

# Manufacturers' Advanced Services: IoT as the key to profitability and growth



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# Executive Summary

## Earlier research conducted by Noventum<sup>1</sup>

confirmed that companies which pursue a broad portfolio of growth strategies, including advanced services, grow faster and earn higher profit margins. Further, the research confirmed that the leadership teams of the surveyed companies see the Internet of Things (IoT) as an enabler of advanced services.

Manufacturers expect the Internet of Things (IoT) to create significant opportunities for their service business. Insights from leading manufacturers already show how their IoT investments have led to substantial service benefits. Schindler Elevator has seen a 22% faster service restoration rate created by their enhanced IoT-based remote diagnostic capabilities. For Varian Medical Systems the IoT investment has already led to 20% fewer technician dispatches worldwide and for each problem resolved remotely the customer service costs are reduced by \$2,000<sup>2</sup>. Boosting the service profitability and growth is one of the main objectives of manufacturers' IoT investments.

Much has been written about the IoT's economic contribution, but few insights are available on the specific impact the IoT creates for the manufacturers' service business. The service business of manufacturers is a complex business domain and needs to be examined in detail to offer highly valuable and immediately applicable insights for manufacturers.

This white paper is specifically focused on the manufacturers' service business and discusses in detail how the IoT impacts on 1) manufacturers' service profitability and growth and 2) the development of sustainable competitive advantage for the service business.

## **1. The IoT's impact on manufacturers' service profitability and growth**

The critical product expertise and company specific brand values differentiate the manufacturers' service from other service providers<sup>3</sup>. While a brand-driven service strategy helps to build the emotional connection with the brand, the IoT helps manufacturers to capitalise on their core expertise to enhance their service offering.

Leveraging enterprise expertise after-sale: The IoT enables manufacturers to offer their core product expertise as a high value service offering. Based on the ongoing access to IoT-based product data, manufacturers can apply their critical expertise to maintain optimal product conditions for their customers.

Scaling the manufacturers' expertise across the installed-base: The IoT expands the reach of the manufacturers' service business beyond its established service customer base. Enhanced remote diagnostics and remote trouble-shooting expand the geographical scope of a profitable service business. New levels of service performance can be offered to a larger customer base.

Applying expertise beyond the manufacturers' own products: The IoT enables manufacturers to integrate competitor products into their service offering. The digital integration with the customer business environment helps to create multi-vendor service offerings and create service growth in stagnant markets.

Efficiency in leveraging the manufacturers' expertise: The IoT creates and captures product status and product utilisation data for the manufacturers' analysis and application.

High levels of automation in monitoring, diagnostics and the service response create unprecedented levels of efficiency in providing critical expertise to the customers.

Manufacturers have the critical expertise to help their customers optimise the utilisation of their products. But the IoT infrastructure provides the connectivity and data to dramatically increase the value of the manufacturers' expertise as it can be applied more efficiently to a large customer base. As industrial products become more sophisticated and customers strive for optimising their use, the demand for the manufacturers' expertise in the form of IoT-enabled value-added services intensifies.

## **2. The IoT as source of competitive advantage**

The service business is becoming a major area of competition for manufacturers. The IoT has become the key for successful service competition and the protection of the current service business.

Capitalise on the installed base: The IoT turns a product into a data source that creates product and market insights. A large IoT-enabled installed base provides critical insights on products, customers and market developments and supports the manufacturers in refining their product and service strategies.

Compete with other service providers: The IoT gives the manufacturer direct continuous insights into the customer's requirements. These customer-insights form the basis for the development of a unique service offering that differentiates the manufacturer from other service providers.

Compete with in-house service departments: The IoT offers the manufacturer critical customer insights to compete with their in-house service department.

The manufacturer obtains the insights to offer the responsiveness and specificity of in-house service departments, in addition to offering its core product expertise. Alternatively, manufacturers can develop IoT-based service offerings to make their unique expertise available to support the

customers in-house service department.

Protect from a new competitive threat: The IoT transforms the service into a data-driven process where companies with a high digital competency will seek to compete. Manufacturers who fail to develop an IoT infrastructure and capabilities will struggle to compete against their digitally savvy competitors, in a market where the data access and analytical capability determine competitiveness. The service business is being changed by the widespread adoption of IoT technology. The IoT provides substantial opportunities for manufacturers to capitalise on their installed base and product expertise, as well as to refine their service offering and create advanced 'pay per use' or 'managed service' offerings. But at the same time, the IoT changes the competitive landscape for the manufacturers' services, introducing new areas of competition and new competitors into the service market.

