

INTERNET OF THINGS



THE UNKNOWNNS IN THIS ARE MUCH BIGGER THAN THE KNOWNNS AT THIS POINT. IT'S AN EXCITING TIME FOR NEW BUSINESSES, ESTABLISHED BUSINESSES AND THOSE LOOKING TO DREAM

KEVIN FOLEY – Partner and Head of Start-ups with Grant Thornton

MACHINE-TO-MACHINE COMMUNICATION

Billions of sensors in everyday objects will soon produce a wealth of data – and opportunity

One of technology's biggest trends is happening right before our eyes, as tiny sensors embedded in everything from trees to traffic signals, street lights to stadiums are talking – not to us but to other machines. Welcome to the internet of things.

The trend is growing faster than forecasts can keep up with. One technology research company, Gartner, said 4.9 billion devices were connected to the internet in 2015 – an almost 30 per cent increase on the previous year. It expects this number to grow to 6.4 billion devices in 2016. In truth, the Internet of Things is one of the most hyped areas in technology right now. Network equipment maker Cisco is widely quoted for its prediction that there will be 50 billion connected “things” by 2020, just five years from now.

Numbers help to explain the hype around the sector. The higher the number

of embedded sensors in a location or for a specific purpose, the more complete a picture can be built up over time.

For example, think of sensors that automatically switch lights on or off as people enter or leave a room. By combining that information with the feed from the machines reading employee swipe cards, or security cameras at gathering areas, a facilities management team could understand the movement of people through a building and adjust its lighting usage accordingly to make an office more energy efficient. A couple of years ago, the only way to do this would be to have teams of people watching and logging this movement. The advantage of using sensors is that the work becomes automated.

However, the true value of the internet of things will be less about the number of sensors deployed and more about the results that emerge when data analytics is put to work, sifting through the information the devices record.

“A huge amount of the infrastructure is already in place and data silos have been created but they're only used to monitor problems or issues. The challenge is to convert that into useful, valuable information,” says Kevin Foley of Grant Thornton.

“Machine-to-machine data creates real, live data that you can make decisions on, and the more powerful decisions are based on informed, reliable information. That's where the value of [the internet of things] is for anyone in business today.”

Ireland is proving to be a popular test bed for internet of things projects, helped by the presence of multinationals, university research teams and tech start-ups, all in close proximity. It's spawning a number of different

projects such as the collaboration between EMC and Vodafone in Cork, and emerging companies like those profiled on the following pages.

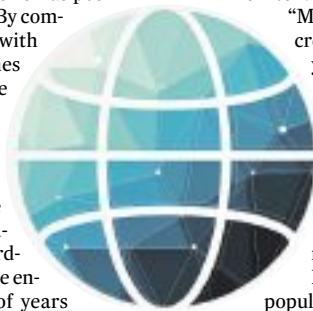
Where technology and hype goes, bubbles are seldom far behind. Foley cautions on the need for realism, as business models are still being worked out while the concept of the internet of things matures and takes hold. “The jury is still out on who's going to make money,” he says.

Collective privacy

Other challenges to tackle include ensuring that all of this data gathering doesn't encroach on individual and collective privacy. Additional more logistical concerns include the energy needed to power all of these sensor networks.

On balance, Foley is optimistic. “We still don't realise the real power of machine-to-machine communication and where it can take us. The unknownns in this are much bigger than the knownns at this point. It's an exciting time for new businesses, established businesses and those looking to dream.”

▶ INTERNET OF THINGS USE CASES



VSTREAM

When your company works with technology to give consumers immersive experiences on behalf of a sponsor or a brand, the internet of things is a logical area to look at, says vStream director Andrew Jenkinson. “Where we see the internet of things being a really interesting space is in augmenting the live sports experience with data, to bridge the gap between the TV experience and the stadium experience,” he explains.

“When you watch TV, you get commentary, stats, details about the players and the team performance. But you miss the atmosphere. When you are in the stadium or at the track, you have all the atmosphere, but miss out on all the insights. We have been working with augmented reality and the internet of things to bring the two experiences closer together for the fan.”

The Dublin company’s R&D lab developed a patented technology platform that overlays information through an augment-

ed reality headset while the viewer watches their sport of choice. Already this year, vStream has launched two commercial initiatives that use this technology, with the Mercedes Formula 1 team and Super Bowl 50 as clients. Using Epson augmented reality glasses, vStream’s platform displays live telemetry data from the cars during an F1 race.

For Super Bowl 50, as well as building “The Cube” – a ground-breaking interactive platform for fans, vStream integrated the augmented reality headset with SAP HANA, a real-time, in-memory database. Viewers can see which player is on the field at any given moment, what the stats are for each player on the offensive team, or watch action replays of previous plays. Jenkinson says vStream also developed a way for fans to switch the augmented view on or off when they want to focus on the game, simply by looking at a certain point on the horizon.



