

The Enterprise Ireland  
Technology Gateway Network

# DESIGN LED INNOVATION



Companies across Ireland are collaborating with **Enterprise Ireland Technology Gateways** to develop new and innovative products & services and deliver smart-solutions to everyday challenges. Through the Technology Gateway Network, start-ups, SME's and MNC's are leveraging the expertise of over 300+ industry focused researchers & engineers together with specialist equipment and test facilities to work on projects which are leading to increased revenues and employment opportunities.

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.

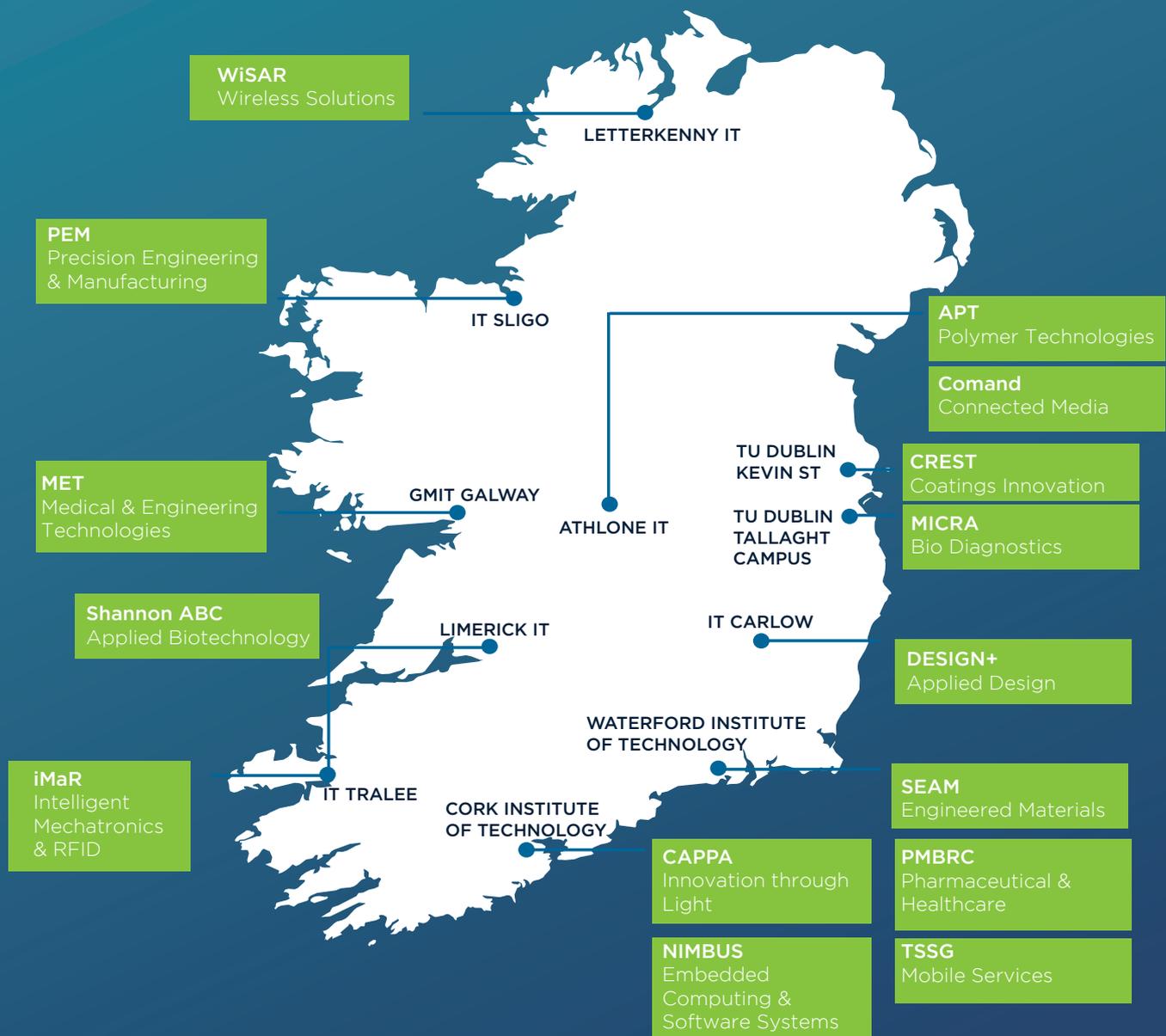


Figure 1 Graphical Representation of the Enterprise Ireland Technology Gateway Network

Design and design thinking has an important role to play in the creation of new products and services, as well as an integral role in enabling innovation within companies. The benefits of a design approach at the initial stage of product innovation is often key to a successful outcome. Providing opportunities to increase productivity and create value in products and services in both traditional and emerging sectors.

