Servitization: service is the future of manufacturing

From maintenance contract to Product-as-a-Service
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Introduction

From product sales to service
Servitization is the process whereby service is given an increasingly important role in the business model of manufacturing companies. In addition to – and sometimes at the expense of – traditional product and machine sales. Service turns from being a cost item into an opportunity to provide better service for the customer and thereby generate additional revenue.

Servitization is nothing new. The term was first used in 1988 in an academic paper by Vandermerwe & Rada1. Loosely translated, they define servitization as: ‘offering customer-focused combinations of goods, services, support, self-service and knowledge, with the aim of adding value to the core product’. A fairly broad definition, but one that nonetheless makes clear that the combination of products and services is a key characteristic of servitization.

Servitization in the manufacturing industry can consist of companies proactively offering repair and overhaul services, spare parts and training in addition to their core products. But servitization also includes broader services such as consultancy, financing, insurance and logistics.

Servitization is in keeping with the times
Servitization is more relevant than ever in the manufacturing industry. One of the reasons is the declining added value of production activities. Rapid copying by competing companies worldwide means that products and production processes stay distinctive for ever shorter periods. Price is now the only distinctive factor, but many OEMs (original equipment manufacturers) and suppliers prefer not to join the race to the bottom. They look for other ways to add value.

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The **smiling curve** by Acer founder Stan Shih (see graphic) shows that the biggest opportunities lie in the first and final phases of the production process. On the one hand, development, branding, and design are lucrative activities, while on the other hand, logistics, maintenance, and after-sales service proportionately generate a lot of added value. Manufacturing companies therefore have a financial reason to move into servitization.

Servitization is also a response to the increasing demands made by customers on their suppliers and products. There is a strong demand for customization, support, and after-sales service, for example to guarantee the uptime of a machine. Service thus becomes an important distinguishing feature of product manufacturers. In the case of faults, unfamiliar situations or customization, they can make the difference for the customer.

Finally, servitization fits in with the general trend of companies refocusing on their core activities. The more companies divest and outsource in-house services, the more opportunities there are for other companies to take over those services. Many machine users already expect their supplier to provide services such as installation, maintenance, repairs, and replacements. Demand for asset management, financing, training, and advice is also growing.

**Servitization: SMEs on the springboard**

At first sight, servitization seems attractive particularly to large manufacturing companies; they have the international networks and financial power necessary to switch to a service-based business model. But servitization is also becoming increasingly attainable for smaller producers. Thanks to developments in software (modern CRM, ERP, and MES systems) and connectivity for machines, SMEs are increasingly able to develop a service proposition.

Small manufacturing companies also have an important advantage over their larger counterparts: they are much more agile, so they can implement changes more rapidly. In addition, the biggest challenges in the transition to servitization lie not in large investments in technology but particularly in business culture and the flexibility of employees.

**Suppliers join the movement**

OEMs which focus increasingly on service require their suppliers to accompany them in the transition. Suppliers are already increasingly carrying out research, product development, and even assembly. In order to be stronger and meet the demands of OEMs, many suppliers consider becoming product manufacturers. They want to transform from *built-to-print* (production based on technical drawing) to module manufacturers, and ultimately to product manufacturers: *built-to-roadmap* (production based on market knowledge). The shift which servitization indirectly causes among suppliers is known as ‘productization’. You can read more about this shift in the report entitled ‘Toeleverancier blijven of eigen product gaan maken?’

**What you can read in this publication**

In this report, we discuss the advantages of servitization, but also the challenges involved in the transition to a service-oriented business model. In section 2 we present the various models of servitization. In section 3 we describe the steps which OEMs and suppliers can take in the SME sector to move to a service-oriented business model. Servitization also offers opportunities for Dutch business. The final section deals with the impact of servitization on employment in industry in the Netherlands.
The potential of servitization

OEMs which do not invest in servitization miss out on a lot of revenue and profit potential. To begin with, there is a lot to be gained from existing customers: the installed base. For companies with a large installed base, revenue from services can amount to as much as five times the revenue from new sales².

Much of the installed base is often unknown
That means there is huge potential which, although nearby, is not within easy reach. Not all companies accurately record the location of their machines or the configuration in which they are operating. In addition, many products are sold through agents, so it is not clear exactly who the users are. Industrial machines, for example, will sometimes change owner during their long service lives without the OEM being aware. In short, the original manufacturer is unlikely to know precisely where all his machines are. It is nevertheless worthwhile for OEMs to survey their installed base accurately and develop an appropriate service proposition.

