Aston Business School

Servitization impact study:

How UK based manufacturing organisations are transforming themselves to compete through advanced services

Executive summary

According to media reporting on government data the UK manufacturing base is on its knees. Negative stories about falling production levels and employment, the balance of payments and overall GDP suggest that the outlook for this sector is a gloomy one. After the passing of Baroness Margaret Thatcher, the news cycle around this issue has only intensified. However a very different story is running in parallel to this which could change manufacturing's complexion entirely. A new and alternative services sector is evolving which is rooted in technological competences of manufacturing. This is showing strong growth opportunities, with a number of companies exploiting this strategy to create new and resilient revenue streams. This interplay between manufacturing and services may not be immediately apparent but, in truth, they are already coming together in a way that is re-shaping the future of UK manufacturing. It's a process identified in this report as Servitization.

What is servitization?

Servitization is the concept of manufacturers offering services tightly coupled to their products. It's about moving from a transactional (just sell a product) to a relationship based business model (delivering a capability) featuring long-term, incentivized, 'pay-as-you-go' contracts. Examples include Rolls-Royce offering TotalCare on gas turbines for their airline customers based on a 'fixed dollar per flying hour'; Xerox delivering 'pay-per-click' scanning, copying and printing of documents; and Alstom Train-Life Services supporting Virgin by assuring the availability, reliability and performance of their Pendolino trains on the West Coast Mainline.

After speaking to 33 key executives from 28 leading organisations that have 'servitized', we have identified four key findings:

1. **Servitization promises sustained annual business growth of 5-10%.** The services model triggers product and process innovations, powered by technology, which results in significant year-on-year growth with both new and existing customers. In time, with maturity, this diversification impacts on business resilience, with revenues from products/services typically split 50/50.
2. **Customers of Servitization are reducing costs by up to 25-30%.** Leading adopters of technology-led services are lowering their own costs while driving business growth in their own services to their customers. Companies that have become customers of Servitization have also been able to improve their financial structure, risk profiles and efficiencies around asset management.
3. **Servitization can deliver resilience and growth to the UK economy.** Using technology to drive new service offerings gives manufacturers a new commercial viability to exploit, and offers significant potential for both the regional and macro-economies. Services are bringing them closer to their customers, building high entry barriers for competitors, and positively impacting environmental sustainability.
4. **Adoption is inhibited by a lack of awareness.** The promises of Servitization are fragile, and need to be nurtured while our understanding develops. Businesses and policy-makers must therefore help create a shift in culture, creating the skills; contracting structures; governance; risk management mechanisms and financing systems that will allow companies to deliver services while building their capabilities to innovate technology along the way.

The servitization model offers an 'alternative way' for industrial strategy in the UK. Industrial operation is becoming increasingly sophisticated and services should no longer be treated with the 'either-or' logic of the past, rather as an addition to existing practices. As a means of competing with cheaper overseas production costs it may be vital to the future of UK manufacturing. But a shift in mind-set, organisational structures and operations is certainly required, and this extends to the way in which GDP statistics are collected and reported. This is to facilitate a move away from the over simplistic view the reported statistics portray that 'manufacturers make things and services do things for us'.

If properly embraced, servitization can create longer term relationships between suppliers and customers, built on trust and delivering more balanced and sustainable growth across the UK economy. But with growth in the manufacturing sector almost stagnant[1] and even the long-term competitiveness of services being questioned, the time to act is now.

[1] The index of manufacturing fell by 1.4% in February 2013 when compared with February 2012., as published by the Office for National Statistics' 'Index of Production 2013'

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Introduction

With the passing of Baroness Margaret Thatcher, we continue to debate intensely the rights and wrongs of favouring a service sector in the UK over manufacturing, and the desirable balance in the economy. But our arguments are based on shaky foundations; original equipment manufacturers (OEMs) are themselves transforming into services providers and so blurring our perspective. This phenomenon is becoming apparent across all industry in the UK.

The business community is struggling to give a name to this transformation. In this paper we use the term ***servitization***[2] to embrace the increasing importance of technology-enabled services offered by OEMs. This term originates in marketing research of the 1980s and 90s, and has broad acceptance amongst engineering and business researchers. Servitization is an evolution in our ideas about manufacturing; it extends our definitions beyond production and factories, and represents those OEMs who are following a services-led competitive strategy and business philosophy. Here, we use the term manufacturing very broadly, to represent all types of organisations with 'technology-innovation' capabilities at their core, whether they are large producers of physical assets (e.g. Alstom with both power generation and trains, Rolls-Royce with gas turbines, MAN with trucks, HCL with IT services in a managed service model) or smaller businesses producing less tangible products (e.g. software delivered via the Cloud, or 'software as a service').

The adoption and impact of servitization within the UK economy have yet to be understood. Our aim in this study has therefore been to explore: how servitization takes place in practice; the drivers, benefits, enablers and inhibitors of servitizing; and the impact upon the industrial landscape in the UK. This is a complex topic to study. Convention favours broad surveys using production-centric metrics (production levels, employment etc.) but such an approach would not accurately reflect how services business models shape organisational performance (commercial viability, customer experience, value for money). In this study we have therefore chosen a Delphi research methodology to capture evidence and opinion from 33 senior executives, in 28 different sized organisations, from a cross section of UK industry.

