

Irish projects using space technology now deployed to respond to COVID-19

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Irish companies are deploying their expertise in space technology to help in the fight against COVID-19.

Skytek and PMD Solutions (in partnership with Beaumont Hospital) were recently awarded contracts by the European Space Agency (ESA) for cutting edge-projects. The successful projects comprise a virtual command and control centre, which will streamline and support effective emergency response, and wearable technology that will support remote monitoring of patient health using satellite technology.

These novel projects are supported through the Irish Government's investment in the European Space Agency's (ESA) programme in advanced communications satellite technologies and systems (ARTES).

Welcoming the announcement, Minister of State for Business, Employment and Retail, Damien English TD said:

"I am very pleased to see further examples of Irish technology companies leading the way in developing innovative technologies to help mitigate the effects of the COVID-19 pandemic. It shows how Ireland's investment in ESA is supporting Irish companies to develop solutions that make a real difference to our lives. These projects also clearly demonstrate how space technology can deliver tangible solutions to current and emerging challenges, including our global fight against the pandemic."

Tom Kelly, Divisional Manager Enterprise Ireland, stated that:

"It is very encouraging to see client companies leading the way in Europe in research and innovation and in adapting space technologies to address real and immediate needs. Space technology pushes boundaries and the solutions associated with this innovation have application in a variety of settings, including tackling the world-wide COVID-19 pandemic. We expect to see further innovations from Irish companies in the coming months supported through the government's investment in ESA."

ENDS

Notes

REACT 2

Skytek's React 2 is a satellite-enabled platform to support 'Virtual Command and Control Centres'. This includes secure information exchange, distributed working of key personnel, provision of pandemic current situational awareness and supporting automated workflows of common tasks.

React2 is designed to streamline and coordinate the response to the ongoing COVID-19 pandemic, linking into Ireland's Computerised Infectious Disease Reporting (CIDR) system to generate alerts when numbers of suspected cases go beyond a defined figure.

Dublin-based Skytek is a leader in space technology, developing software used on the International Space Station as well as satellite and predictive analytics solutions for a range of complex and demanding industries and sectors including marine insurance and the emergency services.

Skytek leads a high-profile European consortium that includes the Italian infectious diseases authority- Spallanzani, the Italian Navy and Rome's largest hospital group Gemelli. In Ireland, the HSE and the Irish Centre for Emergency Management will assist with the design and testing of the system.

Building on Skytek's expertise in insurance and emergency response systems called React (Resource for Emergency Services to Access Command and control data using satellite and hybrid Technologies), React 2 will also link into acute hospital monitoring systems, allowing decision makers to understand the nature of an outbreak.

Streamlined reporting and communication, all fully encrypted, and with support for audio, video, text, document sharing, shared whiteboards and geographical information systems (GIS) will allow for rapid response, all accessible over multiple communications media including cellular telephony and satellite even in areas or weather conditions where communication typically proves difficult.

The principle users will include acute hospitals, Ireland's public health authorities, the community health sector, the National Ambulance Service, general practitioners and contract pharmacies, care settings such as elder care facilities, direct provision centres, facilities for people with an intellectual disability and public health supply contractors.

CORONA- RS – RespiraSense wearable solution

PMD Solutions Ltd, in partnership with Beaumont Hospital, Dublin, is undertaking a space-enabled medical solution "CORONA-RS" - to scale community monitoring of respiratory compromised patients in the community due to COVID-19 and other respiratory compromised patient cohorts.

COVID-19 has transformed the way we care and treat respiratory-compromised patients both in the hospital and now in the community. For healthcare systems to operate effectively it is essential that they either build more facilities or empower patients in the community. The latter is where most healthcare systems are placing their bets.

One of the biggest challenges for community monitoring is the level of technology required to get information from the patient to healthcare provider. Current solutions include ‘middle ware’ devices to send information from devices to clinicians using devices such as mobile phones, tablet computers, patient WiFi, etc. This is significantly slowing down the rate of adoption. It is far too cumbersome and, often, the ageing demographic are not in a position to be both patient and IT support for such systems. In addition, patients require the ability to leave their home to visit family, buy groceries, or to simply go for a walk. This presents an additional challenge for ‘middle wear’ systems to ensure emergency services get to the right location as quickly as possible.

