Chapter 1

INTRODUCTION

The world once seemed simple, manufacturers made things and services companies did things for us. Today, more and more manufacturers are competing through a portfolio of integrated products and services. This is a services-led competitive strategy, and the process through which it is achieved is commonly referred to as servitization. Celebrated icons of such strategies in action include Rolls-Royce, Xerox and Alstom, who all offer some form of extended maintenance, repair and overhaul contracts where revenue generation is directly linked to asset availability, reliability and performance.

Servitization is, however, much more than simply adding services to existing products within a few large multinational companies. It’s potentially about viewing the manufacturer as a service provider. A service provider that sets out to improve the processes of their customers through a business model rather than product-based innovation. The manufacturer then exploits its design and production-based competences to give widespread improvements in efficiency and effectiveness to the customer.

Manufacturers have, however, traditionally focused their efforts on product innovation and cost reduction. Companies such as Porsche
and Ferrari have been celebrated for bringing new and exciting designs into the market, while companies such as Toyota have been held in awe for their work with Lean production systems. These successes can foster a perception that the only way for manufacturing to underpin competitiveness is through new materials and technologies, faster and more reliable automation, machining with more precision, waste reduction programmes, smoother flow of parts, employee engagement, and closer coupling within the supply chain.

Services offer a third way to compete. This is not an ‘instead of’ or ‘easy option’ for companies that are struggling to succeed. Indeed, delivering some types of advanced services can require a set of technologies and practices that are every bit as demanding as those in production. Neither does this require the manufacturer to abandon its technology strengths; instead these can be developed to help ensure long term competitiveness. Consequently, there is a growing realization that such services hold high-value potential.

Ironically, manufacturers competing on the basis of service provision is not a new phenomenon. In the 1800s, International Harvester used services to help establish their new reaping equipment among farmers in the American Midwest. Similarly, origins of power-by-the-hour lie partially in the practices of Bristol Siddeley in the 1960s. Perhaps what is new is our willingness as a business community to recognize that ‘manufacturing’ is not just about product innovation, process technologies and production. We are abandoning a production-centric paradigm to embrace a broader view of manufacturing.

A few manufacturers have been following this route for some time. To illustrate, over the past 20 years there has been an intense debate in the West about the rights and wrongs of outsourcing and off-shoring to China and India. Many in manufacturing have held out hope that the tide would in some way turn. While some production activities have been relinquished, key manufacturers have been quietly moving forward in their supply chains to take over service activities
carried out by their customers. Services have been key to their survival, and as a consequence our language and perceptions are now changing.

Conventional manufacturers can struggle, however, to appreciate the value of services. Managers often seek such a simple explanation of servitization that they fail to appreciate how such a strategy is likely to be of significant benefit. This is often the case with organizational rather than technological innovations. In the early 1980s it was difficult to imagine that ‘Just-in-Time’ would endure, and yet today it’s hard to identify a single manufacturing company that has not been touched by Lean techniques in one way or another.

Servitization is a similar paradigm shift. Success requires managers to hold a different mindset or worldview to their colleagues in production. The challenge is equivalent to persuading a manager skilled in Lean techniques to appreciate the value in craft production. Yet some niche producers excel through their exploitation of such systems (e.g. Holland & Holland in their manufacture of high-value sporting guns).

So, how can the value of services be thoroughly introduced and explained to those who are more familiar with a production-centric view of the world? This is the challenge we have taken up in this book.

Our purpose is to guide conventional manufacturers through the concept of servitization. To achieve this we have tackled the topic in four progressive steps. First, we set about illustrating the conditions in the business world that are causing services to become increasingly relevant for manufacturers. Second, we give illustrations and examples of a services-led competitive strategy, and pay particular attention to those ‘advanced’ services that are widely associated with servitization. Third, we paint a picture of what it takes to compete on the basis of advanced services, and delve into the technologies and practices that leading manufacturers have adopted. Finally, we summarize the conditions that favour the take-up of servitization within a manufacturer.
Collectively, these four parts outline a potential organizational transformation. Our goal has been to explain servitization in such a way that mainstream manufactures will, through following this book, be better equipped to fully understand the relevance of this concept to their broader operations.

