



Servitisation: from products, to profit

Report on Servitisation
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CATAPULT
Digital

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Introduction

In recent years, the UK manufacturing industry has witnessed a rise in servitisation-based business models,¹ with 2020 reports suggesting that 78% of manufacturers surveyed were either developing, or are already offering, services as an alternate revenue stream.² However, despite increasing interest towards the incorporation of servitisation models, uptake in the UK is not as widespread as it could be.



This report explores the business case for servitisation to UK industry, as well as current applications and potential blockers to the practice – particularly in relation to the South West of England and Wales, an area rich in manufacturing subsectors, such as Aerospace and Defence, that could stand to benefit from it.

This report has been written for the DETI consortium to assess the role that servitisation may have in improving manufacturing productivity and contributing to the UK economy, and current practices in the UK and further afield, as well as the appetite and scope for a servitisation centre of excellence in the South West of England region.

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The importance of servitisation to the UK economy

DEFINITIONS

Changes in consumer behaviour, commercial practices and the socio-economic climate have meant that in recent years, many in the manufacturing industry have begun to explore the role that servitisation could play in their business models in order to continue serving evolving customer needs.

Servitisation can be defined as a transformation of the manufacturer from a business which is principally focused on building revenues around the production and sale of products, to one where a significant proportion of the revenue comes from services that focus on the outcome from the use of its products. This does not mean that products are no longer important, but rather that part of the path to markets is through services. This transformation leads to the development of a new business model to better enable the manufacturer to compete through these outcome-based offerings, called 'advanced services'. As a result, through servitisation, manufacturers can potentially achieve differentiation and new sustainable revenue streams.

Though historically the UK economy was dominated by the manufacturing market, over the past 30 years, its share of the economy has declined³ and services have become the dominant element, making up 81% of GDP.⁴ In addition, despite the UK's spike in digitisation intensity, the servitisation activity is substantially lower than EU countries and global benchmarks.⁵ As part of the quest to combat falling levels of productivity in the sector, manufacturers are now looking towards advanced digital technologies, including Internet of Things (IoT) sensors to explore and facilitate various new operating models such as servitisation.

THE BUSINESS CASE FOR SERVITISATION

Servitisation is currently being enabled by two megatrends: society's growing appetite for services – in contrast with an apparent diminishing appetite for production – and rapid advances in information and communication technologies. The latest figures show the UK service sector accounts for 80% of the total Gross Value Added,⁶ and now there is a rapid increase in the number of UK manufacturers also moving towards services.

More industry research estimates a £13.3bn revenue by 2025 from UK manufacturers focused on service business models.⁷ Updated figures suggest over 90% of UK manufacturers are beginning to recognise that one of the most effective ways of tackling post-COVID-19 industry challenges is by exploring more innovative business models,⁸ such as servitisation. As a result, many are learning how to sell various service types directly to the end consumers.

Alongside a reducing market share, the production element of the UK economy – manufacturing – is also seeing low margins from the sale of equipment alone,⁹ and relatively high production costs.¹⁰ By contrast, the services sector of the economy tends to generate more stable revenues and higher margins.¹¹ It has also been estimated that margins on product sales stand at around 10%, whilst margins for aftermarket services reach 25%.¹²

The 'smiling curve' theory, developed by Stan Shih – founder of technology multinational Acer – notes that the manufacturing process itself is one of the least value-adding activities that a manufacturing company can perform. This theory identifies the most value-adding parts of the production chain as being at the beginning and the end of the production chain.

Providing advanced services, the value of which derives more from the performance of the product than from the product itself, is an activity at the end of the production chain. As a result, diversifying manufacturers' offerings from solely product-based transactions to include service-based models can be beneficial in generating a new revenue stream and increasing manufacturers' margins.

Incorporating elements of a servitisation model also enables manufacturers to deliver products that match the evolving and fluctuating needs of consumers. This flexibility for customers can then be given a monetary value. A report by the European Commission notes that enabling 'pay per use' models at varying levels of complexity may include *"...innovative pricing schemes that reflect not the costs of the use of the product, but of the steps involved in delivering a specific outcome linked to the product."*¹³

Embracing a model of servitisation may be a profitable solution for manufacturers in that it can allow for the exploitation of any mutual benefits that may arise when offering both products and services.

BUILDING LONG TERM RELATIONSHIPS WITH CUSTOMERS

Manufacturers may provide services of different complexity, starting with the provision of basic after-sales services, such as installation and maintenance. However, it is at the highest level of servitisation that they can differentiate themselves and build a business with a customer-centric approach.

By transforming the dynamics of manufacturer-customer relations from a one time, completed transaction, to a series of regular interactions, manufacturers are given the opportunity to build a long-term relationship with customers. Through regular, service related communication, manufacturers will be able to update customers on a variety of relevant information, including aspects such as equipment condition, predictive maintenance, and other key indices.





Baxi case study: **Heating-as-a-Service**

Baxi Heating, part of the BDR Thermea Group, is a manufacturer and distributor of heating services and systems with a 150-year legacy of offering traditional heating technologies.

Several important industry changes, including decarbonisation policy, technology advancements and evolving customer needs, have led Baxi to expand its offering. As consumers become increasingly concerned with heating, but not necessarily with boilers themselves, Baxi are looking beyond traditional business models centred around one-off product transactions.

Evolutions in product connectivity enable novel business model innovations such as heating-as-a-service and maintenance plans through remote monitoring, using IoT sensors that allow for higher system efficiency. It also makes for better services, more tailored to specific customer needs, and helps Baxi respond more quickly to its changing operating landscape.



A recent heating-as-a-service trial¹⁴ has helped us get closer to customers than we previously were, in a manner that benefits both sides. Previously, when solely providing boilers, there was little interaction other than when boilers broke down, often at the worst possible time. In this trial however, we have been able to provide monthly updates and advice on the performance and health of the customer's boiler, with quick dialogue to offer support when needed. This real-time system allows for pre-emptive expectations for customers when a fault occurs and we can either help them to sort the issue over the phone or send engineers out.

Offering this remote monitoring and heating service is also beneficial as it works towards emissions reduction goals and a future of sustainability. Data gathered remotely provides customers with the opportunity to use heating in a more efficient way, advising on ways in which they can use less energy and save money. Looking forward, the heating industry may start to look at emerging technologies such as blockchain and how it could be implemented for better operation and service. Some industry discussions have begun on whether it could be possible for customers to trade energy in cryptocurrency or NFTs.

Heating-as-a-service can be customised to suit various customer and industry needs, bringing new opportunities for increased service offerings, especially when blending multiple technologies. This will require ongoing collaboration between stakeholders. Communication across the entire industry of providers of heating systems and products, from manufacturers like Baxi to sensor and control suppliers and beyond – think electric vehicles – will allow customers to get bigger benefits across the board.

