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SMART PRODUCTS FOR ENVIRONMENTS: TRENDS TO WATCH

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It’s remarkable to see how the Internet of Things is forcing smart manufacturers to redefine the way they do business. From faster, more flexible computing that requires less human intervention to smarter electricity grids that can power our buildings and cities. The Internet of Things is driving our standard of living, boosting productivity and conserving our energy resources. By 2020, it’s expected that half of new businesses will run on the Internet of Things . So what smart technology can we expect to see more in the future?

Edge computing

Not so long ago, the cloud was hailed as revolutionary – we’re now seeing the next phase of IT. Edge computing is expected to grow hand in hand with the cloud. So how does it work? If cloud computing happens on remote servers, edge computing happens closer to the device – known as “the edge”. Rather than a conventional central controlling system, edge computing is used as a lighter option with its own set of controls.

Where else does edge win over? For starters, speed. That's vital for businesses with time constraints. When companies push everything to the cloud, they become more vulnerable to internet outages and cloud server downtime – that's not great when there are targets to meet. With edge computing, control centres execute rules faster and stream data to the cloud at a more suitable time. Customers enjoy faster applications and a better quality of service. Factories can reduce accidents and instantly shut down machinery to avoid further issues. Cities can address road and transport maintenance before problems occur. It seems everyone wins. The cloud still has a part to play. Once the data is received, the cloud can run analytics and recommend any necessary rule changes.

Things run faster and more securely with edge computing. In an era where cybercrime is becoming more advanced, edge computing can implement a stricter compliance framework. That means a safer environment for everyone. For example, businesses can filter out sensitive personal information and process it locally, so the company avoids that risky hurdle of sending the information to the cloud for further processing. Of course, it's hard for some businesses to avoid data transfer between devices and clouds. But it can be easier to avoid any potential threats when there's greater visibility right up to the edge of the network.

Many experts feel we're witnessing the dawn of a new industrial revolution. Edge computing is being tipped to play a big part in that. When the action happens closer to "the edge", smart manufacturing can implement a more flexible data-led approach. Smart manufacturing is a general term used with the aim of optimising the manufacturing process using computer controls, modelling, data and other automation to improve efficiencies. With less human intervention to deal with, smart manufacturing has the capability to use machinery to carry out actions in real-time, ensuring a faster, more cost-effective line of production. Essentially, edge computer is driving the development of new technology.

Smart buildings

The Internet of Things also works on a much larger scale. Smart devices are powering a new breed of buildings that could be more suited for the needs of Original Equipment Manufacturers. So what role will the Internet of Things play? Fundamentally, the Internet of Things connect the unconnected. Within a smart building, that translates to intuitive operational systems that simplify and accelerate how technology communicates.

Better communication means things can be fixed before they break. That's predictive maintenance – this uses a program to monitor and test conditions with little human intervention. The operational systems provide rich data so smart manufacturers can better understand the needs of the machine. This can significantly reduce waste from the manufacturing process. An effective predictive maintenance program can help deliver savings of up to 18%.

Intelligent sensors closely monitor a smart building's performance, so systems like HVAC, lighting, fire protection and security become much easier to manage and control. The operational system can quickly adjust what's been underused or overused, which helps the manufacturer reduce energy and, in turn, save money. According to a recent report, a smart building can

reduce energy by up to 35% .

It's easy to see why more and more businesses are adopting smart buildings in their operations. For starters, smart buildings can increase employee and supply chain efficiency using better business intelligence. Live data can be captured and fed into planning and used in resourcing – that means less time looking for assets. Smart buildings take the guesswork out of the equation, which makes for an optimised workplace and a happy business.

Smart cities

Just imagine if a whole city was made up of these smart buildings. For citizens, the benefits of smart cities seem clear: a standard of living that's more comfortable and efficient. And environmentally, it's a far greener solution. But what about economically? What are the benefits for Original Equipment Manufacturers working in smart cities? And what role can businesses play?

Amsterdam might give us some glimpse of the future. The Dutch capital's innovation platform Amsterdam Smart City challenges companies and

knowledge institutions to submit and apply innovative ideas and sustainable solutions to urban challenges. The aim is to encourage sustainable economic growth, efficient use of natural resources and a high quality of life – through the power of technology. The platform's areas of interest range from new business models, open data, smart grids, home energy, connectivity and smart mobility.

Forward-thinking cities like Amsterdam could play a huge role in the pursuit of global environmental sustainability. We've all seen it plastered across the daily news: a climate expert warning us about the state of the environment and what we can do to alleviate some of the damage. McKinsey predicts that smart city applications could cut emissions by 10-15 percent, lower water consumption by 20–30 percent, and reduce the volume of solid waste per capita by 10–20 percent . However, smart manufacturing technology will need to abide by stricter environmental regulations if these targets are to be met. But that's a good thing for businesses. Extra money could be made from recycling and selling old equipment or parts. Reducing energy and water usage could save money on bills and lower waste disposal costs.

