



‘Innovation Through Design’

The Enterprise Ireland
Technology Gateway Network 2017

A Guide For Companies

The objective of the Enterprise Ireland Technology Gateway Network is to deliver near to market technology solutions to Irish based companies to assist them develop new products, processes and services.

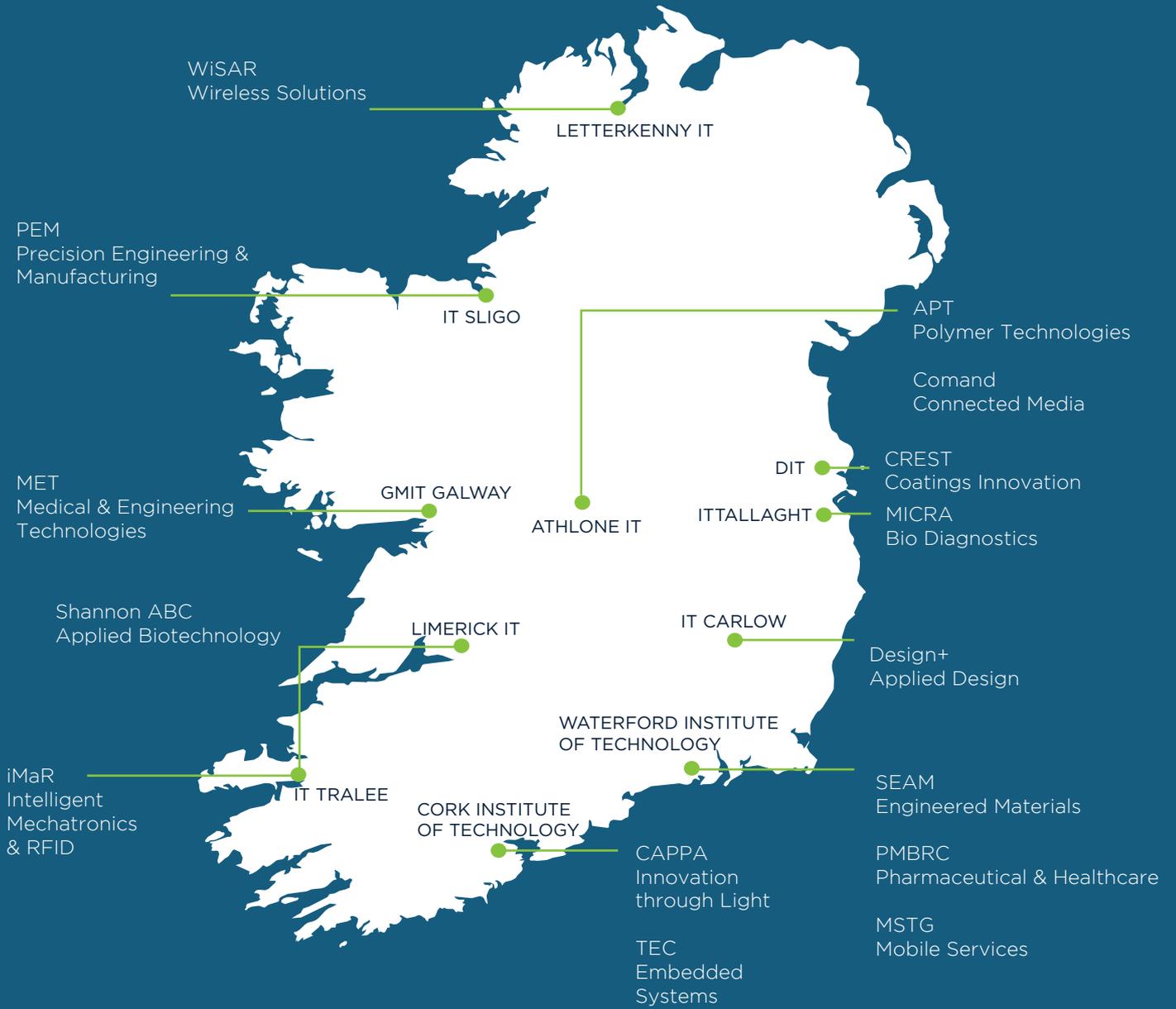


Figure 1 Graphical Representation of the Enterprise Ireland Technology Gateway Network

The following company approved case studies give an example of the variety of design and assisted product development capability that exists within the Network. For more information please go to www.technologygateway.ie.

