The Oxford Handbook of Strategy*. Oxford: Oxford University Press.
- Basu, S., & Fernald, J. 2007. Information and Communications Technology as a General-Purpose Technology: Evidence from US Industry Data. *German Economic Review*, 8(2): 146-173.
- Beere, R. 2015. *Exploring the Impact of Franchising on Industry Evolution: Fast Food/Quick Service Restaurants (QSR) and Real Estate Industries in Ireland*. Doctoral Dissertation. Trinity College Dublin.
- Bessant, J., & Francis, D. 2005. Transferring Soft Technologies: Exploring Adaptive Theory. *International Journal of Technology Management & Sustainable Development*, 4(2): 93-112.
- Bhaskar, R. 1975. *A Realist Theory of Science*. Hassocks, England: Harvester Press.
- Bhaskar, R. 1979. *The Possibility of Naturalism A Philosophic Critique of the Contemporary Human Sciences*. Brighton Harvester
- Bhaskar, R. 1998. *The Possibility of Naturalism*. London: Routledge.
- Bhaskar, R. 2008. *A Realist Theory of Science*. New York: Routledge.
- Bhaskar, R. 2014a. *Critical Realism* <https://http://www.youtube.com/watch?v=TO4FaaVy0Is>: Faculti Films. [Accessed 9th Sept, 2015].
- Bhaskar, R. 2014b. *Introduction to Critical Realism Part One: Transcendental Realism* In G. Hawke (Ed.). <https://http://www.youtube.com/watch?v=Ihg1XT7Lp60>. [Accessed 9th Sept, 2015].
- Bhaskar, R. 2014c. *Introduction to Critical Realism Part Two: Critical Naturalism and Applied Critical Realism*. In G. Hawke (Ed.) <https://http://www.youtube.com/watch?v=8QZ3ir-oCrQ>: Gary Hawke of Alethic Coaching. [Accessed 9th Sept, 2015].

- Boström, G.-O., Zackariasson, P., & Wilson, T. L. 2003. CAD and Consequences in the Swedish Architectural Industry. *Services Marketing Quarterly*, 25(2): 25-41.
- Breschi, S., Malerba, F., & Luigi, L. O. 2000. Technological Regimes and Schumpeterian Patterns of Innovation. *The Economic Journal*, 110(April): 388-410.
- Bresnahan, T. F., & Trajtenberg, M. 1995. General Purpose Technologies ‘Engines of Growth’? *Journal of Econometrics*, 65(1): 83-108.
- Bryman, A., & Cassell, C. 2006. The Researcher Interview: A Reflexive Perspective. *Qualitative Research in Organizations and Management: An International Journal*, 1(1): 41-55.
- Brynjolfsson, E., & Kahin, B. 2000. *Understanding the Digital Economy: Data, Tools, and Research*. Cambridge, Mass. ; London: MIT Press.
- Buenstorf, G. 2016. Schumpeterian Incumbents and Industry Evolution. *Journal Of Evolutionary Economics*, 26(4): 823-836.
- Burgess, T. F., & Gules, H. K. 1998. Buyer–supplier Relationships in Firms Adopting Advanced Manufacturing Technology: An Empirical Analysis of the Implementation of Hard and Soft Technologies. *Journal of Engineering and Technology Management*, 15: 127-152.
- Burrell, G., & Morgan, G. 1992. *Sociological Paradigms and Organisational Analysis: Elements of the Sociology of Corporate Life*. Hants, England ; Brookfield, Vt., U.S.A. : Ashgate, 1992. : Aldershot. (Reprint of 1979 version)
- Burton, R. M., & Obel, B. 2004. *Strategic Organizational Diagnosis and Design: The Dynamics of Fit*: Kluwer Academic Publishers.
- Carroll, G. R., & Hannan, M. T. 1989. Density Dependence in the Evolution of Populations of Newspaper Organizations. *American Sociological Review*, 54 (4), 524-541.
- Carroll, G. R. (ed.), & Hannan, M. T. (ed.). 1995. *Organizations in Industry: Strategy, Structure, and Selection*. Oxford: University Press.
- Casciaro, T., & Piskorski, M. J. 2005. Power Imbalance, Mutual Dependence, and Constraint Absorption: A Closer Look at Resource Dependence Theory. *Administrative Science Quarterly*, 50: 167-199.
- Castaldi, C., & Dosi, G. 2008. Technical Change and Economic Growth: Some Lessons from Secular Patterns and Some Conjectures on the Current Impact of ICT Technology, *LEM Working Paper Series*. <http://www.lem.sssup.it/WPLem/files/2008-01.pdf>. [Accessed 18th Apr 2012].
- Chandler, A. D. 1977. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge, Mass. ; London: Harvard University Press.
- Chandler, A. D. 1990. The Enduring Logic of Industrial Success. *Harvard Business Review*, 68(2): 130-140.
- Charmaz, K. 2006. *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis*. London: Sage Publications.
- Chatfield, T. 2011. *50 Digital Ideas You Really Need to Know*: Quercus.

