

WHITEPAPER

Transforming your
business with **IoT**

Together we can do **more...**



No matter your starting point, you can benefit from implementing an IoT strategy. For years, IoT has been transforming the way we do business, with pioneers leveraging technology to benefit their bottom line in a range of industries that have previously neglected to innovate. It may seem like a simple concept: by connecting devices and transmitting data, an IoT deployment can offer a range of benefits to business, including operational efficiencies and cost savings, as well as unlocking entirely new business models that you may not have previously considered possible. In reality, companies that have moved on from a proof of concept through to implementation have found themselves challenged by the complexities of their supply chains, lack of robust device management tools, as well as conflicting opinions on which connectivity protocol will work best for their solution.

In the complex world of IoT, it's important to keep things simple. For IoT to work for your business, you'll need unified management of your IoT device systems, from the connectivity to the device capabilities and operational processes. Managing costs, ensuring security and navigating the lifecycle and application evolution of a wide diversity of deployments is no easy task. This whitepaper covers a range of use cases that are currently in actual use around the world, in a variety of different verticals and industries, including industrial, transport and logistics, utilities, consumer products and retail. Even if your particular industry is not covered in depth here, take the time to familiarize yourself with the way IoT is being used by other organizations - solutions such as predictive maintenance may be just as applicable in your business, though in a different manner.

We've seen three key themes crop up in most business transformations empowered by IoT.

Remote monitoring and management

Remote monitoring and management is the bread and butter of the IoT sector, with many of our customers looking to connect devices which will harvest data and pass it on to a centralized system. Essentially, they want to monitor a device on their network, gain insight on what the device is doing, control who accesses that device, update its firmware, change its characteristics, and eventually decommission it, if needed.

In the trials and successes of our customers and partners, we have observed that many potential adopters of IoT know they want to connect devices to access that ability to remotely monitor and manage equipment. However, many of these businesses are not aware that they must manage that device throughout its lifecycle, regardless of location, device size or expected lifetime, not to mention the implications of security in this aspect of IoT. For these projects, remote monitoring and management is where the rubber meets the road and the practicalities and complexities of IoT come to the forefront.

Keeping in mind the need for both full stack connectivity as well as comprehensive device management is the key to long-term success in IoT. Simply being able to create and connect a device isn't enough to stay ahead of the curve, you must also have a solid understanding of the realities of a large-scale, often remote or mobile (and hard to reach) IoT deployment.