**James Galloway – Head of Product Marketing,
Commercial, Baxi Heating**

THE POLITICAL CASE FOR SERVICITISATION

Governmental bodies have expressed particular interest in both advancing the adoption of servitisation in the UK, and studying the ways in which it can help manufacturers to innovate and differentiate themselves from foreign competitors. As noted earlier, the UK manufacturing sector currently lags behind other sectors of the economy in terms of productivity, a challenge which the UK government seeks to change by helping to strengthen the resilience of firms currently making manufactured products.

The Government Office for Science's *Services Transformed* report¹⁵ confirms the support from both governmental and non-governmental bodies for the notion that implementation of servitisation could help to restore national productivity, as well as to enable the creation of an ecosystem that allows for testing different service delivery models. UK innovation funding body UK Research and Innovation (UKRI) has launched various funding schemes and competitions, including its Next Generation Services challenge¹⁶ to accelerate the deployment of technologies in high value-added services, whilst the Industrial Strategy Challenge Fund has unlocked £20 million to help businesses adopt Artificial Intelligence (AI) and other data-driven technologies for services, including servitisation.¹⁷

In 2017, the UK government published the Made Smarter review in collaboration with technology conglomerate Siemens as well as other manufacturers and industry players to identify the ways in which industrial digital technologies such as AI, robotics and Internet of Things (IoT) devices can be leveraged for manufacturing.¹⁸ The report notably describes the opportunities and benefits that servitisation could bring to industry, and advocates for the importance of services in manufacturing and industrial digitisation. The government also endorses the Made Smarter programme in an effort to stimulate productivity in manufacturing small and medium-sized enterprises (SMEs) through advanced digital technologies.¹⁹

More recently, the 2022 *Levelling Up White Paper*²⁰ noted the importance of reversing the 'historic decline in manufacturing in the UK' through the use of innovation activities. Amongst other points that will be explored later in this report, this White Paper notes governmental intention to improve the economy of various regions throughout the UK, and the ways in which to support industries of strength in those regions, including through the use of advanced digital technologies and new business models to aid regional and national growth.



Fostering a digital ecosystem to support servitisation

Servitisation of any product or service requires precise sensing of certain data parameters such as appropriate usage and conditions. IoT equipped legacy and new solutions can help to achieve this precision by streaming data from ground level to Business Intelligence (BI) level where it is turned into useful and readable information before being utilised to achieve business objectives.

Until the 2010s, technology solutioning around data primarily involved software development or hardware with some firmware bundling. In these technology areas, as well as others such as network infrastructure, solutions were provided through separate streams. This was particularly the case for non-proprietary solution development. However, in recent years, as industry has begun to enter the accelerated IoT era, more data is being collected than ever before, with the implementation of all the necessary components for a servitisation-ready IoT solution including tailoring sensors, connectivity, hardware, cloud services and other aspects at the same time. Whilst the list of necessary components may expand or shrink according to the use case in question, each of these domains requires expertise and specificity of products, and there is currently not a single vendor that provides all these components.

However, this complexity in IoT solution development has taught the technology sector to form unique ecosystems of technology providers that are specialised in their specific component areas and can work in harmony to create the necessary requirements for servitisation. For example, using a gateway in a solution may require a SIM card for data transmission and may need a cloud endpoint to store, compute and serve data. The data on the other hand may need to be processed and landed into a Customer Relationship Management (CRM) system for Service Layer Agreement (SLA) utilisation. Presently, each of these components is provided by different vendors, each acting as a piece of the IoT solution puzzle. The whole puzzle is the solution, but this ecosystem of pieces is necessary to get the complete picture.

The generation of this ecosystem is seen at the solution provider level, with players ranging from system integrators to technology distributors. These companies aggregate project-based technologies that are more specific to particular use cases. Conversely, the industry is beginning to see the emergence of several businesses that provide off-the-shelf solutions bringing multiple technologies together from an ecosystem of vendors, enabling them to productise an offering. This allows consumers to have access to ready-to-consume technology and as such, accelerate the IoT device market. However it should be noted that whilst this is true for basic gadgets, a bespoke “servitised product” requires a more developed technology ecosystem and development to achieve a data-driven, customer-engaged, Service Layer Agreement utilised servitisation offering.

THE ROLE OF DIGITISATION AND THE INTERNET OF THINGS (IOT) IN SERVICITISATION

The combination of digitisation and IoT is particularly significant within a servitisation offering because it:

- Allows for the creation of advanced monitoring technology and analytics for both the machine and manufacturing process i.e. monitor asset quality, ensuring on-time delivery, KPIs of machine availability / capability
- Addresses the uncertainties arising from renting the asset capabilities e.g equipment availability
- Enables better auditing of performance, particularly as it is closely linked to payment for services
- Enables information and knowledge sharing, notably concerning the service requirements
- Information-based services require effective data management, which IoT sensors help to facilitate
- Allows for an advanced technology enabled remote maintenance or operation

Adapting business activities to include a model of servitisation in an environment where industry is moving towards digitisation and Industry 4.0 involves the establishment of digital solutions for manufacturing. The digital potential of manufacturers in servitisation could come from several offerings.

One such offering can be visualised through a hypothetical use case. In this use case, a manufacturer wanting to expand their offering to include a model of servitisation creates a comprehensive and wide-ranging data platform that manages all systems and provides data-driven operations / services. The consequent dashboard for this platform would require the performance and demonstration of various metrics and functions, including that of advanced analytics. IoT capabilities in this data platform allow the advanced analytics to demonstrate a means of visualising and predicting the expected results of a piece of equipment, a means of controlling its performance and costs, and to ensure the profitability of the service.

Advanced services enabled through IoT sensors include being able to demonstrate flexibility and attention to customer needs, offering predictive maintenance and product traceability, and the capacity for experts to support operational activities remotely – therefore saving the customer time and potential call-out costs, as well as equipping them with useful product knowledge.

THE ROLE OF WIDER RESOURCES AND INTERVENTIONS TO SUPPORT SERVICITISATION

Given that it has been established that a functional and effective digital ecosystem is one of several necessary elements of a business environment that supports servitisation, it is also useful to consider what other resources and interventions can be offered to UK manufacturers, more specifically those based in the South West of England and South Wales. Perhaps the most significant in helping to facilitate the existence of a full and well-rounded environment ecosystem for servitisation is the existence of a dedicated organisation to the topic, focused on enriching the knowledge base, experience and adoption of servitisation.

