Eight organizational enablers of digital service-sales ambidexterity in industrial firms

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Abstract

Purpose – The purpose of this study is to explore organizational enablers of frontline employees' (FLEs) service-sales ambidexterity (SSA) in industrial firms expanding their digital service portfolios.

Design/methodology/approach – The authors conducted a qualitative study of five industrial firms pursuing digital service growth and, for this purpose, collected and analyzed interview data obtained from 50 service and sales managers and FLEs across three continents.

Findings – The authors identify and explain eight organizational enablers of digital service-sales ambidexterity (DSSA), operating at the macro, micro and meso levels.

Practical implications – Service and sales managers should use the identified organizational enablers to exploit the established service business and to explore new digital growth paths.

Originality/value – The study expands the prior understanding of SSA by advancing the concept of DSSA, unpacking its multilevel dynamics and operationalizing eight organizational enablers.

Keywords Manufacturing industry, Organizational change, Service marketing, Industrial marketing, Salesforce, Industrial selling, Service-sales ambidexterity, Digital services, Digital servitization, Industrial services, Smart services, B2B sales, Service sales, Servitization, Multilevel research

Paper type Research paper

The sales rep needs to achieve a certain sales quota. It's easier for him to achieve it if he sells maintenance and repair at a large scale and nothing 'digital' at all. I don't want to insinuate anything, but [...] the effort and benefit of these digital products do not match for the sales rep. (Sales & Process Manager – Digital Products)

1. Introduction

Industrial firms must balance conflicting aims to remain competitive. Facing margin erosion on equipment sales, firms have implemented service transition strategies since the 1990s (Wise and Baumgartner, 1999). More recently, rapidly evolving information technology (IT) has unlocked new opportunities to expand through digital services. Manufacturers pursue *ambidexterity* by managing trade-offs (Gibson and Birkinshaw, 2004) between exploiting the established physical service[1] business and exploring digital service opportunities. In parallel, frontline employees (FLEs) are now expected to perform service and sales tasks, thereby displaying *service-sales ambidexterity* (SSA; Rapp *et al.*, 2017; Ruyter *et al.*, 2020). In short, both organizations and individuals should become ambidextrous.

Against this backdrop, three knowledge gaps are discerned. First, the service transition literature has largely ignored the complementarity of service and sales, instead highlighting the opposing objectives and cultures that separate service from sales (Burton *et al.*, 2016). SSA literature suggests, by contrast, that the areas can reinforce each other (Yu *et al.*, 2013). Combining

these two bodies of literature is rewarding because it can guide industrial firms' managers who are struggling to convert the frontline into service sellers (Ulag and Loveland, 2014).

Second, SSA research has not fully considered service digitalization. None of the SSA studies reviewed by Mullins *et al.* (2020) explicitly discuss digital services. Despite calls to study the implications of digitalization on sales (Singh *et al.*, 2019), recent literature primarily explores the digital transformation of sales operations (Giovannetti *et al.*, 2020; Guenzi and Habel, 2020) rather than service portfolios. This is unfortunate. We expect digital services to shape an ever-increasing number of frontline activities and to further exacerbate role ambiguity (Gabler *et al.*, 2017). Managers need insight into what we call *digital SSA* (DSSA) to understand which behaviors support digital service growth strategies.

Third, it is necessary to shed light on the organizational enablers of SSA. There is mounting evidence that firms struggle to create boundary conditions conducive to SSA (Jasmand *et al.*, 2012). More broadly, organizational mechanisms facilitating SSA are underresearched (Hughes and Ogilvie, 2020; Ruyter *et al.*, 2020; Yu *et al.*, 2013; Yu *et al.*, 2015). This void deserves more attention and closer inspection because leaders should know which levers to pull to spur SSA.

To address these gaps, we examine the following research question: *What are the organizational enablers of DSSA?* To answer

The current issue and full text archive of this journal is available on Emerald Insight at: <https://www.emerald.com/insight/0885-8624.htm>

Journal of Business & Industrial Marketing
© Emerald Publishing Limited [ISSN 0885-8624]
[DOI 10.1108/JBIM-02-2021-0080]

This article is based on the first author's dissertation, which was chaired by the second author. This work was supported by the Swiss Innovation Agency Innosuisse under grant 34121.1 IP-SBM.

Received 4 February 2021
Revised 23 June 2021
11 September 2021
23 October 2021
Accepted 24 October 2021

this question, we conduct a qualitative study of five industrial firms expanding through digital services. Our contributions are threefold. First, we theorize the DSSA concept. In doing so, we bridge the servitization and SSA literature and explain the mechanisms through which the service-sales interface can turbocharge – or stall – the digital service growth engine. Second, we build on and extend multilevel SSA research by operationalizing organization-level and individual-level DSSA. Our results show that DSSA is a dynamic capability formed by individual DSSA behavior. This finding bolsters the frontline's crucial role in generating organizational capabilities. Third, we shed light on eight organizational enablers of DSSA. By revealing a certain equifinality of structural and contextual approaches, we enhance prior understandings of ambidexterity. This observation suggests that leaders can follow different paths to reach exploration and exploitation goals. Table 1 summarizes the research gaps and our contributions. In what follows, we discuss the theory, present our research method and findings, discuss theoretical and managerial implications and conclude with directions for future research.

2. Theoretical background

2.1 Service transition in industrial firms

2.1.1 Servitization

Many industrial firms expand their business-to-business (B2B) service portfolios to counter eroding margins on equipment sales. This strategic shift, termed *servitization* (Vandermerwe and Rada, 1988), assumes that services can create a competitive advantage based on valuable, rare, inimitable and organized resources (Eloranta and Turunen, 2015; Kozlenkova et al., 2014; Opresnik and Taisch, 2015). Conceptually, firms servitize to generate high-margin, steady revenues (Oliva and Kallenberg, 2003; Wise and Baumgartner, 1999). Empirically,

servitization is associated with higher corporate valuation (Fang et al., 2008), revenue (Böhm et al., 2017) and revenue growth (Nezami et al., 2018). However, its overall profitability impact is less evident (Eggert et al., 2014) and is moderated by the firm's service sales capability (Worm et al., 2017).

