

## Servitization and Deservitization: Overview, Concepts, and Definitions

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### Highlights

- We define four interrelated key concepts: servitization, service infusion, deservitization, and service dilution.
- Insights derived from examples of servitization and deservitization in practice are of use to academics and practitioners of business marketing and service management.
- We position the dynamics of service extension and service reduction strategies and processes as an emerging research area.
- A better understanding of the people management aspects of service growth can advance the research domain.

### Abstract

The topic of servitization has generated a considerable body of research and many conferences, as well as industry engagement. Yet, despite the extensive literature associated with this now-mature discipline, there is no broad-based consensus on the core concepts and definitions deployed by servitization scholars, and both terminology and usage often seem ambiguous. This paper examines challenges related to service growth strategies, as well as strategies involving deservitization or a retreat from service offers. Showing that these strategies have been pursued for more than fifty years, clarification is sought here by framing the corresponding processes and proposing definitions for four core terms: *servitization*, *service infusion*, *deservitization* and *service dilution*. It becomes clear that in focusing on the organizational change entailed by these processes, future research must elucidate “softer” issues such as leadership and business logic.

**Keywords:** Servitization, deservitization, service infusion, service dilution, product-service system

## 1. Introduction

There is increasing interest in servitization as a theoretical construct, empirical phenomenon, and research domain. Early phenomenological studies such as Vandermerwe and Rada (1988) reported that firms were adding service to their offering as a means of increasing competitiveness, turnover, and market power. They discussed the evolving process of servitization, from a point where firms considered their offering in terms of “goods *or* services,” through “goods *and* services,” to the marketing of bundles of “goods + services + support + knowledge + self-service.”

Yet, despite rapidly growing research interest and output from both academia and business, several research questions remain unanswered (Eloranta & Turunen, 2015; Kamp & Parry, 2017; Kowalkowski, Gebauer, & Oliva, 2017). Across industries, there is evidence that firms may have overextended themselves in moving toward service, and some are withdrawing from certain service initiatives—a process we refer to as *deservitization*. A case in point is Xerox, often cited as an example of a product firm that has successfully pursued a service growth strategy. In 2013, chairman and CEO Ursula Burns told investors that the “shift to a services-led growth portfolio is paying off” (Raval, 2014). Less than three years later, the company decided to separate its service business, creating the independent firm Conduent as a vehicle for their service-centric business process outsourcing offerings while retaining hardware-centric operations such as high-end color and customized printing under the Xerox brand. To date, theory has not addressed the question of why such changes occur.

Against this background, the two sections of this special issue of *Industrial Marketing Management* explore topics of interest in contemporary servitization research. To begin, this article characterizes servitization as a mature field of research with a growing community of followers, referencing the dedicated publications, conference tracks, and conferences devoted to the subject. Following a brief review of servitization and *deservitization* initiatives among the paradigmatic practices of product-based firms, we examine the dynamics of strategies and processes of service extension and service reduction and go on to define and explain the interrelationship between four key process concepts: servitization; service infusion; *deservitization*; and service dilution. The final section discusses how we can advance our

understanding of this domain by investigating “soft” aspects of servitization—the people management aspects of service growth that prior research has tended to neglect.

From a theoretical perspective, the process of servitization can be framed in multiple ways. This special issue is divided into two sections, each corresponding to a specific call for papers. In both cases, we invited manuscripts that would offer an original perspective, advanced thinking, and scientific rigor. In total, 31 authors from a range of business and management disciplines have contributed; many are leading scholars in the field. Additionally, in the final contribution here, IBM Director Jim Spohrer offers a personal reflection on the history of IBM from the perspective of service.

The goal of the first section—*Servitization and advanced business services as levers for competitiveness*—is to capture the current state of the field before looking ahead to such future concerns as “smart servitization” in the context of business-to-business relationships and industrial networks. The second section—*Critical perspectives on service growth*—aims to promote and integrate critical research that challenges prevailing assumptions and strengthens the field’s theoretical foundations.

## **2. Toward an established research domain**

Along with acceptance and uptake of servitization as a topic in leading journals, congress cycles, dedicated conferences and special sessions, we examine a number of case examples of firms that have pursued servitization and deservitization initiatives. While the innovative and evolving nature of such initiatives has led to mixed outcomes, the examples and timeline below confirm that servitization (and subsequent deservitization) has been a feature of many sectors and markets for more than 50 years.