In developing this paper we have set out to build the evidence base underpinning servitization. While reliable and relevant metrics are elusive, there is a growing body of senior executives who are willing to explain their experiences. It is these experiences that we have brought forward in this paper, providing examples and quotations throughout that demonstrate that the findings we put forward are formed on evidence from industry. We focus on five areas:

- Servitization and technology-enabled services
- Transformation: moving from a product to a services focus
- Impact on the customer and manufacturer
- Enablers and inhibitors
- Potential for UK business and the economy

Our intention is that this paper should explain the concept of servitization and develop a story that reflects how OEMs themselves are affected. In order to illustrate the business transformation on which we focus, we first summarise the transformation of Xerox.

[2] For a fuller description of this topic see: Made-to-serve; how manufacturers can compete through servitization and product-service systems. Baines and Lightfoot, 2013, Published by Wiley.

About our methodology

Servitization is a challenging topic to study; nuances can be easily misunderstood and often require careful explanation. In order to gain a reliable insight into practice, we followed a Delphi research methodology; a systematic and interactive investigation structured around a panel of experts. Each panel member was interviewed for between one and three hours, using a set of research questions.

The conversations were recorded, transcribed, coded and analysed by the research team to find common themes. A draft report was created and circulated amongst the experts to check accuracy and ensure their views were captured in full, and the interviewees were encouraged to review their earlier answers in light of the replies of other members of the panel. A second round of interviews then followed, with the responses helping to shape the final revisions to the paper.

The expert panel comprised senior executives from a range of 28 organisations in the UK. These organisations were chosen because they were either businesses with a manufacturing heritage that had implemented a services-led competitive strategy successfully, or customers that had adopted services from such organisations successfully. Collectively these executives provided insights across the sectors of health, infrastructure, transport and energy (see appendix 1).

Throughout this study the Aston research team partnered with Xerox. This organisation has a long heritage of delivering advanced services coupled to its equipment, and this year generated over half of its revenue from such services. In celebration of this achievement Xerox staff helped with the design of this study to ensure that the outcomes were directly relevant to industry. In true partnership style, the Xerox team (Zachary Emmett, Sonia Panchal and Tim Pearce) respected fully the autonomy and independence of the Aston research team (Tim Baines, Gill Holmes, Patrick Keen, Howard Lightfoot, Iain McKechnie and Eleanor Musson).

The Xerox story

Since the invention of Xerography 75 years ago, the people of Xerox have helped businesses simplify the way work gets done. Today they lead in business process and document management.

Xerox's founder, Chester Carlson, was a patent lawyer and had to deal with composing many copies of the same document by hand. He focused on inventing technology – 'dry writing' – to turn this arduous task into a simple business process. His intent was to "make office work a little simpler, a little less tedious and a little more productive". After enjoying an early dominance in the business market that today equates to companies like Google's juggernaut, Xerox has seen its fair share of obstacles to overcome. There was fierce competition from the Japanese in the 1970's; Apple's use of Xerox technology in the 1980's; and a 'near death' and turnaround at the start of the millennium. And now – today – digital technologies are changing the way people work. Through it all, the company's focus has always been on the customer and creating innovative technologies to help them get their work done. Xerox started looking at the printing environment from a holistic perspective rather than assuming that customers simply wanted cheaper equipment and supplies. The drive was to provide services that would gain control over all aspects of their printing, and the result was the creation of Managed Print Services (MPS).

The company continued to develop capabilities in document management (an industry it created), business process and information technology outsourcing. In 2010 it acquired Affiliated Computer Services, the largest independent business process outsourcer in the United States. This now means Xerox can focus on and transform the back-office operations of businesses and governments: for example in HR, customer care and finance. It provides shared scale and access to expertise to make these operations more productive, reliable and sustainable. Service provision has been a financial success for the company. In 2012, 84% of Xerox's $22.4 billion revenue was annuity based, with services revenue growing 6% from 2011, to $11.5 billion. The company has grown from its origins of delivering on-site, small scale contracts to become a professional shared service organisation delivering substantial outsourcing contracts to its customers, underpinned by its own technology.

Looking to the future, people are increasingly mobile, digitally literate and 'green'. This is shaping how users approach documents and print. 'Information overload' is diminishing their effectiveness and that of the organisations they work for. They need help to stay competitive. Yet paper's role in business remains important: it is still the process and systems integrator, connecting people with business systems. Its operational role needs to be understood by getting insights into customers' operations. Emerging technologies that Xerox has a hand in developing can be used to understand languages, analyse images and route data to help processes cross the 'paper-digital divide'. Automation techniques can be used to streamline paper's use inside business processes: to increase business velocity as well as reduce costs. Ultimately processes can be completely outsourced by routing the workflow to a workflow to a Business Process Outsourcing (BPO) provider. All activities Xerox can support today. Constant changes in technology and work habits will always lead the business world to places yet to be explored. No matter where business goes, Xerox will be working to 'make office work a little simpler, a little less tedious and a little more productive'.

Servitization and technology-enabled services

At the outset we sought to explain how OEMs actually compete through services. *What is particular about these organisations? What types of services are they offering? What are the features of these? And, how might a customer adopt these services?* The following outlines the picture that emerged from the study.

Technology innovators as services providers

Many types of organisations are engaged in delivering services. Our focus has been on one type in particular; those organisations that have been engaged historically with original equipment manufacture, and that have innovated their business models from being production-centric to services-focused. This is a process of servitization, and the language used to describe both these organisations and the change that they have undergone is emotive. Those 'manufacturers' who are advanced in this transformation rarely want to associate themselves with this label, preferring instead to be known as 'service partners' or 'providers'. Yet the phrase 'services company' alone does not do justice to these organisations.