This capability hinges on service and sales FLEs' knowledge, skills and abilities (KSAs). Many service FLEs have historically provided services free of charge, thereby undermining value capture opportunities (Gebauer and Friedli, 2005). Similarly, manufacturers struggle to turn their goods-centric sales force into service sellers (Uлага and Reinartz, 2011). First, the attributes of salespeople conducive to goods and service sales differ (Burton et al., 2017). While goods-centric salespeople typically focus on deal closing (*hunters*), service salespeople emphasize customer retention (*farmers*) (DeCarlo and Lam, 2016; Uлага and Loveland, 2014). Second, the selling of services requires specialized KSAs. They include the ability to connect with higher-level decision-makers in the customer organization, to identify customer-specific value drivers and to communicate the value of services (Huikkola and Kohtamäki, 2017; Kindström and Kowalkowski, 2014). Third, compensation plans tend to incentivize equipment sales (Kindström and Kowalkowski, 2014). Because equipment typically generates higher one-off revenue than services and most sales compensation plans reward revenue (Churchill et al., 1985; Turunen and Neely, 2012), many salespeople seem less enthusiastic about selling services (Reinartz and Uлага, 2008).

Nonetheless, literature is sparse on organization-level mechanisms that alleviate tensions at the service-sales interface. These tensions arise from conflicting objectives, cultures and modes of operation (Burton et al., 2016; Lütjen et al., 2017; Paiola et al., 2013; Turunen and Neely, 2012). Servitization research has suggested organizational levers to overcome these conflicts, including service-specific sales forces, roles,

Table 1 Research gaps and contributions

		Prior research	Current research
Servitization research	Service-sales interface	Service and sales are antagonistic: separate units (Paiola et al., 2013) with opposing objectives, cultures (Burton et al., 2016) and degrees of formalization (Turunen and Neely, 2012)	Service and sales are <i>synergistic</i> : complementary KSAs, roles, organizational units and control systems
	Unit of analysis	Individuals: service technicians (Gebauer and Friedli, 2005) and salespeople (Reinartz and Uлага, 2008; Uлага and Loveland, 2014)	Individuals <i>nested in the service and sales departments</i>
SSA research	Scope of ambidexterity	Simultaneous pursuit of service and sales goals (Yu et al., 2013)	Simultaneous pursuit of service and sales goals for <i>physical and digital services</i>
	Focal industry	Service industries (e.g. beauty salons, Yu et al., 2018; call centers, Jasmand et al., 2012; financial services, Hughes and Ogilvie, 2020; hospitality, Ogilvie et al., 2017) or industry mix (Mullins et al., 2020; Panagopoulos et al., 2020; Patterson et al., 2014).	Industrial equipment <i>manufacturers only</i>
	Level of analysis	Primarily single level: organizational level (Yu et al., 2013) or individual level (Gabler et al., 2017; Jasmand et al., 2012; Yu et al., 2015)	<i>Multilevel</i> : macro, micro and meso levels
	Organizational enablers	Virtually not examined	<i>Identifies and explains</i> eight organizational enablers

processes, units and incentives (Burton *et al.*, 2016; Gebauer *et al.*, 2005; Gebauer and Friedli, 2005; Kindström *et al.*, 2015; Rabetino *et al.*, 2017). However, our understanding of the levers' detailed design remains limited (Raddats *et al.*, 2019).

2.1.2 Digital servitization

Digital servitization is the “transition toward smart product-service-software systems that enable value creation and capture through monitoring, control, optimization and autonomous function” (Kohtamäki *et al.*, 2019, p. 383). It has propelled the creation of new value propositions, business models and revenue streams that complement physical assets with digital services (Coreynen *et al.*, 2017; Opresnik and Taisch, 2015; Suppatvech *et al.*, 2019; Vendrell-Herrero *et al.*, 2017). For example, Bühler, a manufacturer of food processing equipment, sells a cloud-based service to monitor, visualize and analyze production data, for annual subscription fees up to EUR 100,000 (Gebauer *et al.*, 2020).

Digital servitization accelerates change in the sales function. The sales force must clearly understand what value digital services create to explain and sell them (Hasselblatt *et al.*, 2018). Many industrial sales forces lack this understanding and, as a result, miss their sales targets (Klein *et al.*, 2018; Töytäri *et al.*, 2018). To overcome these challenges, sales force transformation is imperative (Paola and Gebauer, 2020). Importantly, more research is required to understand how sales organizations should adapt roles, structures and control systems to improve digital services selling (Singh *et al.*, 2019).

2.2 Service-sales ambidexterity

2.2.1 Service-sales ambidexterity as dynamic capability

We study organizational capabilities from a multilevel perspective. That is, we analyze several capability levels (Salvato and Rerup, 2011) to interpret “much of the nested complexity of real organizational life” (Klein and Kozlowski, 2000, p. 211). Higher-level *dynamic capabilities* allow firms to “purposefully create, extend, or modify [their] resource base” (Helfat *et al.*, 2007, p. 4), including their operational capabilities (Collis, 1994; Teece *et al.*, 1997; Winter, 2003). Operational capabilities – notably service selling and fulfillment (Morgan, 2012) – are underpinned by lower-level *microfoundations*, such as routines, organizational structures and individual KSAs (Felin *et al.*, 2012; Teece, 2007).

Organizational ambidexterity is a specific dynamic capability (O'Reilly and Tushman, 2008). Ambidexterity refers to an organization's ability to both explore and exploit (March, 1991; O'Reilly and Tushman, 2013). Gibson and Birkinshaw (2004) distinguish between *structural ambidexterity*, which uses separate organizational units to achieve these conflicting goals and *contextual ambidexterity*, which denotes the capacity to explore and exploit within an organizational unit.

SSA applies ambidexterity to the service-sales interface and has, specifically, been analyzed at the organizational and individual levels (Mullins *et al.*, 2020; Panagopoulos *et al.*, 2020; Ruyter *et al.*, 2020). Organization-level SSA is a single organizational unit's “simultaneous pursuit of service and sales goals” (Yu *et al.*, 2013, p. 53). Individual-level SSA is an FLE's “engagement in both customer service provision and cross-/up-selling during service encounters” (Jasmand *et al.*, 2012, p. 22). Given the reciprocal effects of organization-level and

individual-level capabilities, we agree with Rapp *et al.* (2017) and conceptualize SSA as dynamic capability formed by individual-level behavior nested in the sales-service interface.

A multilevel perspective is essential to study drivers of SSA behavior (Hughes and Ogilvie, 2020; Rapp *et al.*, 2017). Conceptually, SSA can emerge from organizational forces or employee self-regulation (Yu *et al.*, 2013). Companies have historically used structural mechanisms like the separation of service and sales functions to overcome the goal conflicts inherent in SSA, and to achieve structural ambidexterity (Hochstein *et al.*, 2021; Ruyter *et al.*, 2020). Nevertheless, expectations have increased and service FLEs are required to achieve sales targets and salespeople to provide services (Ruyter *et al.*, 2020). Given these goal conflicts, and to attain contextual ambidexterity, FLEs must wittingly choose between service and sales activities and adapt their behavior accordingly (Jasmand *et al.*, 2012). However, self-regulation depends on individual motivation and KSAs, which differ across FLEs (Jasmand *et al.*, 2012; Sok *et al.*, 2016; Yu *et al.*, 2015).