### **Focus of this white paper**

This white paper analyses the opportunities the IoT creates for the manufacturers' service business. The following specific insights are offered:

- The diverse range of manufacturers' service business models are categorised.
- The scope of the IoT technology is described and its core implications are outlined.
- Diverse practical service business scenarios and the specific IoT contributions are analysed.
- Critical advice on developing an IoT strategy for the manufacturers' service business is offered.

The white paper offers decision makers in the manufacturing industry important insights and hands-on guidelines to exploit IoT-enabled opportunities.

# Manufacturing Services – A Trajectory

Services have become a critical source of revenue for leading manufacturers. For example, at the Rolls-Royce Group services account for 48% of revenue and at Weir, the exploration and exploitation equipment manufacturer, 66% of revenue is based on services. The [Advanced Services Group](#) at Aston University identified that manufacturers can create a sustained annual business growth of 5-10% by offering advanced services to new and existing customers<sup>4</sup>. In addition, it appears that the fast-growing build-out of core industrial infrastructure across different industries will further increase the importance of the services business as a revenue source for manufacturers.

But transforming the service activities into a strategic business line creates substantial operational and strategic challenges for manufacturers:

- Service offerings must exceed the customary services manufacturers routinely offer customers to support the product. These services are often offered at nominal or no cost to the customer, while the real costs are buried in the price of the product.
- The service offering should be differentiated from the service offerings already provided by others.

Manufacturers that transform their service business lines into strategic business units can end up in competition with their existing distribution and service channels. To avoid conflict, or cannibalising existing service lines, successful manufacturers need to find ways to leverage their unique expertise and infrastructure, in order to achieve the expected service profitability and growth.

The shift towards advanced services for the purpose of growing the revenue and the necessary organisational transformation is captured in the term *servitization*<sup>5</sup>.

To effectively compete in the service market, manufacturers use a wide range of service strategies as can be seen below.

## Product-related services

Product-related manufacturer services are focused on retaining the product's optimal level of performance. These service offerings are designed to minimise product down-time, or unscheduled maintenance.

Product-related services provide a critical opportunity for manufacturers to extend the customer relationship beyond the initial sale, increase the understanding of the product-use context, refine product features and better target customer needs. By providing the product-service a manufacturer can also ensure the product functionality and help maintain the brand reputation.

A manufacturer that offers these product-related services competes against other industrial service providers and its customers' in-house service departments on service cost, responsiveness and quality. As a result, manufacturers need to strategically develop their service offering and service operations to successfully compete with their product-related services. For these manufacturers, that seek to compete with product-related services, the IoT technology has in fact become a key enabler.

## Customer-business related services

Customer business-related services go beyond the product itself and focus on adding direct value to the customer's business. They describe a form of advanced services where the product and the services that support the use of the product are provided as a single offering. Within these services the product is the platform for service delivery and the business context, in which the product is used, is the focus of the service proposition. Rolls Royce's '*power by the hour*' propulsion service is a well-known example for such a customer business-related service. Rolls Royce uses its jet engine as the platform to offer its propulsion service to customers, such as British Airways and Qantas. Within this service model the jet-engine and its availability remains Rolls Royce's responsibility.

Business-related services create substantial opportunities for manufacturers, in the sense that they provide their customers with core business capabilities and become an integral part of their business.

In addition, business-related services also change the manufacturer's competitive position. Service providers are largely unable to provide a comparable service offering and instead of having to compete on price, the manufacturer needs to focus on demonstrating the value these service offerings create for the customer. The manufacturer has to provide customers with clear business improvements by passing on cost-savings, by enhancing the agility of customer's existing business processes or by providing the customer with entirely new capabilities. A study by the [Advanced Services Group](#) shows that manufacturers can reduce their customer's cost-basis by 25-30% through the development of such advanced services<sup>6</sup>. IoT technology is in fact a critical tool for the manufacturer to develop a detailed understanding of the customer business and operations, in order to create tailored solutions that address the customer's core business objectives.

As a result, manufacturers across different industries are not only refining their product-related services, but are also expanding their service portfolio to offer innovative business services that reach beyond the scope of their product. To offer these service-propositions, manufacturers transform their business capabilities to advance their understanding of their customer needs and complement their core manufacturing competency.