Enterprise Ireland Technology Gateways aims to highlight the importance and value of design within the innovation process, the benefits involved in engaging with a design process and the role in which design implemented innovation can play in the success of Irish Businesses. A wide selection of our Gateways, in a variety of specialisations and industries offer a design lead approach when working with Irish companies.

### NEAR-TO-MARKET SOLUTIONS FOR BUSINESS AND INDUSTRY

Companies all over Ireland are using Technology Gateways to develop new or better products and services and smarter ways of doing things. Through the Technology Gateway Network, they are leveraging the expertise of over 300 industry-focused researchers, together with the specialist equipment and facilities of the 9 institutes of technology and 1 Technological University to access near-to-market innovation and solutions.

### INNOVATION SOLUTIONS DELIVERING BIG IMPACTS

Technology Gateways are used by companies of all sizes, but especially SMEs. Typical projects focus on the development of a new product or service or the optimisation of a process. The project sizes vary from small short term, of which 60% are €5-10,000, to larger projects which range up to €200,000 typically funded from the Enterprise Ireland Innovation Partnership Programme. For businesses - and for Ireland Inc - the impact of these collaborations can be invaluable.



**3** Unique industry Clusters

**15** Industry-focused Gateways

**300<sup>+</sup>** Researchers & Engineers

**3200** industry projects

**1500** Irish based companies

\*Since 2013

The infographic features a dark blue background with white and yellow text. It includes icons for a checkmark and a handshake. The statistics are presented in a clean, modern font.

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 on Technology Gateways and our support and funding options please go to:**

[www.technologygateway.ie](http://www.technologygateway.ie)

**Follow us on LinkedIn:**

[www.linkedin.com/showcase/technology-gateway-network](http://www.linkedin.com/showcase/technology-gateway-network)

**Follow us on Twitter:**

@EITechgateway @aiotgroup  
@emdcluster @irishfoodtech

# APT Technology Gateway

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

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Applied Polymer Technologies



The **APT Gateway** based in Athlone IT provides polymer technology solutions for companies in the medical, composite, recycling and pharmaceutical sectors

- 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: DESIGN FROM CONCEPT TO MANUFACTURE OF THE HARMONY EQUINE TRICKLE FEEDER

The Harmony Trickle Feeder was developed by Applied Polymer Technologies APT/ CISD\* in collaboration with Michelle O'Connor of Equiniche Science. Michelle is deeply involved in the equine industry for many years from breeding to performance, having competed in the disciplines of showjumping and showing for many years, and currently breeds and produces thoroughbreds. Michelle is also a practising Veterinary Physiotherapist treating horses in all disciplines including racing, showjumping, eventing and dressage. Years of treating and working with horses, combined with an in depth knowledge of equine anatomy, nutrition and performance, and observation of the many problems encountered by trainers, owners and riders when feeding hay to horses, led to the development of the Harmony Trickle Feeder™.

The Harmony Trickle Feeder is a natural feeding solution for horses to prevent gastric ulcers. It provides a constant supply of hay, holds enough for a day and controls at what rate the horse can access the hay via a soft rubber finger mesh. It also allows the horse to eat in a natural grazing position. The product was developed over a number of stages:

**Stage 1:** An early concept development stage was carried out in collaboration with Irish contract manufacturer's Rotofab and Disenbi. This was to ensure a smooth transition through the handover to manufacture phase and minimise late design changes which are often costly and slow to implement. A number of 3D CAD models were developed through this stage based on aesthetics and functionality.

**Stage 2:** Basic prototypes were built by Equiniche Science based on the 3D CAD concepts developed for field testing with horses to enable functional verification.

**Stage 3:** After a period of time of testing had been completed and confidence in the functional systems was attained final detailed design and engineering of the product was carried out by APT/CISD. A full DFM (Design for Manufacture) process was completed and 3D CAD files and 2D drawings with material specifications delivered to the company.

The product is manufactured in Rotofab Athlone and is selling successfully on the market.