These are services providers who are also technology innovators. These innovation capabilities manifest as research, design and production processes that result in intellectual property that differentiates these organisations from more conventional services providers. These organisations exhibit a capability to actually create a product (or asset), put it in the field, manage it, maintain it, repair it, improve it, and dispose of it at end of life. Alstom Transport, for instance, sees itself as holding the *'technical know-how and know-why'* that enables a more exclusive service, and Xerox refers to itself as *services driven, technology enabled*. For customers of Xerox, such as British Airways, the value of Xerox's technology innovation capability is its ability to *'understand, and redesign the technology and make sure it's appropriate for the application and help improve the efficiency and effectiveness of processes within which the technology sits'*.

Advanced technology-enabled services

Manufacturers can deliver various forms of service. It is not unusual for OEMs to deliver both 'base' services (e.g. spare parts for products) and 'intermediate' services (e.g. maintenance, repair and overhaul) all of which rely on technology to some extent. Our particular interest, however, is with advanced, technology-enabled services. Xerox's 'Managed Print Services' is one example; rather than simply selling printing equipment, the company offers 'document solutions' to customers. This means that for a typical customer, such as BA, Xerox provides:

> *'Project management, implementation of all the new technology or the new workflow, through to providing the hardware. They're managing third parties that they're interfacing with, companies like the Royal Mail and courier companies on our behalf.'*

There are various types of advanced services that can be offered, and a wide variety of terms is used across industry to describe these (e.g. availability contracting, performance contracting, managed services, solutions). However the outcome of these contracts is, invariably, a capability for a customer to perform a business function or process. This is distinct from more conventional services where the outcome is product ownership and maintenance of an asset's condition.

Features coupled to advanced technology-enabled services.

Confusion arises because particular contracting features are often coupled to advanced services. There are four key features; the first three of these are relatively widespread:

- **Pay-for-use revenue payment:** pay-per-click, pay-as-you-go, power-by-the-hour etc. are all terms used commonly to refer to advanced services. For instance, in its contract with Xerox, Islington Borough Council receives a 'click charge' each time a document goes through a machine.
- **Long-term contracts:** Contracts of fewer than two years are rare. For example, The Heart of England NHS Foundation Trust has a ten year contract for its pathology laboratory facility, while in power generation, GDF Suez will enter into contracts of 20 to 25 years.
- **Risk management:** The provider takes on the responsibility for ensuring asset availability, condition and performance. An Alstom train can incur penalties of £600 for every minute of delay in arriving at a station if the fault is with the OEM.

Advanced services contracts also increasingly feature commitment to on-going process improvement and cost saving. This is illustrated by BA's tendering processes:

> *'We could just have employed someone to deliver letters around our business and that's it – and there are plenty of companies out there who can do that – but it's the one that has the capabilities and also the vision to start saying well do you need to physically deliver that letter, what about a scanning it in as soon as we receive it and pushing it through a digital workflow? What about pushing into a digital mailroom, so that your chief executive can read his letters whether he's in his office in London or whether he's over in Spain or if he's in Chicago?'*

When these four features are coupled with the principle of delivering a capability, contracts become sophisticated and demanding. Many existing contracts are relatively large, which is perhaps part of their appeal to OEMs. For instance, MAN Truck and Bus UK has 10,000 vehicles under contract at present, and expects this to grow by 50% over the next three to five years, to represent £200 million of business. The Heart of England NHS Foundation Trust's five year contract in its pathology laboratory is valued at £20 million per year.

Customer engagement with advanced services

Advanced services imply a redefinition of the boundary between those activities that are carried out by the customer and those performed by the manufacturer. Three forms of customer engagement are identified by Finning UK;

> *'…customers who want to do it themselves; customers who want us to do it with them, and customers who want us to do it for them.'*

Our particular interest is in the third type (advanced services). However these call for the customer to release an element of control, and there are only certain parts of their operations where customers are willing to do this.

Much revolves around the criticality of the asset. As managers at GDF Suez stress, the operation and maintenance of an asset which they see as delivering a core competence is likely to be retained, but, something simpler like an air compressor would have a service contract with the supplier, which in turn takes on the risk associated with providing the capability.

Willingness to engage in advanced services is ultimately a balance between business criticality and confidence that the customer has in its services partners. Historically, many OEMs are not particularly good at support, focusing mainly on building and delivering a product. In order to succeed, their services capabilities need to be demonstrably better than those of the customer.

Transformation: moving from a product to a services focus

Having established the services being offered, their features and characteristics, we sought to understand what had caused OEMs to develop services strategies: *How had early adopters come to servitization? What factors drove customers to adopt advanced services offered by OEMs? What factors drove OEMs to offer these advanced services? How had OEMs begun to change their organisations to realise these opportunities?*

Origins of services strategies

Some OEMs were very much encouraged to move to services by their customers. For MAN Truck and Bus UK the driver was the 2006 Heavy Duty Truck Comparison in which the company was placed seventh out of seven for customer service; GKN undertook an initiative to look at what its future customers want; and Selex Electronic Systems also moved to services in response to customer demand. Market pull has also occurred through indirect routes; the UK government has inadvertently helped to stimulate servitization through large infrastructure projects where it sought to encourage private finance. Alstom Transport illustrates how this occurred;

> *'Prior to privatization national operators, like British Rail and London Underground, carried out their own maintenance. They bought their own rolling stock, and in some cases with British Rail they made their own. When private finance came into it, it became a matter of risk management, and a matter of the banks and the finance companies saying, 'you want us to provide money, so we want to make sure that the asset remains in tip-top condition and that there isn't any potential compromise to the life of the asset.' To do that, they sought the OEM to be involved.'*

OEMs have also encouraged their customers into servitization; Rolls-Royce came up with proposals which were put to its customers as innovative ways of doing things, but which also achieve the objectives of keeping out other players which were emerging in the marketplace.