# IoT Technology and its Implications

The Internet of Things (IoT) creates an always-on digital link between the manufacturer and its products. This link forms the technology backbone for the development of new manufacturer service models. The IoT World Forum (which includes Cisco, IBM, Oracle and Intel among others) has developed a widely used reference model to illustrate the scope of the critical technology- and software components that link the sensors in the products at the customer's site to the application and business processes at the manufacturer's site.

Specific sensors capture critical product attributes (e.g. status, location, performance, faults), which are passed on to connectivity devices to be

transmitted and made accessible on an IP network. Selective data-processing is carried out at the product-level to filter, summarise and assess the product data before it is accumulated centrally in a database. The incoming data from different sources is abstracted and consolidated to be usable by the manufacturer to monitor the product and its behavior. Specific applications are used to develop critical in-depth understanding of the product and its use, or trigger critical business processes such as pre-emptive repairs.

## IoT World Forum Reference Model



Figure 1: IoT World Forum Reference Model (used with permission from the IoT World Forum).

The ability to continuously analyse the product in-use creates fundamental implications for the manufacturer:

IoT extends the digital enterprise. IoT-enabled products integrate the manufacturer's digital environment with the customer's product-use context. The extent of integration is only limited by the data-sharing agreement - not by location. In some industrial environments the emphasis on security limits the range of data that can be shared.

IoT creates distributed digital resources. IoT-enabled products become a strategic digital resource for manufacturers. As the product-use data drives business process optimisation and critical organisational decision making, a large IoT-enabled installed base becomes a critical source for creating a competitive advantage.

IoT disintermediates the information flow. IoT-enabled products dramatically increase the speed, variety and accuracy of the information manufacturers can obtain about their products. Traditionally, product status information is created by service technicians, or indeed the customer and is limited to a few essential parameters. Detailed near real-time product-status data creates extensive new application opportunities.

IoT produces a digital twin. IoT-enabled products can form the basis of comprehensive digital product representations at the manufacturer's site. PTC - a global provider of technology platforms and solutions that transform how companies create, operate, and service the "things" in the IoT - uses the term 'digital twin' to describe how manufacturers can create rich digital representations of every single connected product with details on its status, configuration and the environment in which it is used. With the use of augmented reality manufacturers can inspect and work on their products without having to physically be at the site.

## The research: The role of IoT in manufacturer services

To identify how manufacturers can utilise the IoT technology to develop their service business models, we examined the IoT application scenarios in fifteen leading manufacturing organisations across a range of industries.

We interviewed senior organisational representatives and industry experts to identify:

- How manufacturers use IoT as a core enabler of product- and customer-business focused service strategies
- How IoT technology enhances a manufacturer's service innovation, growth and profitability
- How manufacturers develop their IoT strategy





