# University of Limerick profits from ties with industry

## Advancements in research and development at the University of Limerick are driven by their work with industry, writes **Killian Woods**

The proactive manner in which the University of Limerick has focused on establishing ties between academia and industry has been a key feature of the institution for quite some time.

Due to its strong ties with industry, the University of Limerick has set the benchmark for graduate employment rate on a national basis.

Speaking about their success in securing jobs for their graduates, Ann Ledwith, Director of Continuing & Professional Education at University of Limerick (UL), mentioned how important it is to maintain such links.

"The University of Limerick has always had a strong focus on maintaining strong ties with industry. It has certainly had a big impact on employability with the employment rate of our graduates about 18 per cent higher than the national average, which can be attributed largely to our close links with industry and largely through our co-op programme," said Ledwith.

"We are the only university that has a centrally managed six to nine-month co-op programme that sees students have to go out and get education in industry to gain a greater understanding of what career path they want to follow."

These ties with industry help the department of Continuing & Professional Education at UL tailor courses so they are providing graduates with the skills industry professionals are looking for in graduates.

"Under Springboard we have a range of programmes in mobile and secure cloud computing. We have a programme that has been running for four years and funded through the Springboard initiative," said Ledwith.

"The students in these courses might have somewhat of a technology and computing background. Then within these programmes, students would focus on learning about IT network infrastructures, cloud computing, IT security, smartphone applications, and other areas industry that companies are looking for workers to be skilled in."

Pauline O'Flanagan, IMDA Skillnet; Sean Moore, course director, UL; Ann Ledwith, director of CPE, UL, Chris Kurjan, Innovation Delivery, all pictured at the start of the Design for Medical Technologies programme in UL

### Industry collaboration

Sharing the sentiments of his colleague at UL, Dr Sean Moore, senior lecturer in Lean and Six Sigma at the university said he feels collaborative research between third-level institutions and industry is vital when it comes to pushing development in information technologies.

"More and more, research has to be collaborative with industry. It's no longer good enough to be an expert in your field, you have to be very aware of how different fields and technologies can combine, such as materials technology combining with advancements in manufacturing," said Dr Moore.

"Current manufacturers might say we are not interested in this because it will invalidate and put our existing technologies out of date. Nobody can think like that anymore, because if you're not thinking about what's coming down the line, you are dead in the water anyway."

One research project that Dr Moore is working on right now involves this kind of collaboration, as he specifically looks to hone in on particular facets of ICT and different machines to help them collaborate better and hopefully revolutionise how stents are manufactured.

"I'm leading the Genesis Stent Project, where we are going to design and build a 3D printed stent in the surgery. Then the surgeon will implant it in the surgery. Typically stents have a 150-day manufacturing life-cycle from ordering to implantation in the patient. We're now going to do it in 30 minutes.

"ICT is going to be key to that because we will be pulling patient information on the surgery table, you're going to use that information to generate a design of stent, then have the stent printed in the surgery. It is emerging technology, but we are trying to see is that possible."

### Future manufacturing

Referencing some specific projects he is working on currently, Dr Moore said in the long term, the modern developments in ICT will change manufacturing as we know it.

"What we're trying to do is shrink down these supply chains to instantaneous products. No longer will you have mass manufacturing," said Dr Moore. "You will either drive locally to a 3D printing shop or have a printer in your facility. You will design, build and use the device. Until now, we had these massive supply chains and now you are talking about building custom-built products, by leveraging all the different elements of ICT."

# At the leading edge of the Internet of Things

## With a EU grant of €1.5 million to develop Internet of Things projects, Richard Linger of the Nimbus Centre in Cork tells **Killian Woods** about some interesting schemes


Richard Linger, director of the Technologies for Embedded Computing Gateway at the Nimbus Centre

The Nimbus Centre on the campus of Cork Institute of Technology

Established in 2008, the Nimbus Centre has been at the core of driving development in Internet of Things (IoT) within Ireland for many years, receiving recognition for the quality of its work recently by securing €1.5 million from the European Union to fund two ongoing projects.

Based on the campus of Cork Institute of Technology (CIT) and housing more than 100 full-time researchers, the Nimbus Centre has been working on embedded technology and using its in-house knowledge to boost the Irish economy.

### Smart Gateway

The centre has developed close ties with Cork City and Cork County Council, working with them to create smart cities in the county through the Cork Smart Gateway programme.

Speaking about its involvement in the Cork Smart Gateway programme, Richard Linger, director of the Technologies for Embedded Computing Gateway at the Nimbus Centre, mentioned its investment in the project to date.

"It is an initiative by the council and ourselves to develop a city and county-wide platform for trialing and developing new technology and promoting the Cork region as a centre for high-tech. We have satellite offices in Mallow to support this, and have a very large energy test bed on the CIT campus, which we've invested over €1 million in."

Linger joined the Nimbus Centre in 2012. Since then, he has worked on many projects at the facility, with as many as 40 projects ongoing at any one time. "We have the ability to do anything from sensor and hardware design, back end and front end software, UI and UX design, and also have behavioural scientists working with us to help translate the impact of new technologies with humans.

"We are the largest single Internet of Things centre in Ireland, working with multinationals, SMEs, and a large number of academic institutions around the world."

### Tip tap tap

Linger is particularly proud of the advances in marine monitoring and educational tech the centre has developed.