Ultimately no one mechanism appears dominant; the origins are summarised by British Airways as an interplay of customers seeing an opportunity to manage costs, and OEMs realising that they can't just rely on producing hardware and that they need to look at the soft services as well.

Initial drivers of servitization

Understanding initial drivers of servitization is fraught with difficulty. The benefits realised by a host can inspire a level of 'post-rationalisation' of the decision, and so caution is needed. However, we were able to identify a number of initial drivers, and found that they fell into two categories (See Table 1);

- Defensive: Improvements in business efficiencies, cost savings and predictability
- Offensive: Improvements in business competitiveness, focus and growth

For customers, defensive drivers were concerned with improved financial, risk and asset management. Desires for cost saving were prevalent. British Airways, for example, sought cost savings and improvements in efficiency; the Heart of England NHS Foundation Trust targeted economic drivers; and typical customers of Selex Electronic Systems desired a year-on-year improvement in cost reduction. Other customers sought to transfer capital expenditure to variable revenue payments (carrying these on the profit and loss account rather than the balance sheet). Hoyer, for instance wanted a pay-as-you-go system where costs were 'per mile' driven, so that its overall contract costs were more predictable.

	Customers	Providers (OEMs)
Defensive Improvements in business efficiencies, cost savings and financial predictability	**Seeking to improve financial, risk and asset management, through:** • Initial cost savings • On-going cost reduction • Transfer of fixed costs into predictable variable costs • Improved asset security • Improved asset reliability	**Seeking to improve commercial viability through:** • Response to customer demand • Competitor lock-out • Smooth revenue streams • Response to legislation • Product life-cycle extension
Offensive Improvements in business ompetitiveness, focus and growth	**Seeking to Improve focus and investment through:** • Focus on core competences • Higher capital investment • Advanced technology adoption and access to associated skills	**Seeking to improve growth through:** • Greater customer intimacy (understanding customer operations / developing relationships) • Market adoption of product innovations • Market adoption of business process innovations

Table 1: Initial drivers of service strategies

What factors initially drove customers to adopt services offered by manufacturers?
What factors initially drove manufacturers to offer these services?

Customers were also motivated to adopt manufacturers' services to drive focus and investment. For instance, British Airways saw these services as taking a lot of its 'pain' away and enabling a focus on the core business of being an airline. Similarly Hoyer sees itself as an expert transport company, whereas the management of workshops is not a core competency.

OEMs, by contrast, were driven towards offering advanced services to defend their commercial viability. In particular, responding to the demands of their customers and so preventing competitors from gaining a foothold in their markets. Alstom Power illustrates this;

> *'…once a third party's into one of our machines here, they can possibly attack around the world and that's what we try and stop with these contracts.'*

OEMs were also driven towards services to assert their capabilities in the market, helping to gain market acceptance for new innovations that would lead to business growth.

Organisational change within the OEM

Both customers and manufacturers have undergone significant organisational change through the adoption and delivery of advanced services. In this study we only sought to identify those at the forefront of executives' minds. Most prevalent were changes to staff and organisational culture. For instance, MAN Truck and Bus UK had to instigate a complete cultural change, coupled with changes to organisational structure, while GKN created a dedicated organisation with particular service skills.

It is often necessary to engage partners to enable the delivery of the complete set of services demanded by the customer. For example Xerox interfaces with companies like the Royal Mail and courier companies on behalf of its customers. There is also a need to adopt new information and communication technologies to report on the location, condition, and use of product in the field. This facilitates management information (MI) that goes back to the customer, and provides transparency and a firm basis for joint conversation around service enhancements.

Change management is wrought with challenges, many of which are not particular to servitization. Transformations are not achieved overnight. Many of the organisations we have studied have been on a servitization journey for at least a decade – such as GKN which started its transformation 10 years ago. For others this has been shorter; MAN Truck and Bus UK rose from seventh position to second place in the Heavy Duty Truck Comparison in the space of four years.