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2 APT Gateway

The APT Gateway assists companies design and develop new products through its range of rapid prototyping technologies

APT based on the Athlone IT campus. APT is providing polymer technology solutions for companies in the medical, composite, recycling and pharmaceutical sectors. APT provides industry with access to:

- Pilot and Production scale Injection Moulding, Blow Moulding, Thermoforming, Extrusion and Compounding lines and 3D additive printing.
- Advanced Analytical Facilities for materials research, testing and troubleshooting.
- Design, Rapid Prototyping and Micro-Moulding Capabilities.

Case Study 'Prototype Development of portable baby bottle steriliser'

Shasta Ltd. is a highly innovative company that specialises in baby care products and leads the way in portable baby care sterilisation technologies. Shasta wanted to develop the world's first portable baby bottle steriliser (Steri-Ova). In collaboration with Shasta, APT developed a plastic prototype using 3D modelling and rapid prototyping technology. The collaboration brought the Steri-Ova concept to reality, producing a superior product in terms of speed, size, convenience and reliability. Steri-Ova is now patented in Ireland and patents are pending in 140 countries. It is currently poised for launch worldwide in partnership with one of the leading names in the baby care market. This work came from the completion of 2 EI Innovation Vouchers. Shasta has a pipeline of further innovative products that it hopes to develop in collaboration with AIT.

"AIT brought Steri-Ova from concept into a prototype that we could show potential customers and investors"

Ann Marie Durkin, CEO, Shasta



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CAPPA Gateway

The CAPPA Gateway assists companies design and develop photonic based prototypes that can be scaled to manufacture

CAPPA based in CIT is applying light based photonic technologies for near to market problems for industrial partners seeking solutions for:

- New Photonics Devices
- Med Tech & Pharmaceuticals
- Food & Beverages
- Manufacturing Technologies

Case Study 'Design of a new laser module system'

ProPhotonix Ireland is based in Cork, and this facility designs and manufactures LED, (Light Emitting Diodes) systems with specific focus on system design and thermal management and efficiency. ProPhotonix identified a current market gap for a cost effective high power fibre coupled module in the near-UV wavelength region. There are high-power arrays available on the market in this wavelength range but the light sources are monolithic so if one emitter in the array loses power or fails it cannot be replaced without the customer replacing the entire system or operating at a restricted power level. The ProPhotonix solution allows end users to replace discrete modules as opposed to the entire system, providing reduced costs while offering increased ease of instalment and repair.

CAPPA & ProPhotonix undertook an initial feasibility study to understand the challenges for this project. Based on preliminary results the project proceeded to full Innovation Partnership funded by Enterprise Ireland in conjunction with the Tyndall Institute. The collaboration generated a number of module prototypes that out-performed the desired specifications by 25%. Pro-Photonix Ireland has signed an exclusive worldwide license with CAPPA Gateway & Tyndall that will extend its laser module solutions offering. The company gained access to key research and development expertise that has allowed them to develop this product and the company now has a market disruptive product with key customers targeted.

"We are delighted with the success of our collaboration with CAPPA & Tyndall and look forward to working together in the future to expand photonics technologies. These new capabilities provide a platform to develop a range of innovative product solutions for our customers in the industrial, security and medical markets for a diverse range of applications including food and pharmaceutical product sorting and semiconductor and biomedical inspection systems. The technology was developed to be "production ready"

Simon Stanley, Managing Director, ProPhotonix Ireland



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COMAND Gateway

The COMAND Gateway designs prototype software apps and architecture solutions for partner companies.

COMAND is delivering solutions for software industry across multiple media platforms. The industry focussed technology offer from COMAND includes

- Cloud Media Platform: Leverage media processing in the cloud and end user
- Media Systems: Intelligent and Cross Platform Multimodal Development
- User Interfaces: multimodal interfacing
- Real Time Data Analytics
- Interoperability of the Internet of things

Case Study 'Design and development of 'chatty app solution'

Openet Telecom, headquartered in Dublin, provides real-time, transaction management software and services to the world's leading telecom network operators. Its products help operators to fully realise the commercial potential of their networks, enable the emerging 'Internet of Things' and explore new business models. The company has over 950 employees and more than 80 customers across 30 countries. In September 2013, Openet was named European Entrepreneur of the Year at the Tech Growth Summit in Berlin.

