
Guest editorial: the future of servitization in a digital era

Guest editorial

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Active domain in service research

Servitization has become one of the most active domains in service research, attracting interests from multiple disciplines, including marketing, operations, service management, engineering management, and strategy. The concept refers to a firm's transition from a product-centric business model and logic that focus on selling products to a more service-orientated business model and logic that focus on facilitating customer value creation through advanced services and solutions (Baines and Lightfoot, 2014; Kowalkowski *et al.*, 2017a). Much of the managerial and scholarly attention builds on the premise that servitization, if successfully implemented, can allow firms to achieve (sustainable) growth and higher profitability as compared to their traditional, product-centric business models. Regardless of whether an industry is new or mature, firms can gain competitive advantage through such strategy (Cusumano *et al.*, 2014). In addition, services and solutions may provide a more stable source of income, as they are more resistant to economic cycles that affect product investment, and to disruptive events such as the Covid-19 pandemic.

In our opinion, what makes servitization research both stimulating and engaging is the heterogeneity and dynamics characterising it, as well as the high degree of practical relevance. For example, in most product industries, it is fairly straight forward to understand and outline the product offering the firm is manufacturing and selling, whether it is capital goods, hardware or consumables. However, for every type of product, there are several different service growth options at hand, including services that extend the lifetime or increase the uptime of the product and solutions based on customised and integrated hardware, software, and service. Furthermore, providers can offer their customers a wide range of guarantees, such as service response time, equipment availability, and operational performance. To analyse how to successfully seize such growth options, including how to best exploit the potential synergies between the firm's product and service businesses while overcoming the tensions between the two, is only one example of research with both high theoretical and managerial relevance. As with service research in general (Gustafsson and Kristensson, 2020), servitization researchers often have good relationships with practitioners and take an interdisciplinary approach, starting out from problems and challenges that organisations and executives are facing. We concur with Gustafsson *et al.* (2015, p. 427), who state that "Service research *can* and *should* make a difference to the industries, firms, customers and employees it investigates."

During the last decade, there has been a sharp rise in academic activities and output in terms of publications, special issues, and conferences dedicated to servitization, which reflects the growing focus on service growth across industry sectors. Traditionally, servitization has been an applied and problem-driven domain (Rabetino *et al.*, 2021), which means that much of what has been published has had high practical relevance (e.g. Lele, 1997; Matthyssens and Vandenbempt, 1998; Oliva and Kallenberg, 2003;



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Vandermerwe and Rada, 1988; Wise and Baumgartner, 1999), guiding further research and knowledge creation without a clear emphasis on rigor (Gustafsson *et al.*, 2015). While the research stream to certain extent is still theoretically and methodologically nascent (Kowalkowski *et al.*, 2017b) as compared to many other service and management research domains, we see that the research area has significantly matured, and rigour gained increased focus. We claim that the servitization community should build on its strong foundation of investigating managerially relevant business issues and its accumulated empirical evidence to increase its level of rigour through boundary-spanning research. Digitalisation is certainly a case in point; digital technologies have enabled new opportunities for service-based value creation and revenue generation that have accelerated servitization. Servitization researchers are in an excellent position to address the managerial challenges and research opportunities that this change entails, thereby combining managerial relevance and theoretical and methodological rigor.

Servitization and digitalisation

The infusion of data-enabled services into many different aspects of business illustrates how digitalisation and servitization are closely intertwined. Merging the physical and digital worlds has emerged as an attractive subarea under the term *digital servitization* (e.g. Gebauer *et al.*, 2021; Kohtamäki *et al.*, 2019). While the term captures industry's focus and appetite on new digital business opportunities and models, we argue that servitization today is essentially all digital, driven or enabled by novel data and technological opportunities — and has so been for several years. Hence, the question is whether there really a need for the “digital” prefix and whether it is still relevant to regard it as a subarea of servitization research.