### *2.1 Dedicated journal publications and conferences*

This special issue of *Industrial Marketing Management* follows a number of earlier publications dedicated specifically to the analysis of servitization or to broader themes related to services in product companies (e.g., B2B service innovation). Table 1 provides an overview of these special issues, including two forthcoming publications.

Table 1: *Overview of special issues on servitization*

<b>Theme of special issue</b>	<b>Journal</b>	<b>Year</b>
The transition from product to service in business markets: An agenda for academic inquiry	<i>Industrial Marketing Management</i>	2008
Product- service modes of working: Operations management implications	<i>International Journal of Operation and Production Management</i>	2009
Setting a research agenda for service business in manufacturing industries	<i>Journal of Service Management</i>	2010
The Global B2B Challenge	<i>Journal of Business &amp; Industrial Marketing</i>	2011
Service & solution innovation: Overview and research agenda	<i>Industrial Marketing Management</i>	2011
B2B Service Networks	<i>Industrial Marketing Management</i>	2013
Management of Complex Engineering Service Systems	<i>Journal of Service Management</i>	2014
Service Innovation in B2B Firms	<i>Journal of Business &amp; Industrial Marketing</i>	2014
Servitization	<i>Strategic Change</i>	2014
Servitization of manufacturing and its implications for operations management	<i>Production Planning and Control</i>	2015
Servitization and Deservitization	<i>Industrial Marketing Management</i>	This issue
Service Implementation in Manufacturing Firms, Strategy, Economics and Practice	<i>International Journal of Production Economics</i>	Forthcoming
Service Transformation in Industrial Companies	<i>International Journal of Production Research</i>	Forthcoming

The growing interest in servitization as a research topic is also reflected in the increasing number of conference presentations and discussions centering on servitization, service innovation, and product-service system thinking. For example, a first version of Oliva and Kallenberg's (2003) seminal article on the transition from products to services was presented at the International Quality in Service Symposium (QUIS), a conference series that has since seen continued growth in servitization-related presentations. Many conferences now offer special tracks and sessions dedicated to deepening the discussion of topics, methods, and the theoretical implications of

servitization. EUROMA, QUIS, ServSIG, and Frontiers in Services are among the general conferences currently shaping the domain.

This high level of interest has led to the emergence of a number of special conferences focused primarily on servitization and product-service systems. In the UK, for example, the Aston Business School runs an annual Spring Servitization Conference that brings together practitioners and researchers, and the Cambridge Service Alliance holds an annual event to facilitate discussion between researchers and large multinational companies. The Spanish research community organizes an annual International Conference on Business Servitization, which is academic-led but is also attended by practitioners. Similarly, a number of Germany's Fraunhofer Institutes organize industry platforms to facilitate service knowledge exchange among companies, and in Italy, a number of universities have come together to organize meetings with industry partners on service management issues (ASAP SMF). Table 2 provides an overview of key conferences.

Table 2: Conferences for research on service growth in product firms

<b>Conference</b>	<b>Organizer/Affiliation/Link</b>
International Research Symposium on Service Excellence in Management (QUIS)	Biannual symposium (initiated in 1988)
Frontiers in Service Conference	Annual conference initiated in 1992; sponsored by INFORMS, the American Marketing Association, and the Center for Excellence in Service at the University of Maryland
International Annual EurOMA Conference	Annual conference initiated in 1994 by the European Operations Management Association
ServSIG International Research Conference	Biannual conference (initiated in 2001) organized by the American Marketing Association's Special Interest Group for Services Marketing and Management
ASAP SMF Service Management Forum	Annual Italian conference initiated in 2003 by the After-Sales Advanced Planning (ASAP) consortium
Service Operations Management Forum	Annual workshop initiated in 2008 and supported by EurOMA and EURAM
International Research Symposium in Service Management	Annual conference (initiated in 2010)
Industrial Product-Service Systems Conference (IPSS)	Annual conference initiated in 2009 under the auspices of CIRP (the International Academy for Production Engineering)