1.1 Terminology and Scope

The word ‘services’ conjures up a variety of interpretations. The later sections of this book will clarify many of the key terms in detail. Here we give a few critical descriptions that provide a foundation for the following chapter and indicate the general scope of the book – as the following headings indicate.

This book deals with manufacturers

All forms of organizations deliver services. In everyday life we come across many organizations that seem entirely engaged with delivering services alone, such as banks, insurance brokers, local government, schools, and hospitals. Sometimes these companies use product nomenclature (for example, an insurance product or a mortgage product) and have many similarities with conventional production systems. However, we consider these as ‘pure-service providers’ and do not study them further.

This book is written for those businesses that engage in product manufacture. We adopt a broad definition of manufacturing and take it to mean that the company has some authority over the design and production of the products with which it deals. We recognize that this terminology does not rest comfortably with some companies who are advanced in servitization. Xerox, for instance, would describe themselves as a services-led technology company; others might choose to be known as a solutions business or services provider. However, we
use the term manufacturing simply to anchor the content of this book, and draw a distinction for these organizations from pure-service providers.

Our intention is to impact all forms of manufacturing. Unfortunately many of the leading examples of servitization are businesses which are large, and produce expensive and technically complex products. Yet such companies are not our exclusive target; many lessons in this book are generally applicable.

Manufacturers servitizing through advanced services

The word service can be used in different ways. For example, service can refer to how well an action is performed (‘that was good service’). Alternatively it can be used to refer to an activity; (e.g., helpdesk, maintenance, training or spare parts provision). Our focus is on the latter use of the word service; activities that a manufacturer can perform to complement the products it produces. All manufacturers offer services to some extent, but some establish market differentiation through these, and so can be thought of as following services-led competitive strategies.

Servitization is a term given to a transformation. It is about manufacturers increasingly offering services integrated with their products. Of these, some manufacturers choose to servitize by offering an extensive portfolio of relatively conventional services. Others move almost entirely into pure services, largely independent of their products, and provide offerings such as general consulting. Others still move to deliver advanced services.

Advanced services are a special case in servitization. Sometimes known as outcome, capability or availability contracts, here the manufacturer delivers services (coupled with incentivized contracting mechanisms) that are critical to their customers’ core business processes. The contracts associated with this type of offering frequently
extend over many years, with the manufacturer adopting greater risk by taking responsibility for the performance of its products, and being rewarded through ongoing and more profitable revenue streams. ‘Power-by-the-hour’, as offered by Rolls-Royce, is an iconic example of such a service.

These advanced services can hold high value for manufacturers. They can help strengthen relationships, lock out competitors, grow revenues and profits. As a consequence these are the services on which this book is concerned. Our particular focus is on manufacturers taking bold moves into providing advanced services as summarized in Figure 1.1.

**Advanced services are delivered through product–service systems (PSS)**

Servitization involves both the innovation of the service offering and also the innovation of the manufacturer’s internal capabilities in operations. This delivery system is just as important as the offering itself. Just as Henry Ford changed the world, not just through the design of
his automobile (the Model T), but also his system of mass production that enabled high volumes of products to be produced at a very low price.

Production systems deliver products; advanced services are delivered by product–service systems. These systems are based on very different interactions with the customer. Figure 1.2 illustrates how each of these systems may appear, based around the example of the provision of excavator equipment.

Figure 1.2: Contrasts between a production system and product–service system
In the production world the manufacturer produces the equipment (the excavator in Figure 1.2). When this is sold the manufacturer is rewarded financially. Although the customer may only want to use the equipment, to do so it has to first raise finance for its purchase, and then provide the necessary consumables (e.g. fuel, lubrication, tyres). They also have to monitor the equipment’s performance and, should a problem begin to arise, the customer invariably performs some diagnostics before then arranging maintenance and repair. These services may well be carried out by either the customer themselves, the original manufacturer, or an independent repair shop on the customer’s behalf. Eventually the equipment wears and needs replacing. Once again the customer becomes engaged, both in new equipment selection, and the disposal of the old. This is a transactional-based ‘production and consumption’ business model; the responsibilities of ownership lie with the customer, and the revenue stream for the manufacturer is largely based around product sale and spare parts.