Signalling overload is an increasing problem in modern mobile networks as a result of the proliferation of smartphone devices and their need to be constantly connected. Openet approached the COMAND Gateway to identify a solution to help its customers address this problem. Modern mobile operating systems manage the lifecycle of applications in order to conserve resources on the device. Once a user finishes interacting with an app, it is often shifted into background mode, where the app relinquishes the user interface of the device, but is still able to perform tasks such as networking. Many apps rely on in-app advertising to generate revenue and constantly poll backend advert servers to check for new ads to display, and this continues in background mode causing significant signalling load on the network.

The solution arrived at through the Enterprise Ireland funded Innovation Partnership project was to tackle the so-called 'chatty' apps with the aims of reducing the resource demand on the radio access network by only allowing full bearer services to applications that are running in the foreground. The approach taken is to deploy agent software on the Android OS that mediates the data flows between the device and backend servers. Background data is permitted in certain cases for 'whitelisted' apps, but, in general, data generated from background apps are blocked. The software agent is controlled via policies set up on a backend server, to which the agent connects periodically. The agent also collects statistics relating to network communications from the device and forwards these on to the server for analysis and display.

"The objectives of the research project were achieved in delivering a first-to-market and innovative commercial product with real-life outputs, and that is what an Innovation Partnership should deliver."
Joe Hogan, Openet Telecom



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CREST Gateway

The CREST Gateway undertakes material and smart coating design solutions for partner companies.

CREST based in DIT delivers coatings innovation solutions for industry in the engineering, construction, healthcare and biomedical industries. CREST offers companies expertise in:

- Protective Coatings for challenging environments
- Surface treatment of metal components
- Coatings for Environmental Applications
- Biomedical Devices

Case Study 'Small Wall Paint Material Design'

Smart Wall Paint is Dublin based high potential start-up company that is manufacturing and distributing a paint which turns any surface into a whiteboard. Once the Smart Wall Paint is painted onto any surface it becomes a high performance dry erasable and durable whiteboard. The main customers are Education Institutes and Businesses that use the whiteboard spaces for Innovation, Training and Idea Generation sessions. The company approached the CREST Gateway in DIT, part of the Enterprise Ireland Technology Gateway Network, to undertake a material development investigation on the paint that will enhance its functionality and its capacity to be used with a variety of visual aids that be utilised in Innovation and Training sessions. This project was funded under an Enterprise Ireland Innovation Partnership project. The output of the project was the launch of smart wall paint on the market where it has won numerous awards for product innovation.

“What will come out of this will be huge for us and for a small Irish company to be able to do that kind of R&D, without that innovation partnership scheme it just wouldn't happen.”



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Design+ Gateway

The Design + Gateway delivers design solutions from concept to working prototype with an emphasis on the end user experience and interface.

Design + in IT Carlow is applying its Industrial Design capabilities for companies from the Engineering, ICT & Software and Bio Lifescience sectors based in the midlands, southeast and nationally. The technology offer to industry is

- Engineering: Prototype design and scale to manufacture
- ICT & Software: Integration of user experience and interface design
- Bio Lifesciences: product design orientated by end user needs

Case Study ‘Development of a Hamstring Testing Device’

NJ Doherty Solutions is a Enterprise Ireland High Potential Start Up based in Kilkenny. The company’s product is The Hamstring Solo, a fitness and testing apparatus for professional sports teams. Hamstring injuries are the number one injury in elite sport. Current exercise methods are not measureable and are often completed incorrectly prolonging the injury. The Hamstring Solo allows athletes to complete the exercise in the correct way.

Design+ engaged with NJD Solutions at the early stage of design and prototype development through an Enterprise Ireland Innovation Voucher. The task for Design+ was to redesign the existing prototype for batch production with considerations for manufacture methods and material selection. The working mechanism, which allowed for the hamstring solo to be also used as testing apparatus needed to be developed and solutions sought for the design issues it presented in the earlier prototypes.