Above: NIALL O'DRISCOLL and ANDREW JENKINSON of vStream. Left: The Cube, an interactive platform for Superbowl 50 fans

TREEMETRICS

Putting sensors on trees is the natural next step for Treemetrics, which since 2005 has used 3D camera modelling and laser scanning technology to improve on decades-old manual methods for measuring forests. “We’re calling it ‘internet of trees’,” quips Enda Keane, forester and Treemetrics co-founder.

Even as technology has advanced, the Cork company’s goal has remained constant – to give forest planners and managers more accurate data to improve sustainability and profitability through better yields and reduced waste. Forests must ensure the right logs are being produced and also take care that harvesting machines don’t encroach in areas that are off-limits. Accurate location data also increases worker safety.

Many forests are outside of reliable mobile coverage so Treemetrics has collaborated with the European Space Agency to combine satellite communications with sensors on the ground – such as those in harvesting machines – to track data about its GPS position, which logs came from which trees, and even identify the shape of the trees’ crowns.

Treemetrics’ internet of things play is a



classic model because it aims to reduce manual work and increase automation. “30 per cent of the world’s land area is covered by trees and it’s going to need sensors. Very little of that is covered at the moment – it still involves a man in van going out and measuring forests. We’re very excited about the prospect of putting remote sensors into forests to monitor for growth, disease and theft. Putting sensors into the forest is our next phase of R&D,” says Keane.

A major driver for the future of forestry will come from climate change. “After the COP21 talks in Paris, you’re going to see a huge amount of new planting of forests around the world, in developing countries, and you’ll also see existing forests being better managed. Our strategy is to be world leaders in internet of things,” he says.

SITESPY

Too often, interesting technologies fail to gain traction because they're a solution in search of a problem. So when SiteSpy co-founders Albert Baker and William Coleman were developing sensors to measure the orientation of mobile operators' antennas, they researched telecoms engineers across Europe to gauge the extent of the issue. It turned out carriers lack accurate data for the direction in which one in every three of their antennas are pointing. Baker could also call on 10 years' experience as a network planner with O₂ Ireland and Ericsson, so he was already familiar with how operators had manually managed their networks until now.

A graduate of the Trinity LaunchBox accelerator programme, SiteSpy has just completed a proof of concept for its smart



sensor cluster that's installed on mobile cell towers and rooftop masts to provide network operators with real-time measurement of antenna orientation. This allows the telecoms companies to plan repair visits in a smarter and more cost-effective way, by prioritising masts that need to be adjusted.

Extreme weather conditions

SiteSpy is scheduled to start a beta trial with Meteor and Ericsson Ireland in April. Baker and Coleman attended the Mobile World Congress in Barcelona during February where they made an informal pitch to Denis O'Brien. His Digicel group often has masts located where extreme weather conditions such as cyclones can affect antenna orientation.

"The problem we are solving exists in every country in the world because of how the telecoms carriers manage their networks, and in emerging markets it's much more valuable because of how the networks were built," says Baker.

By mid-2017, SiteSpy hopes to have 1,000 units rolled out in Ireland and the UK, while it's also planning for a seed funding round of up to €500,000.

SONITUS SYSTEMS

Unusually for a small company in the internet of things space, Sonitus Systems dates back to 2007, far predating today's hype. Founded to provide cost-effective noise monitoring instrumentation to regulatory authorities, the company initially worked with Dublin City Council to set up Ireland's first real-time ambient sound monitoring network.

Having started with a sound monitoring sensor, the former University spin-out evolved its technology, building in an upload capability for sending the data over the GSM network, followed by an analytics platform for publishing information.

"Something is smart if you do something with the data your sensor is gathering to show people the information they need to do their job, or automate a process, or save money," explains managing director Paul McDonald. "The big selling-point of our system is we take lots and lots of readings from very reliable sensor equipment and we turn all those readings into the information our customers need to see on a day-to-day basis."



PAUL McDONALD of Sonitus Systems

The construction industry is a case in point, helping Sonitus' revenues to double year on year. The company has already won contracts in the UK, the US, India, Cyprus and Singapore to help builders comply with noise regulations by automatically recording sound levels, saving on the cost of an environmental technician with expensive equipment.

The five-person company is also work-

ing on smart city projects - a longer-term play than the building sector. At home, Sonitus is also working with Intel on the Croke Park smart stadium initiative where sensors in the Cusack and Hogan stands monitor fans' cheering as their teams score. "The challenge is to try and use technology to improve crowd experience and engagement when they're in the stadium," says McDonald.