Cambridge Service Week	Annual conference initiated in 2010; organized by the Cambridge Service Alliance (founded by BAE Systems, IBM, and the University of Cambridge's Institute for Manufacturing and Judge Business School)
International Conference on Business Servitization	Annual conference in Spain (initiated in 2012)
Spring Servitization Conference	Annual conference initiated in 2013; managed by Aston Business School's Centre for Servitization Research and Practice
Service System Forum	Annual conference initiated in 2015; an initiative of the Warwick Manufacturing Group (University of Warwick)

## 2.2 Industries and companies

In Figure 1, the selected examples of product companies embarking on a servitization journey show how companies of different sizes from different sectors and product categories have been exploring service business opportunities. These companies must cope with multiple issues that include organizational structure, service culture, service innovation processes, and mergers and acquisitions. For example, following historically high losses and failures in the personal computer market, IBM survived by moving successfully from products to services (Loving, 2011; Spohrer, 2016). After selling its personal computer division to Lenovo, IBM changed its registration at the New York Stock Exchange (NYSE) from product to service company. Magna Steyr of Austria, a subsidiary of Canadian global automotive supplier Magna International, produces components and body parts for the automotive industry but also offers assembly services for entire cars. Rolls-Royce pioneered service contracts in the aircraft industry and trade marked “power-by-the-hour” contracts. In the document technology industry, Xerox introduced pay-per-use services (pay-per-copy) to support its new product. Xerox’s business model subsequently moved from pay-per-use to an annuity-based business model, focusing on recurring revenue and cash generation by bundling contracted services, equipment maintenance, consumable supplies, and financing. Similar services have started to appear in other sectors, including everyday consumables, as in Michelin’s price-per-mile contract for tires. And Swiss Fresh Water demonstrated that instead of selling and maintaining water treatment equipment, it was viable to sell water-as-a-service in markets such as Africa, where there is limited availability of potable water.

Despite numerous examples of successful servitization in many sectors, most companies have found it far from straightforward to achieve the expected revenues, profits, and customer satisfaction. Although there is little research on failed cases of servitization or on deliberate deservitization strategies, anecdotal evidence points to a “service (servitization) paradox,” where investment in service growth fails to generate corresponding returns or shareholder value (Gebauer et al., 2005; Neely, 2008). For example, the development of ThyssenKrupp Industrial Services as a strategic business within the company was promoted to reduce the German industrial conglomerate’s exposure to the cyclic nature of steel production and sales and a tendency toward commoditization. However, this new service division did not fully meet financial expectations—or, more specifically, the expected synergies with the company’s other core businesses—and ThyssenKrupp decided to terminate its involvement in the service business by selling it off. Similarly, Dürr, a leading German manufacturer of paint finishing systems, introduced one of the first pay-per-use services, enabling car manufacturers to pay for each car painted rather than investing in equipment and services. However, Dürr found it difficult to predict the level of equipment usage (based on customer production volume) or to calculate an appropriate pay-per-use fee. The service did not meet financial targets, and this eventually forced the company to sell its service division (Premier) to Voith Industrial Services. In a final example, Xerox split into two companies in response to issues that included shareholder concerns about insufficient market capitalization, with its service business now operating as the separate Conduent brand.



