



\$1.1 Trillion

Expected IoT global
value-add by 2020

Can you afford not
to be connected?

3 WAYS IoT WILL REVOLUTIONISE YOUR BUSINESS



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Embedded Communication

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3 WAYS IoT WILL revolutionise your business

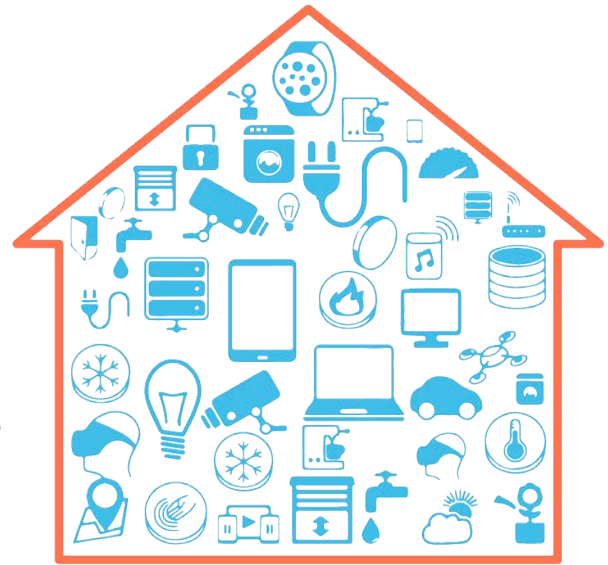


This eBook Is For You ...

...if you are an innovative business leader aiming to drive your organisation and its products into the future. This ebook will outline the importance of IoT, practical applications your business needs to care about, how to overcome any barriers and of course how you can get started building IoT ready products.



IoT Today



IoT stands for the Internet of Things. The simplest way to think about it is to imagine any device made smart through a connection to the internet.

IoT is growing rapidly. **Gartner** predicts the IoT installed base will grow to 26 billion units by 2020, other predictions are even higher with 50 billion things connected in the same timeframe. Business who do not want to fall behind the curve in future years, are examining their IoT opportunities today.

IoT offers convenience and savings to consumers and businesses. Manufacturers are looking for greener solutions that will provide savings in their production lines. Connected devices can predict usage and issues while also pushing updates. This brings savings to reaction times, the environment and the bottom line. **Gartner** describes this with an elevator example:

“*Embedded sensor technologies can be used to allow for bidirectional, remote communication with over one million elevators worldwide. Based on captured data, technicians can run diagnostics and remotely initiate repair options or guide on-site technicians to make the appropriate decisions, resulting in increased machine uptime and improved customer service.”*

Looking at the B2C space, we see a rapid growth in the **spending power** of Millennials. They now make up about 27% of the US market alone. This is the first generation considered digitally native; smart products that understand their lifestyle and offer convenience are clear winners. Their spending power is set to grow to \$1.4 trillion by 2020.

IoT In Numbers



2008

The number of things connected to the internet surpassed the number of people on earth.