Therefore, companies must create an organizational context conducive to SSA behavior (Agnihotri *et al.*, 2017). To do so, managers can adapt recruitment and training routines, resource deployment, control systems and sales support tools (DeCarlo and Lam, 2016; Hughes and Ogilvie, 2020). While empirical studies on individual-level and organization-level antecedents to SSA have emerged (Mullins *et al.*, 2020), more multilevel research is required to explore the organizational enablers of SSA (DeCarlo and Lam, 2016; Hughes and Ogilvie, 2020; Lam *et al.*, 2019; Rapp *et al.*, 2017; Shiue *et al.*, 2021).

2.2.2 Digital service-sales ambidexterity

Discussions on SSA and B2B service digitalization have evolved separately. Recent literature acknowledges the role of digital technologies in facilitating selling (Giovannetti *et al.*, 2020; Guenzi and Habel, 2020; Singh *et al.*, 2019) and, ultimately, SSA (Ruyter *et al.*, 2020). However, to our knowledge, no research article has studied how the digitalization of service portfolios affects SSA.

This is surprising, as digital servitization might worsen the exploitation/exploration dilemma at the service-sales interface. As digital servitization unfolds, manufacturers add digital services to their portfolio of physical goods and services. Thereby, they exploit existing portfolio elements while exploring new digital opportunities (Coreynen *et al.*, 2020; Ritter and Pedersen, 2019). Both options could be incompatible because digital services (e.g. remote monitoring) might cannibalize revenues from physical services (e.g. field inspection) (Gebauer *et al.*, 2020). Therefore, ambidextrous FLEs must not only perform service and sales roles (Mullins *et al.*, 2020) but also balance physical and digital services.

Adhering to our multilevel perspective, we propose two forms of DSSA. At the organizational level, we conceptualize DSSA as a dynamic capability that reflects a firm's ability to achieve service and sales outcomes through physical and digital services. At the individual level, we define *DSSA behavior* as FLEs' engagement in service and sales activities for physical and digital services. In doing so, we conceptualize DSSA behavior as a microfoundation of the DSSA capability. Figure 1 shows that our DSSA definition adds a digital layer to prior

Figure 1 DSSA

SSA conceptualizations. It is the drivers of individual DSSA behavior – which underpin organizational DSSA – that we investigate in this study.

3. Methodology

We conducted an inductive, exploratory study of five industrial firms' efforts to stimulate DSSA. In each firm, we investigated the behavior of individuals nested in the service and sales departments.

3.1 Data collection

Our sample included five globally operating industrial firms headquartered in Europe (Table 2). We selected these firms because they pursued digital servitization, emphasized DSSA and granted us access to key informants. The number of cases examined (5) is within the boundaries, suggested by qualitative methodologists (Eisenhardt, 1989; Yin, 2018), to develop a theory that balances parsimony and depth, and suffices for our “maximum variation” sampling strategy (Patton, 2002). The firms varied considerably in terms of:

- industry;
- maturity of digital service portfolio (e.g. 10-year history of remote monitoring vs first pilots in the pipeline); and

- primary ways of selling services (e.g. dedicated service salespeople vs service technicians).

Contrasting patterns between cases emerged from this heterogeneity, allowing us to build theory (Eisenhardt, 1989) around DSSA.

The data was obtained by means of 50 semi-structured interviews. The informants held managerial and frontline positions in the firms' European, Asian and American service or sales organizations. This variety of geographies, functional areas and hierarchical levels not only enabled us to understand managerial and frontline DSSA behavior but also to learn from “deviants” (Miles et al., 2014) – for instance, service technicians or sales executives who showed no interest in selling services. The number of informants per case reflected the heterogeneous maturity of the digital service portfolios: Venus had only recently formed a cross-functional team to pilot digital services globally [2], while Neptune's service sales force had been selling digital services for years. The face-to-face and video interviews lasted between 52 and 117 min (81 min on average). All interviews, except two, were recorded and transcribed.

3.2 Data analysis

We analyzed our data in three steps. First, we used open coding (Corbin and Strauss, 2008) in ATLAS.ti to capture

Table 2 Firms and informants

Firm (Pseudonym)	Core products	Core services	Revenue [EUR m]	Employees	No. of informants	Informant roles
Jupiter	Industrial automation components	Spare parts, maintenance, predictive maintenance, cyber-security solutions	737	2,243	10	Head of Sales and Marketing, Head of Service, Industry Services Consultant
Mars	Rolling stock, rail automation and electrification	Spare parts, maintenance, full-service contracts, predictive maintenance	284	949	7	Business Unit Head, Director Services, Head of Sales, Senior Account Manager, Sales Manager
Neptune	Elevators, escalators	Spare parts, maintenance, full-service contracts, remote monitoring, digital advertising services	10,340	66,306	13	Global Sales Manager, Commercial Deployment Manager, Sales & Process Manager, Service Leader, Service Sales Manager, Key Account Manager, Region Manager
Pluto	Textile machinery	Spare parts, maintenance, remote monitoring	1,200	5,500	17	Head of Customer Service, Division Manager, Area Sales Manager, Service Manager
Venus	Laser systems, machine tools	Spare parts, maintenance, remote monitoring	3,231	14,325	3	Business Developer Smart Services, Sales Manager, Service Manager

informants' perspectives on DSSA. Drawing on the raw interview data, we inductively generated first-order codes based on informants' conception of "what is going on" (van Maanen, 1979, p. 540). By reviewing the data multiple times, we constantly refined, expanded and merged the first-order codes. Saturation (Glaser and Strauss, 1967) occurred when revisiting the data failed to generate any new insights. Next, we compared and established relationships between first-order codes (Gioia et al., 2013), resulting in 14 initial second-order themes.

Second, we discussed the emerging results with practitioners. To ensure the internal consistency of our findings, we successively presented intermediate results to each of the firms, except for one firm. Based on the feedback, we refined the second-order themes between each presentation. Following these iterations, we presented our results – in an online seminar – to more than 75 practitioners representing a broad range of industries. The seminar feedback enhances confidence in the transferability (Miles et al., 2014) of our findings.