CORONA-RS is a collaboration between PMD Solutions, European Space Agency, and Beaumont Hospital to develop a world’s first patient wearable using 5G technology to eliminate the need for any unnecessary middle ware that has up to now impeded the scaled adoption of community patient monitoring systems. It is intended to support a ‘virtual ward’ where patients in the community will remain under the care of a hospital’s experienced respiratory teams in partnership with community medical teams.

RespiraSense is a body-worn respiratory rate monitor with the advantage of superior position tracking using the European Space Agency’s Galileo satellite system. If a patient becomes unstable, the only intervention is prolonged hospitalisation and possible ventilation in an Intensive Care Unit. Time to intervene is critical in preventing such escalations of care that are currently placing a huge strain on healthcare systems once again in Europe.

In a clinical trial in Beaumont hospital earlier this year, RespiraSense was implemented in the hospital COVID-19 ward. It demonstrated an ability to identify which patients would experience respiratory failure 12 hours earlier than the standard of care. Piloting this innovation in the community as an easy to use and seamless telemetry solution will help prioritise resources and support clinical decision-making processes.

Beaumont Hospital will be the clinical lead for the design of this solution. RespiraSense plans to be able to send critical patient physiological data direct from the wearable device, including patient position using the European Space Agency’s Galileo Global Navigation Satellite System (GNSS), to healthcare providers so the right patients get the right care at the right time.

In both cases the technologies will be trialed in a number of other member states, including Italy and Ireland.

Both of these activities are being supported through the Irish Government’s investment in ESA programme in advanced communications satellite technologies and systems (ARTES).

About Skytek: (www.skytek.com)

Founded by Dr Sarah Bourke and Paul Kiernan, both significant award laureates, Skytek has partnered with both ESA, NASA, Airbus and Aon in developing a range of technology solutions and applications for the commercial space and space related markets.

About PMD Solutions (www.pmd-solutions.com)

A Cork-based medical device company which designs, develops, and manufactures RespiraSense. The company's vision is to improve patient outcomes by making every breath count. RespiraSense is a wearable continuous respiratory rate monitor. Its patented approach measures the mechanics of breathing to produce industry leading accuracy in mobile and alert patients.

About Beaumont Hospital

Beaumont Hospital is a large academic teaching hospital 5km north of Dublin City centre. It provides emergency and acute care services across 54 medical specialties to a local community of some 290,000 people. The hospital employs approximately 3,000 staff and has 820 beds. Beaumont is the principal teaching hospital for the Royal College of Surgeons in Ireland. It also enjoys close links with Dublin City University, especially in the area of nurse training, and with other academic institutions in respect of training and research. The Beaumont Hospital Respiratory Lab is focused on digital research in areas such as treating COVID-19 and other respiratory issues.

About the European Space Agency

The European Space Agency (ESA) is Europe's gateway to space. ESA is an intergovernmental organisation, created in 1975, with the mission to shape the development of Europe's space capability and ensure that investment in space delivers benefits to the citizens of Europe and the world. ESA develops the launchers, spacecraft and ground facilities needed to keep Europe at the forefront of global space activities. Today it launches satellites for Earth observation, navigation, telecommunications and astronomy, sends probes to the far reaches of the Solar System and cooperates in the human exploration of space.

The purpose of Ireland's membership of ESA is to participate in European space programmes with a focus on facilitating innovative Irish operations to develop leading-edge space technologies and to commercially exploit their ESA participation in global space and non-space markets, leading to increased export sales and employment. Irish membership of ESA is funded through an annual subscription that allows Irish companies and researchers to competitively bid for ESA tenders. The value of the resulting contracts is commensurate with Ireland's contribution to the overall ESA budget. Enterprise Ireland co-ordinates Ireland's industrial and research participation in the programmes of ESA in collaboration with the Department of Enterprise, Trade and Employment.