- Chiasson, M. W., & Davidson, E. 2005. Taking Industry Seriously in Information Systems Research. *MIS Quarterly*, 29(4): 591-605.
- Christensen, C. M. 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, Massachusetts: Harvard Business School Press.
- Coase, R. H. 1937. The Nature of the Firm. In S. G. J., & B. K. E. (Eds.), *Readings in Price Theory*: 386-405. Homewood, Ill.: Irwin.
- Collier, A. 1994. *Critical Realism: An Introduction to Roy Bhaskar's Philosophy*. London: Verso.
- Competition Authority. 2008. A Description of the Structure and Operation of Grocery Retailing and Wholesaling in Ireland: 2001 to 2006. *Grocery Monitor: Report No. 1*
http://www.ccpc.ie/sites/default/files/documents/grocery_monitor_report_1.pdf: The Competition Authority. [Accessed 9th Sept 2016]
- Consoli, D. 2005. The Dynamics of Technological Change in UK Retail Banking Services: An Evolutionary Perspective. *Research Policy*, 34: 461-480.
- Consoli, D. 2008. Systems of Innovation and Industry Evolution: The Case of Retail Banking in the UK. *Industry & Innovation*, 15(6): 579-600.
- Cortada, J. W. 2004. *The Digital Hand: How Computers Changed the Work of American Manufacturing, Transportation, and Retail Industries*. Oxford: Oxford University Press.
- Cortada, J. W. 2006a. The Digital Hand: How Information Technology Changed the Way Industries Worked in the United States. *Business History Review*, 80(4): 755-766.
- Cortada, J. W. 2006b. *The Digital Hand: How Computers Changed the Work of American Financial, Telecommunications, Media, and Entertainment Industries*. New York: Oxford University Press.
- Cortada, J. W. 2012. *The Digital Flood: The Diffusion of Information Technology Across the U.S., Europe, and Asia*: Oxford University Press.
- Cortada, J. W. 2013. How New Technologies Spread: Lessons from Computing Technologies. *Technology and Culture*, 54(No. 2, April): 229-261.
- Crowston, K., & Myers, M. D. 2004. Information Technology and the Transformation of Industries: Three Research Perspectives. *Journal of Strategic Information Systems* (13): 5-28.
- Crowston, K., Sawyer, S., & Wigand, R. 2001. Investigating the Interplay between Structure and Information and Communications Technology in the Real Estate Industry. *Information Technology & People*, 14(2): 163-183.
- Crozier & Friedberg 1980. *Actors and Systems: The Politics of Collective Action*. Translated by A. Goldhammer. University of Chicago Press
- CSO. 2014. NACE Rev 2:7311: Advertising agencies Vol. 2017.
<http://www.cso.ie/px/u/NACECoder/NACEItems/7311.asp>. [Accessed 23rd Feb 2018]
- Cusumano, M. 2009. Technology Strategy and Management: Strategies for Difficult (and Darwinian) Economic Times. *Communications of the ACM*, 52(4): 27-28.

- Czepiel, J. A. 1992. *Competitive Marketing Strategy*. Englewood Cliffs, NJ.: Prentice-Hall.
- Daft, R. L. 2004. *Organization Theory and Design* (8th ed.): Thomson Southwestern.
- Daft, R. L., Murphy, J., & Willmott, H. 2014. *Organization Theory and Design: An International Perspective (2nd ed.)*: Cengage.
- Dalum, B., Freeman, C., Simonetti, R., von Tunzelmann, N., & Verspagen, B. 1999. Europe and the Information and Communication Technologies Revolution., *The Economic Challenge for Europe: Adapting to Innovation Based Growth*. Oslo/Rome/Maastricht: Edward Elgar Publishing.
- David, P. A. 1999. Digital Technology and the Productivity Paradox: After Ten Years, What Has Been Learned?, *Understanding the Digital Economy: Data, Tools and Research*. U.S. Department of Commerce, Washington, D.C., 25-26 May 1999: MIT.edu.
- David, R. J., & Han, S.-K. 2004. A Systematic Assessment of the Empirical Support for Transaction Cost Economics. *Strategic Management Journal*, 25: 38-54.
- Delmas, M. 1999. Exposing Strategic Assets to Create New Competencies: The Case of Hazardous Waste Management Industry. *Industrial and Corporate Change*, 8: 635-672.
- Dempsey, B. 2014. *Exploring the Role of the Chief Information Officer (CIO) During a Failing IS Initiative: A Process Inquiry in a Public Sector Setting*. Doctoral Dissertation. Trinity College Dublin.
- Derfus, P. J., Maggitti, P. G., Grimm, C. M., & Smith, K. G. 2008. The Red Queen Effect: Competitive Actions and Firm Performance, *The Academy of Management Journal*, Vol. 51: 61-80.
- DiMaggio, P. J., & Powell, W. W. 1983. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2): 147-160.
- Doody, & Noonan, M. 2013. Preparing and Conducting Interviews to Collect Data. *Nurse Researcher*, 20(5): 28-32.
- Dore, R., Lazonick, W., & O'Sullivan, M. 1999. Varieties of Capitalism in the Twentieth Century. *Oxford Review of Economic Policy*, 15(4): 102-120.
- Dosi, G. 2005. Statistical Regularities in the Evolution of Industries. A Guide through some Evidence and Challenges for Theory, *LEM Working Paper Series*, June 2005 ed., Vol. 17. LEM Working Paper Series. [Accessed 24th Mar 2012].
- Dosi, G., Gaffard, J. L., & Nesta, L. 2008. Schumpeterian Themes on Industrial Evolution, Structural Change and their Microfoundations: An Introduction. *Industrial and Corporate Change*, 17(4): 601-609.
- Dosi, G., Gambardella, A., Grazzi, M., & Orsenigo, L. 2007. Technological Revolutions and the Evolution of Industrial Structures. Assessing the Impact of New Technologies upon Size, Pattern of Growth and Boundaries of Firms, *Conference on Innovation and Competition in the New Economy*. University of Milan, Bicocca.
- Dosi, G., & Marengo, L. 2007. Perspective-On the Evolutionary and Behavioral Theories of Organizations: A Tentative Roadmap. *Organization Science*, 18(3): 491-502.