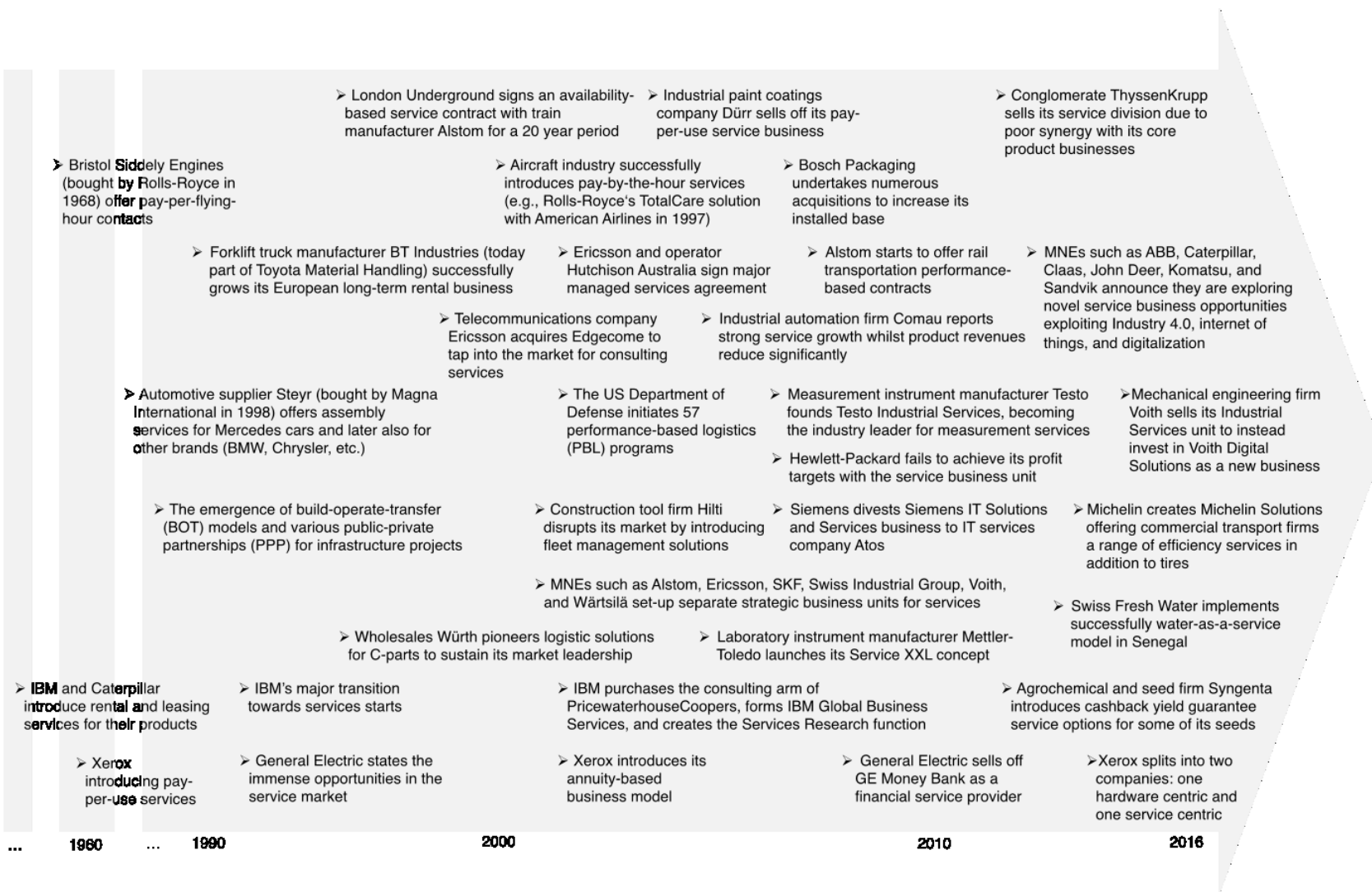


Figure 1. Servitization and deservitization: some examples.

### 3. Clarifying the dynamics of (de)servitization

Despite more than five decades of (de)servitization and a growing body of related literature, little progress has been made toward agreeing on the core paradigm (see also Kowalkowski, Gebauer, & Oliva, 2017; Brax & Visentini, 2017). Among a plethora of terms, even the central concept of servitization has been variously interpreted and defined by different researchers and audiences. To this extent, the servitization community seems to lack a common lexicon and analytical tools that might structure scholarly or practice-led debate.

Service concepts essentially refer to processes, offerings, or practices. The terms “service infusion” (Brax, 2005; Kowalkowski et al., 2012), “servitization” (Vandermerwe & Rada, 1988; Van Dierdonck & Heylen, 1994), and “service transition” (Oliva & Kallenberg, 2003; Fang, Palmatier, & Steenkamp, 2008) are commonly used to denote processes of service growth.<sup>1</sup> Second, there are multiple terms describing “innovative” combinations of goods and services, such as the engineering-led concepts of “product-service systems” (PSS) (Mont, 2002) and “industrial product-service systems” (IPS<sup>2</sup>) (Meier, Roy, & Seliger, 2010) and the marketing-led concept of “hybrid offerings” (Shankar, Berry, & Dotzel, 2009; Ulaga & Reinartz, 2011). Offerings that combine supplier and customer resources to create value in use are frequently referred to as “solutions” in the management and marketing literature (e.g., Macdonald, Kleinaltenkamp, & Wilson, 2016). In many cases, solutions are based on high-technology and high-value goods or complex product systems (CoPS) (Davies & Brady, 2000); the practices of “systems selling” (Mattsson, 1973) and “solutions selling” (Doster & Roegner, 2000) are examples of using such offerings to drive change.