“Without the help of Design Engineer Conor Hayes and the team at AIT, we could not have visualised and developed Harmony from the wooden version I made in the garage to the well-thought through design we have today”

**Michelle Q'Connor of Equiniche Science Ltd.**

\*CISD (Centre for industrial services and design) is the contract design and analytical services section within the Applied Polymer Technologies Gateway.

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# CAPPA Technology Gateway

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



The **CAPPA Gateway** 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
- Sensing and measurement technologies

## CASE STUDY: DEVELOPMENT OF A WIDE FIELD FLUORESCENCE IMAGING SYSTEM

Hooke Bio is a microfluidics company operating in the fields of preclinical drug discovery and personalised medicine. It draws its strength from the close co-operation it has between its biologists and engineers. Hooke Bio has patented microfluidics technologies that allow their screening platform to work with volumes of liquid 10 to 100 times less than current liquid handling systems. This approach requires very high throughput automated testing at small volumes with relevant, translatable disease models.

The primary focus of Hooke Bio is on drug combinations; however the technology is highly adaptable and can be easily used in a variety of additional applications. There is an important unmet need for new medicines that can be mediated by the use of high-throughput microfluidic screening in 3D cell culture. High-throughput screening is required to screen vast numbers of drugs and drug combinations, as their effects on cells are difficult to predict.

Hooke Bio developed the Enigma platform to tackle this problem. The Hooke Bio platform was restricted by narrow field of view of ca. 1 x 1.5mm, which limited the testing to one fluidics channel only. CAPPA has designed and prototyped a bespoke imaging system with a larger field of view that allows investigation on multiplexed channels. Moreover, the expensive and potentially eye-hazardous 488nm laser was replaced with an LED based illumination solution. The system was also integrated with a tailor made software solution.

Hooke Bio envisages expanding its range of tests to other cell lines and disease models and is also interested in personalised medicine. The optics and software development will form part of an on-going collaboration between Hooke Bio and CAPPA in the future.

“I would happily recommend CAPPA because of their high levels of expertise. The system that we are developing is quite a high throughput system so not only did we need to have some bespoke optics designed we also needed some software to manage that process and software to do the analysis. The great thing about coming to CAPPA and talking to the staff here is that it is a one stop shop for quite a broad variety of needs. CAPPA are very flexible and willing to engage with industry. I wouldn't even know where to look for the service in the country and probably in Europe.”

**Mark Lyons, CEO, Hooke Bio**

# COMAND

## Technology Gateway

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

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The **COMAND Gateway** based in Athlone IT delivers solutions for software industry across multiple media platforms. The industry focussed technology offer 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: DEVELOPING MULTIPLE APPS FROM A SINGLE CODE TEMPLATE

TownApps Ltd an SME based in the Midlands, produces mobile apps tailored to individual cities in Ireland, the UK, the US and Canada. The TownApps application is a tourist guide of hotels, restaurants and places of interest.

Multiple entries exist in the app store corresponding to City Partners that have subscribed to the app type. For instance, TownApps could have several apps available including Athlone, Dublin, and Galway. Each app is “subscribed” to annually by a City Partner, each Partner can manage Business Listings within that city, and app Users (mobile phone users) can view Listings by category, and can give the listing a star-rating and make comments. Despite this almost identical nature of the city apps, each app stems from a separate code-base. This means that the Dublin and Galway version of TownApps each have their own code-base despite differing only in such elements as title screen and content listing. The purpose of this project was to integrate development so that apps could be produced from a single code-base in combination with a unique city configuration.

The final project resulted in a complete system for the configuration, build, and deployment of multiple mobile apps with associated cloud-based website, database, and associated application functionality from a single template with minimal owner involvement. Online Apps can now be produced from a single code-base in combination with a unique city configuration, reducing delivery time, maintenance time & creating greater end customer features.

“Townapps inherited an old platform to publish our original apps. This platform was built on unstable technology and wouldn’t allow us to scale our business internationally in a cost-effective, secure, flexible and future-proofed way. Our clients wanted a host of new offerings including live trails and other critical user-engagement techniques. We engaged the team at the Command Technology Gateway with the assistance of an Innovation partnership to travel the journey with us and give us the necessary software development expertise and advice. The end result is now we are using a very balanced solution to roll-out our much improved apps in a lot faster time. There are now very few limitations on the many new commercial opportunities that we can bolt into our existing platform as and when these opportunities arise.”

**Joe Connaughton, CEO, Townapps**

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# CREST Technology Gateway

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



The **CREST Gateway** based in TU Dublin - Kevin St delivers innovation solutions for industry in the engineering, construction, healthcare and biomedical industries.