Apart from the company’s market share, there is also the potential of the market as a whole. An attractive service proposition attracts new customers and generates more product sales. Customers also buy more because a combination of products and services offers them added value. Research shows not only that product sales lead to more revenue from services, but also that the effect of services on extra product sales is even greater³.

High potential earnings after sale

Research by Deloitte among others shows that industrial companies that are most engaged in servitization, generate around 25 to 35 percent of their revenue from services. The share of service revenue as a proportion of total revenue differs from sector to sector (see table). In the case of OEMs that are not yet active in servitization, the proportion is relatively low. In general there is still a lot of benefit still to be gained, particularly as service provision is more profitable than production-related activities.

<table>
<thead>
<tr>
<th>Service share of total revenue (average %)</th>
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<tbody>
<tr>
<td>Aerospace and defence</td>
<td>47%</td>
</tr>
<tr>
<td>Automotive</td>
<td>37%</td>
</tr>
<tr>
<td>Industrial production</td>
<td>20%</td>
</tr>
<tr>
<td>High-tech and telecom equipment</td>
<td>19%</td>
</tr>
<tr>
<td>Medical and Life Science equipment</td>
<td>21%</td>
</tr>
</tbody>
</table>

Source: Deloitte. 2006. The Service Revolution in Global Manufacturing Industries

Deloitte also concluded that the average profitability of services is between 75 percent and as much as 300 percent higher than other activities. In their survey group of large multinationals it turned out that 48 percent of profit came from services. Deloitte also found that revenue from services grows 10 percent faster than revenue from other business units.

Higher profit through servitization

McKinsey and VDMA draw similar conclusions in their recent report entitled ‘How to succeed: Strategic options for European Machinery’ (June 2016). Data from 215 large industrial companies leads them to conclude that machine manufacturers that generate at least 20 percent of their revenue from services achieved an average EBIT margin of 10.7 percent over the period 2010-2014. Companies with a lower service share in the same period had an average EBIT margin of 8.3 percent. It is notable that companies that obtain a relatively large proportion of revenue from software (> 20 percent) score highest, with an average EBIT margin of 13.5 percent. It is from this group that McKinsey also expects the highest growth, averaging 11.1 percent per year up to 2018. McKinsey thus also confirms the potential of the Internet of Things for services in manufacturing.

The chart on the next page shows the extent to which OEMs are missing out on potential revenue and profit. An analysis of 200 companies by Roland Berger shows that the average EBIT margin on product sales is relatively low (2.3 percent). The margins on spare parts, maintenance, training and consultancy are substantially higher (average of 11 percent). According to a practical study carried out by Praetimus, smaller OEMs often do not yet offer all or part of these services, so they may be missing out on up to 55 percent of the revenue and profit potential from services. The potential improvement in revenue and profit margins is therefore impressive.

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Service revenue is relatively stable
Service contracts are a stable and predictable source of income: as long as a contract is running, suppliers can count on regular, steady revenue. Customers with a contract are also less inclined to switch to a cheaper competitor. At times of crisis and recession, service revenue remains constant, as customers react to economic headwinds by investing less in new products and machines, while the existing machines must of course continue to operate. Servitization therefore provides a solution also in less favourable times.

The servitization paradox
The first steps in servitization rapidly lead to higher revenue and profitability. Most Dutch OEMs have therefore already been fairly successful at it. Propositions relating to maintenance, spare parts or second-hand machines, for example, are fairly close to their core competences. They therefore find customers fairly quickly who wish to make use of them.

But research shows that after this initial success there is often a dip. This is known as the servitization paradox⁶,⁷. Improving existing services and developing new ones requires large investments. In addition, the whole organization must focus on services. But that entails extra costs, for example for new maintenance technicians, a call centre, the development of smart software and the creation of service-oriented websites. These costs precede the benefits, and if the service uptake is too low they will often not be sufficiently covered.

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Fat years after the dip

The servitization paradox can be a demotivating experience for businesses. In some cases they may even decide not to continue developing their service offering. That would be a shame, because research shows that profitability peaks once the dip has passed\(^6,^7,^8\). This is due in part to economies of scale and a ‘learning effect’ with regard to both the service and the product. The greater knowledge there is of the use of machines and the services offered, the more these can be geared to the customer. Experience is often also the basis for changes in the machine and product design, making them easier to use and enabling their use to be better aligned with the service offering. Here too there is a clear role for the Industrial Internet of Things: connected machines provide digital information on their status and use. This knowledge enables manufacturers to optimize their machines at low management costs.