# IoT as Core Enabler of Manufacturers' Advanced Services

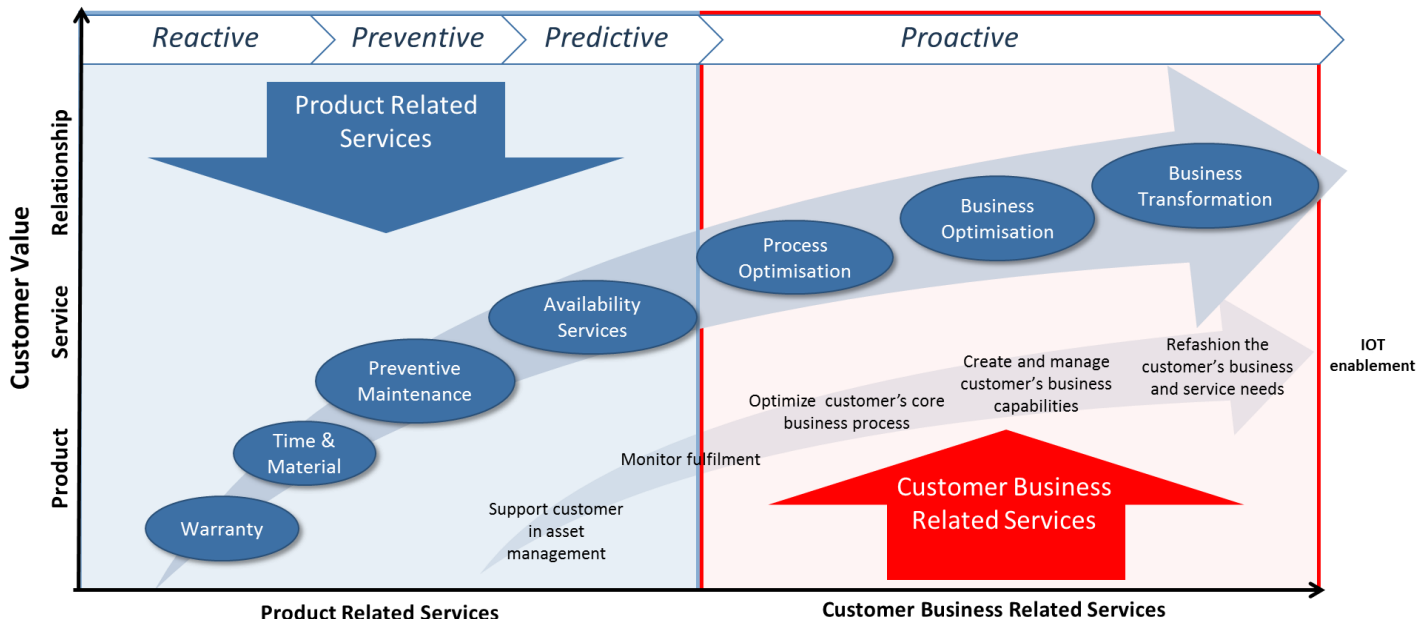


Figure 2: The Service Evolution Model covering all development stages from a Reactive to a Proactive Service Business<sup>7</sup>

## IoT and its impact on product-related services

Most manufacturers provide product-related base services, such as time & material-based repair services and the required warranty services. But leading manufacturers use IoT technology to advance their product-related service portfolio and develop innovative preventative maintenance and availability services to help their customers retain the optimal performance level of their products.

### IoT based preventative maintenance service

Preventative maintenance services are focused on maintaining the product value and minimising unnecessary repair expenses or safety issues. Preventative maintenance service contracts involve regular inspections, adjustments, and parts replacements, which are often bundled with break-fix services to provide responsive technical support on a 'time & material' basis.

For manufacturers, preventative maintenance service contracts play a key role in extending the relationship with their customers beyond the initial product sale and in better understanding their customers' needs. In fact, manufacturers use these service interactions to showcase their range of expertise and often these contracts lead to requests for additional repair or upgrade services.

But manufacturers that offer preventative maintenance services compete on price, quality and responsiveness with other service contractors and also their customers' own maintenance department. As a result, manufacturers need to develop highly efficient service delivery models and value adding service components to compete effectively and develop a profitable service offering. Our research has identified how IoT technology is used to create such competitive preventative maintenance services.

- *Terex Port Solutions*, the manufacturer of cargo handling equipment, uses the IoT technology to carry out remote root-cause analysis in response to service requests. The IoT technology **significantly reduces diagnostic time and repair efforts** as the remotely collected insights help to ensure that the correct technician with the required skills is dispatched or the problem is addressed remotely if possible.

- *Mettler Toledo*, the multinational scale and analytical instrument manufacturer, effectively uses IoT-enabled remote diagnostics to help its technicians to pre-select spare parts for the service visit, in order to eliminate the need for return visits wherever possible. When feasible, repairs are carried out remotely through software updates or configuration changes. The IoT-based insights enhance the manufacturer's **service responsiveness and efficiency**.

- At the *SMS Group*, a leading global manufacturer of metal processing machines, IoT technology provides direct insights into the use and status of critical machine components. These insights help to continuously **refine the maintenance schedule** and to identify additional maintenance measures. The IoT technology is a key component of the manufacturer's preventative maintenance service by **reducing service costs** and **optimising the service delivery**.

- Manufacturers also use the IoT technology to better **demonstrate the value and quality of their products and services**. *Tennantco*, a leading manufacturer of industrial cleaning machines, has developed a web-based portal solution, which supplies customers with IoT-based information on their asset utilisation and maintenance operations, in order to help their customers optimise their own business operations.

- An even more comprehensive IoT solution is offered by *Getinge*, the infection control system provider. Their approach uses the IoT-based data to support their on-site and remote maintenance services at the same time as providing their customers with detailed information on the utilisation and performance of their products.

The IoT solution creates **immediate value for the customer and the manufacturer**. In addition, the IoT solution also enables automatic replenishment of consumables as an **additional value proposition**. But you also have to make sure that clients are [aware of the remote services](#)<sup>8</sup> provided and that they actually value them.