The next section introduces a conceptual framework for the description and interpretation of service growth and reduction processes along two interrelated continua, illustrating the relative importance of service(s) for a company’s business and its relationship and posture toward the market.

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<sup>1</sup> Given the range and variety of concepts, we focus on some of those most commonly found in the contemporary academic literature, excluding such adjacent concepts as *servicizing* and *servicification*. While both of these are frequently used as synonyms for servitization (e.g., Reiskin et al., 1999), *servicizing* has more recently been applied specifically in the context of sustainability to denote “green” business models (Agrawal & Bellos, 2016), where a company sells a product’s functionality or use rather than the product itself (e.g., Plepys, Heiskanen, & Mont, 2015; Toffel, 2008).

### 3.1 Key concepts and dimensions

Using terms that are employed and elaborated throughout this special issue, the processes of service growth and reduction can be described on two continua that reflect firms' corresponding attitudes, practices, and modus operandi. In relation to service growth dynamics, we refer here to *servitization* and *service infusion*; in relation to service reduction, we refer to *deservitization* and *service dilution*. These concepts are integrated in the framework shown in Figure 2. To begin, we discuss the two concepts related to service growth. While the concepts of operations-led servitization and marketing-led service infusion are often used interchangeably to denote service transition strategies and processes, it is constructive for analytical purposes to distinguish between the two (cf. Ostrom et al., 2015).

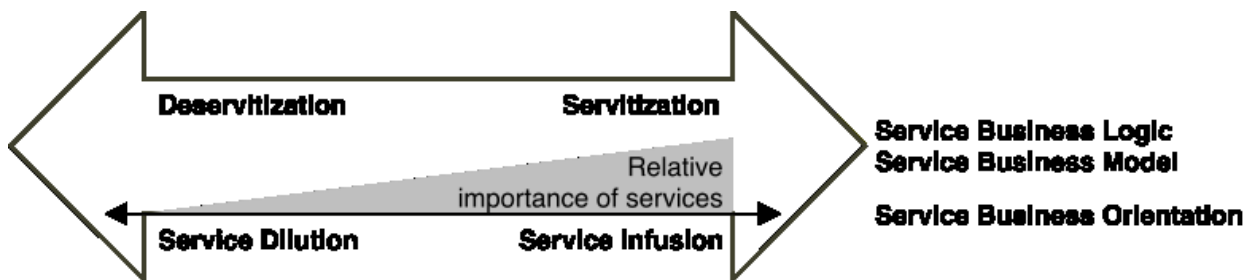


Figure 2. Service growth and reduction processes: two continua.

Service infusion can be defined as the process whereby the relative importance of service offerings to a company or business unit increases, so augmenting its service business orientation (SBO).<sup>2</sup> In line with Homburg et al. (2002), SBO can be operationalized in terms of three dimensions, all of which are positively associated with service infusion: number of services offered, number of customers to whom services are offered, and relative emphasis on services. SBO also relates to Shostack's (1977) product-to-service continuum, in which a company's service orientation increases when more (intangible) service elements become central to its offerings.

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<sup>2</sup> While this discussion focuses on firm-level processes, we recognize that changes may also occur at business unit level, as well as at an aggregated industry or market level.

The general assumption is that companies move in either an evolutionary or a discontinuous manner from basic, product-oriented services toward offerings that include more advanced process-oriented services and product-service systems, leading ultimately to the provision of solutions. While such processes are more common, companies can also increase their SBO by shifting the emphasis from more complex to more standardized service offerings (Finne et al., 2013; Kowalkowski et al., 2015). In addition, service infusion may form part of a deliberate strategy or may occur in more emergent fashion (Brax & Visintin, 2017).