Technology opens up more possibilities than ever

Thanks to technological developments, more is possible than ever in the field of service. For example, distance from the customer is scarcely an obstacle any longer: using a chat function or even a technician’s headcam, you can give your customers high-calibre advice from your chair. A webshop can stimulate sales of individual parts, while an extensive CRM system supports service sales. Technologies such as built-in sensors with GPS also make it easier to maintain an overview of the installed base and to stay in contact with customers and agents.

Product-as-a-service thanks to IIoT

The development of the Industrial Internet of Things (IIoT) means that the service offering will only grow larger. In the future it will be possible to gather data on the full life-cycle of a product or machine: from supplier to end-user. This information can provide the basis for new services, such as predictive maintenance and consultancy.

ABN AMRO also sees IIoT as a springboard and an enabler for the development of pay-per-use and as-a-service business models. The OEM guarantees the output or performance of its products or machines and is paid on that basis for maintenance or even for the entire product. This type of business model requires insight into the use and operation of machines. You can read more about the potential of IIoT in our report entitled ‘Industrial Internet of Things. Noodzaak voor industrie, kans voor IT-sector’.

Culture change is the biggest step

But technology is only the final part of the shift to servitization. Service must become central throughout the organization, and that requires a fundamental change of culture. That means not only in the sales and maintenance teams, but also in departments such as R&D, financial administration, engineering and production. With their short communication lines, SMEs may find it easier to switch than the big players. In the next section we will address the organizational challenges posed by servitization.

\(^{8}\) Fang, Palmatier, Steenkamp. 2008. Effect of Service transition strategies on firm value. Journal of Marketing
Servitization is a journey

Not just pressing buttons
Efficiency and standardization have been central themes in manufacturing industry in recent decades. As a result, the culture of a typical industrial company is almost completely at odds with that of a service provider, for which everything revolves around heterogeneity and flexibility. In practice companies struggle particularly with the fact that service has different dynamics. Service means acting quickly without bureaucracy. That means decision-making powers must be assigned to a different level in the organization⁹. Transformation into a service-oriented organization therefore goes much further than simply pressing the right button. The transition may fail hopelessly, for example, if the management has too little commitment, the organizational structure and culture do not change or there is insufficient investment in IT and information management.

Four phases of service provision
Servitization is a journey in which different destinations are possible. A 2011 study by Atos Consulting (2011)¹⁰ and a complementary 2012 study by Praetimus describe four business models, ranging from a pure product manufacturer to a company focused entirely on the supply of solutions (integrated solutions provider). Praetimus presents these models as four phases which a company can go through to increasingly become a service provider. The chart on the next page shows how the focus of a transformative business shifts and which services it offers in the various phases.

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Servitization is a journey

**Product manufacturer**

**Value added manufacturer**

**Full service provider**

**Integrated solutions provider**

- **Focus shifts from product to use**
- **Focus shifts from use to output**

**Output services**
- **Managed services**
  Administrative services, asset management, SLAs/guaranteed uptime, takeover of entire production processes.
- **Output services**
  Pay-per-use/Output, Product-as-a-Service.

**Business services**
- **Consultancy and support**
  Consultancy, system integration, support for software and applications, engineering.
- **Information management**
  Performance measurement and monitoring, data analysis, benchmarking.
- **Financial services**
  Finance, leasing, rentals, insurance.
- **Services for third parties**
  Competitors’ products, complete product lines.

**Extensive product-related services**
- **Start-up**
  Start-up support, calibration, product trainings.
- **Maintenance**
  Preventive maintenance, remote maintenance, logistics, inventory management for spare and wear parts, self-service tools.
- **Service life extension**
  Upgrades, overhauls, second-hand products.
- **End-of-life**
  Dis-installation, removal, recycling.

**Basis of product-related services**
- **Placement and warranty**
  Installation, placement, testing, documentation, warranty and extended warranty.
- **Spare and wear parts**
  Supply of own spare and wear parts, for example through own webshop.
- **Break-fix maintenance**
  Repairs, maintenance, helpdesk, hotline.

Source: Practinus - 2012, edited by ABN AMRO
Servitization in the SME sector

Most OEMs in the Dutch SME sector are product manufacturers or value-added manufacturers. They concentrate primarily on developing new products and machines, often tailored to customer specifications. Their service revenue is mostly related to the physical product which they supply: for example, they offer maintenance services, upgrades and adaptations. The biggest opportunities for these companies lie in deepening the service offering. For example, they could specialize in overhauling and upgrading systems and software. Or invest in advanced technologies, offering services such as remote and predictive maintenance. In that way service changes from a necessity into a means of adding value.