- Manufacturers also start utilising the IoT technology to **support customers with their own self-maintenance efforts**. *GEA*, a leading international manufacturer of food processing technology, for example, is developing an innovative portal and helpdesk solution to effectively assist its customers with their own maintenance activities. A service platform will provide customers with advanced analytics and direct access to critical expertise to optimise their own service and repair efforts. In this service model the IoT-based information, in combination with the manufacturer's analytical capability and expertise, becomes a service offering in its own right.

**All the above examples show how manufacturers use IoT technology to innovate their preventative maintenance services and associated repair services. The digital connectivity and detailed product insights are used to refine the maintenance schedule, identify the maintenance needs, increase the responsiveness and reduce the overall cost of the service provision. The expertise and analytical capability of manufacturers can form the basis of high-value information-based service offerings that are independent of hands-on service activities.**

## IoT based availability service

Availability services contracts are becoming increasingly more widespread among manufacturers. With these availability services manufacturers guarantee customers a continuous uninterrupted utilisation of their product. The manufacturer maintains and continuously monitors the product to minimise the risk of failure or disruption. At the same time, the operational responsibilities and risks are transferred from the customer to the manufacturer.

Manufacturers can capitalise on their product-quality, expertise and access to quality spare-parts, which creates a distinct competitive advantage over other service providers. The challenge for the manufacturer is to demonstrate the additional value the assurance of availability and operational support creates for the customer and to find ways to effectively reduce the additional product risks they have taken on.

Availability services are widely adopted in the IT service context, where remote servicing and analytical automation is straightforward. IoT technology and the access to detailed near-real-time product status information makes it possible for manufacturers to also offer these availability services.

- *Agfa HealthCare* for example offers availability services for their medical imaging technology on the basis of their digital link with their products. The company offers their health-care customers to **monitor, respond and maintain their imaging hard- and software**, which includes specified uptime guarantees. The availability service offering takes advantage of the fact that the imaging technology is already digitised and networked, which provides a critical opportunity for the company to harness their core product expertise and ensure the availability on a continuous basis.

- *Wincor-Nixdorf*, the leading manufacturer of ATM solutions, is another example of a manufacturer using IoT technology to offer product-based availability services. The continuous connectivity and access to detailed product information makes it possible to offer a specified availability service level.

The IoT technology enables the **remote diagnostic and fast response capabilities** that are required to meet the availability commitments. Find out more about [how they did it](#)<sup>9</sup>.

**IoT technology appears to be the key to offering availability services. The real-time access to product-status data provides the manufacturer with remote diagnostics and efficient response mechanisms to minimise the risk of unplanned downtime. Manufacturers also use the detailed product insights to refine their product's risk profile and to understand the risk profiles of the use scenarios to better assess the profitability of availability service contracts.**

## IoT and its impact on business-related services

Manufacturers that offer customer-business related services are focused on adding direct value to their customers' business. The IoT-enabled product is the essential platform for providing these business-related services. Manufacturers use IoT-enabled products to support the *process optimisation, business optimisation* and *business transformation* of their customers.

### IoT-based process optimisation service

Process optimisation services target the customer's operational context in which the product is utilised. The focus of the manufacturer is to improve the customer's business context to optimise the business value of its product.

Manufacturers utilise their in-depth product expertise and insights from a large variety of installation scenarios to optimise their customer's use of their product. Process optimisation services provide an opportunity to showcase product-quality and add business value, but manufacturers need to effectively compete against process consultants and solution service providers, which are already established in that market. And IoT-enabled products provide manufacturers with unique insights to help compete on the basis of their process optimisation services.

- *GE Aviation's Flight Efficiency Service*<sup>10</sup> is based on such a business optimisation service strategy. *GE* is not just using the performance data from its engines to direct its own maintenance operations, but also to help optimise their customer airlines' flight operations. *GE* applies its advanced analytics to the engine data to advise its customers on precision navigation and fuel management to help reduce their operating costs and increase their aircraft utilisation. *GE Aviation* has developed portal-solutions to provide **continuous analytical insights** to airlines, in order to help optimise their flight operations on an ongoing basis.

- An interesting case of IoT –based process optimisation service is provided by Xerox through its subsidiary, *Newfield IT*. This subsidiary operates as an **independent consulting and analytics service provider**, which advises large organisations on the optimisation potential of their printing environments. Their analysis uses device and network data to identify printing needs and optimisation opportunities. *Newfield IT* operates at arm's-length of its parent company to ensure a high value **product-independent consulting and analytics service** and to remove conflicts of interest. The service is either carried out on behalf of the customer (to specify or evaluate printing service requirements), or on behalf of Xerox or Xerox' competitors (to optimise the delivery of a managed print service).