Smart cities present an opportunity to develop and produce innovative technology. One example relates to water supply. Many cities struggle to cope with water loss (like leaks and blockages) and water over usage – not to mention the energy used to transport water and water waste. What if water could be smarter? Smart water grids use intelligent technology to ensure the security of water quantity during transportation and the safety of consumption. That's likely to mean an increase in demand for smart products (most notably, intelligent sensors).

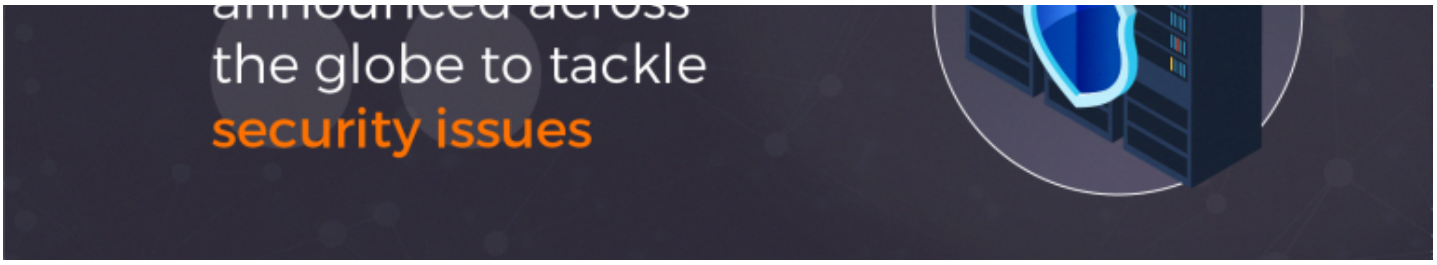
Think about how many commuters pile on to tubes and trains every single day in cities like New York, London, Tokyo and Beijing. By 2025, cities that deploy smart mobility applications like traffic mitigation and public transit could cut commuting times by 15–20 percent depending on the city . This means employees will avoid being delayed on their journey. Employees will

be able to travel much easier through the city with less time wasted in traffic or on public transport, meaning their time can be used more productively. Digital signage or mobile apps can deliver real-time information about delays, so workers can adjust their routes on the go. One city implementing a smarter approach to transport is Barcelona. The Catalonian capital keeps its population moving freely with smart parking and traffic systems to monitor congestion. The city has invested in clean transport with a fleet of hybrid buses and a smart cycling initiative that allows passengers access to over 400 bike stations through smartphone payments.

At the forefront of any city's concern – amidst the rapid acceleration of development – should be the safety of its citizens. Many cities now use Closed Circuit Television Cameras (CCTV) to identify suspicious behaviour. This is nothing new. However, since the introduction of facial recognition to identify criminals, we have seen an increase in the importance of security cameras. Modern CCTV cameras now come equipped with monitor motion, fire and smoke detection and even the capability to lock and unlock doors depending on a situation.

Encouragingly, some of these technologies are already used in cities across the globe. While applications will perform differently from city to city (because of things like legacy infrastructure) we are seeing some noticeable signs that smart cities can drastically improve the experience of living and working in the city. The knock-on effects for business will be largely positive.

Security



As the Internet of Things becomes more widespread, the need for security grows, and the systems themselves need to become more complex. Every smart product is a target for cyber criminals. According to IBM, attacks against the Internet of Things have increased by 600% since 2017 . So, imagine the sheer scale an operation that protects an entire city.

That's why new codes of practice are being announced across the globe to tackle security threats. For example, businesses will need to take the necessary precautions to ensure consumers' data is protected. If they don't, they'll fail to compete in the industry or could face substantial fines and perhaps court fees further down the line.

Here are a few basic practices that companies should follow:

1. **Make passwords unique** – many devices are released insecure with the same key or password. Device passwords shouldn't be able to be reset to a default value.

2. **Keep software updated** – updates should be regular and not impact the functioning of the device.

3. **Communicate securely** – security-sensitive data should be encrypted, and all keys managed securely.

4. **Ensure that personal data is protected** – personal data should be always be protected according to the law.

5. **Make devices easy for consumers to delete personal data.**

6. **Make installation and maintenance for devices easy** – this only needs to

be a few steps. Consumers should be given guidance on how to set up their device securely.

7. **Validate input data** – any data input through user interfaces and transferred via application programming interfaces (APIs) or between networks in services and devices must be validated.

The security of the Internet of Things is an international issue. That's why governments across the world including Australia, New Zealand, the UK, the US, Canada and France are working together to find a solution.

Codes of practices may vary depending on the country you live in.

Final thoughts...

The Internet of Things promises has opened a whole new frontier with huge benefits to smart manufacturers. In the coming years, we could see both productivity and standards of living sky rocket. In order to stay ahead of the game, adopting smart products in manufacturing could give businesses a huge competitive advantage. Exciting times lay ahead – the Internet of Thing has increased consumer demand and redefining the role of Original Equipment Manufacturers.

Want to find out what opportunities exist for your company to leverage these IoT trends?

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