Large companies opt for services

A few large industrial companies and multinationals go a step further: they develop into integrated solutions providers. IBM and Xerox, for example, have distanced themselves so much from the physical product that they now actually focus only on service (business services). Their service offering has been greatly expanded: they offer not only maintenance services but also consultancy, financing and insurance. Such a step requires an enormous culture change in the organization, as well as large investments in employees’ knowledge and a wide range of services.

Integrated solutions provider: a bridge too far?

The step to becoming an integrated solutions provider is therefore a risky one; only a few companies are able to take it. Moreover, companies outside the manufacturing industry also provide services. Players such as Atos, Capgemini, Engie and Cofely have never been active in physical production but provide the same type of services as an integrated solutions provider in the manufacturing industry. Combining business models – such as wide range of services with a ‘deep’ strategy of product innovation – causes extra complexity. It can dilute the focus and competences in a company, thereby also degrading its performance.

New kids on the block

Given the increase in data use and complexity in production processes, new players will also emerge among the integrated solutions providers. Companies which make nothing themselves, but which advise and support OEMs in optimizing their production processes, for example by integrating machines of different manufacturers. They therefore sell processes rather than products or machines. An important motive for this is that software from different machine manufacturers is still not very compatible. This brand-independent integration role exists in IT. In industry too the first system architects will probably also emerge soon, particularly since software and data are also becoming increasingly important in this sector.

Pay-per-use: van product naar output

Companies such as Rolls-Royce (‘Power by the Hour’), Kone (elevators), Vanderlande (internal transport) and Philips Lighting are experimenting with a maintenance model based on output, in which users pay for maintenance on the basis of use or actual output. The risk of faults and expected or unexpected wear are borne by the manufacturer. It is therefore in the producer’s interest to supply products which continue to fulfil the SLA (service level agreement) as closely as possible. Companies providing output services therefore maintain tight control with regard to product development.

Product-as-a-Service: from ownership to use

The next step in output services is the shift from ownership to use. The OEM remains the owner of the product and the user pays for the machine and the maintenance on the basis of hours or output. This is known as Product as a Service (PaaS). Investments in connectivity are crucial for this business model, because the OEM must be able to monitor the use of its products – for example through remote condition monitoring. It is also important to gather information for product improvement. Downtime due to faults or quality problems ultimately has a direct

Servitization is a journey

impact on the manufacturer’s revenue and margins. And design is also an important theme: products and machines must be designed in such a way that they are even more reliable and can be dismantled faster and more easily for maintenance and replacement. After all, in this model the provision of maintenance has once again become a cost item.

Payments are only made on the basis of output or use per hour. This will cause a major shift in manufacturers’ revenue and cash flow. In addition, the substantial investments in technology, software and people will only be profitable if the installed base is large. We therefore expect that for the moment the PaaS model will only developed by the largest companies with good access to capital.

Financing of Product-as-a-Service models

While the role of services and IT is growing, the role of tangible assets is gradually declining. This is giving rise to new revenue models that require new financial models. It is therefore essential that providers of equity and debt are fully aware of these new business models.

The PaaS model entails a change in ownership of the assets that need to be financed. Currently the purchaser of the machine obtains finance, for example from a local bank with a pledge on the machine. In the PaaS model, the OEM will remain owner of the machines and essentially finances the asset for the purchaser. The purchaser becomes a user only. With a growing customer base in the PaaS model this potentially creates a large financing need for the OEM. This situation that cannot easily be catered for in the current financing system, since OEMs remain the owners of assets spread across customers all over the world. This creates a challenge when assets have to be secured as collateral. Different countries have different laws, making the collateralisation process complex, expensive or even impossible.

Finance providers therefore need greater insight into the revenue models of OEMs and the financial performance of their customers. That is why at ABN AMRO we invest in our employees’ knowledge of sectors and study new services and legal structures that are compatible with this trend.

Servitization helps industry operate more sustainably

The shift to more services also provides impetus for greater sustainability in manufacturing. First, services such as maintenance, overhauls and particularly upgrading extend product life cycles. Output-based revenue models (such as PaaS) also require more circular production. Manufacturers that retain ownership of their product or machine also bear greater responsibility in the end-of-life phase. Scrapped machines thus become valuable raw materials for new or refurbished machines. Good product design is crucial in this regard. Companies are challenged to combine biobased or recyclable materials and design for assembly with high quality and flexibility. You can read more about this in our report entitled ‘On the road to the circular car’.