These examples show how manufacturers use the IoT-based product use-data and their unique product expertise to help optimise the context in which their product is utilised. The access to a wide range of product-use data creates the opportunity to benchmark performance and to identify any optimisation potential. In some cases, manufacturers even engage in gain-share agreements in the context of a product optimisation service.

### IoT-based business optimisation service

Business optimisation services are focused on providing the customer with critical business functions and product-related capabilities. Manufacturers use their product to provide and improve their customer's core business activities. The initial example of Rolls-Royce's 'power by the hour' service offering illustrates a business optimisation service: the product (the engine) is used to provide a capability that is core to the customer's business (aircraft propulsion for an airline). The manufacturer (or a financial service provider) retains the ownership and responsibility of the product, which serves as the platform for business optimisation service creation and delivery.

Business optimisation services create a critical opportunity for the manufacturer to develop long-term strategic partnerships with their customers. Based on this, manufacturers provide a continuous and essential capability that is tightly integrated with their customer's business. As a business optimisation service to some extent competes with the traditional product sale model, it is necessary to incorporate cost-savings and service benefits that outweigh the acquisition benefits. What manufacturers do is that they use IoT technology to leverage their unique product expertise, operational scale and efficiency innovations, thus allowing them to manage the product more efficiently than their customers can.

- The truck manufacturer *MAN* in its UK market is heavily reliant on IoT technology to offer its 'transportation as a service' proposition to the haulage industry. *MAN* offers a **pay-per use service model that reduces the customer's fuel bill and other operational costs**. In addition, *MAN* uses IoT technology to assist their customers with the analysis of their driver-behaviour, to advise on opportunities for significant efficiency gains, but also to ensure its trucks operate at their optimal performance level.

- *Abbott*, the manufacturer of clinical diagnostic instrument systems, uses IoT technology to provide diagnostic capabilities as a pay-per-use service to healthcare organisations worldwide. *Abbott* uses its IoT technology to **develop and apply sophisticated predictive algorithms** that help foresee malfunctions, trigger service responses and avoid unplanned down-time to effectively meet its service obligations.

**These examples demonstrate how manufacturers use their IoT-based insights and expertise to provide their customers with critical business capabilities. They also rely on the IoT-based insights to monitor the risks of their service model, as product usage scenarios that are outside the service agreement can be detected.**

#### IoT-based business transformation service

Business transformation services seek to alter the product and service needs of the customers. In the service industry it is not uncommon for companies to fundamentally change their original service value proposition in order to address the root cause of the customers' service requirements. For example, *UPS* not only provides *Toshiba* with the logistics to deliver its laptops, but also looks after the laptop repair service to effectively reduce *Toshiba's* logistics needs.

While manufacturers have been slower in radically innovating their service business models and transforming their customers' service needs, IoT technology seems to be opening up important opportunities for developing these transformative service models.

- *Xerox* with its 'Managed Print and Content Services' is an example of such a business transformation service and the enabling role IoT technology plays. *Xerox*, which started out as a photocopier manufacturer, had already spearheaded the development of 'managed print services', which focuses on providing and optimising the customer's print environment. The evolution into the 'Managed Print and Content Services' further moves the focus from 'devices & printing' to 'capture & content'. *Xerox* helps its customers to optimise their content management and workflow capability and to effectively reduce their printing needs. As a result, the service focus is shifting **from the physical environment of devices and documents to the digital information and communication environment** of its customers.

- *Wincor-Nixdorf's* 'cash-cycle management' is another example of a manufacturer providing IoT-enabled business transformation services. *Wincor-Nixdorf* can not only use the process and performance data from their ATM network to assure product availability, but also to predict the cash requirements of individual machines and offer its customers an optimised cash replenishment service. The insights from its core product form the basis of a **new service offering, which extends its traditional product or service scope**. Find out more about [how they did it](#)<sup>11</sup>.

**This goes to show how manufacturers use IoT technology to develop service offerings that transform the service and product needs of their customers. They innovate with their available digital resources and develop service business models that integrate with their customers' digital environments. The manufacturers' installed product base and core competency is leveraged to create new and mostly untapped opportunities for service growth and diversification.**



# IoT-based Manufacturing Service Innovation: The Core Insights

Manufacturers are using IoT technology to extend and transform their service business. The analysis of the diverse IoT-based service strategies creates a number of important insights for manufacturers.