Third, we entered the theoretical realm by comparing our second-order themes with those in the literature. Constant comparison and theoretical abstraction (Strauss, 1987) reduced the number of second-order themes to eight. In an ongoing dialogue between our data and extant literature (Hughes and Ogilvie, 2020), we assembled the second-order themes into aggregate dimensions (Gioia et al., 2013). Although our initial unit of analysis was the individual FLE, it soon became apparent from the data that DSSA enablers span multiple levels (Nag and Gioia, 2012; Rapp et al., 2017). Our data structure (Figure 2) reveals that DSSA enablers operate at the macro, micro and meso levels.

4. Findings

We identified eight organizational enablers of DSSA (Figure 3). We use pseudonyms for the firms and alphanumeric codes for the informants in the description of our findings.

4.1 Macro-level enablers

4.1.1 Refining objectives

Tradeoffs between the exploitation of physical services and the exploration of digital service opportunities appeared early during the strategy definition. All firms had defined digitalization strategies to increase the share of digital elements in their service portfolios, fulfillment and revenue. Executives had to make strategic choices between the pursuit of stable, high-margin revenue from physical services or, instead, waging on digital growth:

[Digital services] are the business of tomorrow. The spare parts business is eroding, and field services are less in demand and done by others. The digital business is our investment for tomorrow. At the moment, pure digital offerings just make up [...] a small, an extremely small share of revenue. . . . But growth rates are much higher. They're somewhere around double-digit, whereas those of traditional services are between one and five percent at most. (J10)

Strategies underwent major shifts along the way. Initially, the firms set aggressive revenue objectives for their digital business. However, market feedback on initial digital service offerings indicated that most revenue objectives were overambitious. Consequently, executives gradually shifted from a narrow focus on digital service revenue to a broader set of objectives, including cross-selling. The main commercial objective of

digital services became the increase of the sales of spare parts (Pluto) or maintenance contracts (Neptune). Jupiter pivoted radically from considering digital services as a "door opener" for equipment sales to the exact opposite:

We initially thought that digitalization would be an enabler for everything else that we carry around in our vendor's tray. In the meantime, it has become a sideline to our basic business. We sell controllers and if you want a connection to the ERP [enterprise resource planning] or the cloud, we have that as well. I think the initial euphoria that this will be a free lunch has died down a bit. (J07)

Sales strategies were operationalized at the FLE level in three steps. First, objectives were broken down to service types. Pluto distinguished between maintenance and spare parts sales targets because of the relative difficulty of selling maintenance in many of its core Middle Eastern and East Asian markets. To lay the foundation for digital service growth, Neptune defined the quota of connected assets on total equipment sales that subsidiaries had to fulfill. This quota was successively deconstructed by regions and sales territories.

Second, sales strategies were localized. The firms' market share and brand strength varied significantly between countries. So did the customers' willingness to pay for services. As an informant noted: "Our situation is different from China or from India. So, the Japanese customer is [gentler]" (P15). Revenue targets were adjusted accordingly to gain frontline acceptance.

Third, sales initiatives were prioritized. Services were mainly sold to existing accounts. Therefore, salespeople had to examine their accounts' full revenue potential across offerings before starting isolated sales initiatives:

There are [sales]people who don't care about the damage in other divisions: 'Go for it! The main thing is that I've sold my three bolts, regardless of whether the other guy can sell the whole car in the end or not.' Services have a maximum revenue share of five to ten percent. Someone can come in with a service offering and cause trouble with a customer because of 10,000 francs and ruin my million-francs business. (M04)

4.1.2 Reallocating resources

The exploitation/exploration dilemma was reinforced by the unequal resource demands imposed by selling physical and digital services. Neptune is a case in point. Because many countries mandated elevator maintenance by law, bundling contracts with new equipment sales effortlessly generated revenue. Selling digital services, by contrast, consumed substantial resources to verify and explain technical details. FLEs faced major goal conflicts:

[This digital service] requires an on-site meeting to discuss whether the customer can envision it. Then a second meeting in which a colleague joins to do the technical assessment. Now we will schedule another meeting to discuss the offering with the customer. And I mean [...] usually it's like, when I offer a classic repair for EUR 2,000, I send it through to the customer, and he orders. (N06)

Resource reallocation facilitated DSSA. Neptune started experimenting with hybrid sales structures to overcome resource bottlenecks in frontline sales. Tele-sales were deployed to find leads for digital services, thereby freeing FLE capacity. Field sales took over later:

Australia is one example. They are very focused. They have great people who know what they're doing. [...] They sell non-stop. They have a plan in which they go out in a structured, very simple way. They bypass today's service sales team with a call center, saying that a well-briefed call center can easily generate leads for [digital services]. Only then, when it's prepared anyway, when the first round of explanation is done, typical sales force comes in. What are the advantages of that? They can focus on selling, in the

Figure 2 Data structure

Figure 3 Eight organizational enablers of DSSA

sense of concluding the contract, and no longer have to deal with explaining the product. They can just clear the formalities. It works quite well. (N07)

4.2 Micro-level enablers

4.2.1 Enhancing knowledge, skills and abilities

To achieve service and sales objectives, FLEs should improve customer service, selling and digital technology KSAs. Foremost, excellent customer service was foundational for later

sales. This principle, while intuitively appealing, was applied inconsistently across the frontline. Service quality was subject to individual agency:

I love my job – even [though] I work for this company for 27 years, [I] am still very active. This is my hobby. I want to build up the relationship with the customers. Then I'm happy. This is my hobby; [it is] not about the money. OK, you give me a fixed amount of money, but I'm also reacting this way. This is my character. But I would like our company to arrange some training to motivate the other people. We must give more training to

salespeople and service technicians to motivate [them and change] their attitude. (P06)

Moreover, both service and sales FLEs had sufficient room to improve service selling KSAs. Service FLEs, having frequent interactions and close relationships with customers, were in a prime position to sell services. Their intimate knowledge of customer needs allowed service FLEs to recognize natural cross-selling and up-selling opportunities. However, service FLEs seldom fully exploited their respective positions' potential. Many were unwilling or underqualified to accept sales responsibilities:

When customers start saying 'That's too expensive for me' – that's not my world. Sure, I can argue and justify that. But that's not what I like to do. Other people can do that better than me. That's why I'm not a salesperson. (J09)

I have a sales[person] who was a technician for us for 20 years and has now joined the sales department. He knows the technical side of things very well. But the sales strategy? That's all new to him. (P03)

Many goods-centric salespeople still had to become service sellers. This required a fundamental, albeit often missing understanding of services as a creator of value for customers and, consequently, for providers. In the absence of this consensus, "sales mostly just try to sell the machine [and] never care about the service" (P10). Additional KSA gaps appeared around the following aspects:

- selling services proactively;
- recognizing performance improvement opportunities in customer operations;
- identifying and creating the need for digital services;
- feeding these needs back into the vendor organization; and
- understanding new service-related revenue models.