Servitization step by step

Developing a service model is a major challenge, but is not impossible. Product-as-a-Service is still a long way off for most SMEs, but much servitization potential lies within reach. The step-by-step plan below clearly shows how a manufacturing SME can gradually focus more on services.

<table>
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<tr>
<th>Growth from Product sales</th>
<th>Determine where your growth markets are</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Increase sales of new products within and outside your existing customer base</td>
</tr>
<tr>
<td></td>
<td>Offer basic services proactively with new sales</td>
</tr>
<tr>
<td>Growth from existing installed base</td>
<td>Determine what your total installed base is and where it is located around the world</td>
</tr>
<tr>
<td></td>
<td>Gain visibility on your existing service penetration</td>
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<tr>
<td></td>
<td>Sell basic services proactively to your existing installed base</td>
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<tr>
<td>Growth from new services</td>
<td>Develop new service propositions and contracts</td>
</tr>
<tr>
<td></td>
<td>Expand from maintenance to overhauls, upgrades and second-hand machines</td>
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<td></td>
<td>Relieve customers of software concerns through training and consulting</td>
</tr>
<tr>
<td>Growth from new technology</td>
<td>Develop remote services (remote monitoring, remote support)</td>
</tr>
<tr>
<td></td>
<td>Develop connectivity for predictive maintenance and system integration</td>
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<tr>
<td></td>
<td>Use data analysis as information for product improvement and new revenue models</td>
</tr>
<tr>
<td>Growth from game changers</td>
<td>Develop performance-based contracts for your services</td>
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<tr>
<td></td>
<td>Turn your entire product into service and remain the owner of your product (output services)</td>
</tr>
<tr>
<td></td>
<td>Or: distance yourself from your product and focus entirely on services (managed services)</td>
</tr>
</tbody>
</table>

Source: Praetimus, 2012. Edited by ABN AMRO
Servitization stabilizes job losses

The robots are coming...

Kasper Buiting, Sector Economist at ABN AMRO, wrote on 23 September 2016: ‘Robots can’t do it on their own.’

The first alarming reports about robotization and digitization appeared in 2013. Since then a constant stream of research and opinion pieces have predicted that millions of people will lose their jobs. This grim news is based on the work of two Oxford researchers, Frey and Osborne. In 2013 they concluded that 47 percent of existing jobs were at high risk of being automated and hence disappearing. But is this prediction correct?

Number of jobs in industry is falling

The predictions of Frey and Osborne are borne out by industry data. Technology and automation have a major impact on manufacturing. Routine tasks in the production process are increasingly being automated, while human operations are reduced and the number of associated professions decreases. This trend accelerated in 2000 when technological developments in manufacturing really took off.
Computing power is increasingly cheap and robots are becoming easier to operate. Smaller SMEs are now also optimizing parts of their production process. The number of jobs in manufacturing, like the number of professions directly linked to the production process, has therefore declined over the last fifteen years (see chart).

OECD: automation does not mean immediate loss of jobs
The doomsday scenario of Frey and Osborne is fortunately put into a different perspective by other researchers. The OECD concludes, for example, that a job will not necessarily disappear if an employee’s work is automated. In many cases the employee will collaborate with the new technology. The technology supports him in his work.

Servitization creates jobs
Servitization creates new possibilities for employees with a technical background. The new revenue models based on customer service generate work that cannot be left to robots. On-site maintenance, training and advice require a thorough knowledge of machines, technology and applications. Who better is there to carry out this work than the technicians who have worked on these machines for years? Servitization can actually boost employment in manufacturing.

Servitization repatriates jobs
Servitization also leads to reshoring, bringing work back from foreign locations to the Netherlands. More than 65 percent of the machines produced in the Netherlands go abroad. At present, customers still have maintenance and repairs carried out by their own technical support department or outsource them to a local maintenance company. But if manufacturers provide these services from the Netherlands with their own technicians and call centres, that will generate a lot of employment in the Netherlands – at any rate in the short and medium term.