Based on their research expertise and extensive experience of working with global manufacturing firms and technology companies, the Advanced Services Group (ASG) has developed and produced various tools and frameworks to support firms in their servitisation transformation journeys.

advancedservicesgroup.co.uk

These resources include:

- A step-by-step process for helping SMEs go from ‘zero awareness’ of servitisation to a fully-populated customer value proposition, supported by a plan for skills / technology / digital
- Support in securing finance or financing
- Help for interested parties to gain an understanding of the competitive advantage that these aspects provide them with

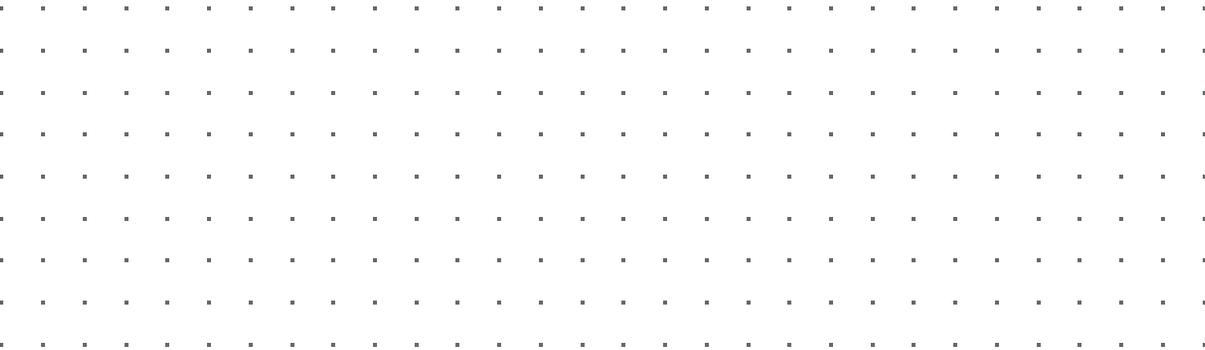
A series of mini guides is available from ASG which include servitisation research, models, frameworks, and tools. These miniguides are tested with partners and government agency project participants, and are then used by industry to help them create impact through their use of the mini guides and adoption of the methods.

These include:

- a. The services vision template that allows businesses to create and represent a vision for servitisation, to act as a platform for effective communication and debate in helping to promote alignment in management decisions.
- b. A guide on customer value propositions to help businesses co-create and validate service value propositions with the customer by using a storyboard and empathy mapping techniques.
- c. A customer segmentation tool to help businesses identify customers’ needs and attitudes towards services, which then allows them to choose target segments based on their ability to effectively serve those segments.

- d. The Service-led Business Model Blueprint, elaborating on various aspects of value creation, delivery and capture, and focusing on the competitive landscape to help businesses identify knowledge gaps and facilitate organisational visioning.²¹
- e. A value network for services tool to help servitising firms review and inform decisions about their firm’s relationships with stakeholders such as distributors, technology vendors, and competitors. A storytelling tool to help executives create compelling story content which can be used to foster positive stakeholder engagement across servitisation initiatives.
- f. A financing and contracting guide focusing on the potential clauses and components of an equipment services contract, including a checklist to help executives determine what level of detail their service contract should contain.
- g. An online tool that helps businesses understand their current and future competitive strategies in relation to the product, price, and type of service solution.²²
- h. A guide on Engineering Design 4 Service, co-created with Rolls-Royce to help manufacturers navigate through the complexities of finding the balance between an investment in the product, the infrastructure surrounding the product, the cost of the service and the value delivered to the customer.²³

All of these templates, tools and models provide industry with a means to understand the strategic imperative being addressed, the transformation journey to be undertaken and the steps needed to make the switch from a product-led strategy to a services-led strategy.



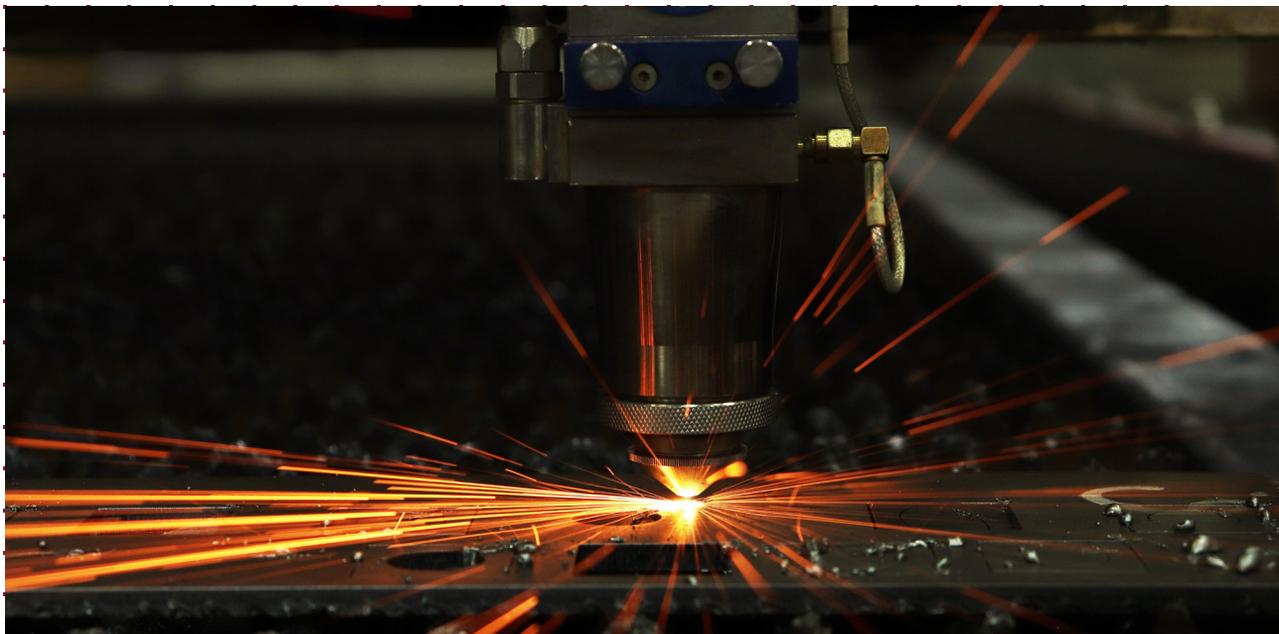
UNLOCK YOUR INSIGHT ANALYSIS

Unlock Your Insight (UYI) is an assessment tool created by the Advanced Services Group (ASG). The tool was designed to help firms understand their most dominant competitive strategy based on their current business strategy, and to support UK SMEs on their roadmap to servitisation in manufacturing. This included considerations such as:

- If firms have a bias towards product development and / or new product innovation
- If they have a pressure from product / asset price / pricing (increasingly commoditised marketplace) or a need to improve margins by using price as a mechanism to protect their position with customers
- If they see the bundling of a product and service (package) as a means to get closer to the customer (intimacy), or to secure a competitive advantage and therefore more easily exclude their competitors

Industry research by Treacy & Wiersema²⁴ indicates that firms, and manufacturing firms in particular, can typically excel in one of these dimensions but cannot typically excel in all three dimensions at the same time. The UYI tool works to help firms understand their dominant strategy in terms of the product, price or package dimension. As a result, it provides an indicator for the need for firms to either extend their dominant advantage (with continued focus and prioritisation of the strategic intent) or to recognise the need to switch from one dimension to another in order to secure advantage in their market or wider customer context.