£40 million

UK government investment in IoT testbeds and incubators in 2015

Up to 50 billion

The number of things that will be connected by 2020

4 billion

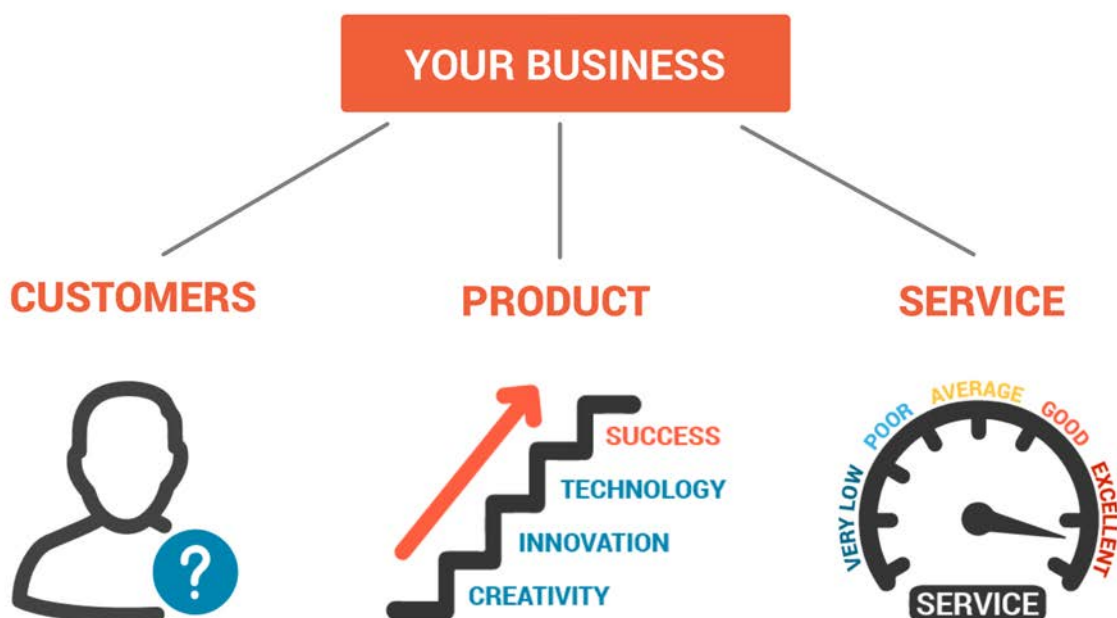
The number of connected people in 2020

\$4 trillion

The total value of the revenue opportunity by 2020

3 Ways IoT Will Revolutionise Your Business

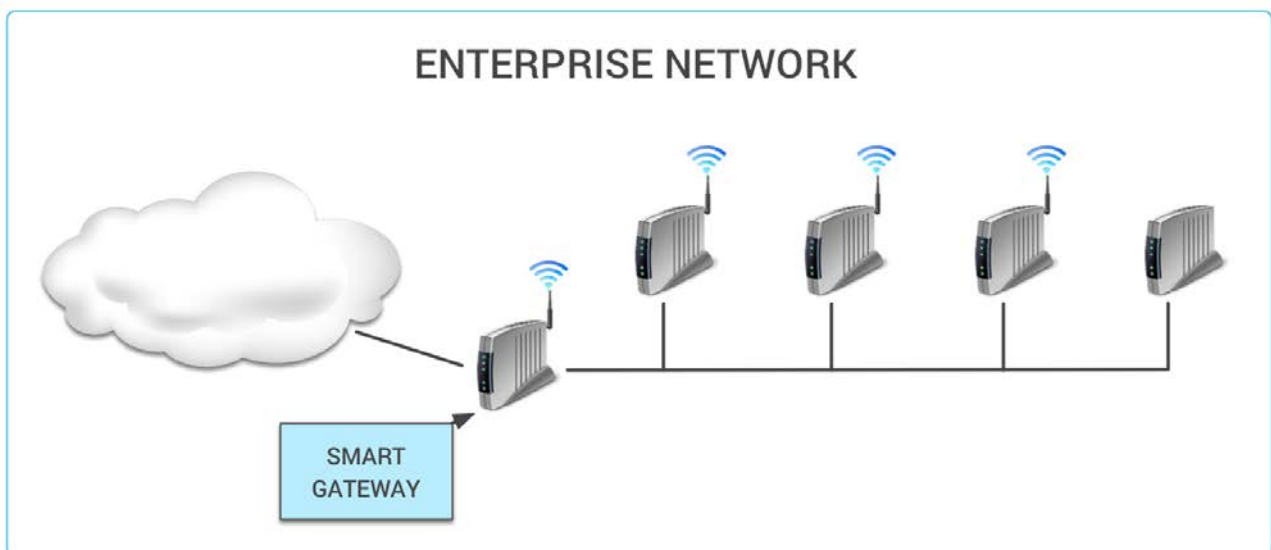
Your business depends on creating outstanding customer experiences through your products to generate revenue. This revenue in turn allows you to grow the business; to become successful. IoT can influence how you create and deliver next-level customer experiences and impactfully influence the bottom line.



1. Understanding Customers

Many R&D or Product Development Teams rely on research data and calculate a margin of error when examining customer surveys. Some businesses bet on 'educated guesses' even. IoT allows you to truly know how your products are being used. In its simplest form, IoT enables devices to send data in one direction - from the customer back to you. This can include data about product usage such as frequency, settings most used, time of day most used, malfunctions etc.

An enterprise network can facilitate this by reporting data back to one control unit from any number of devices:



Product Development

Product development is the obvious benefactor for this application of IoT. Discovering that your product may be used differently than you thought, or a minor setting being broadly used, gives you the inspiration for new product generation.

You may also discover brand new opportunities for service offerings to accompany your product.

Marketing

Your marketing team will also understand which features of your product are the ones they should be promoting most.

Production

Your production team can work with usage patterns and malfunction reports to understand which areas of your product need to be improved, how many new orders or replacement orders are to be expected.

Finance

Finally, finance is impacted. By understanding usage patterns, you can forecast consumption. By evaluating malfunction reports, you can estimate servicing and / or replacement costs.



2. Product Innovation

The logical step following on from understanding customers, is the ability to take this data to create new products based on the findings. But even without this prior data, companies are building connectivity into their new and existing product lines. The reason is simple; market demand is there with sources like the [World Economic Forum](#) expecting 50 billion devices to be connected in the next 5 years.