Within a PSS, the manufacturer still produces the equipment. However, ownership and the associated responsibilities are not necessarily transferred to the customer; rather the manufacturer sets out to provide a ‘capability’ (an excavation capability in the case of Figure 1.2). Understanding the customer’s requirement, the manufacturer rather than the customer then takes responsibility for equipment selection, consumables, monitoring of performance, and carrying out servicing and disposal. In return the manufacturer receives payment as the customer uses the capability that the equipment provides. This is a ‘value in use’ business model; the responsibilities for equipment performance lie with the manufacturer, who receives revenue as the equipment is used by the customer.

Neither production systems nor product–service systems operate in isolation. Both are supported by an ecosystem of suppliers and partners; but the roles of these differ from one system to another. In particular, the financial partner is a critical enabler that is often over-
looked. *Try asking how a manufacturer such as Rolls-Royce affords to provide gas turbines typically costing $10,000,000 on a power-by-the-hour contract? How can they afford to ‘own’ the gas turbine on their balance sheet?* In this instance partners such as International Leasing and Financing Company (ILFC) can finance the purchase of the turbine and then lease it to the customer (user). This fee then forms part of the customer’s monthly payments on the power-by-the-hour contract. We will explore the role of suppliers later in the book, and pay particular attention to how they enable this financial model.

**Product-service systems significantly impact the operations of the manufacturer**

This book focuses on the broad operations of the servitized manufacturer. Just as many authors have given their attention to understanding Lean practices and technologies that support production, our goal has been to understand the system that has to be created to deliver advanced services efficiently and effectively.

The practices and technologies differ in six key areas. As summarized in Figure 1.3, those manufacturers who are successful in the

---

**Figure 1.3: Practices and technologies key to delivering advanced services**
delivery of advanced services create facilities that are co-located and distributed throughout customers’ operations; these are vertically integrated to ensure control over responsiveness and continuous improvement, and are staffed by personnel who are flexible, relationship builders, service-centric, authentic, technically adept and resilient. These people work with processes that are integrated into their customer’s operations and, supported by remote asset monitoring, help to manage proactively the condition, use and location of assets in the field. The whole system is controlled by measures that are those of the customer and focused on outcomes, and yet complemented by tactics that broadly demonstrate value across the operations.

Occasionally this is described as a ‘service delivery system’ for advanced services. Such terminology is sometimes favoured by scholars as it helps to capture the complexities, interactions and interdependencies of delivering these services. We use such terms sparingly, and instead favour more traditional terminology that is more readily understood by practitioners. We must though emphasize that we take a broad view of operations, and include within our scope the interactions with customers and partners that come together in a broad relationship to deliver services.

A final note on scope. The challenges of servitization reach beyond operations. Success demands the right offering, to the right customer, for the right application. In this way, the content we present is intended as a complement to texts that, for example, examine the design and marketing of services.

1.2 Knowledge Base

This book represents the culmination of an extensive research programme that has set out to understand in-depth the strategies of
world-leading servitized manufacturers. When we started on this programme we realized that our success would depend critically on:

1. *Industrial excellence with relevance*: We had to engage with manufacturers who were both demonstrating outstanding success in delivering what we would later recognize as advanced services, and would generally be seen as mainstream producers. We would need to avoid somewhat specialist manufacturers who, though they might be successful, would be difficult for the broader community to identify with.

2. *Breadth with depth*: We had to examine the entire system of practices and technologies that enable manufacturers to deliver on servitization. To succeed we would need to engage personnel ranging from senior executives dealing with an organization’s strategy through to field technicians delivering on-site services. And we would need to do this across a range of organizations.

3. *Rigour with translation*: We had to execute our work following the conventions and rigours of scientific research. Only by following such a process could we be confident in our findings and also their limitations. However, we also needed to recognize that rarely do practitioners have the time or inclination to wade through scientific papers. We would need to explain our findings succinctly in a straightforward style.