A survey using ASG's UYI tool was conducted from July 2018 to January 2022 and garnered 475 responses. Respondents included 163 executives, 65 non-executives with customer-facing roles, and 157 organisations. A tendency towards services can be seen from Figures 1 and 2 overleaf (product & service as a 'package', as opposed to 'product' or 'price'), with this tendency trending upwards over the forecast period. The data therefore indicates that companies are increasingly considering the introduction or continuation of a service offering in their future business strategy.



EXECUTIVES

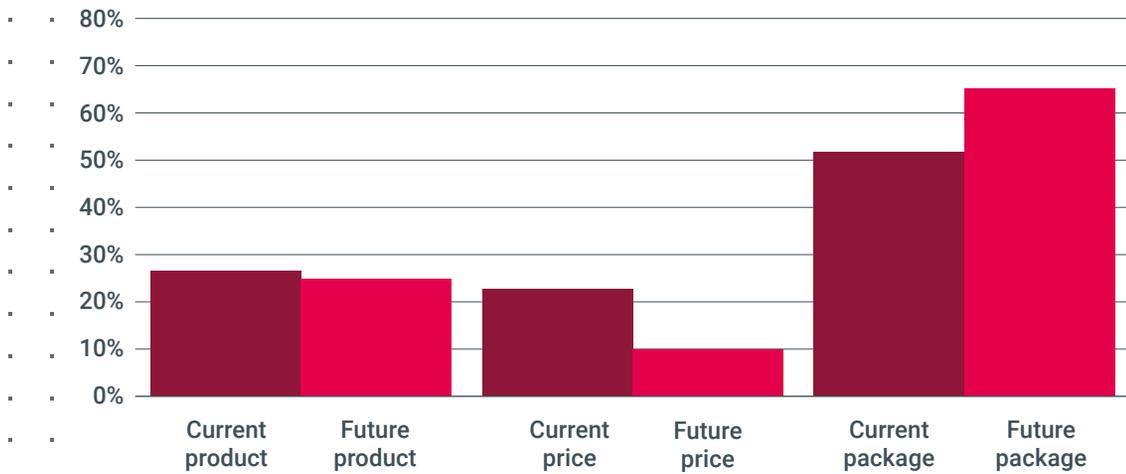


Figure 1. Executive roles showing an increased tendency towards services

CUSTOMER FACING

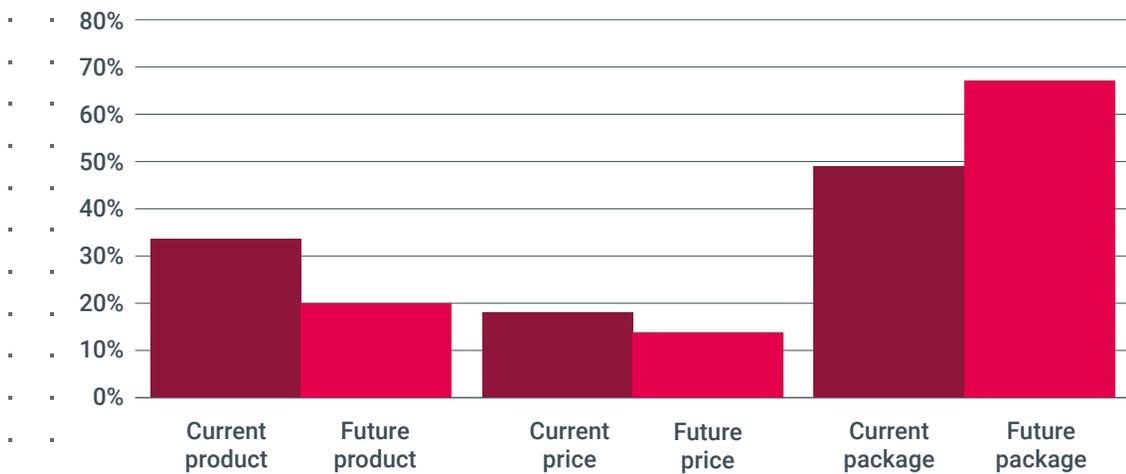


Figure 2. Customer-facing roles showing a greater tendency towards services

In both figures above, the apparent preference amongst respondents towards the services dimension is demonstrated (respondents reacted more positively to the idea of product & service as a 'package', as opposed to the singular 'product' or 'price' dimensions noted earlier), and the trend leads upwards over the forecast period. This indicates that companies are increasingly considering offering services in their future business strategy. The difference between 'current' and 'future' was determined by the respondent but was typically accepted to be between 3-5 years in the future.

Skills and servitisation – where are the knowledge gaps?

A 2018 survey identified skills shortages as one of the biggest problems for 50% of servitised SMEs in the EU.²⁵ This lack of skills is also noted by industry experts to be present as a major barrier to servitisation in the UK manufacturing sector. One reason for this is that the process of transforming an activity into a product-service system requires both organisational and management capacities in a different manner to those required for product-oriented logic.²⁶

Moreover, studies indicate that offering advanced services is far more complex than both base and intermediate services.²⁷ Servitisation can become more complicated due to the fact that whilst some manufacturing personnel may have previous experience in services, the majority are unlikely to have this experience to the required level, and as such, their ability to identify and meet the demands associated with service delivery may be hampered. This suggests that to achieve the baseline for transforming the manufacturing culture to include that of servitisation, suppliers required for the service delivery process need to be upskilled.²⁸ This upskilling would include expanding the knowledge base related to the business, management and digital skills that manufacturers possess.

Related to this is the question as to whether training employees in-house is sufficient to achieve the required skill set, or if efforts should be focused on attracting new employees already in possession of these skills.

However, manufacturers may not have the luxury of fully relying on the latter, as the UK suffers from a talent and skills deficit within the industry. According to a 2018 UK Chambers of Commerce study, 81% of manufacturers struggle to find the right staff with the right skills.²⁹ Given this, manufacturers may find benefit in upskilling existing employees where applicable, amongst whom a knowledge gap is likely to exist in the area of digital and programming skills, alongside hesitancy to work with unfamiliar technologies such as high-tech machines and automation. This is compounded by an ageing workforce who are retiring from the profession, taking with them valuable industry experience, but also less likely to be willing to learn the required skills.³⁰

Other skill barriers to servitisation models include the following:

Lack of digital skills

Servitised business models are usually combined with digital technologies to enable connectivity, predictive maintenance, and remote monitoring of products. Lack of such skills compromises a firm's ability to understand how and where their products are used, knowledge that helps manufacturers offer uptime guarantee to their customers. Servitisation also requires a higher level of digital analysis to coordinate activities with customer needs. This implies that the staff should develop skills on software development, but also to manage the IT infrastructure and the cloud system.³¹ Manufacturing mainly struggles to find qualified Computer Numerical Control (CNC) machine operators / programmers.

Lack of data management and analytical skills

Remote monitoring collects crucial product data which needs to be analysed, so it can be used to design and deliver services specific to customer needs. The lack of such skills risks the firm's ability to effectively utilise product performance data and its ability to monetise through services.

Lack of engineering-specific skills

These are important to support service delivery, in particular implementation and maintenance. The absence of such skills can trigger operational risks and jeopardise a company's servitisation program.