- Coatings and surface treatments on construction materials
- Protective Coatings for challenging environments
- Surface treatment of metal components
- Coatings for Environmental Applications
- Biomedical Devices
- Sustainable Building Technologies

## CASE STUDY: SOFA BED FOR HOSPITAL & HOSPICE ENVIRONMENTS

Gerard Crofts set up The Sofa Factory in 1993 and it developed into one of the most recognisable furniture brands in Ireland by the mid-2000s. The Company had designed and patented a reclining mechanism allowing a sofa to be converted quickly into a multi-positional chaise or bed, for which they received positive feedback from the HSE and the NHS.

The project looked at the overall design of a sofa bed that could be used in hospitals and healthcare environments. The sofa had to fold to a bed whilst maintaining a minimal footprint and considering issues from ease of use to infection control. Siesta Sofa required product development expertise to turn the concept into a real product.

CREST Technology Gateway through CreateLAB helped develop the prototype into a product that could be manufactured in volume, with consistency. It also helped Siesta Sofas make improvements, such as ease of use, so that the mechanism now converts from sofa to bed in just 10 seconds. The initial reaction to the improved product has been excellent, with many units placed in NHS hospitals in the UK. A second innovation voucher helped to develop the product and range further.

CREST Technology Gateway in collaboration with the School of Creative Arts continues to work with the company in order to develop a larger research area looking at Healthcare Furniture. The Sofa bed is now in full production and has been sold to approximately 50 hospitals in Ireland and the UK. The company has won several large contracts in Ireland and the UK.

“We are excited because we believe we have a unique product with worldwide appeal,” said Gerard Crofts. “We are very grateful to the team at TU Dublin who worked with us to research and hone our product development. We were also delighted to be awarded an Enterprise Ireland Innovation Voucher to help with research costs.”

# DESIGN+

## Technology Gateway

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

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DESIGN+  
Bioscience · Engineering · Computing

EMDIreland  
an Enterprise Ireland  
Technology Gateway cluster

Irishfoodtech  
an Enterprise Ireland  
Technology Gateway cluster

The **DESIGN+ Gateway** based in IT Carlow champions the application of the design thinking process within the Technology Gateway network, with a focus on the Engineering, ICT and Bioscience sectors.

- Design: design strategy, visual communication and product design capabilities
- Engineering: smart energy systems, embedded circuits & systems technologies and surface and coating engineering
- Prototyping: 3D printing, machining and modelling

### CASE STUDY: DESIGN DEVELOPMENT OF A WATER TESTING DEVICE

Founded in 1991, T.E. Laboratories (TelLab) is an Irish-owned company, focused on science and technology in the areas of environmental analysis, oil analysis, chemical manufacturing, research and new product development. Based in Tullow, Co Carlow, TelLab houses four laboratories, a production area and a dedicated R&D centre, staffed by an expert, multi-disciplinary team of chemists, researchers and engineers. This project focused on the design of a new water testing unit being developed by TelLab. The Design+ team at IT Carlow was asked to explore a means of securing the unit to a bank and incorporating the necessary internal electronic components and a removable cartridge system, containing both chemical and waste fluid. In addition, the team was asked to develop a visual identity for the unit, with the final design to result in a scale appearance prototype for testing purposes.

The solutions were delivered through three stages:

**Stage 1:** Examination of TelLab's water testing device was undertaken from a user's perspective. This focused research identified two key areas for innovation - The main housing and the removable cartridge system. Within these two areas, there were a number of design challenges to be addressed - portability, tethering, loading/locking the cartridge system and overall usability.

**Stage 2:** The design team identified a number of creative and technical solutions exploring form, function and visual aesthetic. These solutions were presented to the TelLab team through 3D sketch modelling allowing them to make important decisions on the key aspects they wanted to bring into a single concept for further development.

**Stage 3:** This single concept was further refined and developed into a component assembly using CAD 3D modelling. Suitable manufacturing processes and materials were identified. Full-scale prototype parts were created using 3D printing for visual demonstration, testing and analysis.

The project will enable the client to move forward with communicating this new water testing device to the market.

'We were delighted with the opportunity to work with the Design+ team at IT Carlow and look forward to working with them again in the future.'

**Mark Bowkett, CEO, T.E. Laboratories (TelLab)**

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# MET Technology Gateway

The MET Gateway is an interdisciplinary technology centre providing solutions for the Medtech and general manufacturing sectors.