- Dosi, G., & Nelson, R. R. 2009. Technical Change and Industrial Dynamics as Evolutionary Processes, *LEM Working Paper Series*, August 2009 ed.: 88.
<http://www.lem.sssup.it/WPLem/files/2009-07.pdf> [Accessed 24h Apr 2012]
- Drees, J. M., & Heugens, P. P. M. A. R. 2013. Synthesizing and Extending Resource Dependence Theory: A Meta-Analysis. *Journal of Management*, 39(6): 1666-1698.
- Drnevich, P. L., & Croson, D. C. 2013. Information Technology and Business-Level Strategy: Toward an Integrated Theoretical Perspective. *MIS Quarterly*, 37(2): 483-510.
- Earl, M., & Feeny, D. 2000. Opinion How to be a CEO for the Information Age. *Sloan Management Review*, 41(2): 11-23.
- Edmondson, A., C., & McManus, S. E. 2007. Methodological Fit in Management Field Research. *Academy of Management Review*, 32(4).
- Eisenhardt, K. M. 1989. Building Theories from Case Study Research. *The Academy of Management Review*, 14(4): 532-550.
- Eisenhardt, K. M., & Graebner, M. E. 2007. Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, 50(1): 25-32.
- Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic Capabilities: What are they? *Strategic Management Journal*: 1105-1121.
- EL-Darwiche, B., & Singh, M. 2012. Digitization and Prosperity. *Strategy+Business* (68): 1-8.
- Evans, D. S. 2009. The Online Advertising Industry: Economics, Evolution, and Privacy. *Journal of Economic Perspectives*, 23(3): 37-60.
- Evans, P. B., & Wurster, T. S. 1997. Strategy and the New Economics of Information. *Harvard Business Review*, 75(5).
- Fine, G. A., & Deegan, J. G. 1996. Three Principles of Serendip: Insight, Chance, and Discovery in Qualitative Research. *International Journal of Qualitative Studies in Education*, 9(4): 434-447.
- Flyvberg, B. 2006. Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, 12(2): 219-245.
- Friedrich, R., Merle, M. L., Grone, F., & Koster, A. 2011. Measuring Industry Digitization: Leaders and Laggards in the Digital Economy. *Booz&Co*.
- Friedrich, R., Merle, M. L., Peterson, M., & Koster, A. 2011. The Next Wave of Digitization: Setting Your Direction, Building Your Capabilities, *Booz&co*.
http://www.booz.com/global/home/what_we_think/reports_and_white_papers/ic-display/49582410: Booz&co. [Accessed 13th Apr 2012].
- Gadiesh, O., & Gilbert, J.L., 1998. How to Map your Industry's Profit Pool. *Harvard Business Review*, 76(3): 149-162.
- Gadiesh, O., & Gilbert, J. L. 1998. Profit Pools: A Fresh Look at Strategy. *Harvard Business Review* 76(3): 139.
- Geroski, P. A. 2000. Models of Technology Diffusion. *Research Policy*, 29: 603-625.

- Geroski, P. A. 2001. Exploring the Niche Overlaps Between Organizational Ecology and Industrial Economics. *Industrial & Corporate Change*, 10(2): 507-540.
- Ghemawat, P. 2002. Competition and Business Strategy in Historical Perspective. *Business History Review*, 76(1): 37-74.
- Giachetti, C., & Marchi, G. 2010. Evolution of Firms' Product Strategy Over the Life Cycle of Technology-based Industries: A Case Study of the Global Mobile Phone Industry, 1980–2009. *Business History*, 52(7): 1123-1150.
- Giddens, A. 1984. *The Constitution of Society: Outline of the Theory of Structuration*. Los Angeles: University of California Press.
- Glaser, B. G., & Strauss, A. L. 1967. *The Discovery of Grounded Theory*. New York: Aldine de Gruyter.
- Gorry, G. A., & Scott Morton, M. S. 1971. *A Framework for Management Information Systems*. Cambridge, MA: Massachusetts Institute of Technology.
- Grant, R. 2005. *Contemporary Strategy Analysis* (5th ed.). Oxford: Blackwell.
- Greiner, L. E. 1972. Evolution and Revolution as Organizations Grow. *Harvard Business Review*, July-August: 37-46.
- Greiner, L. E. 1998. Evolution and Revolution as Organizations Grow. *Harvard Business Review*, May-June: 55-67. (Updated version of 1972)
- Guba, E. G., & Lincoln, Y. S. 1989. *Fourth Generation Evaluation*. Newbury Park, CA: Sage.
- Guba, E. G., & Lincoln, Y. S. 1994. Competing Paradigms in Qualitative Research. In E. G. Guba, & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research*: 105-117.
- Hanchar, A. 2011. *Exploring the Role of Trade Associations in Industry Evolution: Banking and Motor Industries in Ireland*. Doctoral Dissertation. Trinity College Dublin.
- Hannan, M. T., & Carroll, G. R. 1995. An Introduction to Organizational Ecology. In G. R. Carroll, and M. T. Hannan (Ed.), *Organizations in Industry: Strategy, Structure, and Selection*: 17-31. New York: Oxford University Press.
- Hannan, M. T., & Freeman, J. 1977. The Population Ecology of Organizations. *American Journal of Sociology*, 82(5): 929-964.
- Hannan, M. T., & Freeman, J. 1984. Structural Inertia and Organisational Change. *American Sociological Review*, 49(2): 149-164.
- Hawawini, G., Subramanian, V., & Verdin, P. 2003. Is Performance Driven by Industry-or Firm-specific Factors? A New Look at the Evidence. *Strategic Management Journal*, 24(1): 1-16.
- Hill, C. W. L., & Jones, G. R. 2001. *Strategic Management: An Integrated Approach* (5th ed.). Boston: Houghton Mifflin.
- Hillman, A. J., Withers, M. C., & Collins, B. J. 2009. Resource Dependence Theory: A Review. *Journal of Management*, 35(6): 1404-1427.

- Hirsch, P. M. 1972. Processing Fads and Fashions: An Organization-Set Analysis of Cultural Industry Systems. *American Journal of Sociology*, 77(4): 639-659.
- Hirsch, P. M. 2000. Cultural Industries Revisited. *Organization Science*, 11(3): 356-361.
- Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. 2007. Building Theoretical and Empirical Bridges Across Levels: Multilevel Research in Management. *Academy of Management Journal*, 50: 1385-1399.
- Hodgson, G. M. 1999. *Evolution and Institutions: On Evolutionary Economics and the Evolution of Economics*. : E. Elgar.
- Hodgson, G. M. 2013. Understanding Organizational Evolution: Toward a Research Agenda using Generalized Darwinism. *Organization Studies*, 34(7): 973-992
- Holden, M. T., & Lynch, P. 2004. Choosing the Appropriate Methodology: Understanding Research Philosophy, *The Marketing Review*, Vol. 4: 397-409.
- Howard, M. 2005. Collaboration and the '3DayCar': A Study of Automotive ICT Adoption. *Journal of Information Technology*, 20: 245-258.
- Iacono, S., & Wigand, R. T. 2005. Information Technology and Industry Change: View from an Industry Level of Analysis. *Journal of Information Technology* 20: 211-212.
- Jacobides M.G. 2016. Industry Architecture. In: Augier M., Teece D. (eds) **The Palgrave Encyclopedia of Strategic Management**. Palgrave Macmillan, London.
- Jacobides, M. G. 2005. Industry Change Through Vertical Disintegration: How and Why Markets Emerged in Mortgage Banking. *Academy of Management Journal*, 48(3): 465-498.
- Jacobides, M. G., Knudsen, T., & Augier, M. 2006. Benefiting from Innovation: Value Creation, Value Appropriation and the Role of Industry Architectures. *Research Policy*, 35: 1200-1221.
- Jacobides, M. G., & Winter, S. G. 2005. The Co-evolution of Capabilities and Transaction Costs: Explaining the Institutional Structure of Production. *Strategic Management Journal*, 26(5): 395-413.
- Jacobsson, M., Linderoth, H. C. J., & Rowlinson, S. 2017. The Role of Industry: An Analytical Framework to Understand ICT Transformation within the AEC Industry. *Construction Management and Economics*, 35(10): 611-626.
- Kahal, H. S., & Singh, V. P. 2005. *Digital Economy : Impacts, Influences, and Challenges*. Hershey: Idea Group Pub.
- Kelly, K. 1999. Pro-choice: The Promise of Technology. *Organization & Environment*, 12(4): 428-429.
- Kelly, K. 2010. *What Technology Wants*. New York: Viking.
- Klag, M., & Langley, A. 2013. Approaching the Conceptual Leap in Qualitative Research. *International Journal of Management Reviews*, 15(2): 149-166.
- Klepper, S. 1997. Industry Life Cycles. *Industrial and Corporate Change*, 6(1): 145-182.