On conclusion of the project, the company was provided with a set of technical drawings of the product components and assemblies along with corresponding 3D computer generated models. NJD has subsequently manufactured the improved product using the Design+ project outputs and has secured sales with the IRFU as well as three inter-county hurling teams. NJD Solutions are currently operating from the post-New Frontiers hot desk room at the Institute of Technology Carlow’s Enterprise and Research Incubation Campus.

‘The visual presence of the product was also addressed, designing the overall colour pallet and feel of the product. The feet and end caps of the product were also given a distinguishing design along with the kneeling pads. Addressing the visual presence of the product ensured that the physical design communicated strength and technical excellence.’

NJ Doherty CEO NJD Solutions

Design+ Gateway

Case Study: Electrical drug delivery patch'

Design+ engaged with Magnetar Medical Devices to further design and develop their product. The electrical drug delivery patch (patent pending) has a niche application as a medical product, replacing traditional hospital IV infusion equipment used to deliver morphine to patients. The product is designed to be initially applied by a medical practitioner onto the patient for the first delivery of the drug and then used by the patient thereafter.

The delivered design of the product has many key features that allow the product to be used successfully and safely by the patient and medical practitioner. Some of these features include a boost button, LED interaction points and the ability to refill the product. The patch was visually designed by Design+ to conceal its presence by making the material the same colour as skin tone, over-the-counter plasters use this technique to great effect.

Once used, the patch can be easily removed by pulling a tab, and then refilled. The whole system and product was designed to be simple, manufactured efficiently and use as little material as possible while still being easily modified if required. The project combined design thinking with electronic engineering.

On conclusion of the project, the client was provided with a set of technical drawings of the product components and assemblies along with corresponding 3D computer generated models. They were also supplied with materials and manufacturing specifications. Since their engagement with Design+ the client has subsequently engaged with potential investors.

Magnetar Medical Devices are currently operating from the Institute's Enterprise and Research Incubation Campus in Carlow. They have been selected as one of the best technologies in the EU at the Medtec 2016 Europe exhibition. They have also successfully secured Competitive Start Funding from Enterprise Ireland.

"We have found the Design+ Technology Gateway input to be inspirational and efficiently executed. Incorporating their knowhow at an early stage has expedited the process of fully realising our concepts. We are extremely satisfied with the work produced and found Design+ to be responsive, dynamic and creative".

Ger Fitzgibbon, Magnetar Medical Devices



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8 MET Gateway

The MET Gateway assist biomedical device companies primarily in the cardiovascular to develop new product solutions

MET in GMIT has a technology offer for the medical device and engineering companies based in the West of Ireland and nationally which consists of:

- Medical Imaging Technologies
- Biomedical Engineering Technologies/Solutions
- Data Analytics and Visualisation
- Design Engineering/Verification

Case Study 'Clinically relevant vascular models for treating patients suffering from chronic total occlusion (CTO)'.

Capsos Medical is a High Potential Start-Up medical device company based in Galway that design & develop medical devices to penetrate total occlusion of blood vessels. The company has developed a patented balloon catheter & guidewire combination device called CapBuster to facilitate the treatment of chronic total occlusions (CTO). CapBuster re-opens the most resistant total occlusions where a calcified cap has formed on the surface of the blockage. This new device utilises standard tools and techniques used in all angioplasties in every Cath lath in the world.

Currently, 50% of CTO's are managed with medications, whilst approximately 40% are treated with bypass surgery, which is an invasive procedure with high surgical costs associated. No clinically relevant CTO's was commercially available that replicates the specific anatomical challenges relevant to test the company's device. MET Technology Gateway and Capsos Medical collaborated on an Enterprise Ireland innovation partnership project to address the technology gap by developing an in vitro simulation system for testing the performance of their product. MET researchers gathered the relevant clinical data and designed and developed various CTO's plaque configurations, which were incorporated into clinically relevant coronary vessels. Following the vascular replication, MET designed a state of art customised in vitro simulation system with interchangeable vascular sections which was fluoroscope compatible.