Our knowledge base was therefore derived from three sources. First, throughout this programme we have studied closely Rolls-Royce Civil Aerospace, Alstom Transport (particularly the Train Life Services division), Caterpillar (including selected dealers in the UK and USA), MAN Truck and Bus and Xerox. Table 1.1 gives a brief introduction to the principal activities of these core collaborators. These companies have been exceptional hosts. In all cases they have granted access to their facilities, introduced our team to partners within their extended supply chain, and arranged interviews with key customers.
### Table 1.1 Examples of advanced services

<table>
<thead>
<tr>
<th>Rolls-Royce</th>
<th>Alstom Transport</th>
<th>MAN</th>
<th>Caterpillar and dealers</th>
<th>Xerox</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic name</strong></td>
<td>TotalCare</td>
<td>Train Life Services</td>
<td>Fleet Management</td>
<td>Equipment Management Services</td>
</tr>
<tr>
<td><strong>Customers include</strong></td>
<td>Cathay Pacific, United Airlines, Singapore Airlines</td>
<td>Virgin Trains Tubelines Arriva Trains Wales First Group</td>
<td>Wincanton Distribution, Hoyer Logistics</td>
<td>Rio Tinto AngloGold Ashanti</td>
</tr>
<tr>
<td><strong>Service activities include</strong></td>
<td>Predictive maintenance, logistics management, global repair and overhaul</td>
<td>Maintenance, renovation, spare parts management and technical support</td>
<td>Inspection, maintenance and worthiness, along with visibility of driver and vehicle performance</td>
<td>Monitoring condition, use and location, preventive maintenance, unscheduled repair</td>
</tr>
<tr>
<td><strong>Delivered by</strong></td>
<td>Rolls-Royce, and as joint ventures</td>
<td>Alstom</td>
<td>MAN/independent distributors</td>
<td>Caterpillar dealerships</td>
</tr>
<tr>
<td><strong>Typical duration</strong></td>
<td>Ten years</td>
<td>Twenty–thirty years</td>
<td>Five years</td>
<td>Two–ten years</td>
</tr>
<tr>
<td><strong>Basis of revenue received / penalized</strong></td>
<td>Fixed dollar per flying hour/ hours out of service</td>
<td>Miles travelled/lost passenger hours</td>
<td>Miles travelled/time out of service</td>
<td>Fixed dollar per operating hour/ hours out of service</td>
</tr>
</tbody>
</table>
To illustrate, at Caterpillar we conducted multiple case studies of their own operations as well as key dealers and customers in Europe and the USA. Such studies included facility visits, in-depth interviews with staff ranging from vice presidents through to field service engineers and operatives, and the collection of a broad data set about performance and practices.

We are extremely grateful for the openness shown by our core collaborators. In return, we have taken care to protect the anonymity of individual personnel and avoid reference to overly specific company data. It is important to stress that although our case companies have engaged with us throughout the research process, the interpretations presented across these companies are our own.

Second, this in-depth process has been complemented by also looking across a wide range of industries. While our core collaborations have allowed us to dig deep into services and their delivery, we have also surveyed many other manufacturing companies to ensure that we have a broad and representative knowledge base. Execution of the programme soon revealed that we would not be able to share the names of organizations and people with which we have worked. Many businesses were, for example, willing to grant access and share their experiences only on the condition that we would not reveal their identity when presenting and discussing our results. We have respected their requests.

Finally, we have systematically reviewed articles, reports and papers emanating from the wider research base. As part of this process we have held hundreds of conversations and private briefings with managers and engineers, along with workshops, conferences and industry forums. We have ourselves contributed to conferences and journals, and received feedback from the respective research communities on our contributions.

Our resultant knowledge base is a distillation of the data from these three sources. Yet there have also been many people who
have contributed, both directly and indirectly, to this programme of research. Many academic and industrial colleagues have provided critiques of our work and suggestions on how to improve. We are immensely grateful for their input. In Appendix 1 we acknowledge their participation in, and contribution to, this study.