Finally, FLEs had to enhance their understanding of the digital technology embedded in new services. Despite extensive knowledge about equipment and their maintenance, long-tenured FLEs struggled to grasp how digital services worked:

Mechanics and technicians think rather logically and know elevators. But all things digital that disappear somewhere and then somehow get computed at the headquarters [...] are somewhat intangible. (N03)

Two crucial KSA-enhancing mechanisms emerged from the data. Regular training tailored to different frontline roles served as the primary enabler. Workshops that provided FLEs with firsthand practice were pivotal. Most workshops on digital services featured a Digital Technology 101. However, the workshop exercises that clarified the customer value of digital features, such as role plays to recognize use-cases in customer interactions, were more important. Intuitive sales brochures – the second enabler – were essential if the training knowledge were to remain. Unfortunately, most brochures emphasized technical details over tangible customer benefits, thereby not gaining frontline acceptance. To overcome these challenges, a Neptune subsidiary installed showrooms displaying digital services at its headquarters.

4.2.2 Transforming frontline roles

Frontline roles underwent three transformational changes as service portfolios evolved. First, existing frontline roles were expanded with service sales responsibilities. Pluto's sales force's main task was to sell new equipment. Additional service offerings, such as spare parts packages, were addressed only if the situation allowed it. However, role expansions could result

in goal conflicts. Because equipment deals with price-sensitive customers could collapse if services were added, some of Neptune's salespeople deliberately refrained from promoting services:

Every salesperson avoids talking about [maintenance contracts], because we are upper league, pricewise. Some small shops charge a half to a fifth of our price. And extrapolating that to an elevator's lifecycle of 20 years... you have to see how you can sell that. Back when I was selling modernizations, if I could avoid talking about maintenance, it didn't come up. And I think that's still commonplace, especially with new installations. (N05)

Second, dedicated service sales roles were introduced. At Jupiter and Neptune, service salespeople were assigned to sales territories where they worked alongside equipment salespeople. Both sales forces were then tasked with the selling of digital services. This seemed like a natural choice, given their geographic coverage. However, some salespeople, especially those with considerable experience, struggled with the digital side of SSA:

Some salespeople simply cannot be digitalized. They have sold switches for 20, 30 years. Now [the salesperson] suddenly has to sell something that he can't even touch; that annoys him anyway because the computer annoys him all day long. Now he is supposed to sell it. This going to be relatively difficult. It's the mindset on which we need to work. And it is also the education and quality of these salespeople, of which not all are able or willing to become digital salespeople. (J07)

Natural employee fluctuation facilitated DSSA. To accelerate frontline transformation, vacancies were gradually refilled with new recruits showing a greater inclination for all things digital:

The conservative salespeople [...] are eventually going to die [...] They will retire, and new, younger salespeople will take their place. Unless they're hired by the age of 59, they are the ones who will bring in [digital services selling skills]. The new generation of salespeople – who are in their late 20s and early 30s – have a different relationship to [digital services]. They don't see every cloud solution primarily as a gateway for hackers, spies, and such things. Instead, they have already grown up in this environment. So, they have fewer reservations. The others will not be able to be straightened out; they will continue to sell their contactors and motor protection switches. (J07)

Third, new frontline, intermediary and backend roles were introduced for digital service sales. New frontline roles included digital service sales representatives and business developers. This role configuration merged depth – with a single, dedicated role focusing on digital expertise and breadth – with traditional roles covering sales territories. Typically, area sales managers identified new leads and handed them over to digital service sales representatives, who closed the sale.

Digital service champions played a pivotal intermediary role. Champions worked closely with corporate headquarters to boost subsidiaries' adoption of digital services. To do so, champions trained local sales forces, accompanied colleagues who visited customers to pitch digital services and fed market information back to the organization.

New backend roles updated sales processes and systems for digital services. Neptune introduced a process manager role that forecasted and tracked digital service revenues. Process managers also ensured that ERPs could manage varying service contract configurations. This was crucial for sales operations:

We once had a model in [the ERP that accounted for the service subscription term length]. So, for example, if [the customer] signs a 10-year contract for this service, he gets a lower price. If he signs up for two years, then it's a standard price that's higher. This was a complete overload for the sales force because customers had completely different terms for different contracts and customer then always got different prices for the same service. [...] We discarded this [model] quite quickly, also because the system did not allow us to present it in a great way. (N03)

4.2.3 *Renewing routines*

Routines along the sales funnel were renewed to drive DSSA. Lead identification and follow-up routines were updated to find digital service leads in new equipment sales and extant maintenance contracts. To accelerate the growth of its digital service business, Jupiter added digital services to its lead referral program:

If along his field intervention, the [service technician] brings a lead for a small migration, he is compensated with one percent of the sales volume. If it's a service contract we're able to sign, it's three percent. That's not only for service technicians, but also our sales force, that is, product sales. (J06)

Area sales have a lead program with digital targets. They need to bring two leads per month. We have thirty salespeople out there who should bring in sixty leads per month. (J10)

Value-based selling gained traction with service digitalization. Typically, ordinary maintenance interventions and contracts were mandated by urgencies or law. Hence, their benefits required limited explanation. Digital services, by contrast, were often considered as discretionary spending. Salespeople had to prove the additional value digital services created:

Consider a reduction of delay minutes. We calculate [financial amount x] per passenger delay minute. And we have offered a service to permanently monitor [train] doors in order to be able to do predictive maintenance. In other words, we maintain the doors in such a way that they never malfunction. Availability on [a specific route] has increased by 70%, thanks to this. And if you now convert this into passenger delay minutes that have improved, it has a financial impact. (M05)

Innovative revenue models also required reinvigorated pricing routines. The firms relied predominantly on rigid pricing routines, using service operations costs and macroeconomic factors as their main input. To transition toward recurring (freemium/subscription) or usage-based (pay-per-X) revenue models, pricing routines had to become more flexible. Multiple iterations were needed to adjust prices to customer value creation:

We had a slightly more expensive pricing before, which has now been adjusted downward. But we have also had cheaper pricing right at the beginning, which was then corrected upward. It means we are now in the third pricing loop for [remote monitoring], in which we have already learned a few lessons. (N03)

4.3 Meso-level enablers

4.3.1 *Upgrading information technology systems*

Transparency of the installed base was essential to identify service sales leads. Customer relationship management (CRM) systems served to store and retrieve customer relationship data, including details about visits, contracts and the installed base.

