The rise of **connected devices**

In-home internet of things device adoption rates are set to soar in the coming years. We explore what opportunities this brings to manufacturers and how they can deliver connected experiences that provide value to consumers

BY REBECCA LAMBERT

The number of people who own wearable devices, such as Microsoft Band, will reach 28% by 2016

Acquity Group's 2014 *Internet of Things Study* reports that today, 7% of consumers own a wearable internet of things (IoT) device and 4% have an in-home IoT device such as a smart thermostat or in-home security camera. By 2016, wearable device adoption rates are expected to reach 28% and, within the next five years, nearly two-thirds of consumers plan to buy an in-home IoT device.

"While IoT is still in its infancy, this technology is poised for massive growth in the next decade," says the report. "We are already seeing computer- and sensor-infused objects in a variety of industries, including automotive, energy, consumer electronics and in-home appliances. As it becomes less expensive to integrate technology into physical objects, we will see more applications and adoption of this technology."

Indranil Sircar, director of Microsoft's industry technology strategy for discrete manufacturing, is not alone in the belief that the rise of IoT presents a huge opportunity for manufacturers. "IoT offers so many benefits for manufacturers, both in terms of market demand for the production of billions of new smart devices, which will generate new revenue streams, but also from the chance to more efficiently track materials and components, leading to better service delivery as well as cost efficiencies."

While many talk about IoT as a revolution, Sircar explains that it is more likely to come as an evolution. "IoT has arrived and 'things' are already being connected, allowing people to harness data to generate new insights, efficiencies and opportunities. Over time, these connected systems will become connected to other connected things, creating more effective solutions delivering significant value to end consumers."

One key area in which IoT is expected to have a dramatic impact is in consumers' homes. According to NXP Semiconductors, within five years, most homes will have 200 devices linked to the internet, from light bulbs to washing machines.

Earlier in 2014, US home automation and control technology company Insteon integrated Cortana, Microsoft's Windows phone digital assistant, with its smart products, enabling users to control and monitor their homes via voice commands.

Through the Insteon Windows 8.1 Phone app, users can accomplish a variety of tasks by simply speaking to their Windows phone, such as turning lights on and off or dimming them, locking and unlocking doors, opening and closing a garage door, adjusting the thermostat and more.

"Our long-term goal is to give users complete autonomy over their homes and smart prod-

VIEWPOINT

End-to-end design

Olivier Ribet at Dassault Systèmes highlights the importance of bringing together multi-disciplinary teams to deliver smart products in the age of IoT

Consumers don't just want products anymore. They want true end-to-end compelling and intuitive experiences that are possible thanks to the combination of hardware, software, content, applications and services.

But delivering ultimate experiences presents a number of challenges for manufacturers. Products are much more complex to design when they have multiple components. Bringing together multi-disciplinary teams requires extraordinary coordination of systems, electronics, mechanical and software engineering.

The development environment requires more than simple product lifecycle management tools. Diverse engineering work must be intelligently captured, coordinated and shared in real time with low effort and easy-to-understand user interfaces. Different design goals, best practices, terminologies, specifications and schedules must all be efficiently managed and shared with a holistic view.

The Dassault Systèmes Industry Solution Experiences powered by the 3DEXPERIENCE platform help high tech companies streamline their global product development processes. They provide a structured, integrated, yet flexible and modular collaborative development experience. This ensures that each engineer is 100% aware of their colleagues' work and the associated impacts that each change will generate. It helps accelerate product development cycles and minimise engineering costs, while improving product development capacity.

Olivier Ribet is vice president of High-Tech Industry at Dassault Systèmes

ucts," said Joe Dada, Insteon's CEO, in a press release. "Adding a voice-driven, personal assistant into the mix is just another way that we can make people's lives easier."

IoT devices are also expected to become increasingly popular in the wearables space. Microsoft has recently unveiled a new wearable smart band and health platform that aims to make the process of tracking personal fitness easier, more insightful and more holistic. Microsoft Band features ten smart sensors that monitor wearers' heart rate, calorie intake, sleep quality and more. It also delivers a number of productivity scenarios with smart notifications, including incoming calls, e-mails, texts and social updates, as well as access to Cortana.