Lack of skills required for building service contracts

These are necessary for drafting reliable outcome / performance-based contracts around which servitisation offerings are built. Lack of such skills can trigger financial risks and weaken customer trust in the firm's ability to develop service offerings.

Lack of skills at the management level

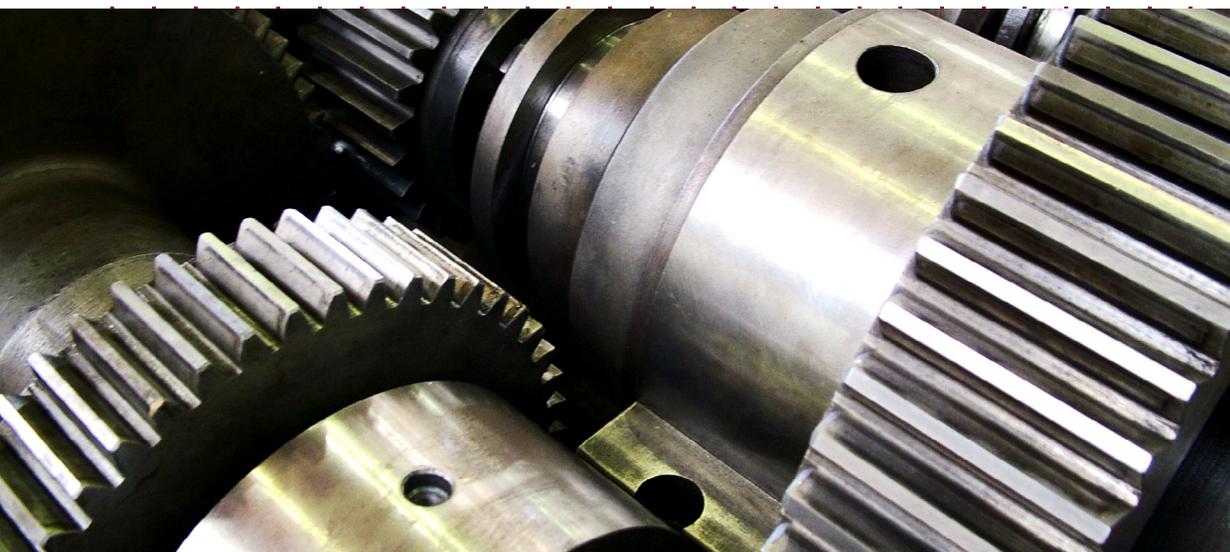
The inability to efficiently manage service-specific operations can trigger strategic risks and affect a company's ability to redesign business processes for services. This will have a knock-on effect on the business which will not be able to adequately meet the service needs of clients.

Lack of interpersonal / soft / customer management skills

Manufacturing-as-a-service involves more interaction and deeper relationships with customers. Interpersonal skills are therefore crucial across customer-facing roles for relationship building. For example, more field engineers should be trained to visit the customer's facilities and deliver the service. Employees who face and engage with customers should also demonstrate strong communication skills.³² The lack of such skills can negatively affect proximity with the customer required for the successful delivery of service offerings.

Lack of service marketing skills

The inability to effectively package and sell services can trigger a false perception by customers of the value of the services. This can negatively affect service revenue and lead to poor customer retention.



Maturity of the servitisation model in the South West of England and South Wales

REGIONAL STRENGTH – SOUTH WEST OF ENGLAND

Manufacturing holds a significant presence in the South West of England, producing £14.8bn in manufacturing output per year, and representing 11% of overall regional output, compared to £191bn of output and 10% of GDP at national level.^{33, 34}

The aerospace and defence manufacturing subsectors account for a large portion of these figures, as the region is home to the largest aerospace cluster in the UK. With multinational aerospace companies such as Airbus, BAE Systems and GKN Aerospace, as well as other prominent manufacturers such as Mars Wrigley, Princess Yachts International and Kawasaki Precision Machinery, advanced engineering has been identified as vital to the regional economy. The majority of South West's manufacturing activity takes place in its transport equipment industry, which is equivalent to 22.4% of the regional manufacturing output.³⁵ The South West of England, which includes the West of England Combined Authority (WECA), has 7.1% of UK R&D expenditure with 8.1% of UK R&D employment; with a time-series trend showing increases in both.

The South West is also experiencing a growing appetite for digital skills, particularly in non-digital industries such as aerospace and energy. Data indicates that computer programming and digital consulting are the two subsectors seeing the most steady growth in demand for skills³⁶ and Bristol has been ranked third in tech city performance in the UK.³⁷ Given this increased interest in digital and the growing number of digital related skills, this may be seen as indicative that the South West is already fostering the necessary digital ecosystem that could support the adoption of servitisation.

POST COVID-19 & THE UK'S DEPARTURE FROM THE EUROPEAN UNION

The manufacturing sector in the region, as with other UK regions, has suffered from difficulties associated with COVID-19 and the UK's departure from the European Union. Manufacturing in general has seen a return to more muted growth due to soaring energy prices and shortages.³⁸ The region's slower recovery is mainly caused by its dependence on its transport industry, which has suffered several breakdowns due to the pandemic.³⁹ However, despite these disruptions, the South West has started to see improved levels of business confidence, output and investment by manufacturers.^{40, 41, 42}

SERVITISATION IN UK REGIONS

Given that manufacturers in the region are looking towards growth and investment, servitisation may have a part to play in a post-COVID-19 economy, with some manufacturers already considering ways to do so. Servitisation has shown its potential for industries such as airlines, railways, heavy equipment and car rental.⁴³ As the South West specialises in transport and aerospace, the region could stand to significantly benefit from the same advantages. However, due to the fact that current uptake in the region is slow, as many manufacturers are in the early stages of understanding the benefits it could provide, or what an offering could look like for them, it is helpful to look at the ways in which servitisation has benefitted other UK regions.

The West Midlands, a region which has similar levels of employers⁴⁴, and in late 2021 had similar levels of manufacturing output, investment and business confidence as the South West and Wales⁴⁵, has had several use cases that were successfully carried out in the region, showcasing the potential of servitisation for the South West.

Between 2012 and 2018, the Advanced Services Group (ASG) helped 157 manufacturing SMEs generate £32.25m in Gross Value Added through servitisation. During this period, ASG invested £2m in the region (of which 50% came from the European Regional Development Fund) in an effort to work with 157 firms across a 7-year period.