Specifically, information about the number, location, type and age of the installed equipment was crucial. For physical services, this information was screened for opportunities to renew maintenance contracts or cross-sell other services, such as retrofits. For digital services, this information was necessary to identify equipment that could be connected to the internet and serviced digitally. The accuracy of this information was decisive for FLEs serving customers with heterogeneous installed bases:

We receive some leads for retrofits. But they are not differentiated as to whether they make sense or not, just: 'This equipment doesn't have any digital service – try to sell digital services there.' Whether this is a single-asset customer or a customer with one hundred assets, is not differentiated. Preparatory work has simply not been invested in a way that would make

sense for me to use this as a basis for my work, especially regarding digital services. (N05)

CRM-enabled DSSA evolved in four stages. First, access barriers to CRM systems had to be lowered. Informants indicated that current CRM systems were insufficiently used due to poor graphic design and usability, incompatibility with mobile devices and lacking system interfaces or access rights. To address these deficiencies, most companies had recently launched or were about to launch new CRM systems.

Second, managers and FLEs had to accept the concept. Informants admitted not using their CRM, perceiving too few benefits compared to the effort of feeding data into the system. Managerial commitment was essential to drive CRM adoption:

I focused too much on the salespeople and not on their bosses. First, it's to convince branch managers and service managers of the benefits they can have with the [CRM]. And then, if you convince them, then they will make it work. But [what] if you just train the people [and] tell them, 'This helps you in your daily activities,' but their direct boss doesn't request them or even ask them about that? They have to be very, very process-oriented people to keep [on] doing it. So, this was how I failed. (N13)

Third, CRM data had to be exploited. Some FLEs fed the CRM with data, ignoring how the data would later be used or how to extract the data themselves:

We are putting everything, every order information into the CRM. But, actually, is the CRM supporting us or not? I don't know. (P15)

Fourth, CRM-based activity management was imperative. Informants deemed the planning, execution and monitoring of frontline activities based on up-to-date CRM data to be essential for selling digital services:

In terms of CRM-based sales, we're still in the Middle Ages at [Neptune]. For example, visit reports, we're at level zero. Now, applying this to digital services: I think, this approach – that salespeople are let loose on customers like in the Wild West – [...] is not the right approach. (N01)

ERP systems required upgrades to expedite new pricing mechanisms. Venus was unable to introduce features-on-demand for its digital services because the ERP did not allow a temporary limiting of feature access. Neptune was unable to apply usage-based pricing for a digital service because of the restrictions imposed by the ERP:

We need to count these calls in some form. How often does [a customer] send a request to our system to obtain data? We need to measure that. But we can't, simply because our ERP is not designed for that. (N08)

4.3.2 *Restructuring organizations*

Each firm approached structural ambidexterity differently. Jupiter's customer service unit harbored ambidextrous salespeople for physical and digital services. A recently formed digital unit added more specialized, digital-service-sales representatives. Venus formed a cross-functional digital service go-to-market team. This team accessed the resources of different organizational functions, notably after-sales and development, but had no profit and loss accountability. In addition to two goods-centric sales units, Mars introduced digital-service-sales roles within its customer service unit to approach customers. Organizational integration avoids overwhelming customers with competing sales forces:

Today, we have at least three sales units approaching the same customer. One sells vehicles, the other infrastructure, the third services for vehicles and infrastructure. Ideally, there would be one [Mars] sales organization selling solutions to the customer. But we haven't got that far yet. (M05)

Conversely, Neptune re-integrated its digital unit after a few years of separation. The intention of the re-integration was to drive “customer-centricity” (N07) and synergies between the physical and digital service business:

We are now all part of one big organization called Operations. In Operations there are the big business lines new installations, modernization, and service. In each line you have sales and fulfillment. In the past, [subsidiaries] still had huge product management and developed some of the services themselves. This will be somewhat reduced, because – of course – as a company we live on standardization. In Service, [...] digitalization allows us to be a bit more flexible, because we have new services that are based purely on remote monitoring, like remote inspections, remote interactions, remote recoveries of units, in combination with physical visits. (N07)

4.3.3 Aligning control systems

An objective fact base is essential to manage performance. Measuring service profitability is a first step in this direction. Some companies had achieved this since the early 2000s to enhance “professionalism in services” (J09). Conversely, “[b]ecause [Pluto] today... [as we say in China is] like a state-owned company,” (P16) it must still take this step by following a strategic transformation plan to drive the competitiveness of its service business.

The monitoring of financial and non-financial metrics evolved alongside portfolios. Revenue and profitability measures were grouped in three baskets, namely, spare parts, maintenance and digital services. Sometimes, to track recurring revenues, maintenance was subdivided into field interventions and contracts. Because of the equal importance of the monitoring of non-financial metrics, connectivity rates of newly sold equipment were measured to ease the penetration of digital services. Companies also made significant efforts to improve measurement and to follow up customer satisfaction, often using the net promoter score (NPS).

Incentives were a crucial organizational enabler of DSSA. At the time of the research, physical goods and services generated considerably more revenue and profits than digital services. Most incentive systems, however, solely focused on backward-looking financial metrics without accounting for the growth potential of digital services:

Revenue is the main concern. Digital services are not generating much revenue at the moment, which is why many salespeople are simply ignoring them. Everyone is rushing into the big retrofit projects, the big spare parts packages, the big connectivity projects. But selling a [cloud service] tenant for CHF 2,000 a year is at least as much work as the retrofit. But then you get 2,000 instead of 100,000. That's a bit of a conflict. That's why revenue targets partly stand in the way of pushing these new technologies really hard on the market. For this you would almost have to leave revenue targets out and just say: 'We now have this solution. It doesn't make any money today, but it's the future. Now go out with this, so that we can plant the seed somewhere, so that at some point it will grow into a plant, at some point into a tree. But don't look so much at revenue but go and sell that many [cloud service] tenants.' (J04)

The alignment of managerial and FLE incentives fostered DSSA behavior. Managerial compensation in Mars' service sales organization was linked to a broader set of metrics. To balance sales-related and service-related behavior, managerial metrics included order intake, sales expenses, profitability and NPS. FLE incentives were aligned in two ways. First, by streamlining incentives across physical goods, services and digital service sales roles:

The [head of service sales] and [digital service sales representatives] now have exactly the same objectives as the salespeople selling trains or infrastructure. That helped a lot. Now it's not anymore about where people book the sale, but just: 'Let's sell that together.' (M05)

Second, by adding specific digital service sales incentives. At Jupiter, the relative weighting of such incentives ranged from “a small percentage share” (J06) for area sales managers, through “a small factor” (J05) for service salespeople, to “50/50” (J10) for digital service sales representatives. Neptune piloted similar incentives in its sales force. For equipment salespeople, a certain share of elevator and escalator sales agreements had to include digital services. Service salespeople's compensation plans were revamped – at the time of the research – and included incentives to sell maintenance contracts and digital services.