Existing Product Lines



Take [Philips](#) as an example. A well-established organisation who for decades provided a variety of lighting products amongst other things. They have launched [Hue](#). Here, by building on their existing product lines of light bulbs and fixtures, they've created a connected lighting experience.

New Product Development

There are of course countless startups and established organisations who have discovered that moving into the IoT space opens up new markets and revenue streams.

Both [Hive](#) and [Nest](#) offer one of the most used smart home appliance to date: the smart thermostat. Allowing consumers to access their heating remotely; saving energy, while still coming home to a warm house. For Nest the thermostat was only the beginning, they now offer smart smoke / CO alarms and home cameras for security or just to check up on your pet while you are at work.





Smart thermostats or even wearable fitness trackers, only emerged in the last number of years. They are only the beginning; how can we innovate products that continue to offer convenience and savings to our business customers as well end consumers?

Remote access is generally the first application that comes to mind for product innovation in the IoT space. This simple thought, answers the call in industry and from consumers for more easy access to devices. We all know consumer examples, but let's think in the B2B space. A great example is **Connected City Lighting**. By giving a city access to remotely control all lights and have a system that learns from data, a city can improve security, gain substantial savings and react to real-time occurrences.



3. Getting Service Right

Earlier we quoted the elevator example from Gartner which through bidirectional data transmission was able to avoid system failures to occur. You will know when an issue has occurred even before the customer calls you. Often, you will be able to diagnose and send a fix much faster than on the traditional route. For any business with a large number of customers, this can be vital information that kicks off customer outreach or ensures that enough service staff are at hand to deal with the issue. **Orbotech** is another strong example here, who substantially reduced downtime through IoT.

The bidirectional data transmission goes further than a response to service issues. The remote management of devices gives businesses the opportunity to also control them remotely. In the manufacturing world this could mean regulating production lines based on collected data. In any business with a transportation aspect, improving fleet management and delivery systems can increase volumes and create real savings.



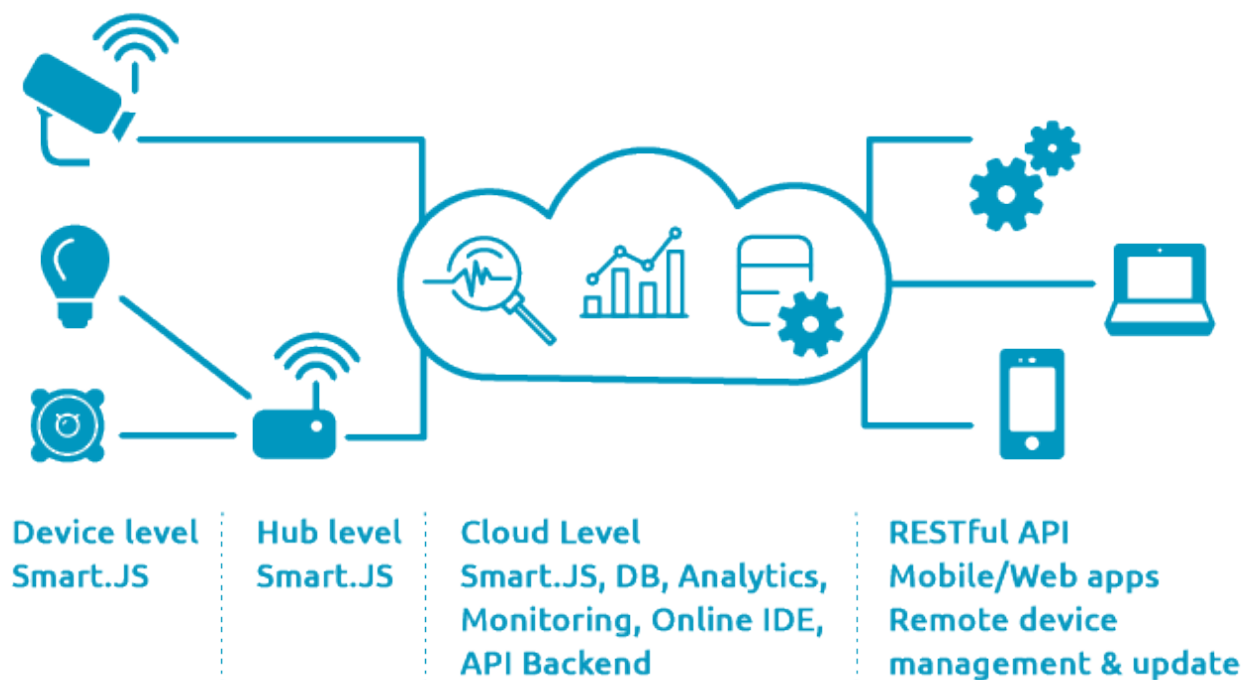
Most of us own a smartphone and are prompted on a regular basis to install software updates to increase battery life, improve functionality etc. Imagine your car doing just that. **Tesla Model S** receives upgrades regularly from updates on where to find charging locations to automatic emergency braking.