Edge intelligence

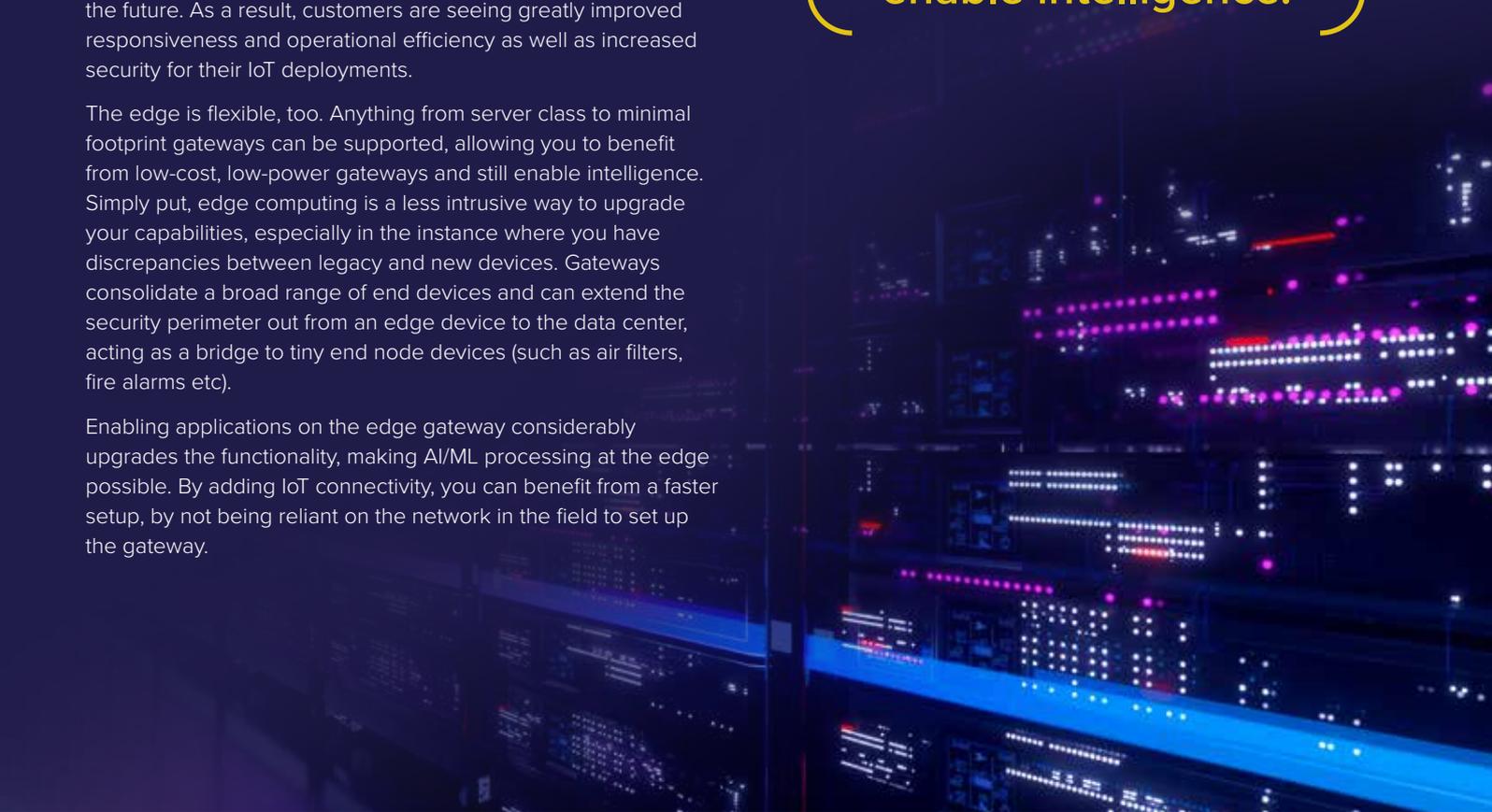
As edge computing continues to dominate as an industry trend, we're seeing an evolution of what edge intelligence means and what it can enable. Many edge solutions can miss the mark in terms of accelerating business transformation by introducing more complexity. Businesses looking to connect edge devices should be prioritizing truly unified management of not only their devices, but also their applications and gateway systems. Deploying intelligence to the edge enables resiliency, edge-to-cloud security and offers more opportunities to evolve in the future. As a result, customers are seeing greatly improved responsiveness and operational efficiency as well as increased security for their IoT deployments.

The edge is flexible, too. Anything from server class to minimal footprint gateways can be supported, allowing you to benefit from low-cost, low-power gateways and still enable intelligence. Simply put, edge computing is a less intrusive way to upgrade your capabilities, especially in the instance where you have discrepancies between legacy and new devices. Gateways consolidate a broad range of end devices and can extend the security perimeter out from an edge device to the data center, acting as a bridge to tiny end node devices (such as air filters, fire alarms etc).

Enabling applications on the edge gateway considerably upgrades the functionality, making AI/ML processing at the edge possible. By adding IoT connectivity, you can benefit from a faster setup, by not being reliant on the network in the field to set up the gateway.



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Product-as-a-service

Product-as-a-service has been emerging as a highly beneficial business model for IoT adopters. If you've ever wondered how best to monetize the IoT, this is your answer.

Many customers have come to us from a mindset of selling their hardware once and that comprises the entirety of their revenue. Naturally, when a product is IoT-connected, there is a continuing cost for the connectivity and management of the device. By developing a product-as-a-service offering, the cost can be recouped in a range of different ways, including monthly subscription models, a cost per application or fees for digital service purchases. Another option for product-as-a-service

businesses is the harvesting of end user data. By monitoring and capturing user data, your business can benefit from better insight into your market, enabling you to recommend new products or services based on customer behavior.

These additional revenue streams are often after-thoughts in the creation of IoT solutions. By considering the eventual business outcomes of what you're deploying, you'll see much better ROI and more long-term success. In the case of the remote management and monitoring solutions that your deployment will be enabling, you could create services around the data being generated, such as predictive maintenance.

Industrial solutions

The term “industrial” is exceptionally broad, referring to any number of markets in the industry, including manufacturing, automotive, agricultural, oil and gas, and many more. The innovation brought to the industrial sector by the IoT has been astounding. An incredible number of IoT solutions have cropped up to improve efficiencies and reduce costs while increasing safety and productivity.

IoT IRL - Our customers have driven progress in industrial IoT across a range of real-life use cases.