A first pilot programme was conducted between 2012 and 2015 to support 77 SMEs and the firms evidenced a new GVA of creating £11.6m, while the TRAN-SIP second project programme (run between 2016 to 2018) created an additional £20.65m with 80 SMEs in the Greater Birmingham and Solihull LEP (GBS LEP). Following the success of the two programmes, two other SME support programmes were delivered in the West Midlands (GBS LEP and Black Country LEP), from 2019 to 2021, with a total investment of £2.85m, again with 50% intervention from ERDF, the results of which will be published in April 2022. Other companies relied on ASG's frameworks and models to build their own services to create new revenue streams and drive business growth.⁴⁶

The ten case studies cited below show a range of companies supported by the Greater Birmingham and Solihull LEP. Among these firms, 30 were featured in the 'Servitisation Applied' book⁴⁷, which compiles successful case studies around manufacturing and tech-oriented firms employing up to 125 staff. These companies leveraged more than £10m in new revenues through the offer of new services, including servitisation. Expansion of the workforces were key to these firms, with many of them having to adopt some form of digital technology to support their servitisation strategies. The firms were also tasked with finding new skills to bring in-house and investing in training to move from product development & manufacturing towards service delivery. Moreover, the COVID-19 crisis compelled many companies such as Allsee Technologies and Alphadrive to rethink their business model. Faced with furloughs, low margins, and new priorities due to the pandemic, the companies listed had to reflect on new ways to stay competitive and many turned to servitisation.

Below are the main insights from ASG's use cases:

- **CHH CoNex:** offers a service featuring their non-metallic cabinets for hosting 5G networks and devices under an IoT umbrella. This resulted in a £796K increase in revenue.
- **Koolmill Systems:** offers rice-milling as-a-service, after having invested in technology making machine cost insignificant. Its estimated turnover has increased from £66K to £76K and the annual turnover for the coming year would increase to £120K.
- **Allsee Technologies:** has a portfolio of services, such as Service Level Agreements focusing on digital signage. Its turnover increased by more than 2%. Its Managing Director, Thomas Fraser Bacon shares the following:

"Several partners told us they had won major projects on the back of our service offer, some of which were with blue-chip companies. Our turnover increased by more than 2% in 2020 despite the pandemic, and we performed far better than many of our competitors. I genuinely believe that wouldn't have been possible without the work we have done around servitisation."

- **Alphadrive Engineering Services:** provides the recycling sector with a range of usage-based services to reduce carbon footprint. Through servitisation, it designed surrender bins to support the West Midlands Police with weapon surrender. It has so far collected more than 1,000 knives and now intend to offer advanced service solutions to police forces across the country.
- **Database Design:** developed an outcome-based business model enabling manufacturers to transform their operations through software-as-a-service solutions. Operating as a cloud-based software system, they help door manufacturers improve workflow efficiencies and quotation processes. In 2019, the company had an annual turnover of £84K, which increased to £100K in 2020.

- **Dignio:** offers digital healthcare services for the NHS to take the strain away from busy care facilities, drive efficiencies, and liberate clinicians from routine tasks. Although in its early stages, it has led to 47% cost reduction per patient per month, 42% fewer doctor appointments and a 32% drop in hospitalisations. This outcome-based pricing model is already increasing revenues.
- **HanaTech:** develops product-service packages combined with IoT to offer outcome-based services that support manufacturers in their transition to Industry 4.0. The company increased its turnover from £60K in its first year of operation in 2019, to £120K in Year 2, which is expected to double again in Year 3.
- **LG Davis:** provides procurement services in the print industry. It involves offering print management systems, which are stocked to free up customer warehouse space. An online portal is made available for ordering and delivering on demand across the country. LG Davis projects an annual growth for 2022 of 12%, 5% of which is supported by servitisation.
- **AE Aerospace:** develops a service-focused business model of 'machining-by-the-hour'. It has had to implement a new Enterprise Resource Planning system to support the company's customer-focused approach. It has more than doubled its turnover from £2m to £5m.
- **UV Light Technology:** aims to provide a 'total package' service for UV disinfection in the food industry sector. This includes delivering digital services, such as remote monitoring and control. While in its early stages of servitisation, the company already witnessed an increase in its turnover by 25% and an increase in profits by 84%.



Between 2012 and 2018, the Advanced Services Group (ASG) helped **157** manufacturing SMEs generate **£32.25m** in Gross Value Added through servitisation.



AE Aerospace case study:

Headquartered in Birmingham, AE Aerospace specialises in the manufacture of precision machine components. The majority of its operations takes place in aftermarket support for the aerospace and marine sectors.

AE decided to invest time and resources into service offering because servitisation presented opportunities to grow its business and move away from the traditional manufacturing expansion. As servitisation had already provided successful use cases, the company joined the ASG programme to assess how a 'manufacturing-by-the-hour' service could help to differentiate from competitors. Since AE's core activity revolves around traditional machining, services on machine metal components have been carried out. Customers are offered to rent AE's machines and machining cells on an hourly basis.

Managing Director Peter Bruch acknowledged that *"simply investing in equipment and having just one to two people who were focused on our customer service was a barrier."* Following this servitisation roadmap implied investing in three business areas: People, Equipment and Facilities.

The first challenge was to assess how servitisation could be applied to a make-to-print business, and what kind of infrastructure should be built to deliver the service effectively. The company had to accurately

measure the customers needs and how AE could meet them. Undertaking a business transformation to servitisation also required a shift in mindset in both the top and lower levels of management. Staff's beliefs and attitudes about the value of service offering for the company had to change.

To successfully achieve its servitisation programme, AE needed to become an integral part of customers' supply chains. The services needed to ensure quality, safety and lead times to the customers. To achieve this, AE had to implement an Enterprise Resource Planning system to assist the new customer-oriented approach. As such, the 'glass factory' model came up to allow customers to monitor their own cells of operation, and therefore to reduce machining and delivery time, reduce costs and increase production quality.

As a result of this new service offering, turnover has moved from £2.8m to £5m since 2016. AE also had to hire more staff to meet its servicing needs, going from 38 to 45. By 2025, services will represent 25% of profit margin, and 65% by 2030.

Enabling companies in the South West and South Wales to adopt servitisation

SERVITISATION CENTRE OF EXCELLENCE

As previously noted, increased societal appetite for services across a variety of contexts and industries and rapid advancements in communication technologies are two of the largest drivers of servitisation in manufacturing which, naturally, leads to the rise of new business models based on advanced services.

The purpose of this business model shift is primarily to offer manufacturers alternative ways to compete and to increase their revenue streams, amongst others.

The ASG as a centre of excellence has designed tools to accompany companies seeking to integrate servitisation into their manufacturing activities. These include the following:

- Transformation Roadmap⁴⁸: this identifies the different stages of development in the journey towards servitisation, and highlights the main internal challenges and external influences. It includes both business and technology drivers.
- Services Staircases⁴⁹: this is a business tool to help manufacturers understand the different levels of servitisation that can be adopted, based on value creation and implementation risk.

ASG has an established framework for helping manufacturing SMEs to take advantage of servitisation, advanced services and new business models. The framework has been developed, tried & tested with more than 400 manufacturing or technology-innovating SMEs in the West Midlands in the period 2012-2021. The framework was developed to suit SMEs supported under European Regional Development Fund provisions but it can also be made applicable to large UK firms.