By providing a highly realistic CTO model and a simulated use environment, the company could carry out design verification studies to evaluate and optimise their prototypes. This customised simulated system accelerated the product development cycle and reduced significant costs associated with pre-clinical animal testing. The capabilities developed through this project enabled Capsos Medical to design a CTO treatment device that performs in a fashion superior to other products in the market. Since completion of the project, GMIT has maintained a high level of interaction with the company and has generated various models with varying CTO properties.

'This project enabled Capsos to test our CTO treatment device (CapBuster), in an environment that accurately simulates challenging in-vivo conditions, and to evaluate and refine our designs rapidly and effectively, shortening the development cycle and therefore reducing the development cost.'
Brendan McLaughlin CEO CAPSOS Medical



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PEM Gateway

PEM offer engineering design solutions and optimised manufacturing processes through component design for manufacture.

Gateway based in IT Sligo has a technology offer for industry in precision engineering, manufacturing and materials targeted at companies based in the North West and nationally which consists of:

- Precision Engineering and Design
- Manufacturing Process Modelling and Simulation
- Advanced Process Monitoring and Control
- Advanced Material Syntheses and Characterisation

Case Study “Development of a dry ridge roof tiling system’

Northwest Aluminum is an SME based in Donegal that manufactures and distributes Roofing and Ventilation Products. The company sought expertise from the PEM Gateway in IT Sligo through an Enterprise Ireland Innovation Voucher to further develop their dry ridge roofing system for a range of roof types including plain tile and slate mediums. The work entailed developing a 3D model of the attachment mechanism for ease of understanding to the end user. The existing drainage gasket was also optimised to present its functionality when fixed.

PEM also identified ancillary opportunities and accessories that can be introduced into the current roofing fixing product line. The Gateway designed and developed a jointing solution for Northwest’s slate dry verge product to overcome site fixing issues. This entailed creating 3D printed prototypes for a straight and apex jointing solution to replace “quick fix” on-site methods for jointing currently employed. The series of 3D prototypes of variable dimensions were tested alongside the company’s existing range of verge components with satisfactory results.

“From our perspective the outcome from working with PEM and Enterprise Ireland enabled us to develop prototypes for a new product concept that we wouldn’t have been able to produce in house. The prototypes that were developed have now gone into pre production and will be launched within the next few months after testing. As a result of the innovation voucher, we have now decided to continue this collaboration with PEM and increase our investment in R & D by embarking on an ambitious Innovation strategy that will be implemented on a continuous basis into the future. Innovation is paramount to our companies future success.”

Daniel Gallagher MD, NWA



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Shannon ABC
applied biotechnology centre

Shannon ABC Gateway

The Shannon ABC Gateway offers support to companies in the Food and Beverage industry to optimise their products and ingredients based on consumer need and trends

Shannon ABC is based on the IT Tralee & Limerick IT campuses and develops new processes and novel products from bio-resources, transferring these solutions to Biotech, Food and Life Science industries. Shannon ABC has expertise in:

- Bio-Prospecting & Bio Processing: Screening, extraction, characterisation and testing of bioactive molecules, as well identifying routes to scale-up.
- Analytical and Research Services: Expertise and state of the art facilities and equipment are available to assist companies to address specific challenges.

Case Study 'Company Collaboration to Develop a Bespoke Sea Mineral Drink Product'

IASS (Irish Atlantic Sea Salt) is an SME based on the Beara Peninsula producing the only Irish made, gourmet sea salt. The company launched its first product onto the market place in early 2011 and won a Great Taste Gold Star in 2012. 3 years of a process and product development has produced a very high quality, pure sea salt flake product. The company also produces a high quality distilled water and a pure sea mineral compound as a by-product from this process which Irish Atlantic Sea Salt believed could be developed into new products thereby creating a new income stream for the company.

The company collaborated with Shannon ABC to identify opportunities for these by-products and the Gateway identified a potential opportunity to collaborate with NUE Water and provided introductions for the companies. NUE Water are an SME based in Carlow and were established in 2013. Nue Water produce a lightly flavoured water with natural fruit, herbs and spices; with no additives, calories, sweeteners or preservatives. The company had previously worked with Shannon ABC on shelf life and favouring investigations.

NUE's Water product development team developed a range of healthy beverages containing this unique Irish Atlantic Sea Minerals containing over 60 essential micronutrients which work as a natural electrolyte beverage. Through this collaboration of companies and Shannon ABC, a unique product has been developed. Once it was brought to market it has been received a very positive response. To date the product has been given a national listing by SuperValu and can be found in such corporations as Google HQ.