Industrial air filters:

This customer has a large number of air filters deployed out in the field, which in this instance can mean anything from a single building with an older HVAC system to a series of factories with hard-to-reach physical infrastructure. By empowering their products with IoT, they can ensure the filters are working as intended and that they remain functional. Sensors relaying data help with planning and enabling predictive maintenance, which in turn translates to less emergency downtime and reduces lost productivity. Most important of all, the ability to remotely manage their devices, updating firmware and ensuring they stay secure in the field, onboarding or decommissioning with the touch of a button, saves time and resources. No need to send out a costly technician to crawl in air ducts or struggle to reach a remote HVAC system.

Smart AI-powered buildings:

With devices connected to a unified platform for monitoring and management, major advancements in the smart building sector have been spear-headed by a few of our customers. By monitoring a range of factors such as occupancy levels, lighting, temperature, social distancing and cleanliness, these connected facilities are constantly producing a stream of data ripe for harvesting insight. A device management platform provides the tools to manage the device estate securely, simplifies the onboarding process for all building systems, enables secure and straightforward integration between existing systems. Flexibility and reduced complexity means that any device can be onboarded and relay data to any other type of device, reducing risk of vendor lock-in. Recent surveys have shown that 67% of facilities management decision-makers are seeing a more significant ROI for their IoT deployments than they expected, clearly demonstrating significant potential for the smart building business.

Monitoring of industrial equipment:

Our customers have implemented a range of productivity enhancements through the monitoring of their (or their customers') equipment, including predictive maintenance, usage statistics and efficiency measuring. One customer has introduced IoT-enabled sensors integrated within an air compressor to collect vibration and temperature data which is then relayed via an eSIM over a 4G network to a browser-based visualization tool for remote monitoring and analytics. This data generates insights that can highlight machine parameters, and trends over time that may indicate a loss of efficiency or a complete failure that could result in an outage impacting the overall equipment effectiveness of a facility. This data can also be passed to the manufacturer's proprietary dashboards thanks to simple APIs, which can assist in predictive preventative maintenance.



Transport and logistics

The primary characteristic of this vertical is the challenge that lies in connecting, monitoring, and updating devices that are constantly on the move. To solve this problem, our customers have depended on IoT connectivity that is flexible, resilient, and secure regardless of where the asset is located. When you're shipping high value goods, you must be able to rely on the data produced by the sensors on your delivery pallets. For some global companies, those devices can be traveling across oceans and through very remote locations.

IoT IRL - Here are a few actual use cases that Pelion has helped enable in the transport and logistics industry.

Global asset tracking:

For shipping companies, tracking their assets as they travel can be a logistical nightmare. Millions of shipments are on the move every day and there is a huge business opportunity within the industry for smart tracking devices which can transmit a range of data back to a centralized platform. One of our customers in the logistics sector has created innovative tracking tech, with small low-power devices that can be attached to crates, boxes, and pallets, with a battery life of 5+ years. These sensors collect data which can include temperature, location and even retail footfall once the box or pallet is displayed on the shop floor. Ultra-reliable IoT connectivity is key for this use case, especially when your bottom line may be dependent on the delivery of expensive cargoes. In these cases, the reassurance of constant updates regarding the location and condition of your shipment is non-negotiable.

AI-powered fleet management:

This Pelion partner is dominating the transport industry by delivering an AI-powered data analytics platform, which combines in-vehicle smart data collection devices with mobile and web-based services to provide actionable insights for fleet management, vehicle health, shared mobility, and insurance telematics applications. A slew of platform capabilities include

real-time vehicle and asset tracking, route planning, driver behavior analytics, as well as predictive and preventative maintenance, all powered by IoT connectivity. As a global player, they have also had to tackle the challenges of connectivity which works across borders, where roaming costs can drastically affect their profit margins. To solve this problem, they leveraged Pelion's network coverage for IoT connectivity and were able to expand their footprint into new markets.

Wireless connectivity for public transport:

Public transportation is a sector which offers a plethora of opportunities for IoT innovation. As the market continues to thrive post-pandemic, IoT solutions can deliver a range of benefits, including greater customer security, more reliable passenger information updates, and improved occupancy monitoring. One of our customers is currently leveraging fast 4G backhaul for wireless connectivity which is enabling product features like CCTV streaming and real-time information updates to busses as they're on the move. We've provided reliable, cost-effective cellular connectivity as well as device management capabilities which have greatly reduced the need for manual visits to the busses and depots, saving on time and resources.