We regard servitization as an overarching concept that includes but goes beyond service infusion, where servitization is defined as the transformational process of shifting from a product-centric business model and logic to a service-centric approach. To varying degrees, servitization involves a redeployment and reconfiguration of a company's resource base<sup>3</sup> and organizational capabilities and structures (Baines et al., 2009); a redefinition of the mission of the firm; and a revamping of routines and shared norms and values (Kindström & Kowalkowski, 2014). A service business model means that the supplier commits to improving customers' value in use, so assuming greater responsibility for the overall value-creating process as compared to product-centric, transaction-based business models. The service model's revenue mechanism depends on the outputs of customer value-creating processes, such as guaranteeing a level of availability of products or achieving an expected level of performance, rather than inputs such as numbers of service hours sold.<sup>4</sup> As well as a redesigned business model, servitization also entails a revision of business logic, encompassing the firm's *raison d'être* and managers' mental models. While the concepts of business logic and business model may be seen as interrelated, business model conceptualizations typically omit these "softer" aspects (cf. Wirtz et al., 2015).

As noted by Vandermerwe and Rada (1988), servitization is not confined to manufacturers or other product firms (although this is a common perception). In fact, service sector companies can also servitize, just as firms may go in the opposite direction—that is, away from constructs associated with service provision. For instance, because service firms such as banks often retain a

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<sup>3</sup> This includes the extended resource base made available by networked relationships with other organizations in the service system.

<sup>4</sup> Such business models are also referred to as *solutions* (Storbacka et al., 2013). In the transition toward such a model, companies advance along four continua: customer embeddedness, offering integration, operational adaptiveness, and extent of organizational network.

product logic (maximizing the sale of prepackaged “financial products” while distancing themselves from their customers through automation and digitalization), they may adhere to a product-centric mindset and business logic (Shah et al., 2006). Similarly, as Grönroos (2006) observed, a supplier of consumer durables or industrial products may follow a service logic that focuses not on products but on the processes in which those products are integrated and where customer value emerges. In short, a predominantly service-based company with high SBO may pursue a product-centric logic (and vice versa). The four key concepts of service growth and service reduction illustrated in Figure 2 are defined in Table 3.

*Table 3. Key concepts and definitions underpinning service growth and reduction processes*

<b>Key concept</b>	<b>Definition</b>
Servitization	The transformational processes whereby a company shifts from a product-centric to a service-centric business model and logic.
Service infusion	The process whereby the relative importance of service offerings to a company or business unit increases, amplifying its service portfolio and augmenting its service business orientation.
Deservitization	The transformational process whereby a company shifts from a service-centric to a product-centric business model and logic.
Service dilution	The process whereby the relative importance of service offerings to a company decreases, reducing its service portfolio and augmenting its product business orientation.

### *3.2 Deservitization and service dilution*

To date, research has focused almost entirely on servitization, presenting this as a beneficial process. However, in such cases as a price-competitive market, a company may decide to reduce or curtail service provision if uneconomical. Rangan and Bowman (1992) referred to this kind of deliberate service dilution as a service compression strategy. As demonstrated by the history of IBM (Spohrer, 2017) as well as by the evolution of the computer industry in general (Cusumano, Kahl, & Suarez, 2015), many large firms continuously pursue both service infusion and service dilution initiatives. These dynamics are not confined to service flows from one actor to another (upstream or downstream) but also depend on such factors as innovation, maturity, and

competence. For example, Valtakoski (2017) views deservitization as a special case of industry evolution. In the computer industry in the 1980s, as technological uncertainty decreased, technology diffusion increased and standards were established, prompting firms to deservitize. As products and services may both complement and replace each other (Araujo & Spring, 2006) standardized, lower-cost products eventually replaced customization and other services. At company level, service reduction can be achieved through sale, liquidation, or divestment. Cases such as Xerox challenge the notion that adding more services represents a viable strategy for product firms in general, and Benedettini, Swink, and Neely (2017) demonstrate empirically that such a strategy does not increase the chances of survival.

In parallel with service growth, companies face a related technological change that Spohrer (2017) refers to as the “cognitive” phase of the current digital transformation of industry and the global economy, informed by advances in artificial intelligence. Also referred to as the Industrial Internet, the Internet of Things, or Industry 4.0,<sup>5</sup> these technologies facilitate the decoupling of machine software from hardware across the socio-technical industrial system and enable fuller utilization of product data in combination with other data. These increasingly autonomous systems and self-aware, predictive, and reactive machines communicate seamlessly with each other and with human actors, offering immense opportunities for service growth and driving new service innovation, such as cognition-as-a-service, as well as enabling more viable service systems. As discussed by Spring and Araujo (2017), these advances are coevolving with new opportunities to move from linear industrial processes to “circular economy” principles. At the same time, as in the past, many established services are likely to be negatively affected and even replaced. The servitization-deservitization dynamics of such technological shifts at company and industry level are still not well understood and represent fruitful directions for further research.