Over time, Microsoft Health will combine fitness data with calendar and e-mail information from Office. This will help to deliver insights into fitness performance relative to work schedules and determine things such as whether eating breakfast improves performance.

Sircar explains that products like this will become more widespread as the capabilities to deliver useful insights continue to develop.

"At the end of the day, it is about providing a consumer experience that delivers significant value," he says. "In the case of Microsoft Band, it's not just about delivering health insights, it's about bringing together all of the elements of a consumer's work and day-to-day life"

Aside from manufacturing these physical connected products, companies will also need to develop services that coordinate and manage the multiple things that consumers will interact with on a daily basis – both at home and at work. In fact, research firm Gartner predicts that IoT will create US$1.9 trillion of economic value add by 2020, and 80% of that supplier revenue will be derived from services rather than products.

"The incremental cost of hardware and embedded software is relatively small, whereas the service and analytics opportunity is much larger," according to Gartner. "While initially, much of the supplier focus in the IoT markets will be on hardware and software, as business models mature, the market will increasingly be driven by services, including data analytics."

In the future, as more data is processed and analysed by smart connected products, the greater opportunities businesses will have to deliver value to their customers, identify trends for further product and service marketing initiatives, as well as help to save on energy use. "For example, as the maturity of cloud-based connected consumer devices evolves, more sophisticated tools – such as machine

VIEWPOINT

IoT in the factory

Manufacturers can benefit from connected products to reduce downtime and ensure greater efficiency across their businesses, explains Johannes Petrowisch at COPA-DATA

Big data and IoT solutions are reshaping business as we know it today. They are helping manufacturers to optimise their operations, provide better services to their customers and create new fields of businesses.

Today, the key to success is all about efficiency, flexibility and the ability to optimise production processes, and this is exactly what can be achieved by collecting and analysing process data in real time. By having the insight to reduce equipment failure and maintenance downtime, and optimise the use of resources, manufacturers can improve overall equipment effectiveness and achieve significant cost savings across their businesses.

Connected sensors will take this a step further. Not only will manufacturers be able to fix equipment failures more quickly, they will be able to predict potential problems too. And maintaining machines before they break down means addressing failures before they even happen.

From sensors and mobile devices to the cloud, COPA-DATA's HMI/SCADA and reporting software zenon enables manufacturers to collect and process data from multiple industrial hardware components, providing the information they need to optimise their production processes. This includes the analysis of real-time and historical data across multiple production sites, allowing for better benchmarking and actionable insights for manufacturers.

Johannes Petrowisch is partner account manager at COPA-DATA

Insteon's Windows 8.1 Phone app allows users to remotely control appliances in their home

learning – can be applied to vehicle data to develop optimal performance settings and even send control parameters to the car for better performance," explains Sircar.

Over the next few years, Sircar says that the rise of standards like AllJoin will make interoperability a lot easier to accomplish, allowing more things to become connected to each other, generating greater value for the end user. "It may not be too farfetched to imagine that home appliances in future will be connected to each other and able to send useful insights. So, a refrigerator may be able to send me an alert when I'm on my way home to let me know that I need to pick up some more milk. I believe we're just at the start of realising the true potential of IoT."

VIEWPOINT

Smarter and safer vehicles

Aside from building the cars themselves, manufacturers also need to focus on the overall vehicle experience, says Olivier Sappin at Dassault Systèmes

Soon, cars will not only be an expression of personal style; they will become a mobility-based service delivery vehicle that intelligently connects to traffic, urban and even community and home-grids. They will be smart and safe.

We are entering the era of mobile experiences, and in the automotive space this is leading to innovations around onboard systems, passenger and pedestrian safety, and much more. In fact, electronics and software currently represent over 80% of vehicle innovation, with much of that focused on active or passive safety, entertainment and performance.

Our industry solution experiences like 'Smart, Safe & Connected Car' and 'Modular, GloCal & Secure' are tailored for automotive manufacturers and developers of complex systems, helping them to holistically address the specific needs of this dynamically evolving industry. Customers like Renault, Jaguar Land Rover, Akka Technologies and Tesla motors are already leveraging the 3DEXPERIENCE platform to exploit new levels of engineering productivity while pushing the boundaries of innovation.

Olivier Sappin is vice president of Transportation and Mobility Industry at Dassault Systèmes