The **MET Gateway** based 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
- Medicinal Nutrition

## CASE STUDY: PROTOTYPES REVIEW FOR OPTIMISATION OF FINAL PROTOTYPE DESIGN

Adventure Sports designed and patented a new prototype called Wetsuit Buddy which is a wetsuit removal device to facilitate surfers and other wetsuit users to remove their wetsuit with ease.

The company had designed a number of prototypes produced by a UK based company, however these prototypes were either too cumbersome or not effective.

Following numerous design iterations informed by testing on a mannequin and volunteers, GMIT re-designed and produced a working prototype using 3D Modelling and Rapid Prototyping capabilities at the institute was produced.

Working with Adventure Sports, MET transferred the data and design drawings to an Irish based manufacturer to improve the cosmetic aspect of the device and to produce the device for sale on European and US markets.

‘We used our Enterprise Ireland innovation voucher with Met Technology Gateway to work on prototype development and design verification. The MET Technology Gateway team helped us overcome a large hurdle in design modelling with the functionality and form factor of our prototype. The MET Gateway team’s core strength is taking prototypes from concept to fully functional. MET Technology Gateway’s vast knowledge, years of practical engineering experience, and creative thinking makes this team one of the best in the country. We will be returning to work with MET in future and we would highly recommend them’

**Laura Taylor, Adventure Sports**

# MiCRA Technology Gateway

## The MiCRA Gateway

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The **MiCRA Gateway** based in TU Dublin - Tallaght Campus delivers solutions across the agri-food, in-vitro diagnostics (animal and human), environmental, and biopharmaceutical industries with expertise in:

- Rapid and portable electrochemical sensor design, development and prototyping
- Specific expertise in bio-, immuno- and chemical sensors for the detection of microbes, biomarkers, chemicals and food allergens
- Application in areas of quality, toxicity, viability and chemical and biological contamination analysis
- Advanced analytical services and materials development

### CASE STUDY: OPTIMISATION & CLINICAL APPLICATION OF AN HSV-2 VIRUS BIOSENSOR CHIP

Founded in 1978, Aalto Bio Reagents is a well-established biotech company positioned as a leading global provider of high quality and esoteric biological raw materials to the in-vitro diagnostics industry and research laboratories. Aalto Bio Reagents key capabilities include providing first to market antibodies for new emerging viruses, a wide range of products for multiple immunoassay formats and the custom manufacture of antibodies and recombinant antigens. They aim to bring ground-breaking technology to the market faster, allowing for cost-effective and efficient patient management at the point of impact.

The aim of this partnership was to develop an electrochemical immunoassay Point-of-Care system for the rapid diagnosis and qualitative detection of HSV -2 virus in human samples. Key to the collaboration was combining the market leading antigen technology developed in Aalto Bio Reagents with the electrochemical immuno-based biosensor technology and expertise in MiCRA Bio Diagnostics.

The team developed a novel 'biochip' assay specific to the HSV-2 virus, incorporating patented microfluidic design, electrochemical ELISA based biosensor technology and the Aalto Bio Reagents antigen technology. This technology showed a high level of agreement with current standard methodologies, but offered the significant advantage of being a rapid diagnostic assay for Point-of-Care (PoC) applications. Aalto Bio Reagents have a vision to provide a platform of infectious disease assay technology that will allow healthcare professionals to move towards point-of-care style testing with rapid and flexible sample-to-answer testing, thus enabling immediate preliminary diagnosis with the patient. This project delivered an operationally validated HSV-2 Biochip biosensor tested against a panel of predicate human blood samples for HSV-2 infection thus offering Aalto Bio Reagents significant opportunities to further development collaborations and commercialisation opportunities across a wide range of diagnostics applications.

"The Industry / Science engagement with Micra to develop a prototype 1st in class HSV2 Infectious Disease Biochip for our HSV gG2 protein was extremely valuable. The Micra team are experts in the Electro chemistry element of the project whereas as Aalto Bio offered the protein/antibody experience to the project. As an industry /University collaboration we delivered one of the Worlds' first ever Electro biochips for HSV".

**Philip Noone, CEO Aalto Bio Reagents**

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# NIMBUS Technology Gateway

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

The **NIMBUS Gateway** develops Internet of Things (IoT) and Cyber Physical System prototypes for a broad range of companies, connecting everyday objects and systems and making them smart.