There are numerous successful examples of firms providing digitally enabled services and solutions for years or even decades. For example, Rolls-Royce's archetypal solution TotalCare, which relies on sensors and data analytics, began in 1997 (Macdonald *et al.*, 2016) and BT Industries (since 2000 part of Toyota Material Handling) created its logistics-planning software system BT Compass in 1993, to help its customers improve their inventory handling and reduce overall costs (Anderson and Narus, 1995). When discussing these and other similar service offerings and business models, it is worth recalling the difference between “digitisation” and “digitalisation.” Digitisation involves turning analogue data into digital data (Ng and Wakenshaw, 2017) whereas digitalisation includes the socio-technical processes that accompany digitisation (Lusch and Nambisan, 2015) and refers to the use of digital technology to change a business model, thereby providing new forms of value-creating and revenue-generating opportunities (Svahn *et al.*, 2017).

As Kowalkowski *et al.* (2021) point out, a technology-oriented firm with a product-centric mindset may have little difficulty in implementing digitisation whereas digitalisation, just like servitization, may prove considerably more challenging. The music industry is a case in point; moving from selling analogue Long Plays (LPs) to digital Compact Discs (CDs) proved no difficulty for the record companies, but rather a formidable sale's opportunity to the same customers (i.e. many consumers who had a record as LP would later buy it as CD). However, rather than embracing the new digital opportunities enabled by digitalisation (e.g. “softwareisation”), which changed the way people interact with music, record companies generally clung on to a product-centric business logic of selling CDs. Rather than developing business models based on Internet distribution they strived to protect their business model by such things as copy-protected CDs. Ironically, this defensive stance pushed many people to illegal downloading to conveniently access software-based music (e.g. mp3), thereby undermining their product-centric model even further (Kowalkowski *et al.*, 2021).

For product firms, digitalisation enables new opportunities for long-term competitive advantage through servitization but also pose new challenges and entail trade-offs among strategic options, changing not only intra-firm and inter-firm processes and relationships but also overall service ecosystem dynamics (Kapoor *et al.*, 2021). Given the profound impact of digital technology on the processes, practices, and strategies of organisations, we believe that time is ripe for moving from “digital servitization” as one of many subareas to just digital as an integral part of servitization, which influences all aspects of it (e.g. value creation and capture, innovation, sales, and delivery processes, customer relationships, organisation, governance).

The importance of a community

Similar to other academic subjects, servitization researchers come together a couple of times a year at conferences and networking events to present and debate their ongoing research. These conferences not only provide opportunities to present new ideas, but also a platform to further develop the field and connect different academic communities who are interested on the topic. Amongst such events, the Spring Servitization Conference (SSC) is the largest and longest running conference. The conference has come a long way since its modest beginning 11 years ago, when it started life as a workshop at Aston Business School (Birmingham, UK).

SSC was created to build and formalise a research community around servitization, and to genuinely support and accelerate academic endeavour in this area. Servitization is a topic which, for a variety of reasons, is not well served by the focus and processes of traditional academic conferences. Partially this is because servitization is, by its very nature, a topic which cuts across disciplines, whereas academic conferences tend to sit within these. This means that conventionally scholars in marketing are unlikely to meet their counterparts in operations, technologies, finance, or economics. Yet to properly progress servitization necessitates engagement across these areas. Similarly, while traditional conferences can attract several hundred people, their system of multiple tracks can easily mean that more disparate topics such as servitization tend to be poorly supported. All too often servitization researchers find themselves presenting to just a few people, while any keynotes they may attend tend to be generic or even irrelevant. So, all in all, a largely unsatisfactory “outcome” if you are a servitization scholar.

SSC was designed to overcome such limitations: It is entirely focused on servitization, attracting scholars from across disciplines, arranged around a single track where presenters speak to the whole community, and coupled with highly relevant industrial keynotes. As a result, SSC has become the largest international gathering of researchers interested in servitization, attracting over 100 delegates every year, and since 2016, it has been held in Birmingham, Manchester, Lucerne, Copenhagen, and Linköping.