5. Discussion

Many industrial firms struggle – simultaneously – to capture revenues from proven physical services and to grow their digital service business. Despite its importance for both goals, researchers have not studied SSA in terms of a digital servitization perspective. Our study addressed this gap by exploring DSSA and its organizational enablers in five industrial firms, and produced three key research takeaways:

- DSSA encapsulates the ability to achieve service-related and sales-related outcomes in the physical and digital service spheres.
- DSSA is a multilevel phenomenon: organization-level DSSA is a dynamic capability that rests on individual-level DSSA behavior.
- Eight organizational enablers, running at the macro, micro and meso levels, facilitate DSSA.

5.1 Theoretical implications

5.1.1 Digital service-sales ambidexterity

Prior literature has evaluated digital servitization and SSA separately. This study, by proposing the DSSA concept, is the first to combine both perspectives. Our findings suggest that many FLEs fail to sell digital services (Paiola and Gebauer, 2020) because service digitalization fuels SSA-related role ambiguity (Yu *et al.*, 2015). Subject to a top-down, inorganic role expansion (Hughes and Ogilvie, 2020; Ruyter *et al.*, 2020), FLEs in digitally servitizing firms now have to develop KSAs in a 2 × 2 matrix of activities (service; sales) and services (physical; digital), even though FLE compensation is not always commensurate with the incremental resource and KSA demands imposed by digital services. With appropriate organizational mechanisms in place, DSSA presents a way out of the “digitalization paradox” (Gebauer *et al.*, 2020). Without organizational adjustments, service digitalization risks making the “dark side of ambidexterity” (Gabler *et al.*, 2017) even darker.

5.1.2 The multilevel nature of digital service-sales ambidexterity

Scholars have called for multilevel research to better understand SSA and its enablers (Hughes and Ogilvie, 2020; Rapp *et al.*, 2017). We respond to these calls by conceptualizing DSSA at the organizational and individual level. Organization-level DSSA is a dynamic capability because it reflects a firm's ability to reconfigure and modify service and sales resources (Helfat *et al.*, 2007), to achieve a superior level of performance. More specifically, ambidextrous firms can reconfigure human resources (e.g. FLEs), intangible resources (e.g. IT systems)

and capabilities (e.g. service selling) to exploit *and* explore, thus supporting the firm's long-term survival (Helfat *et al.*, 2007).

Furthermore, we build on the SSA (Rapp *et al.*, 2017) and the microfoundations literature (Felin *et al.*, 2012) to show that the organization-level DSSA capability rests on individual-level DSSA. Our results indicate that organizations can only become ambidextrous if individuals leverage the necessary KSAs (Barney and Felin, 2013). Both managers and FLEs must consistently display DSSA behavior – by encouraging and engaging in service and sales activities for physical and digital services – to attain the DSSA capability (Abell *et al.*, 2008).

5.1.3 Eight organizational enablers of digital service-sales ambidexterity Research on organizational drivers of SSA – although necessary – is minimal (Mullins *et al.*, 2020; Panagopoulos *et al.*, 2020; Shiue *et al.*, 2021). We extend prior knowledge by operationalizing eight organizational enablers of DSSA (Table 3).

In doing so, we contribute to the servitization and SSA literature. Servitization research has made little attempt to decipher organizational mechanisms alleviating tensions in the service-sales interface (Raddats *et al.*, 2019). The eight organizational enablers represent a first foray in this domain.

Moreover, this research contributes to the SSA literature by revealing a certain equifinality (Gresov and Drazin, 1997) of structural and contextual approaches to ambidexterity (Gibson and Birkinshaw, 2004). Structural approaches overcome service/sales-related role ambiguity by creating separate organizational units or roles (Gabler *et al.*, 2017; Rapp *et al.*, 2017). We expand this understanding by illustrating that firms

create separate structures, such as cross-functional teams (Raisch *et al.*, 2009) or independent units (O'Reilly and Tushman, 2013) but also that they may dissolve them once the digital services have gained traction. Moreover, we find that industrial firms use separate roles like those of digital service salespeople to prove structural ambidexterity. This observation resonates with Hochstein *et al.* (2021), who highlight the effectiveness of structural approaches – based on specialized roles – to develop organization-level SSA.

Nonetheless, the results suggest that contextual mechanisms do matter. Because “traditional” service and sales FLEs typically outnumber digital service salespeople, more mechanisms are needed to instill DSSA behavior in the frontline. Insights into the organizational enablers of contextual ambidexterity (Gibson and Birkinshaw, 2004) are vital because, eventually, FLEs – on their own – need to tackle the challenges posed by the pursuit of conflicting goals (Jasmand *et al.*, 2012; Yu *et al.*, 2015). By unpacking organizational mechanisms such as resource reallocation, KSA enhancement or control system alignment, this research contributes to the burgeoning SSA enablement literature (Hughes and Ogilvie, 2020; Mullins *et al.*, 2020; Panagopoulos *et al.*, 2020) and advises managers how to cultivate DSSA within existing structures.