Services strategy benefits

The initial stimulus and drivers are helpful in understanding the early adoption of advanced services. More useful still is to understand the actual benefits that both customers and manufacturers have realised. *How well did these align with their drivers? What other benefits were realised? What draw backs have become apparent?*

Benefits; realisation of early drivers

The companies we studied realised the benefits they sought. Table 1 expresses the 'initial drivers' that helped to explain the particular motives for both customers and OEMs to servitize, and Table 2 shows what they achieved. As expected those organisations featured in the study recorded success (the criterion for their inclusion) nevertheless it is reassuring that their strategies realised the specific results they sought. For example, against the customer drivers given in Table 1 the following achievements were recorded;

	Customers	Providers (OEMs)
Defensive Improvements in business efficiencies, cost savings and predictability	**Improved financial, risk and asset management, through:** • Initial cost savings • On-going cost reduction • Transfer of fixed costs into predictable variable costs • Improved asset security • Improved asset reliability *Also:* • Improvements in safety • Environmental improvements (e.g. energy cost/legislation) • Organisational change	**Improved commercial viability through:** • Response to customer demand • Competitor lock-out • Smooth revenue streams • Response to legislation • Product life-cycle extension
Offensive Improvements in business competitiveness, focus and growth	**Improved focus, investment and performance, through:** • Focus on core competences • Higher capital investment • Advanced technology adoption and access to associated skills *Also:* • Improved service quality to the end user	**Improved growth through:** • Greater customer intimacy • Market adoption of product innovations • Market adoption of business process innovations *Also:* • Growth of customers • New customers • Improved product design

Table 2: Benefits of service strategies

How did customers actually benefit through services? How did OEMs benefit? What additional, unexpected benefits were realised?

'We've handed over that activity to Xerox, and now we just consume on a great pricing code.' [British Telecom]

'We put in a managed print service to take a million pounds off the cost of printing a year, and we did it.' [University of Nottingham]

'Investment in terms of the rolling stock and the infrastructure has been huge.' [Alstom Transport]

The manufacturers spoke of equivalent experiences against their drivers;

'If we had not engaged as a service organisation this company would be dead.' [MAN Truck and Bus UK]

'Nobody else can run this equipment more efficiently than we can, nobody else can provide the parts and the correct service provision better than we can, so it's a very unique position.' [Finning UK]

'Right now we've got several hundred million pounds' worth of contract agreements or business …it is very sizeable and far beyond just supplying a part.' [GKN]

Benefits; beyond early drivers

The benefits of these advanced services far exceed the original motivations for their adoption. Table 2 shows how this picture has developed, beyond the early drivers of Table 1, illustrating what servitization has enabled in these organisations.

For customers, there have been improvements in safety and environmental sustainability. MAN Truck and Bus UK reported that the services it provided improved fuel consumption by at least 10% and reduced CO2 emissions by 10-15%. The University of Nottingham sees its document management systems as about 70% greener. In addition, these services have enabled structural change that was elusive within the customer.

From an offensive perspective, customers have also improved their own competitiveness through improved service quality to their own customers. For instance Alstom Transport described how the West Coast Mainline was actually smaller than the East Coast when Virgin (and partners) took it over. Today it is twice the size of the East Coast because of the improved standards of rail travel: there are now up to 32 million passengers a year travelling on it.

For manufacturers there has been a range of significant benefits to growth in terms of customer numbers, markets, and new market entrants. Growth with existing customers has been achieved through improved customer intimacy brought about by closer and stronger relationships. Moreover, new market opportunities have been created; for example, Rolls-Royce services such as TotalCare have supported the creation of low-cost airline operators because the emphasis on maintaining the product is with the OEMs. There have also been benefits to product development, as exemplified by MAN Truck and Bus UK;

'The truck is a mobile R&D centre…I've now got a ten billion kilometre database of all categories of transport where I can show quite clearly what our vehicles cost to operate.'

Similarly, Xerox is now managing over 1 million devices, half of which are those of competitors, so providing incredible insight into the technical features and performance of products in the market place.

	Customers	Providers (OEMs)
Defensive Improvements in business efficiencies, cost savings and predictability	**Cost reductions that can be attributed to advanced services.** BA – 30% saving in printing and reprographic costs Islington Borough Council 28% reduction in printing costs over 4 years Sandwell Borough Council 30% reduction in printing costs over 5 years, delivered through Transform Sandwell BT 40% saving on reprographics over 4 years BAE Systems: "UK National Audit Office recognised significant cost savings for MOD"	**Current product/ service mix.** BAE Systems: 50% product 50% services Rolls-Royce: 50% product 50% services Xerox: 46% product 54% services Alstom Power: 60% product 40% services Evidence of range of companies aspiring to a split of 50% product and 50% services; (e.g. Alstom Power – *'by 2020 it will level out at around 50/50'*; MarchantCain Design – *"we are aiming for a 50/50 split in five years"*; W.E.T – *"I foresee the business operating at roughly an even split of product versus service in the future")*
Offensive Improvements in business competitiveness, focus and growth	**Improvements in business competitiveness, focus and growth** Business growth attributed to adoption of advanced services Alstom Transport: increase in passenger numbers from 13 million per year to 32 million per year BAE Systems: *"RAF Aircraft in theatre with enhanced capability"*	**Business growth attributed to adoption of advanced services** Xerox: Last year 6% growth in services revenue, due to advanced services, though total growth held back by decline in product sales revenue; MAN predicts 50% growth in services in the next 3 to 5 years Evidence from Alstom Energy suggests a 9% compound growth in services over the foreseeable future.

Table 3: Impact on business performance through service strategies

Quantified impact on customers' performance (cost savings and growth)
Quantified impact on providers' performance (product-service mix and growth)

Quantifying impact

Our goal has been to translate these benefits into quantifiable business impact. The four quadrants in Table 3 indicate how the adoption of services had impacted business performance. For customers, *'cost reductions attributed to the adoption of services from manufacturers'* reflects their desired improvements in business efficiencies, while *'growth of their own services through improved service performance'* helps to indicate improvements in their own business performance attributable to the services of the manufacturer. For manufacturers, a move away from relying only on product sales, and diversification into services, was taken to indicate resilience, while growth in services revenue indicated improvements in business competitiveness.