This special issue

The papers that are included in this special issue explicitly or implicitly advance our understanding of servitization in a digital era. They were selected from the papers presented at the 2020 Spring Servitization Conference based on quality, novelty, and relevance, but also to display the great diversity of research in the field. The *Journal of Service Management* has a long history of publishing servitization research (including the seminal paper by Oliva and Kallenberg (2003)), ranging from survey studies (e.g. Raddats *et al.*, 2015), analysis of secondary data (e.g. Benedettini and Neely, 2019) and quantitative (e.g. Stormi *et al.*, 2018) and qualitative case studies (e.g. Ettlie and Rosenthal, 2012; Salonen *et al.*, 2017) to conceptual research (e.g. Nordin and Kowalkowski, 2010) and

literature reviews (e.g. [Eloranta and Turunen, 2015](#)). We see that the six papers in this special issue each contribute in different ways by strengthening the empirical and theoretical foundation. The special issue is published in two different issues of the journal, with two papers appearing in Issue 5 (Volume 32, 2021) and the remaining four in this issue (Volume 33, 2022).

Three of the papers focus on different aspects of digital service innovation and development. The first paper, “*Patterns of business model innovations for advancing IoT platforms*” ([Gebauer et al., 2022](#)), investigates the emergence of Internet of Things (IoT) platforms from a business model perspective. Based on two research studies, the paper identifies three distinct, sequential innovation patterns, each associated with distinct triggers, goals, and actions. First, platform skimming is triggered by technological advancements and the goals are to improve internal process and cost efficiency and connect as many products as possible to the IoT platform. As for platform revenue generation, which is triggered by demand for sales growth, the aim is consequently to increase the number of users and converge them to paying customer. The latter is generally a challenge for companies aiming to servitized (e.g. [Witell and Löfgren, 2013](#)). Finally, platform orchestration requires higher competences to compete on customer outcomes rather than inputs. While this pattern may involve pay-per-use pricing ([Gebauer et al., 2017](#)) or cost and revenue sharing arrangements, as in the case of outcome-based contracting ([Hypko et al., 2010](#); [Ng and Nadurupati, 2010](#)), the authors also discuss a case where a freemium approach was adapted.

In “*Digital service innovation: a paradigm shift in technological innovation*” (2022) the authors make a case for updating and broadening the innovation taxonomy proposed by OECD’s Oslo Manual. Their critique echoes the calls from service scholars for acknowledging service innovation as a multidimensional phenomenon (e.g. [den Hertog et al., 2010](#); [Rubalcaba et al., 2012](#)). Pointing at the key role digital service innovation plays for the competitiveness of manufacturing firms, they suggest adding digital service innovation as a new type of technological innovation in manufacturing and integrating non-technological service innovations into existing types of marketing (product-service bundling) and organisational (contractual) innovations. The study, which is based on data from 423 Spanish manufacturing firms, also shows that digital service innovation is needed to enhance the performance of manufacturers in typical B2B industries, such as machinery, vehicles, and electronics. Whereas traditional product and process innovation is sufficient in industries closer to consumer markets, high firm performance in many B2B industries requires simultaneously deploying product, process, and digital service innovation.

The third paper, “*Unfolding the simple heuristics of smart solution development*” ([Huikkola et al., 2022](#)), describes how Wärtsilä, a leading maritime solutions provider, applies simple heuristics to manage new digital service development projects. Prior research has shown that having a service development strategy has substantial effect on innovation performance ([Edvardsson et al., 2013](#)) and that the development process needs to be adapted to manufacturing companies ([Kindström and Kowalkowski, 2009](#)). However, as conditions and objectives change, existing development processes may have to change accordingly. In Wärtsilä’s case, the firm aims to provide “smart”, software-based marine solutions, which puts new requirements on its development processes. The case reveals process, boundary, preference, schedule, and stop rules as main managerial heuristics, and discusses how they are applied during the phases of ideation, incubation, transformation, and industrialization for attaining project outcomes. In doing so, it contributes not only to servitization research but also to the rich literature on new service development and service innovation (e.g. [Engen et al., 2021](#); [Heinonen and Strandvik, 2020](#); [Martin and Horne, 1993](#)).