- Kling, R., & Lamb, R. 2000. IT and Organizational Change in Digital Economies: A Sociotechnical Approach. In E. Brynjolfsson, & B. Kahin (Eds.), *Understanding The Digital Economy*: 295-324. Unites States of Amercia.
- Kotler, P., Wong, V., Saunders, J., & Armstrong, G. 2005. *Principles of Marketing* (Fourth European Edition ed.): Pearson/Prentice Hall.
- Kraaijenbrink, J., Spender, J. C., & Groen, A. J. 2010. The Resource-Based View: A Review and Assessment of Its Critiques. *Journal of Management*, 36(1): 349-372.
- Kvale, S. 1996. *Interviews: An Introduction to Qualitative Research Interviewing*. London:Sage.
- Lenox, M. J., Rockart, S. F., & Lewin, A. Y. 2006. Interdependency, Competition, and the Distribution of Firm and Industry Profits. *Management Science*, 52(5): 757-772.
- Leonard-Barton, D. 1992. Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development. *Strategic Management Journal*, 13(Special Issue: Strategy Process: Managing Corporate Self-Renewal): 111-125.
- Lewin, A. Y., & Volberda, H. W. 1999. Prolegomena on Coevolution: A Framework for Research on Strategy and New Organizational Forms. *Organization Science*, 10(5): 519-534.
- Loch, C. H., & Huberman, B. A. 1999. A Punctuated-Equilibrium Model of Technology Diffusion. *Management Science*, 45(2): 160-177.
- Lorenzen, M. 2005. Industry and Innovation: Continuity and Change. *Industry and Innovation*, 12(1): 1-3.
- Lorenzen, M. 2007. The Dynamics of Industry and Innovation. *Industry and Innovation*, 14(1): 1-3.
- Levinthal, D. A. 1991. Organizational Adaptation and Environmental Selection-Interrelated Processes of Change. *Organization Science*, 2(1): 140-145.
- MacKenzie, D. A., & Wajcman, J. 1999. *The Social Shaping of Technology* (2nd ed.). Buckingham: Open University Press.
- Majumdar, S. K., Carare, O., & Chang, H. 2009. Broadband Adoption and Firm Productivity: Evaluating the Benefits of General Purpose Technology. *Industrial and Corporate Change*, 19(3): 641-674.
- Majumdar, S. K., & Chang, H. 2010. Technology Diffusion and Firm Performance: It Pays to Join the Digital Bandwagon! *Technology in Society*, 32: 100-109.
- Malerba, F. 2005. Innovation and the Evolution of Industries. *Journal of Evolutionary Economics*, 16(1-2): 3-23.
- Malerba, F. 2006. Innovation, Industrial Dynamics and Industry Evolution: Progress and the Research Agendas. *Revue de l'OFCE*, 5: 21-46.
- Malerba, F., Nelson, R., Orsenigo, L., & Winter, S. 1999. 'History-friendly' Models of Industry Evolution: The Computer Industry. *Industrial and Corporate Change*, 8(1): 3-40.

- Malerba, F., Nelson, R., Orsenigo, L., & Winter, S. 2008. Vertical Integration and Disintegration of Computer Firms: A History-friendly Model of the Coevolution of the Computer and Semiconductor Industries. *Industrial and Corporate Change*, 17(2): 197-231.
- Malerba F., & Orsenigo, L. 1996. The Dynamics and Evolution of Industries. *Industrial and Corporate Change*, 5(1): 51-87.
- Malerba, F., & Orsenigo, L. 2015. The Evolution of the Pharmaceutical Industry. *Business History*, 57(5): 664-687.
- March, J. G. 1991. Exploration and Exploitation in Organizational Learning. *Organization Science*, 2(1): 71-87.
- Marks, H. J. 2015. *An Exploration Into The Relationship Between Brand And Industry Evolution*. Doctoral Dissertation. Trinity College Dublin.
- Massey, B. P. 2014. *Enterprise - Industry Coevolution: A Value-Based Perspective*. Doctoral Dissertation. Trinity College Dublin
- Mata, F. J., Fuerst, W. L., & Barney, J. B. 1995. Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis. *MIS Quarterly*, 19(4, Dec): 487-505.
- Maxwell, J. A. 2009. Designing a Qualitative Study. In L. Bickman, & D. J. Rog (Eds.), *The Sage Handbook of Applied Social Research Methods* 2nd ed.: 214-253. Los Angeles ; London: Sage.
- McGahan, A. M. 2000. How Industries Evolve. *Business Strategy Review*, 11(3): 1-16.
- McGahan, A. M. 2004. How Industries Change, *Harvard Business Review*, 82(10): 86-94.
- McGahan, A. M., & Porter, M. E. 1997. How Much Does Industry Matter, Really? *Strategic Management Journal*, 18(Summer Special Issue): 15-30.
- McKelvey, B. 1997. Quasi-Natural Organization Science. *Organization Science*, 8(4): 352-380.
- McNurlin, B. C., Sprague, R. H., & Bui, T. X. 2009. *Information Systems Management in Practice* (8th ed.). Upper Saddle River, N.J.: Pearson/Prentice Hall.
- Meyer, A. D., Brooks, G. R., & Goes, J. B. 1990. Environmental Jolts and Industry Revolutions: Organizational Responses to Discontinuous Change. *Strategic Management Journal*, 11(Summer): 93-110.
- Meyer, C. 2013. What Does it Take to Redesign an Industry. *Harvard Business Review*, (March): 36.
- Meyer, J. W., & Rowan, B. 1977. Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, 83(2): 340-363.
- Meyer, J., W., & Scott, W. R. 1983. *Organizational Environments: Ritual and Rationality*. United States of America: Sage
- Miles, M. B., & Huberman, A. M. 1984. *Qualitative Data Analysis: A Sourcebook of New Methods*. Beverly Hills ; London: Sage.