Quantifiable performance data is elusive and too commercially sensitive for many organisations to divulge. Typically we were told *'we don't feel comfortable sharing details about this but we have seen a very significant increase in revenue as a result of us having embraced advanced services. This is a trend we are seeking to harness and continue into the future'.* Where we were given evidence, we were often not permitted to publish it.

Table 3 captures the limited data that organisations were willing to share. For customers, leading adopters have experienced significant cost reductions through the adoption of advanced services. These range from 25-30%. Although the data points are few, there is clear indication that significant savings are possible. Likewise, while we were told of many improvements to services of customers, only Alstom Transport was able to indicate this impact by describing the change in passenger numbers on the West Coast Mainline.

Evidence is stronger for OEMs themselves. A range of companies indicated that they had either achieved, or are striving to achieve a 50/50 split in product/ service revenues. Although it is difficult to establish the precise make-up of these service revenues, there is clear indication of a 'balanced economy' within manufacturers themselves, improving their resilience to economic downturn. As for growth, the evidence we have suggests that OEMs themselves believe they can achieve a growth in services revenue in the region of 5-10% per year. Again, there are many caveats to this figure; the main take-away point is that growth is seen as achievable in an otherwise stagnant economic context.

Business trade-offs

The counterbalance to the benefits of offering advanced services is complex. It is all too easy to become distracted into a debate around the challenges of transforming and adopting servitization. Our focus is not this change management process. Instead, our interest is in understanding the drawbacks of being successful in adopting and delivering advanced services.

For the customer, one danger is that the long term contracts associated with advanced services have the potential to disrupt innovation and technology adoption. Moreover the number of people employed in the delivery of services can reduce, especially within customer operations. This may be a desired change, but may, in some cases, inhibit adoption. For example, Alstom Transport cites Bucharest Metro, where the workforce has gone down from 1,700 to circa 850, by moving it from public to private operation.

For manufacturers themselves, conventional revenue streams are likely to reduce. Sales of spare parts will decline, and the internal consumption of spare parts (for repair and overhaul) reduces as these become a burden on the host; Alstom Power has seen its concentrated product development and support organisation shrink significantly.

Enablers and inhibitors of service adoption

Our study also explored the process of advanced services adoption. In particular: *What factors are inhibiting and enabling the adoption of these services within both customers and OEMs?* Table 4 summarises our findings.

Inhibitors within customers

Customers resist engaging in advanced services where they are unconvinced, uncomfortable, or unable. There are practical factors around: ease of product substitution (e.g. if it fails it can be replaced easily); availability of suppliers that can offer a sufficient range of technologies; and institutional unwillingness to engage in outsourcing style contracts. Adoption will also be hindered where there is fear that being overly dependent on a single supplier may restrict the customer's ability to obtain value for money (both now and in the future). For example, Finning UK described how some of its customers fear that putting 'all their eggs into one basket' may restrict their ability to get best value for money, and Islington Borough Council stressed the importance of knowledge retention to enable market re-entry, should this be desirable.

Even when the prospect is appealing, the customer may not be able to adopt advanced services. Limiting factors exist around process compliance, budgeting systems, data systems, legislation and contracts. For instance, Heart of England NHS Foundation Trust stressed the importance of process compliance before services can be considered for outsourcing. Contract complexity can inhibit both the customer and manufacturer. Another factor is a lack of people with the appropriate contracting skillsets. Moreover, even when a contract is in place, there may be a reluctance to continue engagement if the customer feels service levels are not being met or more generally that value is not being demonstrated.

Enablers within customers

Customers are enabled to adopt advanced services when they are confident of clear organisational fit, and have processes in place that reassure them of value for money, by either benchmarking or reliably knowing their own costs. In the case of Eon UK;

> *'You're okay actually letting the manufacturer do the services for you but you want to feel confident that you're getting value for money.'*

Trust in the services supplier has a direct impact.

> *'We have to trust them that they're not just going to walk away and leave us with very little support.'*
> *[Heart of England NHS Foundation Trust]*

> *'For our customer putting more trust in their client was quite a major change of culture for them which they struggled with for quite a few years before certain people recognised the benefits.' [Rolls-Royce]*

Inhibitors within manufacturers

Manufacturers share inhibitors around contracting, finance, and data systems. The skills to construct usable and reliable contracts are a major inhibitor for smaller organisations, as is the availability of finance from third parties to 'unlock' services contracts.

Assuming that the manufacturer is committed to pursuing servitization and delivering advanced services, there are also particular inhibitors that impact their ability to follow and sustain such a strategy. Linked to contracting is the lack of intellectual property within the manufacturer to innovate and modify its technologies to give the cost and efficiency savings.