In the fourth paper, “*Should we cooperate? Game theory insights for servitization*” (Wagstuf *et al.*, 2021), the authors employ a mixed method approach to examine dyadic relationships and how they affect levels of servitization. Service as business logic emphasises the benefits of relationship marketing and how firm profitability is inextricably linked to customer needs, wants, and value-in-use (Grönroos and Ravald, 2011; Kingman-Brundage *et al.*, 1995; Ng *et al.*, 2012). Building on prior studies that show that higher levels of servitization produce more cooperative relationships (e.g. Baines and Lightfoot, 2013), the authors use game theory to investigate relationships in the oil industry, which is a novel context for servitization research. While cooperation between key stakeholders is needed to realise the gains (political, environmental, and financial) achieved by increasing the recovery factor of oil extraction, they find that such behaviour is only evident at advanced levels of servitization. The study illustrates how mimetic isomorphism drives collective “incumbent inertia,” which prevents collaboration and service-based opportunities for value creation and suggest that resistance to change is institutionalised rather than socio-cultural.

Finally, two papers examine servitization and internationalisation. The fifth paper, “*International resource configuration of product-related services in the digital age – an analysis of its antecedents*” (Jovanovic and Morschett, 2021), investigates the impact of service characteristics on the decision to centralise or decentralise resources. It also examines digitalisation and administrative heritage impact this decision. The characteristics of services suggest that local presence and customer-supplier interaction plays a more important role as compared to product sales (Grönroos, 1998). On the contrary, digitalisation enables increased centralisation of service resources (Sklyar *et al.*, 2019). By analysing survey data from 116 German and Swiss manufacturing firms, the authors find that servitization has a direct, positive effect on resource centralisation. This is particularly the case for smaller firms that may lack capital and human resources. Furthermore, services are more likely to be provided by central resources when they are aimed at customers in countries with high digital readiness. In particular, resources for knowledge-intensive services tend to be centralised; these services rely on highly skilled employees, which is a scarce resource, and centralisation can be means to address this constraint.

In “*Digital servitization strategies for SME internationalization: the interplay between digital service maturity and ecosystem involvement*” (Reim *et al.*, 2022), the authors study the internationalisation process of small and medium-sized manufacturers. Prior research has shown that servitization can contribute to firm profitability, even when the service ratio is low. However, given the resource constraints of SMEs and the costs of implementing a service growth strategy, profitability can erode when servitization reaches a certain level (Kwak and Kim, 2016). One way to overcome this challenge is to collaborate with other actors in the business network, especially when internationalising. Based on qualitative studies of Swedish and Finnish SMEs, the authors identify three stages of “ecosystem involvement” which can facilitate the process. They also distinguish three stages of digital service maturity required for such internationalisation. Similar to other frameworks that conceptualise service growth along two dimensions (e.g. Matthyssens and Vandenbempt, 2010; Oliva and Kallenberg, 2003), these two dimensions form a process framework for how SMEs can expand internationally through digital servitization. SMEs can increase their international service sales by focusing on digital service innovation before harnessing the potential of the ecosystem or vice versa. Alternatively, firms can pursue both strategies in parallel, which is the most challenging and resource intensive option.

Future direction to advance research on servitization

An observation of the servitization research landscape clearly demonstrates that the research community is growing, and the knowledge continues to build and coalesce around the digital

aspects as well as the potential economic, environmental, and societal impacts of servitization and service-led strategies. Currently, as exemplified by the papers in this special issue, the servitization studies focus on digitally-enabled and data-driven offerings and business models, service development and innovation, inter-firm and intra-firm relationship dynamics, and performance implications. Yet, the research community needs to be more joined up and more inter- and multidisciplinary research is needed if the opportunities with servitization are to be embraced (cf., [Buyalskaya et al., 2021](#)). It is essential to create a synergy between data/technology and business model innovation, across industrial sectors, and hand-in-hand with governance, legal and financial innovations.

To orchestrate the direction of future research on servitization, we propose an integrative approach, illustrated in [Figure 1](#). We argue that in order to support the industry in transforming towards servitization and adapt new service-led business models, we require a research community that not only excel in delivering leading and innovative technologies (such as AI, IoT, robotics, blockchain, etc.), but also position them within the frameworks of business model (such as outcome-based, token-based, and multi-sided business models), financial innovations (such as smart contracts and captive finance), and legal innovation (such as reg-tech and new legal practices). Such knowledge and understanding needs to be co-developed with stakeholders from industry, consumer, and policy stakeholders, and should operate across traditional silos and functions to treat business as a holistic, people-centred industrial system.