"We've been developing something called Tip Tap Tap, a project where we are trying to make wooden school desks intelligent. These school desks can connect as an interactive surface so students can put their books onto the desk and have them interactive as well.

So, you can connect books to a software system in the classroom. That is going to be commercialised this year.

"Another interesting project is what we call our Mallow Buoy, which is an inshore river monitoring system that we built ourselves, and now being deployed on a national scale."

### Next developments

There are many reasons why there has been a sudden spike in IoT related solutions appearing in different sectors of industry, but Linger felt it was the proliferation of handheld devices that was fueling its rise.

As corporate business considers how it can form business models around this, as well as sell more hardware and cloud computing space, Linger felt it was important that R&D into IoT security is encouraged as we creep closer to artificial intelligence tech.

"The next major development will be in the security of these machines that are interacting, ensuring that the machines work in an effective way and in no way are harmful to people, while also ensuring undesirables don't get access to water treatment plants and power stations.

"Another major change will be computer control and process optimisation through machine-to-machine connectivity. That will lead to some of the biggest paradigm shifts in how we work with machines in the future.

"Whether that's your car connected to other services, or items you buy being continually connected by the seller of those products. This all allows us to move towards high levels of artificial intelligence and remove the human from the mundane decision-making processes."

# How the Internet of Things is reshaping retail

## Highlighting applications for its IoT platform, Gavin Peacock of TRC Solutions talks to **Killian Woods** about the transformative power of connectivity

**As an SAP Business One partner, TRC Solutions has been driving change within the retail sector for many years now. Recently its focus has shifted to the benefits the Internet of Things (IoT) can have on revolutionising basic retail practices.**

**Speaking about an everyday use of its SAP Business One IoT platform, Gavin Peacock, chief executive, TRC Solutions said, "Practically, it means we can tell whether or not in the dressing rooms of a retailer's store, a lot of garments have been tried on, but still left in the dressing rooms ready to be put back on the shelf.**

**"We could even tell because of the footfall counters, that there are not many people in the store; it may be going through a lull. So, using our intelligent systems a task can be sent out via email, text, or dashboard to a store, prompting them to carry out a task such as removing excess garments from a fitting room and putting them back on display."**

**IoT can be a difficult concept for some businesses to get their head around. Peacock said energy management and savings in this area is a big selling point for the company when promoting these solutions to clients.**

**"One of the biggest costs to any business is energy. We're running out of it and historically it has been very expensive.**


Gavin Peacock, chief executive, TRC Solutions

**Using IoT solutions, you can get a text message to automatically turn lighting systems off in your factory because with an IoT-enabled people counting and energy management system, a factory manager will know nobody is in the building, but that 85 per cent of lights are on."**

**Peacock believes it is inevitable that IoT solutions will become more widespread among retail companies globally, as every device purchased in the future will be connectable to other pieces of equipment.**

**"Everything is becoming digital, everything is becoming connected. What we see is the need to get intelligent data out of these, and these devices can only become intelligent when they are linked across multiple devices."**



# On the right frequency for supply

## For more than a decade, Vision ID has been reaping the rewards of the internet of things, and its predecessor, radio frequency identification

The supply chain is often regarded as the first sector of industry that saw large-scale adaption of what we know today as the Internet of Things (IoT), with companies such as Vision ID at the cutting edge of helping Irish companies track products at the assembly level for the past decade.

Denis Conway, general manager at production line solutions company Vision ID, said the principles of IoT have been at the core of its business for some time.

"Across the supply chain management of it, the core of the business is barcode scanning, label printing, mobile computing and wireless networks; all the components of what would be typical in the supply chain.

"I think our industry was one of the first to come across the term IoT, particularly through our work in the radio frequency identification (RFID) side of things and how these different solutions complement each other."

### RFID

Conway said RFID had revolutionised his business, increasing cost-effectiveness and solving issues of labour intensive activities such as scanning boxes to track their whereabouts. Now with RFID, a whole pallet at a time can be scanned, cutting the time products need to spend on the factory floor.

"We saw the first uses of IoT – the use of data. The effects of having this data at your disposal throughout production is invaluable.

"In the past, typical conveyor belt, product going down the line, and the manual elements of tracking that, was the closest we had to traceability. You knew at that time, at this date, this person worked on this product.


Denis Conway, general manager, Vision ID

"Then we moved along to RFID, which means we now know that this product at this time was in this place because the human error has been taken out of the process. It's just evolved."

### Tipping point

Speaking about how future developments in IoT could possibly affect Vision ID's practices, Conway said that there is still a lot of R&D to be undertaken into the potential of IoT's application to supply chain management.

But he does feel the focus will be on how technology will interact as a whole, who machines will interact with, and the growing intelligence of machines.

"In particular, smart tools, smart machines, new conveyor systems, robotics in manufacturing; it's how they all complement each other and the way they are communicating – that's the big difference.

"It's an evolution of cloud computing and the data involved. It's come along a lot, but in our industry it's getting into the real nitty gritty when you apply this smart sensor technology."

Even though it can be difficult to quantify the effect IoT will have on SMC, Conway said that VisionID's clients are already seeing IoT and RFID solutions paying dividends.

"The increase in productivity and accuracy is what our clients seem to notice the most. The ability to redistribute skillsets and employees to other areas because a production line that previously used 40 people, now might only need 20 people, and those numbers can be shifted somewhere else in the business. We're already seeing the effects."