> *'Sometimes our ministry tries to buy rights to IP…. you'd have thought we were in a strong position. The Australian Air Force came along a bit later and actually got rights to the IP. So somehow or another our Ministry of Defence didn't do ... didn't match up to the negotiations that the Australians got.'*
> *[Marshall Aerospace]*

	Customers	Providers (OEMs)
Inhibitors	**Customers are unconvinced, uncomfortable, or unable when:** • Products are easily substituted • Providers don't hold sufficient range of technologies • There is an intuitional unwillingness to outsource • Value for money is not demonstrated • Technology innovations lack visibility • Control is lost / being dependent is a drawback • Process compliance is weak • Budgeting systems lack flexibility • Management information is lacking • Useful and usable contracts are not available	**OEMs are unable to support services when:** • Useable and useful contracts are not available • Financial resources for business transformation are insufficient. • Management information is unavailable • Contract length is insufficient to recoup investment • Intellectual property to support innovation is insufficient
Enablers	**Customers are confident of clear organisational fit when:** • A trusting relationship is in place • They are reassured of value for money by processes and competition • Applications are repeatable and predictable • Processes can be re-engineered • An evidence-based business case exists • A financially stable service provider is involved	**OEMs are confident and capable when:** • A strong relationship with the customer exists • They have strong relationships with their own suppliers • Their equipment is reliable • The customer is an organisation with credibility • They have the ability to respond to customer need • They have the ability to innovate processes and equipment • They have access to required skill sets, including the capability to setup and manage projects • They have the ability to identify and manage risks (to transformation/operation/reputation)

Table 4: Enablers and Inhibitors of service strategies

Skillsets in general are a major concern for OEMs.

> *'…if you look at where technical skill sets are developed, it's generally within a new build environment. And my concern is with manufacturing- certainly within the heavy industries- actually being minimised, then…will that know-how and know-why and capability be there to sustain service business in the longer term? Now I think if you look at the service businesses in the UK then there's still very heavy skill sets that are there from manufacturing … My concern is, in 20 years will we still have that same capability?' [Alstom Transport]*

Enablers within manufacturers

For manufacturers, a principal enabler is having strong relationships with the customer. As Finning UK argued, *'having the relationship is pretty much key to our success, if not the whole of it'*. Underpinning this relationship is the reputation of the equipment and organisation itself. Again, Finning UK explained that

> *'Customers that want to deal with us know that we are backed by Caterpillar – it's a very powerful brand.'*

Relationships between the supplier and its supply chain are equally important. As Finning UK put this;

> *'We leverage our relationship with Caterpillar, they understand that the customer is our customer, that buys through us to buy and get the Caterpillar product. So one doesn't jump in front of the other, we are very joined up with this.'*

The manufacturer is also enabled by its capability to innovate. This is not simply a case of having a services function and a production function as part of the same organisation; internal systems have to be in place to link these capabilities. Moreover, a capability to set up and project manage a transition to advanced services is essential.

Potential for UK business and economy

The growth of the UK economy is stifled. The index of manufacturing fell by 1.4% in February 2013 when compared with February 2012. The largest downward contributions in manufacturing output were: the manufacture of coke and refined petroleum products, which fell by 16.0%; followed by the manufacture of basic pharmaceutical products and pharmaceutical preparations, which fell by 13.6%; and the manufacture of rubber & plastic products and other non-metallic mineral products, which fell by 6.9%. The only significant increases came from the manufacture of transport equipment, which rose by 8.4%; and other manufacturing and repair, which rose by 1.4%. Analysis is unfortunately complicated by the recession. However, even this indicates a generally declining trend in manufacturing employment and percent of GDP, balanced by a growth in services.

The key question for businesses and the economy on the impact of servitization is around net benefit: *is it going to promote growth through enhanced competitiveness and so reverse this trend*? This is easier to answer at a business level than on an economy-wide level. The companies we have studied certainly indicate potential, with examples of growth ranging from 5-10% year. This confirms previous studies (e.g. Barclays Bank report, 2011) which indicate a positive correlation between the adoption of servitization and growth in revenue, profits, and employment.

At the economic level, however, we must also take account of displacement and ripple effects. *To what extent does the success of a servitized company achieve efficiencies at the cost of other (albeit less productive) businesses and employment? To what extent does the improved ability to compete globally with this business model serve to enhance wealth-creation in the UK?* There is clear evidence that servitization is a response of manufacturers in advanced economies to external pressures, a chance to differentiate their offering, and a way to support economic restructuring and growth. Conceptually, servitization offers an opportunity that can impact both national and regional growth. It moves away from reliance on simply 'selling a product' and builds on technological capabilities.

The senior executives that have participated in this study comprehensively reinforce the message:

> *'Britain went too far towards services, and has got to get back to manufacturing … but the two are completely complementary in these terms.' [GKN]*

> *'You've got a safer, more reliable, more economical and more environmental installed based, number one.' [MAN]*

> *'It presents an opportunity for companies which are basically listed on the UK Stock Market to get a foothold in other markets in the world.' [BAE]*

Exploitation of servitization can be enhanced by industrial policy. Adoption is inhibited by a lack of awareness in OEMs and their customers. This innovation is fragile, and OEMs need help with the associated changes to organisational culture, skills, contracts and financing (Table 4) that are particular to servitization, so that they can deliver services whilst building their technology innovation capabilities along the way. The government did much to stimulate the inception of servitization in the UK with large OEMs in the 1980s; there is now opportunity for a second phase of initiatives. Actions should include:

- Improve the measurement mechanism at a micro and macro-level so that progress in the adoption of servitization can be better monitored within organisations and in the economy as a whole.
- Improve awareness of and incentives for the adoption of services from OEMs (big and small) amongst public servants responsible for both national and regional procurement of goods and services.
- Encourage financial and accounting institutions to appreciate the value of services from OEMs, and aid them in finance and contracting.
- Continue to develop an engineering and technology skills base in the UK, and educate students that these skills can be exploited in the delivery of services rather than simply in products alone.