How these component and themes might be drawn together can be illustrated by the concept of Heat-as-a-Service (HaaS). Decarbonising heat is one of the biggest

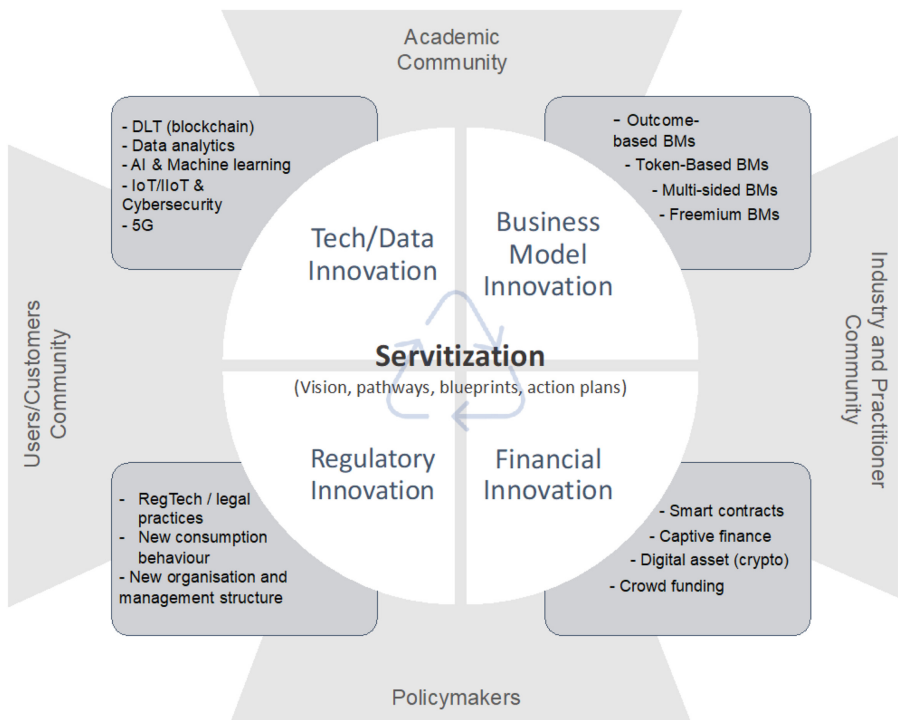


Figure 1.
Holistic view of the
relevant innovations
for servitization

challenges that most countries are facing in terms of transforming the energy system to meet carbon reduction targets and achieve the clean growth ambitions. In the UK, for instance, around 15% of total greenhouse gas emissions and 25% of total energy use comes from heating (Milne *et al.*, 2019). Currently, the consumer is responsible for purchasing their heating system and despite subsidies for heat pumps, solar etc. a recent estimate by the UK's Energy Systems Catapult estimates that at the current rate of replacement, reaching the net-zero target in the energy sector will take over 1,000 years. HaaS (Figure 2), which focuses on the outcome (a warm and comfortable home) rather than selling units of fuel, could drastically accelerate the process of decarbonisation as it put and keep heat where and when consumer wants. The provider uses customer and property characteristics to come up with an optimised, tailor-made heating solution, and then takes full responsibility for the owning, fuelling, maintaining, and operating of the heating system.

Development and adoption of such new business models in practice, however, is fraught with challenges and complications as they demand a holistic, yet joined up approach towards business model innovation, digital technologies, contracts and legal, and new financial practices. Offering HaaS models require extensive collection of energy consumption data from households, running sophisticated data analytics, considering the cyber security issues (e.g. solutions to protect HaaS digital infrastructure against confidentiality, integrity, and availability attacks), understanding how the cost structure and revenue models should be developed, and ultimately, understanding of the contractual aspect amongst different parties involved.