- Advanced analytical services and materials development Sensor devices and systems
- Mechanical design
- Software
- UX (User Experience) & UI (User Interface)
- Virtual and augmented reality

## CASE STUDY: TECHNOLOGIES PLANT COMPONENT CHANGE DOWN, MONITORING AND MANAGEMENT SYSTEM

SCRI-IS Technologies are an independent specialist consultancy, testing, analysis, training and technology solutions provider for the asset management of polymers and elastomers in the pharmaceutical, biopharmaceutical, and biotechnology industries. This Project focused upon developing a Customer Relationship and Asset Management System, based upon gathering data associated with mechanical aspects of valves and for generally managing the service provision associated with ECO (Elastomer Change Out).

Taking a structured approach for this phase of the project, it was proposed that Nimbus Technology Gateway researchers work with SCRI-IS Technologies to develop a Customer Relationship and Asset Management System to be used for a subset of the plant, where valve diaphragms are being serviced/maintained (ECO Service). Researchers from the Nimbus Technology Gateway applied a User Experience (UX) methodology to gather information to identify and analyse end users' requirements, which were influential towards informing both functional and non-functional requirements incorporated during the software development lifecycle. The project applied Design Thinking as a user centred design process where user research, design, prototyping and user testing activities were undertaken in collaboration with representative end users and stakeholders during engaging user experience design workshops. The Nimbus Technology Gateway team have progressed with the development of the Customer Relationship and Asset Management System beta version through a second SCRI-IS Technologies co-funded innovation voucher. This is currently being piloted by SCRI-IS Technologies' staff.

"The Nimbus Technology Gateway, through funding opportunities from Enterprise Ireland, have contributed greatly to initial services research and development for SCRI-IS Technologies. This approach has certainly removed some of the initial risks associated with such projects and allowed SCRI-IS Technologies some breathing space to focus on creating further value added services within the company. We would envisage furthering the development of the SCRI-IS Technologies Customer Relationship and Asset Management System in 2019. May I use this opportunity to thank Enterprise Ireland and the Nimbus Technology Gateway for all their support so far. SCRI-IS Technologies has a strong international focus and this project certainly paves the way for earlier than expected entry into targeted international markets".

**Dr Darren McDonnell, Director SCRI-IS Technologies - [www.scriis.com](http://www.scriis.com);**

# PEM

## Technology Gateway

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

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The **PEM Gateway** based in IT Sligo has a technology offering 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
- Process Monitoring and Control
- Material Testing and Investigation

### CASE STUDY: DESIGN OF NEW DOOR RANGE

Masonite® is recognised as a brand leader in the supply of architectural, commercial and residential doors. It is known worldwide for innovative, quality products, exceptional customer service and a commitment to excellence. Masonite's Irish facility is based in Carrick-on-Shannon, manufacturing and supplying door skins for the European, British, US and Irish markets.

Masonite want to extend their current range of products and as a result they tasked the PEM Gateway with examining current design trends and then design a range of doors for the wider European Market e.g. Germany, Italy, France, Netherlands. Masonite's brief was to be as creative as possible and really push the boundaries of what a door can look like with a view to creating concepts in the following categories:

- Modern Apartment Living
- Student Accommodation
- Luxury Hotel
- Office Block/ Corporate

The PEM Gateway's lead Creative Design researcher tasked four teams of creative design students to each research one of the above categories and create one A1 mood board each. Each individual in the team then developed 5 concepts sketches per category (20 concepts in total). An explanation was also provided of how/why the concepts meet the requirements/style of the relevant category. Each concept sketch was reviewed; and Photoshop renderings were made of a number of selected concepts. A presentation was then made to Masonite highlighting the selected concepts and why they were chosen.

Masonite received valuable information and insight on the design direction their new range of doors could take to remain an innovative provider to the architectural, commercial and residential door market in Europe.

"At Masonite we found it an engaging and rewarding experience working with the PEM Gateway. The creations we received from IT Sligo's design researchers and students fulfilled exactly our project brief and were of a standard that allowed us to show them at an internal exhibition. This internal exhibition offered us the opportunity to involve all staff in rating each design".