Utilities

The utilities sector has embraced the digital transformation offered by IoT with open arms, with smart metering becoming a familiar household staple across the globe. In turn, a huge wealth of advantages have been unlocked by utilities companies, including usage monitoring, the introduction of flexible tariffs and the potential for smart home applications. However, innovators in this space are also facing a few major challenges. Regulatory compliance is key, and depending on local authorities, can vary from market to market. The accurate remote monitoring of energy usage must be continually tracked, with a staggering amount of data flowing from their devices to their management platform.

IoT IRL - We've seen some incredible innovation from our customers and partners in the utilities space.

Electricity metering:

Pelion assisted a major national utilities company as they made their transition from an ordinary energy supplier to a services and platform powerhouse. They experienced a myriad of challenges upon integrating 30 million smart meters, as well as a whopping additional 1 billion IoT nodes, to their energy grid. Concerns such as device security, scaled out management requirements, and the need for reliable IoT connectivity had to be addressed. By empowering the company with secure device on-boarding, monitoring, updating and decommissioning, they were able to easily scale their deployments, and the chip-to-cloud security provided by Pelion assuaged any concerns about data integrity. Moreover, the sheer amount of data being transmitted into their energy metering platform was able to be consolidated into a single unified view, allowing for deeper insights to be gained into their customer behavior and energy usage, simplifying their billing cycles.

Smart gas and water metering:

Automated meter reading (AMR) devices are instrumental to efficient operations in the gas and water industry. One of Pelion customers provides the connectivity service needed for these IoT devices, with hundreds of thousands of nodes deployed over remote locations. As in our electricity use case above, we've seen the need for reliable and secure data transmission for these devices; information being sent from thousands of AMRs can tear through bandwidth allowances (and budgets) in no time. The remote monitoring and management of the AMR devices is critical, and Pelion streamlines the entire process. As a result, the customer benefits from an estate of meters that is easy to manage, cost-effective and boasts high levels of redundancy, with thousands of meter feeds consolidated into a single user interface, regardless of network connection.



Retail

In the post-Covid world, we're seeing a rise in IoT adoption within the retail industry. Zero-touch smart vending machines, PoS systems placed at tables in outdoor dining, and sensors installed to help maintain social distancing are becoming critical to success for many physical stores. Another important component that plays into the retail sector is supply chain management. An IoT solution can accurately monitor your stock in order to ensure a constant supply of products while minimizing losses or spoilage. RFID tags and smart labels can help pinpoint movement of products down to the second, as well as keeping track of environmental factors such as temperature and humidity.

IoT IRL - Real-life use cases of IoT in retail abound, and you've most likely experienced many of them in your day-to-day life.

Connected digital signage:

Dynamic messaging directly to customers, wherever they're located, is made possible by IoT connectivity. By offering a more personalized advertising experience, retail businesses are seeing improved sales and a more responsive customer audience. As a result, the signage industry has benefited from huge growth, with fresh innovations, new (sometimes impractical) screen locations and increased revenue year-over-year. A key component of digital signage is IoT connectivity, which provides the remote monitoring and management of screens as well as the mechanism for content delivery. By removing the need for manual maintenance, businesses can profit from greatly reduced operating costs, while the ability to deliver dynamic, targeted content provides a stream of income from advertisers.

Smart Point of Sale devices:

Wirelessly connected Point of Sale (PoS) terminals are becoming increasingly intelligent and transmitting more data than ever. Retail is a rapidly evolving industry and many of our customers have a keen desire for flexibility, with the wired connections and wasted retail space of cashier stations becoming a thing of the past. Not only a mechanism for wireless payments, enterprising retailers are also expecting more than just simple transaction data to flow through their PoS devices. By connecting their PoS to the IoT, they can harvest and abstract customer data, creating profiles to provide a more personalized service. Payment services require ultra-reliable and secure IoT connectivity, with fallback measures available in case of downtime. Again, the theme of connecting consumers and meeting their needs regardless of location continues to dominate in the retail space.

It would be impossible to document all the endless use case examples of real IoT deployments in this whitepaper, so if you haven't seen the exact fit for your solution here, don't despair. The Pelion team can offer decades of device and connectivity

expertise to assist you in your digital transformation. We hope this has been a good jumping off point for your journey to IoT success, and encourage you to reach out to our experts so we can help you on your path.

Want to get started with connected fleet management? Tangerine's AI-powered data insights have transformed the smart mobility sector, by combining Pelion's reliable and resilient connectivity with their data analytics platform. Contact us to find out more at www.pelion.com/contact/