- Miles, M. B., & Huberman, A. M. 1994. *Qualitative Data analysis : An Expanded Sourcebook* (2nd ed.). Thousand Oaks, Calif. ; London: Sage.
- Mingers, J., Mutch, A., & Willcocks, L. 2013. Critical Realism in Information Systems Research. *MIS Quarterly*, 37(3): 795-802.
- Mintzberg, H. 1979. An Emerging Strategy of "Direct Research". *Administrative Science Quarterly*. 24(4): 582-589.
- Mintzberg, H. 2005. Developing Theory About the Development of Theory. In K. G. Smith, & M. A. Hitt (Eds.), *Great Minds in Management: The Process of Theory Development*: 355-372. Oxford: Oxford University Press.
- Mintzberg, H., Ahlstrand, B. W., & Lampel, J. 1998. *Strategy Safari: The Complete Guide Through the Wilds of Strategic Management*. London: Prentice Hall.
- Mjøset, L. 2009. The Contextualist Approach to Social Science Methodology. In D. S. Byrne, & C. C. Ragin (Eds.), *The SAGE Handbook of Case-based Methods*: xvii, 542 p. Los Angeles ; London: Sage.
- Mooney, J., G., Gurbaxani, V., & Kraemer, K. L. 1996. A Process Oriented Framework for Assessing the Business Value of Information Technology. *ACM SIGMIS Database*, 27(2): 68-81.
- Mokyr, J. 2003. Thinking About Technology and Institutions. *Macalester International*, 13(8): 33-66.
- Morgan, G., & Smircich, L. 1980. The Case for Qualitative Research. *The Academy of Management Review*, 5(4): 491-500.
- Mowery, D. C., & Nelson, R. R. 1999. *Sources of Industrial Leadership: Studies of Seven Industries*. Cambridge: Cambridge University Press.
- Moyon, E., & Lecocq, X. 2010. Co-evolution Between Stages of Institutionalization and Agency: The Case of the Music Industry's Business Model. *International Management*, 14(4): 37-53.
- Müller, O., Fay, M., & vom Brocke, J. 2018. The Effect of Big Data and Analytics on Firm Performance: An Econometric Analysis Considering Industry Characteristics. *Journal of Management Information Systems*, 35(2): 488-509.
- Murmann, J. P. 2013. The Coevolution of Industries and Important Features of Their Environments. *Organization Science* 24(1): 58-78.
- Murmann, J. P., Aldrich, H. E., Levinthal, D., & Winter, S. G. 2003. Evolutionary Thought in Management and Organization Theory at the Beginning of the New Millennium. *Journal of Management Inquiry*, 12(1): 22-40.
- Neff, J. 2014. How Tech Took a Bite Out of the Ad Industry, *Adage*. <http://adage.com/article/digital/tech-a-bite-ad-industry/293020/> [Accessed 15th Dec 2015].
- Nelson, R. R. 1991. How Do Firms Differ, and How Does it Matter? *Strategic Management Journal*, 12(Winter Special Issue): 65-85.

- Nelson, R. R. 1995. Co-evolution of Industry Structure, Technology and Supporting Institutions, and the Making of Comparative Advantage. **International Journal of the Economics of Business**, 2(2): 171-184.
- Nelson, R. R. 2005. **Technology, Institutions, and Economic Growth**. Cambridge, Mass. ; London: Harvard University Press.
- Nelson, R., R. 2008a. Factors Affecting the Power of Technological Paradigms. **Industrial and Corporate Change**, 17(3): 485-497.
- Nelson, R. R. 2008b. What Enables Rapid Economic Progress: What Are the Needed Institutions? **Research Policy**, 37: 1-11.
- Nelson, R. R. 2012. Richard R. Nelson - **The Moon and the Ghetto Revisited**. <https://http://www.youtube.com/watch?v=KfL27L29l20>: ingenio [Accessed 8th Jan 2018].
- Nelson, R., R. 2018. Observations and Conjectures Stimulated by David Teece's "Profiting from Innovation in the Digital Economy..." **Research Policy**, 47: 1388-1390.
- Nelson, R. R., & Sampat, B. N. 2001. Making Sense of Institutions as a Factor shaping Economic Performance. **Journal of Economic Behavior & Organization**, 44(1): 31-54.
- Nelson, R. R., & Winter, S. G. 1982. **An Evolutionary Theory of Economic Change**. Cambridge, Mass. ; London: Belknap Press.
- Nelson, R. R., & Winter, S. G. 2002. Evolutionary Theorizing in Economics. **Journal of Economic Perspectives**, 16(2): 23-46.
- Nienhüser, W. 2008. Resource Dependence Theory –How Well Does It Explain Behavior of Organizations? **Management-Revue**, Vol. 19: 9-32.
- North, D. C. 1990. **Institutions, Institutional Change and Economic Performance**. Cambridge University Press, New York: Cambridge, MA.
- North, D. C., & Wallis, J. J. 1994. Integrating Institutional Change and Technical Change in Economic History: A Transaction Cost Approach. **JITE: Journal of Institutional and Theoretical Economics**, 150(4): 609-624.
- O'Callaghan, E., & Wilcox, M. 2000. Superquinn Alive and Kicking: An Illustration of Innovation in the Irish Grocery Market, **EAERCD European Association for Education & Research in Commercial Distribution Conference Proceedings**. ESADE, Barcelona.
- O'Mahony, M., & Ark, B. V. 2003. EU Productivity and Competitiveness: An Industry Perspective – Can Europe Resume the Catching Up Process? In **E. Community (Ed.)**. Luxembourg: Enterprise Publications.
- Oliver, C. 1991. Strategic Responses to Institutional Processes. **Academy of Management Review**, 16(1): 145-179.
- Orlikowski, W. 2000. Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. **Organization Science**, 11(4): 402-228.
- Orlikowski, W. J., & Barley, S. R. 2001. Technology and Institutions: What can Research on Information Technology and Research on Organizations Learn from Each Other? **MIS Quarterly**, 25(2): 145-165.