Concluding remarks

In this study we have engaged executives from organisations that are significantly important to the UK economy. There is little doubt that competing through services is a vitally important concept for the future. It is not a panacea, it is not for all organisations at all times, but it is an aid to improving the commercial and environmental sustainability of the national economy. To summarise:

1. OEMs that have been early adopters of services strategies have largely done so to protect their commercial viability (Table 1). They have also found that services enable innovations to both products and business processes that result in growth in business with both new and existing customers (Table 2). This diversification impacts their resilience (revenues from products/services are typically split 50/50) and enables overall business growth (typically 5-10%, Table 3).
2. Customers use these services to improve their financial structure, risk profile and efficiencies around asset management (Table 1). They have also found benefits to their own growth as a consequence of improved service performance (Table 2). Leading adopters have experienced significant cost reductions (Table 3) and experienced business growth in their own services to their customers.
3. Resilience and growth in the UK economy can be positively impacted by servitization. While the UK economy is complex, multi-faceted and un-predicable, there is real revenue growth amongst OEMs that successfully deliver services. Consequentially the executives in our study see significant potential for both the regional and macro-economy if the opportunity presented by these services-focused business models can be harnessed more effectively.
4. Exploitation is inhibited by a lack of awareness in OEMs and their customers. This innovation is fragile, language needs to coalesce, and nurturing is needed while our understanding develops. OEMs in particular need help with the culture change, skills, contracts and financing that are particular to servitization. (Table 4).

This is a report on industrial practice. It has set out to illustrate how OEMs are competing through a services-focused business model, the impact this has made, and the enablers and inhibitors they have encountered along the way. It progresses our understanding of this phenomenon, but there are three areas where further work is needed in the immediate future:

- **Understanding what fails:** Our study has exclusively targeted organisations that have succeeded with the adoption of servitization either as providers or consumers. It would be helpful to gain insights into organisations that have chosen not to take this route, and it would be valuable to know more about OEMs who have in some way failed to achieve the desired outcomes.
- **Understanding the relative significance of enablers and inhibitors.** Our study has reported on a raft of enablers and inhibitors, but with limited indication on the relative importance of these. Improving our insight in these areas will help shape the strategies of organisations and industrial policy. Knowing what works, and what stops it from working, is critically important to widespread adoption of servitization,especially in the light of cloud-based technologies that offer customers new tools and manufacturers new servitization opportunities.
- **Strengthening evidence of economic impact.** Reliable indicators of the economic impact are elusive. The true impact of industrial innovations is difficult to determine reliably – try assessing the true value of Lean techniques! Nevertheless, we need to continue to strengthen the evidence base to heighten the debate and indicate the opportunity for the national economy.

Appendix:
The expert panel

	Company	Name	Job Title
Interviewed as a customer	Boughey Distribution Services	Paul Brimelow	Group Fleet Engineer
	British Airways	Mark McCarthy	Procurement Executive, Corporate Services, British Airways PLC
	British Telecom	Michael Davidson	Desktop Service Delivery Manager, End User Technology and Security
	British Telecom	Cate Warman-Powell	Procurement Manager, BT Group Procurement
	Eon UK	Paul Morton	Plant Manager, Grain Power Station
	GDF Suez	Michael Maudsley	Manager, Deeside and Shotton Power Stations
	Heart of England NHS Foundation Trust	Simon Hackwell	Commercial & Strategy Director
	Hoyer	Mark Binns	Group Board Director
	Islington Borough Council	John Roberts	Head of Accommodation, Facilities and Corporate Landlord
	Transform Sandwell	Mark Mayer	Chief Operating Officer
	University of Nottingham	Jim Reed	Director of Procurement
Interviewed as a provider	Alstom Power	Alexander Bill	Service Manager
	Alstom Power	Richard Kelly	Operations Director
	Alstom Transport	Martin Higson	Tram Operations Director – Train Life Services, UK & Ireland
	Alstom Transport	Michael Hulme	Vice President – Train Life Services, UK & Ireland
	Babcock International	Andrew Chappell	Head of Supply Chain Capability
	BAE Systems	Terry Warren	UK Defence Collaboration Consultant
	Finning UK	Jason Howlett	Director of Equipment Solutions Division
	Finning UK	Paul Ryder	General Manager Product Support Operations
	GKN	Andrew Reynolds-Smith	Chief Executive, Automotive and Powder Metallurgy
	Haigh Engineering	Mark Brian	Managing Director
	HCL Technologies	Padmakumar Easwarapillai	Director of Manufacturing Solutions
	IBM Global Business Services	Elliot Hirst	Senior Managing Consultant, Product Lifecycle Management
	Malvern Scientific	Kate Browne	Director
	MAN Truck and Bus UK	Des Evans	Chief Executive Officer
	MarchantCain Design	Pamela Cain	Director
	Marshall Aerospace	Neil Goulding	Head of Commercial, Support Solutions
	Marshall Aerospace	Nick Whitney	Managing Director, Support Solutions
	Rolls-Royce	Stephen Marlowe	Head of Services Research and Development
	Selex Electronic Systems	Doug Whittaker	Head of Platform Solutions (UK)
	UK Council for Electronic Business (UKCeB) / Rolls-Royce	Steve Shepherd	Executive Director, UKCeB
	Water Environmental Treatment	Gary Parkinson	Managing Director
	Xerox	Tim Pearce	Head of UK Marketing, Global Document Outsourcing

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