'Shannon ABC have proven to be an invaluable part to NUE Water's business development and also to the product expansion for IASS. With their continuing help and support, two Irish companies have come together to produce a very unique product with an exciting future. Thank you to Tim and all the team'.
Colin Tierney (Owner of NUE Water).



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SEAM Gateway

The SEAM Gateway delivers design for manufacture and reliability solutions for in sectors such as Bio-medical devices, Pharmaceuticals, Micro-Electronics, Precision Engineering & Construction

SEAM has core expertise in:

- X-Ray Micro-tomography (XMT): 3D Non-destructive characterisation
- Finite Element Analysis: 3D Software Modelling
- 3D Metal Additive Manufacturing
- Materials & Precision Engineering: engineering design & characterisation
- Bio Medical Engineering: Development of Novel materials

Case Study 'Redesign of Impeller section of shaft components to improve their life time'

Sulzer Pumps Ireland based in Wexford has a wide range of pump manufacturing capabilities including machining, assembly, motor winding, packaging and shipping of submersible pumps ranging from 100 W to 52 kW from the submersible wastewater segment. There is a Product research and development team located on site and the plant in Wexford is home to a state-of-the-art product testing facility. The facility in Wexford has a long tradition in manufacturing wastewater pumps since 1973 and it has developed into the largest producer of submersible pumps of the ABS product brand. The Wexford facility currently employs 270 people.

The SEAM Gateway collaborated with the company to analyse and redesign the impeller section of various shaft components as far as the main bearing section using Finite Element Analysis (FEA). SEAM undertook FEA analysis on the current design before proceeding on to investigating a number of design options and then selecting the most suitable solution to provide improved life time of the shaft component. Validation of the finalised design is currently ongoing at Sulzer. The partnership provided Sulzer with access and expertise to expensive computer simulation software which is greatly more cost effective than having such facilities in house. The collaboration with SEAM has provided Sulzer the opportunity to refine and fully explore design concepts without the cost of building full scale prototypes.

'SULZER's contact with SEAM began in September 2015 with the re-design of a rotorshaft on the XFP PE3 submersible, solids-handling sewage pump. This is the second largest pump built at the SULZER plant in Wexford with P2 of 22kW. Each report from SEAM contained analysis, inferences and recommendations which is a great benefit and truly collaborative. Throughout the process there have been helpful discussions and exchanges of information as required, avoiding delay. SEAM provide a complete materials investigation, design support and failure analysis service.'

Ben Breen Sulzer- Technical Manager



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TEC Gateway

The TEC Gateway collaborates with companies to develop prototype product solutions that can be scaled to manufacture integrating hardware with software system design

TEC develops 'Internet of things' prototypes for a broad range of companies, connecting everyday objects and systems and making them 'smart' with a focus on the following sectors:

- Energy: Intermittency & Demand
- Water: Remote monitoring,
- Location Based Services and Applications: Security, Tourism and eHealth

Case Study 'Design of a Prototype E-Health Sensor System'

Nixatel is a start-up software development company based in the Rubicon incubator at Cork Institute of Technology that provides web and mobile application development services to big and small companies. Nixatel wanted to develop a prototype system to remotely monitor elderly people's movement in the home. They lacked the technical expertise required to research, plan and develop a prototype solution to the problem. Through an EI Innovation Voucher project, the TEC Gateway in CIT's Nimbus Centre researched and selected the optimum Architecture Specification for the required E-monitoring system hub with appropriate off the shelf sensors. Next they developed and documented the process for Data gathering from Sensors to the monitoring hub. Once this was complete the 'backend development' took place, designing and creating a database and web application to store information from the sensors. 'Front end development' then began, allowing the data from the sensors to be seen real time. The entire package was tested to prove that the data flowed correctly from sensor to monitoring hub to web server and finally to browser. This fully documented package was then delivered to Nixatel.

Nixatel came to Nimbus with an idea for implementation and at the end of the project had a fully tested prototype which they could showcase to potential clients and investors. This work advanced the business from a conceptual stage to a real, implemented application.