- Ovans, A. 2015. What is Strategy, Again? *Harvard Business Review* (May, 12th): 2-5.
- Pan, S. L., & Tan, B. 2011. Demystifying Case Research: A Structured–pragmatic–situational (SPS) Approach to Conducting Case Studies. *Information and Organization*, 21(3): 161-176.
- Payne, R .L.1975. *Epistemology and the Study of Behaviour in Organizations*. Unpublished Memo No 68, MRC, Social and Applied Psychology Unit, University of Sheffield
- Payne, R .L. 1982. *The Nature of Knowledge and Organisational Psychology*. Unpublished Memo No 445, MRC/SSRC, Social and Applied Psychology Unit, University of Sheffield
- Penrose, E. T. 1959. *The Theory of the Growth of the Firm*. New York: Wiley.
- Pepper, S. C. 1942. *World Hypotheses, a Study in Evidence*. Berkeley and Los Angeles,: University of California press.
- Perez, C. 1983. Structural Change and Assimilation of New Technologies in the Economic and Social Systems. *Futures*, 15(4): 357-375.
- Perez, C. 2009. Technological Revolutions and Techno-Economic Paradigms. *Cambridge Journal of Economics*, 34: 185-202.
- Pettigrew, A. M. 1985a. *The Awakening Giant: Continuity and Change in Imperial Chemical Industries*. Oxford: Blackwell.
- Pettigrew, A. M. 1985b. Contextualist Research: A Natural Way to Link Theory and Practice. In E. E. L. III, A. M. M. Jr., S. A. Mohrman, G. E. L. Jr., T. G. Cummings, & a. Associates (Eds.), *Doing Research that is Useful in Theory and Practice*. London: Jossey-Bass.
- Pettigrew, A. M. 1987. Context and Action in the Transformation of the Firm. *Journal of Management Studies*, 24(6): 649-670.
- Pettigrew, A. M. 1990. Longitudinal Field Research on Change: Theory and Practice. *Organization Science*, 1(3).
- Pettigrew, A. M. 1997. What is a Processual Analysis? *Scandinavian Journal of Management*, 13(4): 337-348.
- Pettigrew, A. M. 2012. Context and Action in the Transformation of the Firm: A Reprise. *Journal of Management Studies*, 49(7): 1304-1328.
- Pettigrew, A. M., Woodman, R. W., & Cameron, K. S. 2001. Studying Organizational Change and Development: Challenges for Future Research. *Academy of Management Journal*, 44(4): 697-713.
- Pfeffer, J. 1982. *Organizations and Organization Theory*. Boston, Mass. ; London: Pitman.
- Pfeffer, J. 2005. Developing Resource Dependence Theory: How Theory is Affected by its Environment. In M. A. Hitt, & K. G. Smith (Eds.), *Great Minds in Management : the Process of Theory Development*: 436. Oxford: Oxford University Press.
- Pfeffer, J., & Salancik, G. R. 1978. *The External Control of Organizations: a Resource Dependence Perspective*. New York ; London: Harper & Row.

- Phillips, P. A., & Wright, C. 2009. E-business's Impact on Organizational Flexibility. *Journal of Business Research*, 62: 1071-1080.
- Pilat, D. 2004. The ICT Productivity Paradox: Insights from Micro Data, *OECD Economic Studies No. 38*, Vol. 1. <http://www1.oecd.org/eco/productivityandlongtermgrowth/35028181.pdf>. [Accessed 17th Dec 2012].
- Porac, J. F., & Thomas, H. 2002. Managing Cognition and Strategy: Issues, Trends and Future Directions. In W. R., P. A., & T. H. (Eds.), *Handbook of Strategy and Management*: 165-181. London: : Sage Publications.
- Porac, J. F., Thomas, H., & Baden-Fuller, C. 1989. Competitive Groups as Cognitive Communities: The Case of Scottish Knitwear Manufacturers. *Journal of Management Studies*: 397-416.
- Porter, M. E. 1979. How Competitive Forces Shape Strategy. *Harvard Business Review*, 57(79): 137-145.
- Porter, M. E. 1980. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York, London: Free Press; Collier Macmillan. (Republished with a new introduction, 2004).
- Porter, M. E. 1983. Industrial Organization and the Evolution of Concepts for Strategic Planning: The New Learning. *Managerial and Decision Economics*, 4(3): 172-180.
- Porter, M. E. 1990. *The Competitive Advantage of Nations*. London: Macmillan.
- Porter, M. E. 1996. What is Strategy? *Harvard Business Review*, 74(6): 61-78.
- Porter, M. E. 2001. Strategy and the Internet. *Havard Business Review*, March: 1-20.
- Porter, M. E. 2004. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York ; London: Free Press. (Republication of 1980 with a new introduction).
- Porter, M. E., & Kramer, M. R. 2011. Creating Shared Value: How to Reinvent Capitalism - and Unleash a Wave of Innovation and Growth. *Harvard Business Review*, January- February: 62-77.
- Porter, M. E., & Millar, V. E. 1985. How Information Gives you Competitive Advantage. *Harvard Business Review*, 63(Jul/Aug): 149-174.
- Powell, W. W. 1990. Neither Market Nor Hierarchy: Network Forms of Organization. *Research in Organizational Behaviour*, 12: 295-336.
- Powell, W. W., & DiMaggio, P. J. 1991. *The New Institutionalism in Organizational Analysis*. Chicago ; London: University of Chicago Press.
- Powell, W. W., Koput, K. W., & Smith-Doerr, L. 1996. Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology. *Administrative Science Quarterly*, 41(1): 116-145.
- Prahalad, C. K., & Hamel, G. 1990. The Core Competence of the Corporation. *Harvard Business Review*: 79-91.