How Your Business Can Connect





You want to get your devices connected fast, securely, reliably and at a reasonable investment cost. Many of the organisations that we quoted here have either developed their own solution or purchased a platform that requires high-level development. This spells out high investment costs. But it's about to change:

Cesanta Software has developed **Smart.js**. This IoT platform lets programmers use JavaScript for embedded development. JavaScript is one of the most used scripting languages in the world; the majority of websites employ it and it's supported by all modern browsers without the need for plug-ins. JavaScript makes development easier, safer and faster than with existing embedded tools.



Further, Smart.js is hardware agnostic and available to use today with the top selling microcontroller chips: ESP8266 and TI CC3200. Your development team can also get straight to work from their desktop without the need for any chips by using our POSIX option.

There is no need to reinvent the IoT wheel or invest in continuous software maintenance if you work with an existing solution either. Here a full comparison of in-house development vs. Smart.js:

DECISION FACTOR	IN-HOUSE DEVELOPMENT	USING SMART.JS
 Experienced developers	Hire, train & retain	Done by Smart.js
 Platform flexibility, scalability, security and reliability	Needs to be build	Already implemented
 Time to Market	Longer	Much shorter
 Cost	High	Low



Smart.js Examples

Peeples and Smart.js



Building 10 is developing their innovative smart camera Peeples. This product attaches to existing peepholes in people's homes and easily connects to WiFi. The user can then identify, screen and be alerted to an outside presence via his or her smartphone app.

Currently still in development, Peeples have high hopes for Smart.js:

“[...] Smart.js will provide the holy grail of development options in which it gives us the performance and speed or be deeply integrated with the hardware, while providing ease of use and the flexibility of a high level programming language.”

To achieve this, Chris and his team are working with Cesanta's experienced engineers through our **Consulting & Development Services Offering**. Here, Cesanta is fine-tuning Smart.js to meet Peeples' objectives of network latency and robustness.

On the importance of finding the right partner for IoT development:

“We needed a partner that would respect the difficulties in developing hardware while providing high-level software development - it's a rare find in development houses,”

Chris Chuter, CEO and co-founder.

The full case study is available for you on [Cesanta.com/Use-Cases](https://cesanta.com/Use-Cases).



Quantex and Smart.js



Quantex is a German based automotive diagnostics company who started work with Smart.js in July 2015. They were looking for a cost-effective IoT solution that would offer data transfer stability, high throughput and low latency to take their diagnostic product to the next level.

Quantex' products are used by garages and car owners to identify faults in a car that can often stem from multiple and hard to identify electronic issues. While previous units were able to provide the detail when the diagnostic unit was physically plugged into the car, the addition of Smart.js allows for remote access via WiFi. A slow connection or in a worst case a dropped connection was not acceptable for Quantex, and Smart.js provided the stable and strong connection in conjunction with ESP8266 chip.



“Working with Cesanta was very smooth. We are not experts in implementing network functionality. They are. And they exceeded our expectations for both latency and bandwidth. The team is professional, fast to respond to questions and most importantly they made a real effort to understand our own complexities before presenting the right solution,”

Andrey Voronko, Managing Director of Quantex.

The full case study is available for you on [Cesanta.com/Use-Cases](https://cesanta.com/Use-Cases).



Overcoming Barriers



There are two barriers that come up time and again in IoT conversations. We'll address them both:

Investment Cost

The initial cost of investment could be high as traditionally you would have needed to employ highly-skilled engineers. Your team would have to focus on this project, while perhaps existing project lines suffered, causing more cost through longer development times. This is no longer the case when you work with platform providers like Cesanta.



Further, Smart.js is open source and this means that as you test and perhaps even prototype, you can access the complete platform free of charge. Only when you commercialise your application does commercial licensing apply.

Security

The big fear is that as we transfer data, leaks will occur and that general IoT systems are still unsafe and open to hacks. Working with skilled partners, who learn to understand your application and safety needs, is the key to providing solutions to end consumers that provide the high level of security. The Cesanta team is here to work with you on this.



Get Started

It's time to get started and here are the steps you need to take:

1. Identify your product opportunity
2. Speak to your development team
3. Share the download to the [Smart.js Source Code](#)
4. Get testing
5. Contact our engineering team in case of tech questions
6. Work with Cesanta on the right licensing for your product
7. Take your product live!





Pass this link to your development team so they can test Smart.js for themselves.

Contact our team to explore the IoT opportunity for your organisation.



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