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<sup>5</sup> While engineering conglomerate General Electric discusses the Industrial Internet, European organizations such as engineering multinationals ABB and Siemens frequently refer to Industry 4.0. The term originates from a German government project promoting the digitalization of the manufacturing sector. Thomas Newcomen’s steam engine of 1712 represents the advent of Industry 1.0; the first use of electricity for industrial production 1870 marks the birth of Industry 2.0; and Industry 3.0 was triggered in 1969 by programmable logic.

#### **4. Conclusions**

For over 50 years, the alternating dynamics of service extension and service reduction strategies and processes have been observed and studied in many different sectors and markets, yielding a significant body of academic literature. In demonstrating the growth and maturation of this field of study and presenting examples of both processes over time, we have sought to bring greater clarity to the core concepts of servitization, deservitization, service infusion, and service dilution.

Beyond increased service business orientation and the addition of services to a firm's portfolio, servitization also encompasses the transformation to a service-centric business model and logic (cf. Grönroos, 2006; Normann, 2001). This includes cultural and attitudinal changes that may have profound implications for both the company and its business network. Prior research confirms that an established product-centric organizational culture and business logic may impede service growth (Bowen et al., 1989; Gebauer & Friedli, 2005; Homburg et al., 2003; Sawhney et al., 2004). According to Johnstone et al. (2014), "While such suggestions are intuitive, the empirical evidence and theoretical explanations regarding people management issues in organizations pursuing a servitization journey remains surprisingly thin" (p. 277). Johnstone et al. (2014) argue that even where a firm overcomes the "service paradox"—growing their service business and generating a healthy financial return—it may still encounter seemingly intractable cultural and attitudinal challenges. In fact, inculcating a service culture—which involves changing the mindsets of hundreds or thousands of employees habituated to a product-centric vision and mental model—may be the primary barrier for product firms looking to gain from service offerings (Davies et al., 2006). For example, a key element in the servitization journey of SKF (a global leader in the bearings business) was a cultural shift from firefighting and reactive maintenance by "overtime heroes" to a service culture of promoting and innovating. Rather than breakdowns and failure avoidance, the key drivers of service operations are uptime and growth.

What, then, are the people management implications of service growth? While there is anecdotal evidence from cases like SKF, and prior exploratory and descriptive research provides some insights, further empirical research is needed to investigate how the tension between product logic and service (dominant) logic can best be managed—a friction that is particularly in evidence in firms that integrate products and services into solutions and other hybrid offerings (Gebauer & Friedli, 2005; Oliva et al., 2012). Fostering a service culture also requires the

involvement of customers and key partners in co-creation throughout the service process (cf. Aarikka-Stenroos & Jaakkola, 2012). Without alignment of business logics among these parties, no service initiative is likely to succeed (Kowalkowski, 2011). Given the reliance of many product firms on dealers and other channel partners, cultural change may also have to encompass firms in the broader business network.

From the perspective of service business logic, the litmus test of whether a firm is truly servitized is not the extent of its services and PSS portfolio but whether the primary purpose of these offerings is to defend its product business or to enable customer value creation. In practice, the latter entails a willingness to cannibalize the product business where necessary to craft a better overall value proposition (Kindström & Kowalkowski, 2014). This requires leadership skills beyond those needed to develop a separate service business within a product firm or to nurture a service culture within a service-specific unit. For industry incumbents in particular, this leadership and change management challenge lies in being sufficiently agile to withstand new competitors, including software powerhouses like Amazon, Google, and Microsoft as well as smaller and more nimble pure-service players. Leadership is also central to the other themes discussed in this special issue; in the face of opportunities and threats such as acquisition and divestment options, new and disruptive technologies, and the uncertainties of multiple strategic positions and business models, executives must know how to set priorities in deciding what service growth routes to pursue.

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