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



The **SEAM Gateway** based In Waterford Institute of Technology delivers design for manufacture and reliability solutions for sectors such as Bio-medical devices, Pharmaceuticals, Micro-Electronics, Precision Engineering & Construction

- 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: TRAILER STRUCTURAL ANALYSIS

Dennison Trailers based in Nass, Co. Kildare is a leading manufacturer of semi-Trailers for the container transport sector in both Ireland and the UK. The company services many other markets including construction, timber, steel and oil industries. In Ireland & the UK, Dennison dominates the Cargo Container skeletal trailer market. Throughout its history, Dennison has been an innovative company, with continuous research and development being at the core of the business. As a result it has had a strong competitive advantage in terms of new product development. Dennison was interested in carrying out a detailed structural analysis for its Trailers. With that in mind they approached SEAM Gateway.

In 2018, the SEAM Gateway contributed to the company's research and development program by performing an in depth structural analysis. SEAM built a detailed Finite Element Analysis (FEA) model of a trailer design which was used to predict its stress and strain response under operating load conditions. Using its expertise in structural analysis and the results of the FEA model, SEAM was able to provide a comprehensive assessment of the trailer behaviour and design capacity.

The detailed picture of the trailer performance made possible by the use of FEA allowed SEAM to make several design optimisation recommendations. The additional insight provided to Dennison Trailers is currently being incorporated into the company's design process. SEAM utilises engineering simulation and analysis to solve problems across a wide variety of industries. SEAM has expertise in structural analysis involving FEA, as well as Computational Fluid Dynamics (CFD) for the analysis of fluid flow phenomena. The application of these analysis techniques has resulted in cost reductions for SEAM's client companies through reduction in physical prototyping, improved operating performance, and improved product lifespan.

"In 2018 we partnered with SEAM, through Ramesh & WIT, to produce an FEA analysis of an existing trailer design which had been displaying early failures in the field. Through their analysis we were able to identify problem areas & rectify the issues with the initial design. We found SEAM to have a great technical knowledge & be highly cost effective. We are looking forward to partnering with them again in the near future."

**Ronan Lambe, Senior Design Engineer, Dennison Trailers**

# TSSG Technology Gateway

The TSSG Gateway is a one-stop-shop for industry to access cutting-edge knowledge and solutions in advanced mobile services and service enablers

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The **TSSG Gateway** based in Waterford Institute of Technology is an advanced software R&D Centre with particular expertise in all aspects of mobile networks and communications platforms and services,

- Distributed & cloud-based mobile services
- Virtual and Augmented Reality services
- User experience design and development / digital & print design
- Artificial Intelligence/Machine Learning

## CASE STUDY: DEVELOPMENT OF A SINGLE FINANCIAL MOBILE APP

Based in Dublin, Fusion Payments has developed a new platform for customers who want to use a single mobile app to manage all aspects of their finances. Offering real-time, dynamic account aggregation, the app called Pay With Fusion gives users a 360-degree view of their finances across all their banks and providers. Fusion Payments's research showed that people place a large emphasis on the ability to view all their finances across different accounts and financial institutions. This is at the core of Fusion's planned product offering. In addition, with the number of accounts being used to manage money on a day-to-day basis, an understanding of how and where this money is being spent is a problem the company wished to address, along with the ability to use the platform to action payments.

The challenge for TSSG was to deliver a solution that:

- is fast and easy to use for everyone, everywhere;
- gives customers more insight and control over their money, saving them time;
- has one core screen that can answer most questions, with tap/swipe functionality to deep dive;
- creates a platform for deeper engagement;
- defines the platform and the app's functionalities;
- has good user experience and interface;
- includes an iOS prototype; and
- is key functionality-planned.

For the new wave of digital banking apps, the route to market has largely been to build a core, prepaid card-based account, integrating some budgeting and financial management – there has been little from an aggregation perspective. Fusion Payments wanted to be the only bank app that clients will ever need, with mobile features enabling customers to manage the breadth of their financial lives in the palm of their hand. The company's approach is to start with aggregation, which will provide genuine integrated analysis and insight. Fusion will be a virtual banking dashboard where customers can do all their day-to-day bank errands, across any account in any bank, with a layer of real insight to help them get more out of their money.

"We have been really impressed with the TSSG team and the level of research that they have put in and their obvious technical experience. Very professional, proactive and great to work with."

**Richard Hartnett – Director, Fusion Payments**

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**WiSAR Lab**

**Applied IoT**  
an Enterprise Ireland  
Technology Gateway cluster

# WiSAR Technology Gateway

The WiSAR Gateway provides solutions to Irish industry for The Internet of Things (IoT) using expertise in wireless, embedded systems and power electronics

The **WiSAR Gateway** 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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