To further support companies who seek to integrate a servitisation model into their business practices, a physical centre of excellence could play a vital role in scaling the existing specialised offering that a 'virtual / quasi-physical' centre of excellence such as ASG provides in facilitating servitisation adoption to a greater range of manufacturers in the South West and South Wales. This centre of excellence would seek to create transformation as the core of phase 2 of the DETI project. The centre would offer opportunities that the partners are uniquely placed to offer, pulling together various key stakeholders including ones such as ASG, the Institute for Manufacturing, Digital Catapult, National Composites Centre (NCC) and other key players in manufacturing and advanced digital technologies, to form the basis for an offering in transformation services for SMEs.

Companies engaging in this physical centre of excellence could be supported in a number of ways, including the following:

- In 2-day workshops where businesses are taken from the point of 'no knowledge of servitisation' to having their own 'business model blueprint' for a new business model; by attending 6 x 2-hour online workshops (delivered using Zoom, Teams or other online platforms) – or this could be a flexible use of 12-hours by breaking this into 4 x 3-hour sessions or 3 x 4-hour sessions (it depends on the distance from the preferred workshop location or time available);
- A hybrid model in which firms, as a cohort, would spend 2-days at NCC where 50% of the time was spent, in a workshop setting, on developing innovative products / digital tools around advanced services and the other 50% of the time was spent in a classroom environment learning about servitisation – leading to the development of a new business model based upon their newly developed product / digital tool.

Evaluation of the UK manufacturing industry would initially suggest that servitisation can be recognised as ‘expansionist’ (top line growth); however, many manufacturers can be defined as ‘reductionist’ (in terms of cost, quality, delivery).

As such, to align the UK’s increased digitisation intensity and the low servitisation activity, the following is suggested as a potential approach to address these areas via a Servitisation Experience Centre for Accelerated Adoption:

1. Placing a high level importance to digital technology as a means of facilitating servitisation
2. Supporting a circular economy through new business models and transparency of emissions
3. Providing a uniquely beneficial environment and an ecosystem boost that gives competitive advantage to UK companies
4. Aids in the transformation of UK companies that currently lack ambition to ones that explore and benefit from innovative business models

The value that can be gained by the Servitisation Experience Centre can be defined under the following categories:

Connected product:

- Products-as-a-service (including additional services complementing a “traditional” product)
- Predictive maintenance-as-a-service, as a core component of service offering
- Proving net zero (net zero products)
- Link between IoT / Distributed Ledger Technology (DLT) – automated audit and certification (reduction of bureaucracy, improved trust)
- Operational efficiency of a product in service: increase output, reduce waste
- Reduction of risk – reduce cost of capital / insurance / simpler financial forecasting
- Security and privacy of data

As a macro view:

- True costs of supply chain – understand the hidden costs
- Data governance – getting the right information to the right people
- Assist the process of Carbon Disclosure

Such a centre could potentially be linked to existing Digital Catapult projects and programmes including:

- Made Smarter Innovation Digital Supply Chain Hubs
- Digital Twin Centres, as it can allow companies to test in a virtual environment processes such as servitisation scenarios by simulating the effectiveness of the business case

WHAT MARKET FAILURES WILL BE CORRECTED?

Increased public investments to ‘level up’ the UK means aligning resources around place-based potential. The project mitigates market failure by coordinating bottom-up working, and aligning accountability structures at the local level to enhance capability and promote market development in servitisation.

The centre would address national coordination failures and information failures that often hinder efforts to harness the potential of long-term market opportunities in the UK’s innovation ecosystems, which is a shared objective of all partners and funders. It would bring together diverse institutions to work through a shared engagement framework.

By building collaboration between local, regional and national institutions, the centre would ‘crowd in’ private investment to the West of England and South Wales; securing the translational benefits of R&D and growing the contribution of areas outside of the Greater South East to the shared prosperity of the United Kingdom.

It would also direct shared resources in pursuit of smart, sustainable and inclusive economic growth and societal benefits which deliver for businesses and communities.

The project would unlock this R&D scale-up potential of an identified comparative advantage deriving from the Western Gateway’s industrial, academic and institutional mix; thus harnessing benefits of collaboration for shared leverage in growing marketable strengths and applied impact. Evidence from the OECD acknowledges that with good quality governance and low fragmentation across local ecosystems⁵⁰, place-based innovation is positively associated with efficiency and productivity uplift.

By working through the Western Gateway Partnership, project partners would coordinate both the diffusion and adoption of innovation by:

- Providing the market with a mechanism to harness scale-up potential around a specific innovation challenge, creating shared understanding around a market opportunity and de-risking and directing the application of advanced technologies
- Improving the quantity and quality of investment in applied R&D and innovation and driving associated employment and business growth outcomes, underpinning efficient knowledge exchange and capital organisation
- Accelerating place-based competitiveness through engaging and coordinating talent, skills provision and the industrial base around human capital development; for the benefit of businesses and citizens in the West of England, Wales and the wider UK
- Delivering the industrial and innovation assets and capacity to drive enduring Collaborative R&D in the Western gateway the wider UK; delivering positive externalities deriving from applied innovation within and beyond local frontier sectors

POTENTIAL FUNDING OPPORTUNITIES FOR THE CENTRE

Research, Development and Innovation (RDI)

- The 2021 Spending Review⁵¹ outlined government policy to increase annual public investment on RDI to £22 bn by 2026/27; with details of the plan announced in the Levelling Up White Paper. Innovate UK's budget will also increase to £1.1 bn by 2024/25 – up from £700m in 2021/22 and 2022/23, and £800m in 2023/24
- Following publication of the White Paper and the announcement of funding programmes through UKRI, the centre could be positioned as part of efforts to grow an innovation Supercluster in the South West, leveraging significant private investment, as funding opportunities arise. Early engagement with, and adoption of, advanced digital technologies can explain regional productivity differences for up to 16 years⁵²; delivering direct benefits to local economies as an early-adopter region of advanced digital technologies

- Local leaders and partner institutions can explore this potential funding route for DETI; either as part of a local package of measures or for matched funding with a specific national funding programme, such as the emergent UK Shared Prosperity Fund⁵³

The Levelling-Up White Paper⁵⁴ published 2nd February 2022 plans to reinforce commitment to leveraging private sector investment and growing 'Superclusters' across the UK – helping to grow economies where they are weak, and enable those innovation economies outside the 'Golden Triangle' – with capacity to absorb RDI funds, to access public funding to help reach their potential. It also endorses further iterations of Devolution Deals, such as those developed and delivered by the West of England Combined Authority in partnership with the Government.

It provides the following points that relate to servitisation or digital opportunities:

- **Mission 2.** By 2030, national public investment in R&D outside the Greater South East will increase by at least 40% and by at least one third over the Spending Review period. This additional public funding seeks to mobilise at least twice as much private sector investment over the long term to drive innovation and productivity growth
- To help increase domestic public investment in R&D outside of the Greater South East by at least 40% by 2030, the Department for Business, Energy and Industrial Strategy (BEIS) is committed to investing at least 55% of its domestic R&D funding outside of the Greater South East by 2024/5

Relevance to DETI: Future funding priorities can be influenced by running pilot servitisation programmes in the South West of England to demonstrate impact potential and to trigger engagement from the R&D within manufacturing, digital and technology.