Same examples and analogy exist in other sectors, including in health with assisted living-as-a-service and transport with mobility-as-a-service. These real-world examples clearly demonstrate that moving towards servitization is more than just thinking about the right business model or the suitable technology. Currently, limited knowledge and evidence exists on more integrative and multidisciplinary approaches and topics, such as those that are summarised in Table 1. We, therefore, envisage and encourage the future research to draw from these themes/questions as a collective.

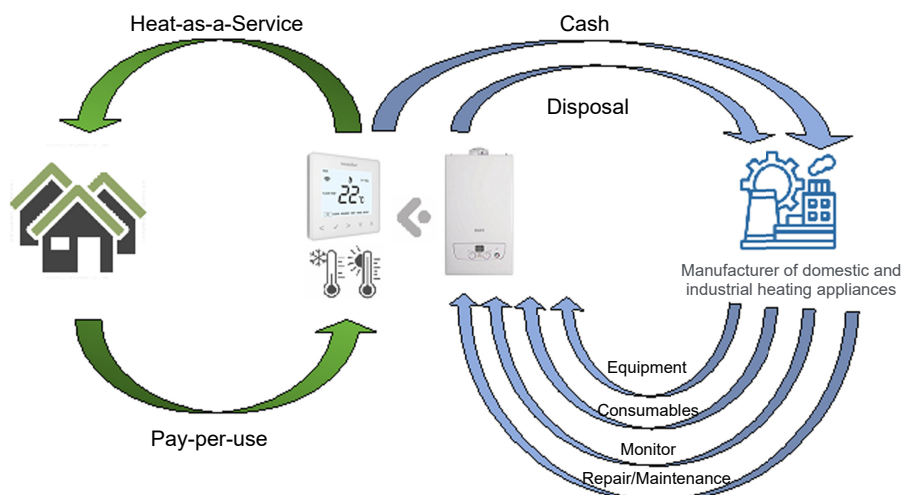


Figure 2.
Heat-as-a-service

Source(s): Adapted from Baines *et al.*, 2007

Table 1.
Illustrative research
questions for the future
studies

	Examples of questions that might be drawn from each theme as a component of a broader research project
Tech/data innovation	- How can edge computing provide security and privacy for digitally-enabled services? - How can distributed ledger technologies provide rigorous and immutable audit trails for service contracts? - How can emerging technology enhance resilient service operations? - How can Privacy Enhancing Technologies protect consumer and company data in outcome-based contracts? - How could big data lead to the development and adoption of new service-led business models for greater value creation and value capture?
Business model innovation	- How can advanced service business models be better understood and communicated? - How can decentralised peer-to-peer systems enhance the adoption of outcome-based business models? - How can outcome-based business models be rapidly designed? - How can customer involvement in co-creation of business models be enhanced? - How can service-led business models support market adoption of innovative technologies? - How can organisations acquire competences need for service-led business model innovation?
Financial innovation	- How can innovative technologies such as DLTs, AI, and IoT address challenges related to the financial aspects of servitization? - How can distributed ledger technology broaden financial outreach for servitized business models? - How can blockchain technology be adopted to transfer the value via digital protocol? - How can decentralised finance (DeFi) drive service-led business models? - How can new tokenisation methods and new kinds of token be developed to support the adoption of outcome-based contracts? - How can peer-to-peer transactions enable service-led business models? - How could blockchain innovations unlock issues around asset ownership? - How can blockchain technology enable the delivery of outcome-based business models?
Regulatory innovation	- How can smart contract protect privacy violations in advanced service contracts? - How can smart contracts be informed by big data analytics while respecting customer privacy and compliance in service-led business models? - How can new regulatory innovation enhance trust and compliance in servitization? - How can regtech support the development of new financial innovation for outcome-based contracts? - How can new regulations and governance protocols support the adoption of servitization?

Christian Kowalkowski

*Department of Management and Engineering, Linköping University, Linköping, Sweden and
Department of Marketing, Hanken School of Economics, Helsinki, Finland, and*

Ali Ziaee Bigdeli and Tim Baines

Aston Business School, Aston University, Birmingham, UK

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