1.3 What’s New Here?

Our purpose is to guide manufacturers through the concept of servitization, in particular advanced services, and how to deliver these successfully. So, what is new about this topic, and what is new in this book?

Our challenge with this topic has been twofold. Those readers who are new to servitization will want to feel enlightened and enthused, while those who are familiar with the topic will demand to know significantly more about its complex concepts. This challenge is formidable in itself, but heightened by the limitations in the current knowledge base on servitization. There are particular tensions with:

1. *Exemplars:* Most of the examples are from large multinational companies delivering expensive and complex equipment to a relatively small set of customers, whereas many manufacturers are producing high volumes of products for a large range of customers.

2. *Research:* Most research focuses on these business-to-business applications because these are the companies claiming success through services. Many researchers want to broaden their scope, but are faced with a critical question. *Who is successful with servitization?* It’s quite natural to want to refer to financial records of performance, but rarely do these provide sufficient insight into the performance of a services business within a manufacturer.

3. *Expectations:* Servitization is seen as a new concept that is not commonly understood; expectations are high. A simple explanation of the topic rarely leaves the practitioner confident that such a strat-
egy is likely to have significant impact on their business. Yet a detailed and convoluted debate will be dismissed as being academic with little relevance to the ‘real world’.

4. Mindsets: The topic of servitization sits at the confluence of two worldviews, production systems and service systems. It borrows ideas from each. An unfortunate consequence is that some people from the production systems world can struggle to envisage ambitious services offerings; similarly people from the service systems world can struggle to see value in products and technological competences.

History has a habit of repeating itself. In the early 1980s researchers were struggling to convey the virtues of Just-in-Time. The exemplars were from the automotive industry and companies like Toyota didn’t stand out for profitability. What was new anyway? Inside a Toyota factory you will see many of the concepts pioneered by Henry Ford; standardized parts, division of labour and moving production lines. Perhaps only 20% of the way Toyota operated was significantly different. Through the late 1980s the language consolidated. Simple changes occurred, such as the word ‘quality’ generally being taken to refer to conformance to specification rather than inspiring a philosophical debate. In the early 1990s our knowledge of Just-in-Time consolidated, it translated into Lean, and today Toyota is the world’s largest automotive manufacturer.

So, what was it those people just couldn’t see in the 1980s? We’ve been through a paradigm shift in our ideas of how to organize design and production for efficient manufacture. As time moves on and the business environment continues to evolve, so too our ideas will continue to evolve; not abandoning those of the past but, just like Toyota, subsuming much of what has gone before. But make no mistake, as a community our knowledge base of servitization lags far behind that of Lean. Perhaps we are in the equivalent of the mid-1980s. This is
not to suggest that it will take 30 years before the topic is mature and well understood, but rather that our knowledge base is fragile and will continue to evolve. This places a special challenge on you the reader.

We are in no doubt that servitization is vitally important. In carrying out the research for this book we have spent a large portion of our lives in the servitization world, but we also know well the world of production. In this book we set out to deliver the message that these worlds are different, and explain how and why this is. If you are deeply involved with production, maybe hold off for a moment from relating back to your own worldview. In return, we will set out to convey the principles, concepts, practices and technologies of servitization practically and succinctly. Our goal is for you to appreciate that this phenomenon is something subtle and not simply about adding a few services to products.

1.4 Navigating This Book

We have shaped this book to reflect how we expect senior executives from manufacturing firms will want to appraise servitization. This introduction provides the necessary foundation for the four principal parts, namely:

1. *Business context:* Factors that are influencing the adoption of servitization especially by western manufacturers.
2. *Competing through services:* The key elements of servitization and advanced services; what they look like in practice, and the motivations, risks and rewards explaining their appeal.
3. *Service delivery system:* How leading manufacturers organize their operations to successfully support the delivery of advanced services.
4. *Readiness to servitize:* The conditions that favour the take-up of servitization, both within sectors and individual businesses, and the factors that influence success.

Each part begins with a brief summary of the subsequent content. In the final chapter we reflect on the book as a whole and suggest how servitization may continue to evolve into the future.