NB – the White Paper does not specify how the Levelling Up agenda will impact on the devolved administrations e.g. Wales (hence leaving it out of references to regional impact / opportunity) as these decisions are outside this White Paper. However, the Levelling Up agenda is expected to affect the whole of the UK.

- The £2.6 billion UK Shared Prosperity Fund will be decentralised to local leaders as far as possible, with investments set to regenerate communities, boost people’s skills, and support local businesses

Relevance to DETI: This fund can be directed to use impact evidence, as measured in the 4 SME programmes run by ASG / Aston University (2012-2021), to build regional proposals to align with the development of executive teams within small firms. The 2 ERDF part-funded programmes in the West Midlands invested £2m between 2012 and 2018 and achieved an excess of £30.25m in new GVA (with the results of two of the large programmes, investing a further £2.85m during 2019 to 2021, to come post programme evaluation – expected April 2022).

- A commitment to vastly simplify the local growth funding landscape to allow local leaders to drive tangible, visible change in their communities
- The large majority of the country gains access to 5G broadband

Relevance to DETI: Show how small pilots create impact and the local leaders will get behind the new initiative to drive servitisation and advanced services across the manufacturing and technology-innovating firms in the South West of England and South Wales.

- **Mission 4.** By 2030, the UK will have nationwide gigabit-capable broadband and 4G coverage, with 5G coverage for the majority of the population
- Promoting the adoption of productivity-enhancing technologies and management practices by businesses

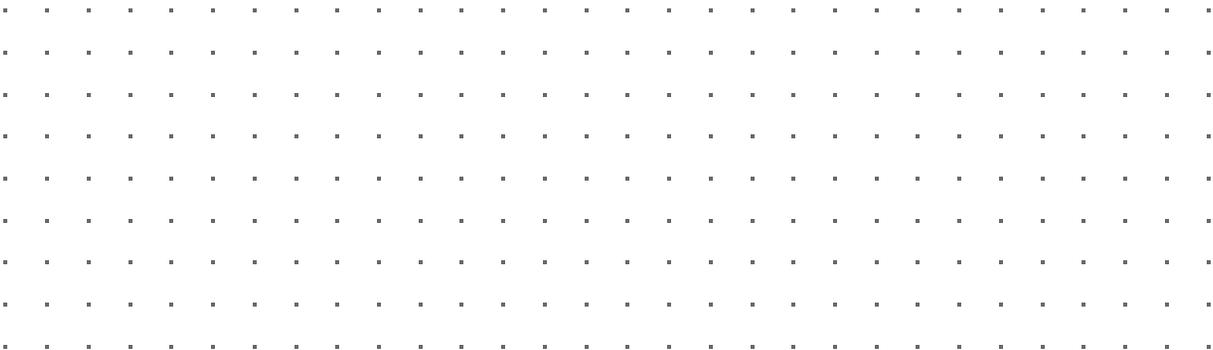
Relevance to DETI: As an enabling technology, 5G will unlock significant value in product / service scenarios by allowing the manufacturer to incorporate sensors and data systems to support IoT connectivity, to minimise IT risks to end-customers by operating on independent networks, and to monitor the condition and performance of a connected asset.

Existing centres in other subject areas could offer insight as to suitable funding models for a servitisation centre of excellence.

These include:

- Digital manufacturing innovation hub in Wales – an industry led funding model
- Include Baxi, part of a regional growth hub through which the centres should be coordinated.
- HVMC Catapult money to implement centres in various locations

Another potential funding model is a membership model in which IoT companies and other relevant industry providers with solutions pay to sponsor the centre in exchange for having their solutions a presence within the centre. This would allow them to be seen as leaders in the area of servitisation and potentially incentivise interested manufacturers to partner with them on upcoming activities.



Conclusion

Although the manufacturing industry in the UK – and particularly the South West of England and South Wales – is at a turning point in terms of improving productivity levels and competitiveness with respect to domestic and international peers thanks to servitisation, uptake of the practice remains slow.

This is particularly due to a lack of awareness of the benefits or the ways in which to adopt it, a still nascent and dispersed digital ecosystem of providers of the necessary equipment and devices, and a general traditionality and risk-averseness of the sector that may be holding potential users back.

One of the most appropriate ways of fostering and supporting the adoption of servitisation is through both a supply and demand driven mechanism. Enabling the digital ecosystem of equipment providers required to make it happen

and supporting manufacturers at any stage of their servitisation journey can be achieved by establishing a physical centre of excellence which would allow for real-world education, testing and collaboration. A physical centre in the heart of the South West, where a thriving manufacturing ecosystem exists, could have significant potential to produce early adopters and industry leaders in the field to not only aid in companies' own levels of productivity, but also to serve as examples of best practice to other UK regions.

WHAT INCENTIVES COULD ACCELERATE SERVICITISATION?⁵⁵

Based on the challenges raised by major manufacturing companies in adopting advanced service business models, the following conclusions and ambitions of industry can be drawn:

- There is a desire for financial and accounting institutions to assist Original Equipment Manufacturers (OEMs) with financing and contracting for servitisation
 - Industry would like increased motivation in the development of engineering and technology skills in the UK, and for firms to be made aware that these skills can be exploited for services rather than products alone
 - The recognition of the importance of digital connectivity and investment in building a digital infrastructure in order to support servitised offerings is highly desired
 - Industry would like incentives to be improved for the adoption of servitisation across both big and small OEMs
- The development of measures that monitor the progress of servitisation within organisations and the impact it has on the UK economy would be considered beneficial
 - Companies would value increased focus on policies that can help create a shift in culture, assist with the contracting structures and related governance, so manufacturers can manage risks whilst building their capabilities to deliver advanced services
 - Industry would value investment in collaborations that involve manufacturers, government, businesses, universities, catapult centres and/or other R&D support services to use their combined knowledge and capabilities, in order to help manufacturers with innovative service business models aimed at achieving a competitive advantage
 - The design of mechanisms to offer advice for SMEs and large manufacturers about innovation, regulations, IPR, export etc would create a wider knowledge base and help to bridge the skills gap



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DETI brings together advanced engineering companies, digital technology pioneers and universities to push the boundaries of digital engineering for the future, to help UK businesses maintain engineering leadership. It helps companies identify and develop the tools, technologies and processes they need to rapidly accelerate digital engineering capabilities and identify the skills needed to embed digital.

THE ADVANCED SERVICES GROUP:

The Advanced Services Group are specialists in servitisation research and practice. Based at Aston Business School, its work is grounded in the latest academic research, real industry insight, business know-how and experience.

It helps manufacturing companies and technology innovators on their servitisation journey to develop services-led strategies and ultimately transform their business model to compete through advanced services. It has worked with over 450 businesses, multinational companies and SMEs to develop their growth strategies through services. The Group is led by Professor Tim Baines, the world's leading scholar on servitisation.

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