Technological innovations such as remote maintenance (using video and VR) and predictive maintenance are important tools in this regard and also allow efficient scheduling of customer visits. In the longer term Dutch machine manufacturers will need to set up their own maintenance offices abroad. Employment will then shift partly abroad again, but the profits will remain in the Netherlands. Manufacturers can also create new jobs by investing these profits.
**Different skills requirement**

The question is whether today’s technical employees have sufficient knowledge and skills to carry out service-based work for customers in future. New tailored education and training will probably have to be developed. That represents a substantial investment to keep good personnel on board in manufacturing. In addition, service is no longer about technical operations themselves (hard skills), but much more about customer contact (soft skills). In the popular management book entitled ‘The Second Machine Age’ Brynjolfsson and McAfee (2014) are optimistic: ‘...technological progress will cause workers to lose their jobs, but the fundamentally creative nature of capitalism creates other, usually better, opportunities for them...’

**Servitization stabilizes job losses**

Although further training of technical personnel is important, it will not solve the major shortage of technical talent, so employees will have to be retrained. In the annual Talent Shortage Survey by ManpowerGroup (October 2016) no fewer than 17 percent of Dutch employers say they find it difficult to fill their vacancies; in 2015 the figure was 14 percent, with technicians in the number one spot. There is a shortage not only of production personnel, but also increasingly of maintenance technicians.

Servitization creates jobs in manufacturing companies, but industrial service providers will also seek to exploit the potential. Since some industrial personnel lack the skills or ambitions to start a new service-oriented job, servitization will mean an overall shift in the labour market. It seems certain that there will be more work as a result of new services and reshoring, but it is difficult to state precise numbers of jobs. Nevertheless, servitization is expected to help stabilize the number of jobs and employees in industry in the years ahead.
Conclusions

The time has come for servitization
Servitization is the process whereby services are given an increasingly important role in the business model of manufacturing companies. Although the term has existed since the 1980s, it is now more relevant than ever to manufacturing companies. Servitization offers distinctive capability in a commoditized market and meets the steadily increasing demands of customers. In addition, SMEs can now expand their service proposition better and more cheaply than ever, thanks to rapid developments in the field of software, sensor technology and the Industrial Internet of Things (IIoT). But it is not all about technology: a culture shift from ‘products’ to ‘services’ is complex and requires great agility. In this regard SMEs have the edge over the large multinationals.

Big opportunity for extra profit
The main argument in favour of a shift to servitization is the promise a pot of gold. By offering a wide mix of services in addition to their manufacturing activities, OEMs can turn service from a cost item into an opportunity to provide better service for the customer. And that has advantages:
- Extra revenue from services and increased product sales;
- Higher profit since margins on services are higher than on products;
- Higher growth because sales of services grow on average faster than those of products;
- Stable revenue since services are less sensitive to economic fluctuations.

The transition to more service provision is a journey
Servitization is a journey, with different possible destinations. The four destinations in this report are equivalent to four business models, ranging from a pure product manufacturer to a company that only provides solutions:
1. Product manufacturer
2. Value added manufacturer
3. Full service provider
4. Integrated solutions provider
Every business model has its own service proposition corresponding to the extent to which the business model revolves around services. The first two business models are currently very common among SMEs. Looking further into the future, there is potential in models 3 and 4, with concepts such as pay-per-use and Product-as-a-Service playing an important role. Transformation into an integrated solutions provider may be attractive, but is not achievable for most companies, including SMEs; increased depth is therefore a better choice.

**Starting to grow in services**

It is worth starting by carrying out a proper survey of the installed base and developing an appropriate service proposition. That will immediately generate more revenue from existing customers and also attract new customers. The next step is to expand the service further. Technological developments in the field of remote monitoring and predictive maintenance considerably increase the potential to provide service.

**Servitization stabilizes job contraction**

Frey and Osborne concluded back in 2013 that 47 percent of the existing jobs were at high risk of being automated – and hence disappearing. Data from CBS (Statistics Netherlands) support this gloomy outlook: over the past 15 years the number of jobs in industry has also declined in the Netherlands. ABN AMRO believes servitization can provide a counterweight. Currently many foreign companies are still maintaining their machines themselves, or engaging the services of a local maintenance company. Thanks to automation and new technologies such as predictive and remote monitoring, Dutch OEMs will be able to ‘recover’ these maintenance services.

Furthermore, services such as maintenance, on-site overhauls, training and consultancy are difficult to automate. Robots and machines cannot take over these tasks from us; we will always need people with specialist technical knowledge to perform them. We already have a shortage of maintenance technicians. To solve this problem, manufacturing companies need to provide additional training and retraining for their own technical personnel, to unleash the full potential of servitization. Process automation will lead to a further reduction in jobs in industry, but job creation through servitization could stabilize this contraction in the years ahead.
Colophon

This is a publication by ABN AMRO. The report was written by ABN AMRO Sector Advisory & Sustainability and Praetimus.

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