- Quilliam, J. 2015. *Strategy in the Digital Age Fundamentals of Management and Organisation*, Trinity College Dublin, June: 5.
- Quinn, J. 2002. *Industry Evolution: A Comparative Study of Irish Wholesaling*. Doctoral Dissertation. Dublin City University.
- Quinn, J. 2008. Contextualism, *Presentation*. Trinity College Dublin.
- Quinn, J. 2012. The Drivers and Process of Industry Evolution. *Unpublished Research Seminar*, 13th Feb 2012.
- Quinn, J. 2015. Editorial: Re-introducing Evolutionary Theory to Business History: Making Sense of Today's Structure, *Business History*, 57:5, 655-663.
- Quinn, J. 2019. *Personal Email Communication* [3rd Jan 2019]
- Quinn, J., & Leavy, B. 2002. Structural Innovation in Irish Wholesaling - The Voluntary Group Format. *Irish Marketing Review*, 15(1): 49-56.
- Quinn, J., & Leavy, B. 2004. Government Activism and Industry Change: The Structural Evolution of Irish Wholesaling. *Irish Journal of Management*, 25(1): 110-124.
- Quinn, J., & Leavy, B. 2005. The Drivers of Industry Evolution: A Study of Irish Wholesaling. *Journal of Marketing Channels*, 13(1): 37.
- Quinn, J., & Murray, J. 2005. The Drivers of Channel Evolution: A Wholesaling Perspective. *The Int. Rev. of Retail, Distribution and Consumer Research*, 15(1): 3-25.
- Quinn, J., & Murray, J. A. 2009. The Community Context of Evolving Industry Architecture. *Journal of Marketing Channels*, 16(4): 327-357.
- Quinn, J., & Sparks, L. 2007. The Evolution of Grocery Wholesaling and Grocery Wholesalers in Ireland and Britain since the 1930s. *Int. Rev. of Retail, Distribution and Consumer Research*, 17(4): 391-411.
- Rockart, J. F., Earl, M. J., & Ross, J. W. 1996. Eight Imperatives for the New IT Organization. *Sloan Management Review*, 38(Fall, 1): p43-55.
- Rogers, E. M. 1995. *Diffusion of Innovations* (4th ed.). New York, NY.: The Free Press.
- Ronda-Pupo, G. A., & Guerras-Martin, L. Á. 2012. Dynamics of the Evolution of the Strategy Concept 1962-2008: A Co-word Analysis. *Strategic Management Journal*, 33(2): 162-188.
- Ross, J. W., Beath, C. M., & Goodhue, D. L. 1996. Develop Long-term Competitiveness through IT Assets. *Sloan Management Review*, 38(Fall): 31-42.
- Ross, J. W., & Feeny, D. F. 2000. The Evolving Role of the CIO. In Z. R. (Ed.), *Framing the Domains of IT Management: Projecting the Future Through the Past*: 385-402. Cincinnati, Ohio: Pinnaflex.
- Rumelt, R. P. 1991. How Much Does Industry Matter? *Strategic Management Journal* (March): 167-185.

- Sabbagh, K., Friedrich, R., El-Darwiche, B., & Singh, M. 2012. *Maximizing the Impact of Digitization*. http://www.booz.com/media/uploads/BoozCo_Maximizing-the-Impact-of-Digitization.pdf. [Accessed 4th Jun 2012].
- Sambamurthy, V., Bharadwaj, A., & Grover, V. 2003. Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms. *MIS Quarterly*, 27(2): 237-263.
- Santos, F., & Eisenhardt, K. 2005. Organizational Boundaries and Theories of Organization. *Organization Science*, 16(5): 491-508.
- Sawyer, S., Crowston, K., & Wigand, R. T. 2014. Digital Assemblages: Evidence and Theorising from the Computerisation of the US Residential Real Estate Industry. *New Technology, Work & Employment*, 29(1): 40-56.
- Sayer, A. 1992. *Method in Social Science: A Realist Approach*. London.
- Schmoch, U., Laville, F., Patel, P., & Frietsch, R. 2003. Linking Technology Areas to Industrial Sectors. In D. R. *Final Report to the European Commission* (Ed.). Karlsruhe, Paris, Brighton.
- Schumpeter, J. A. 1911. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Cambridge: Harvard University Press.
- Schumpeter, J. A. 1939. *Business Cycles*. Philadelphia, Porcupine Press
- Scott, W. R. 2001. *Institutions and Organizations* (2nd ed.). Thousands Oaks: Sage Publications.
- Scott, W. R. 2005. Institutional Theory: Contributing to a Theoretical Research Program. In M. A. Hitt, & K. G. Smith (Eds.), *Great Minds in Management: The Process of Theory Development*: 471. Oxford: Oxford University Press
- Scott, W. R., & Davis, G. F. 2007. *Organizations and Organizing: Rational, Natural, and Open System Perspectives* (1st ed.). Upper Saddle River, N.J.: Pearson Prentice Hall.
- Seely- Brown, J., & Hagel III, J. 2003. Does IT Matter? *Harvard Business Review* (July): 109-111.
- Segars, A. H., & Grover, V. 1995. The Industry-level Impact of Information Technology: An Empirical Analysis of Three Industries. *Decision Sciences*, 26(3): 337-369.
- Shearman, C., & Burrell, G. 1987. The Structures of Industrial Development. *Journal of Management Studies*, 24(4): 325-345.
- Shin, N., & Edgington, B. H. 2007. An Integrative Framework for Contextual Factors Affecting Information Technology Implementation. *Journal of Information Technology Theory and Application*, 8(4): 21-38.
- Siddiqui, D. A., & Ahmed, Q. M. 2018. Institutionalized Social Technologies Index: A Global Perspective. *Theoretical and Applied Economics*, XXV(4): 63-92.
- Siggelkow, N. 2007. Persuasion With Case Studies. *Academy of Management Journal*, 50(1): 20-24.
- Silverman, D. 2005. *Doing Qualitative Research* (2nd ed.): Sage Publications.