## IoT as service innovation engine

### IoT is key for service development and delivery

IoT technology turns a product into a platform for ongoing interaction and service provision. Manufacturers utilise the detailed data on the product status and the context of its use (e.g. error-codes, inefficient operations) to inform and optimise the service offering. Manufacturers also use the digital connection to provide remote services and even automate its delivery.

***Insight:** Manufacturers should focus the development of their IoT strategy on creating opportunities for innovating their services and service delivery.*

### IoT extends, not replaces, manufacturers' base services

IoT technology enables the expansion into advanced high value services, but is also used to optimise the manufacturers' base services. Manufacturers that begin to offer customer-business related services continue to offer profitable maintenance or repair services. In addition, the underlying IoT technology supports the manufacturers' wide range of service strategies.

***Insight:** Manufacturers should focus on the range of current and potential future service offerings to develop an IoT strategy that will support the entire service portfolio.*

### IoT supports service and product business

The benefits of IoT-enabled products are not limited to the service business. The detailed insights from the products in-use help to refine the product design and gain market insights. Des Evans, former CEO of MAN UK described the fleet of IoT-enabled MAN trucks on the road as "a mobile R&D center with 10,000 vehicles generating one billion kilometers of data every year".

***Insight:** Manufacturers should base their IoT strategy on the information needs of the different organisational stake-holders to increase the benefit and buy-in across the organisation.*

## IoT to drive service profitability & growth

### IoT creates service efficiency

Earlier research by Noventum<sup>12</sup> indicated that companies which pursue a broad portfolio of growth strategies, including advanced services, grow faster and have better profit margins.

The use of IoT technology directly reduces the cost of service delivery and service operations. In addition, IoT technology creates opportunities for remote services and accelerated root-cause analysis. It creates the option for centralising core technical expertise to provide critical support to field-technicians and improve first visit completion rates. At the same time, predictive modelling helps to anticipate service- and repair-needs to optimise spare parts and service scheduling.

***Insight:** IoT can help manufacturers to reduce service delivery and operations costs, but can also help address the imminent technical skill-shortage to ensure reliable service delivery in the future.*



### IoT extends the service reach

IoT-enabled remote service provision and service automation help to offer service contracts to customers who would typically be outside the scope of service delivery. IoT technology increases the manufacturer's geographical scope by providing efficient analytical support to guide local technicians. In addition, the automation of service operations makes it feasible to provide profitable support services to smaller customers. Moreover, the opportunity to develop information-based service offerings to 'self-maintainers' further broadens the scope of the customer base.

*Insight: As manufacturers explore their IoT strategy they should reassess the scope of their potential customer base, as the IoT technology can broaden the reach of a profitable service delivery.*

### IoT strengthens business risk assessment

Manufacturers use the IoT-based product- and customer-insights to continuously optimise the estimation of future service costs. A growing database of product histories and use scenarios creates an increasingly more accurate understanding of failure rates and optimal support scenarios. In addition, IoT technology helps manufacturers to estimate the service risks and develop a competitive yet profitable service portfolio.

*Insight: Manufacturers should use the analytical IoT opportunities to refine their service and pricing strategies in order to effectively balance the profitability and growth of their service business.*

### IoT as a change in competitive environment

#### IoT introduces new sources of competitive advantage

The value of the manufacturer's IoT strategy is determined by its product use-data and analytical capability. Manufacturers require extensive data that covers a larger time-span and variety of product-use scenarios, together with a sophisticated analytical capability to create competitive service offers and optimise the service delivery. The installed base of IoT-enabled products determines the data that is captured for future analysis.

However, the development of the analytical capability requires ongoing experimentation and evaluations over time. For manufacturers the IoT-based data and analytical capability are becoming core sources of competitive advantage, which develop over time.

*Insight: Manufacturers should examine how their IoT-based products now create the data that is required to compete in their future service business.*

### IoT intensifies competition

IoT technology provides manufacturers with substantial economies of scale and network effects. Investments in analytical capability and the automation of IoT-based service operation and delivery can be recovered across different service models, over a large number of customers. Increasing the installed base of IoT-enabled products and boosting the number of IoT-based service contracts helps manufacturers to compete with optimised service pricing and efficient service delivery.

*Insight: Manufacturers should treat their IoT investment as a core strategic priority to prepare for an intensifying competition in the service business of the future.*

### IoT leads to an entrance of new competitors

For the service business of manufacturers, the access to product use-data and the analytical capability is becoming a key differentiator and source of competitive advantage. As the value of data and analytical expertise increases the service market becomes interesting for data-focused companies, which seek to capitalise on their analytical expertise. These new entrants will support some of the manufacturers with their IoT operations, but will also utilise their expertise to compete for some aspects of the valuable service business. As a result, IoT-based manufacturing service eco-systems will emerge with different collaboration and competition scenarios.