"We are delighted to have worked with the TEC Gateway in Nimbus CIT and with the solution they have delivered. They were very quick in picking up our requirements for our assisted living solution and simplifying the complex process. The team produced a proposal which was spot on and reflected exactly the areas discussed. They then delivered a solution which not only met our requirements, but surpassed them. We are very pleased with the outcome."

Russell Quigley, CEO Nixatel



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WiSAR Gateway

The WiSAR Gateway collaborates with companies to develop prototype product solutions that can be scaled to manufacture integrating hardware with software system design

WiSAR based in LyIT provides solutions to Irish industry for The Internet of Things (IoT) using expertise in wireless, embedded systems and power electronics and offers this expertise to companies in the following sectors:

- Wearable Tech: Healthcare, Sport & Tourism
- Remote monitoring: Industrial Control, Environmental, Marine
- Power electronics: Renewable Energy and Electric Vehicles
- Communications: WLAN, Zigbee, Bluetooth, UWB, RF and Microwave

Case Study ‘Smart Wheelchair for Pressure Sores Prevention’

LC Seating, established in 2008 in Grange Co. Sligo is a medical supplier company specialising in the provision of all types of rehabilitation and seating products. The company operates throughout Ireland, primarily dealing with occupational therapy / seating clinics by providing engineered solutions for a variety of complex seating needs. People with mobility issues can develop pressure sores from sitting in the one position for extended periods of time. Pressure sores when formed can be difficult to treat, so their prevention is of critical importance and this is achieved through regular movement of the person to alleviate the build-up of pressure. LC Seating and the WiSAR Gateway in LyIT, through an Enterprise Ireland Innovation Partnership Project developed a ‘prototype smart cushion’ that can detect and monitor the pressure build up and then send wireless alerts to a monitor giving a local reminder to a paralysed person or carer when it is time for their position to change.

Key to the approach taken was the utilisation of smart fabrics that change their electrical properties when stretched providing a signal which can be processed. WiSAR performed extensive research into the identification of suitable pressure sensor fabrics, which were then tested for accuracy and repeatability. A prototype was developed consisting of a bespoke pressure-sensing mat, a wireless data acquisition unit and a wireless base station. Pressure across the cushion surface is represented on a monitor in the form of a heat map which allows real time adjustment of the patient’s position to optimise pressure distribution. Thus, the developed prototype can be used as either a pressure monitoring system or a visual pressure mapping system.

“It’s been a very good experience. These devices can be tested in occupational therapy departments. Our aim was to develop wireless alert systems with WiSAR, which will be much more affordable than what’s out there at the minute. Embarking on this new venture is exciting and we’re pleased to be funded by Enterprise Ireland - it’s a strong vote of confidence”



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EMD (Engineering, Materials & Design) Ireland is a cluster of six Enterprise Ireland Technology Gateways operating within the engineering, materials and design sector. The cluster provides a range of expertise for companies who are looking to access research and development within these areas. The cluster can connect with over 300 industry researchers in areas such as Precision Engineering, Biotechnology, Polymers, Protective Coatings, Prototype Design, Medical Imaging Technologies and 3D Metal Additive Manufacturing

The EMD Ireland cluster consists of:

- APT - Applied Polymers (Athlone IT)
- CREST- Innovative Coatings (DIT)
- Design + - Applied Design (IT Carlow)
- MET - Medical & Engineering (GMIT)
- PEM - Precision Engineering & Manufacturing (IT Sligo)
- SEAM - Materials & Engineering (WIT)

Applied IoT



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The Applied Internet of Things (A-IoT) Cluster is a consortium of five of Enterprise Ireland's Technology Gateways, providing a single point of contact for companies looking to access technical capabilities for Internet of Things (IoT) research and development. Via the cluster, industry can connect with 300 research professionals in software, hardware, communications/networks, data analytics, control, UI/UX and trialling. The A-IoT Cluster is open to all companies, of any size, nationally and internationally.

The Applied IoT cluster consists of:

- TEC - Embedded Systems (CIT)
- IMaR - Intelligent Mechatronics & RFID (IT Tralee)
- WiSAR - Wireless Solutions (Letterkenny IT)
- MSTG - Mobile Services (WIT)
- COMAND - Connected Media (Athlone IT)

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