- Simon, H. A. 1957. *Models of Man*. New York: Wiley.
- Sminia, H. 2009. Process Research in Strategy Formation: Theory, Methodology and Relevance. *International Journal of Management Reviews*, 11(1): 97-125.
- Sminia, H., & de Rond, M. 2012. Context and Action in the Transformation of Strategy Scholarship. *Journal of Management Studies*, 49(7): 1329-1349.
- Smith, A. 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*.
- Smith, K. A., Vasudevan, S. P., & Tanniru, M. R. 1996. Organizational Learning and Resource-based Theory: An Integrative Model. *Journal of Organizational Change Management*, 9(6): 41-53.
- Steinfeld, C. W., Markus, M. L., & Wigand, R. T. 2005. Exploring Interorganizational Systems at the Industry Level of Analysis: Evidence from the US Home Mortgage Industry. *Journal of Information Technology*, 20: 224-233.
- Stokes, R., & Banken, R. 2015. Constructing an 'Industry': The Case of Industrial Gases, 1886–2006. *Business History*, 57(5): 688-704.
- Strauss, A. L., & Corbin, J. M. 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Newbury Park, Calif.: Sage Publications
- Strauss, A. L., & Corbin, J.M. 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. (2nd ed.). London: Sage Publications.
- Sztompka, P. (1991). *Society in Action: The Theory of Social Becoming*. University of Chicago Press.
- Teece, D. J. 2007. Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. *Strategic Management Journal*, 28(13): 1319-1350.
- Teece, D. J. 2018a. Business Models and Dynamic Capabilities. *Long Range Planning*, 51: 40-49
- Teece, D. J. 2018b. Profiting from Innovation in the Digital Economy: Enabling Technologies, Standards, and Licensing Models in the Wireless World. *Research Policy*, 47: 1367-1387.
- Teece, D., J, Pisano, G., & Shuen, A. 1997. Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7): 509-533.
- Thomas, G. 2011. A Typology for the Case Study in Social Science Following a Review of Definition, Discourse, and Structure. *Qualitative Inquiry*, 17(6): 511-521.
- Tilson, D., Lyytinen, K., & Sorensen, C. 2010. Digital Infrastructures: The Missing IS Research Agenda. *Information Systems Research*, 21(4): 748-759.
- Tripsas, M., & Gavetti, G. 2000. Capabilities, Cognition, and Inertia: Evidence from Digital Imaging. *Strategic Management Journal* (21): 1147-1161.
- Van de Ven A. H. 1992. Suggestions for Studying Strategy Process: A Research Note. *Strategic Management Journal*, 13: 169-191.
- Van de Ven, A. H., & Poole, M. S. 1995. 'Explaining Development and Change in Organizations'. *Academy of Management Review*, 20(3): 510-540.

- Volberda, H. W., & Lewin, A. Y. 2003. Guest Editors' Introduction. Co-Evolutionary Dynamics within and between Firms: From Evolution to Co-Evolution. *Journal of Management Studies*, 40(8): 2111-2136.
- Wernerfelt, B. 1984. A Resource-Based View of the Firm. *Strategic Management Journal*, 5(2): 171-180.
- White, M. A., & Bruton, G. D. 2007. *The Management of Technology and Innovation: A Strategic Approach*. Beijing: Publishing House of Electronics Industry.
- Williams, D. E. 2009. The Evolution of e-tailing. *The International Review of Retail, Distribution and Consumer Research*, 19(2): 219-249.
- Williamson, O. E. 1981. The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87(3): 548-577.
- Williamson, O. E. 1999. Strategy Research: Governance and Competence Perspectives. *Strategic Management Journal*, 20(12): 1087-1108.
- Williamson, O. E. 2005. Transaction Cost Economics: The Process of Theory Development. In K. G. Smith, & M. A. Hitt (Eds.), *Great Minds in Management: the Process of Theory Development*: 485-508. Oxford ; New York: Oxford University Press.
- Winter, S. G. 2003. Understanding Dynamic Capabilities. *Strategic Management Journal*, 24(10): 991-995.
- Winter, S. G. 2015. *Wharton Prof. Sidney Winter on Dynamic Capability and Evolutionary Economics*. <https://http://www.youtube.com/watch?v=Ztyy4IKVOAo>. [Accessed 11th Jan 2018].
- Witt, U. 2008. What is Specific about Evolutionary Economics? *Journal of Evolutionary Economics*, 18(5): 547-575.
- Woolgar, S. 1983. Irony in the Social Study of Science. In K. D. Knorr-Cetina, & M. Mulkey (Eds.), *Science Observed: Perspectives on the Social Study of Science*: Sage.
- Wry, T., Cobb, J. A., & Aldrich, H. E. 2013. More than a Metaphor: Assessing the Historical Legacy of Resource Dependence and its Contemporary Promise as a Theory of Environmental Complexity. *The Academy of Management Annals*, 7(1): 441-488.
- Wynn, D. J., & Williams, C. K. 2012. Principles for Conducting Critical Realist Case Study Research in Information Systems. *MIS Quarterly* 36(3): 787-810.
- Xi, L., Lei, L., & Guisheng, W. 2009. Evolution of the Chinese Automobile Industry from a Sectoral System of Innovation Perspective. *Industry & Innovation*, 16(4-5): 463-478.
- Yin, R. K. 1981. The Case Study Crisis: Some Answers. *Administrative Science Quarterly*, 26(1): 58-65.
- Yin, R. K. 2009. *Case Study Research: Design and Methods* (4th ed.). London: Sage.
- Yip, G. S. 2000. Global Strategy in the Internet Era. *Business Strategy Review*, 11(4): 1-14.
- Zachariadis, M., Scott, S., & Barrett, M. 2013. Methodological Implications of Critical Realism for Mixed-Methods Research. *MIS Quarterly*, 37(3): 855-879.

- Zackariasson, P., Boström, G.-O., & Wilson, T. L. 2009. Technology and Change in the Swedish Architectural Industry. *Competitiveness Review: An International Business Journal incorporating Journal of Global Competitiveness*, 19(1): 46-62.
- Zaring, O., & Eriksson, C. M. 2009. The Dynamics of Rapid Industrial Growth: Evidence from Sweden's Information Technology Industry, 1990–2004. *Industrial and Corporate Change*, 18(3): 507-528.
- Zhouying, J. 2003. The Fourth Generation of Technology Foresight and Soft Technology. *Futures Research Quarterly*, 19(2): 23-38.
- Zhouying, J. 2004. Technological Progress in History: A Survey of Evolution and Shift of Research Emphasis from “Hard-tech” to “Soft-tech” Development. *International Journal of Technology Management & Sustainable Development*, 3(2): 133-148.
- Zhouying, J. 2005. Globalization, Technological Competitiveness and the “Catch-up” Challenge for Developing Countries: Some Lessons of Experience. *International Journal of Technology Management & Sustainable Development*, 4(1): 35-46.