*Insight: Manufacturers should carefully position themselves through the development of digital expertise and collaboration networks to effectively compete with their IoT-enabled service business within these eco-systems.*

# Advice for the IoT Strategy Development

IoT technology transforms the manufacturing service business and our research has identified important lessons manufacturers have learned for the development of their IoT strategy.

## **Accelerate the IoT-based value creation**

The development of an installed base of IoT-enabled products and the development of the critical analytical capability creates substantial long-term service business value. However, it is essential to also focus on the creation of immediate IoT-enabled business value to effectively grow the installed base and stimulate the analytical experimentation.

### Creating immediate customer value

Customers require an immediate benefit to acquire IoT-enabled products or services and agree that their product use-data is utilised. Developing an IoT-based service offering that creates an immediate customer value is critical to grow the IoT-enabled installed base and to capture the critical data which forms the basis for future service developments. To boost the adoption of IoT-enabled products, manufacturers either focus their IoT strategy on developing portal solutions that help customers to better manage their product fleet, or focus on heavily discounting the service prices if the contracts are based on IoT-enabled products.

But how do you ensure that [clients are aware of the remote services provided](#)<sup>13</sup> and that they also value them?

### Prototyping and experimentation

Digital businesses often use agile development methods to explore new business opportunities in iterative ways. The flexibility of the digital environment makes it possible for businesses to

follow the mantra of 'fail fast, fail often' to rapidly develop solutions (together with customers) and create valuable experiences in a short time-frame.

Our research has shown that manufacturers also start to adopt such agile approaches to accelerate their development of IoT-based service-solutions and to jointly experiment with their customers to create shared value with their IoT-enabled products.

## **Allocate the IoT responsibility**

The IoT creates far-reaching implications across the manufacturing organisation. In addition to the service function, the IoT impacts product development, product sales and marketing. Conflicting priorities and independent approaches within the organisation can stifle the IoT strategy development and the creation of a coherent IoT-enabled product-portfolio.

### Bridging IoT priorities

For a manufacturer, bridging the diverse priorities and consolidating the development and utilisation of the IoT infrastructure is critical. A number of organisations involved in this research have already gone through a process of assigning clear IoT responsibilities and formalising the process for integrating the diverse priorities. As the service business arguably will be the function that will create most value from the IoT development, some organisations have decided to allocate the IoT responsibility within the service business.

## **Partner for IoT-enabled service development**

Manufacturers that want to capture the long term strategic IoT opportunities need to develop the basis on which to build the future service business. Establishing a future-oriented IoT infrastructure and integrating the IoT opportunities into an innovative service strategy is essential for capturing the long and short-term opportunities.

### **Selecting a technology partner**

Most manufacturers participating in this study have early on collaborated with experienced technology partners to help develop their IoT approach. Software providers or technology integrators support the complex data capture, storage and analysis elements. Working with a reputable technology partner also helps to overcome the data security among customers.

### **Selecting a strategy partner**

Developing the IoT-enabled service strategies involves a range of challenges that go beyond the development of the technology solution. To develop the manufacturing services that effectively leverage the IoT infrastructure requires substantial developments across the strategic and operational aspect of the service business. Working together with a strategy partner who has the expertise to assess the service opportunities and to develop and implement the service strategies is critical for capturing the business value of the IoT technology.



# Conclusion

Our research has shown how the IoT fundamentally affects the manufacturers' service business. The IoT creates a diverse range of critical opportunities for manufacturers to improve the profitability of existing service offerings, but also to grow the service portfolio by developing new and innovative service offerings. We trust that our research provides a guiding framework that can help manufacturers to identify the specific opportunities the IoT creates for the further development of their service business.

This White Paper is the result of our latest Research Project, which falls under the umbrella of Noventum's [Service Innovation Programme](#).

The objective of the Service Innovation Programme is to facilitate access to all knowledge, practical tools and experience needed to innovate your service business. This is achieved through [Service Innovation Projects](#), [Research Projects](#) and Service Business Opportunity Assessments.

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This Research Project was conducted in cooperation with [Aston Business School](#) and the [Advanced Services Group](#), a centre of excellence at Aston Business School.





# End Notes

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