5.2 Managerial implications

5.2.1 Set separate strategic objectives but pivot if necessary

It is unlikely that many digital services will soon reach the revenue levels of physical services. Still, to protect current

Table 3 Eight operationalized organizational enablers of DSSA

Organizational enablers			Abstract concepts from prior SSA literature... are operationalized in this study	
Level	#	Enabler	Abstract concepts from prior SSA literature...	... are operationalized in this study
Macro	1	Refining objectives	SSA enables “firms to align sales- and service-related strategic foci” (Rapp <i>et al.</i> , 2017, p. 62)	The formulation of strategic objectives such as digital service revenue, maintenance contract closures, spare parts revenue or installed base connectivity
	2	Reallocating resources	“SSA behaviors impose significant resource limitations” (Mullins <i>et al.</i> , 2020, p. 38)	The deployment of hybrid sales structures leveraging tele-sales to overcome resource limitations
Micro	3	Enhancing KSAs	“[F]irms should consider establishing ambidexterity in skill-enhancing practices” (Panagopoulos <i>et al.</i> , 2020, p. 97)	The use of training, workshops, brochures and showrooms to improve DSSA-related KSAs
	4	Transforming frontline roles	Roles are renewed (Yu <i>et al.</i> , 2013) by adding responsibilities to frontline roles (Rapp <i>et al.</i> , 2017) and recruiting candidates who display ambidextrous behavior (Hughes and Ogilvie, 2020)	The addition of responsibilities to frontline roles to sell digital services, and the creation of new (digital) service sales roles
	5	Renewing routines	SSA requires abandoning outdated routines (Yu <i>et al.</i> , 2013)	The renewal of lead identification, follow-up, selling and pricing routines
Meso	6	Upgrading IT systems	Tools to enhance selling efficiency (Hughes and Ogilvie, 2020; Ruyter <i>et al.</i> , 2020) and customer relationships (Gabler <i>et al.</i> , 2017) must be deployed, notably CRM systems (Giovannetti <i>et al.</i> , 2020)	The updating, deployment and leveraging of CRMs to manage frontline activities and the adjustment of ERPs to new pricing mechanisms
	7	Restructuring organizations	Service and sales functions must be separated to achieve structural ambidexterity (Jasmand <i>et al.</i> , 2012; Ruyter <i>et al.</i> , 2020).	The establishment of separate digital services units in some firms and the reintegration of digital units or the building of cross-functional teams in other firms
	8	Aligning control systems	Control systems should balance conflicting objectives (DeCarlo and Lam, 2016; Panagopoulos <i>et al.</i> , 2020; Yu <i>et al.</i> , 2013) and include forward-looking metrics (Hughes and Ogilvie, 2020)	The linking of managerial compensation to profit and NPS, the inclusion of incentives for digital service sales in frontline plans and the use of role-dependent, relative weighting

margins and preserve future growth options, executives must set specific objectives in both domains. Non-financial metrics, such as the share of new equipment sold with active connectivity, can pave the way for future digital service growth without imposing unrealistic revenue targets. Importantly, executives should remain open to adjusting objectives based on market feedback. Our study is sobering because it describes how companies degrade digital services from a topline growth engine to an add-on to the core business. Executives should consider this caveat when defining service growth targets.

5.2.2 Get all frontline employees “up to digital speed” but concentrate expertise in specialist roles

It is important that the entire service and sales frontline develop a basic understanding of the technology and customer value behind digital services. Although “traditional” service and sales FLEs still occupy most customer touchpoints, many lack the KSAs required to sell digital services. This is unfortunate because ambidextrous FLEs are indispensable to identify service sales leads and to realize the full potential of cross-selling and up-selling opportunities. Hence, leaders should mandate role-specific digital service training for all FLEs. However, it is neither economical nor realistic to transform the entire frontline into digital services sellers. Therefore, leaders should first pick the “low hanging fruit” by selecting the most digital-savvy FLEs before developing them into digital champions or service salespeople.

Leaders ought to take more incisive decisions if this approach fails [3]. Some FLEs will be unable or unwilling to develop KSAs for selling digital services. If the number of digital-competent employees is insufficient and natural employee fluctuation is too slow, managers should – as a last resort – consider ending those FLEs who resist change. The later hiring procedure must include selection mechanisms (e.g. digitally focused online tests or in-depth interviews) to ensure that only suitable candidates permeate the application process.

5.2.3 Upgrade information technology systems before updating individual metrics

FLE enablement starts with high-performing CRM and ERP systems. CRM systems that promote the transparency of the installed base and customer relationships are essential to identify up-selling opportunities, tailor service sales campaigns and guide frontline activities. Similarly, ERP systems should be upgraded to remove barriers preventing the selling of customer-specific service packages and the implementation of new pricing mechanisms. Only when a comprehensive fact base about service and sales potential and performance exists can managers adapt metrics that steer individuals in the intended direction.

5.3 Limitations and research directions

This study suffers from limitations of methodology, sample and scope. As we used qualitative methods, the usual caveats about generalizability apply. Moreover, our data come from interviews. A longitudinal study, collecting objective service and sales performance data, would be useful to further explore the cross-level dynamics of DSSA and to answer, among others, the following questions: Is DSSA necessarily inorganic and top-down (Hughes and Ogilvie, 2020)? Do firms with higher levels of DSSA attract and nurture individuals who

display higher degrees of DSSA behavior? Is DSSA development primarily a bottom-up phenomenon (Ruyter *et al.*, 2020) in which ambidextrous individuals engage in activities that lead to organization-level DSSA?

Moreover, we selected cases based on convenience rather than on pure theoretical sampling (Glaser and Strauss, 1967). There are industries, firms or individuals displaying even higher degrees of DSSA that are worth studying. Specifically, the ambidextrous “customer success manager” role has permeated software firms to surface – through the present emergence of recurring revenue-based services – in more traditional industries (Hochstein *et al.*, 2021). It would be interesting to examine how industrial firms implement this role and which organizational enablers they use. Furthermore, our principal scope was the service and sales field force in digitally servitizing firms. This limitation offers two, potentially rewarding, research directions. First, as we only scratched the surface of hybrid sales organizations, more research is needed to investigate how the inside sales force (Sleep *et al.*, 2020) can resolve goal conflicts inherent in DSSA. Second, as highlighted at the outset, research on the digital transformation of selling is gaining momentum (Mattila *et al.*, 2021). Because digitalization affects both sales and service operations (Singh *et al.*, 2019), future research should explore how digital services generate data that are simultaneously exploitable for sales force automation and service fulfillment.

Finally, questions remain about the outlined organizational enablers. When, regarding digital services, should sales executives pivot from non-financial to financial targets? Which digital services warrant specialized sales roles? Which screening and training procedures are effective in finding and developing ambidextrous FLEs? What are “best-practice” control systems for digital services? How do compensation plans relate to the used revenue model (Classen and Friedli, 2021)? We hope that our DSSA theory will encourage more research on this academically and managerially relevant topic.

Notes

1. We use the term *physical services* for services fulfilled exclusively by physical means (i.e. “non-digital services”; Raddats *et al.*, 2019), such as product installations, retrofits and repair. We use the term *digital services* for services in which fulfillment is partially or entirely digital and enabled by data exploitation, like in remote and predictive maintenance services (Lerch and Gotsch, 2015; Opresnik and Taisch, 2015).
2. Supporting documents, obtained from Venus’ Head of Service, bolster the internal reliability (Jick, 1979) of our interview data and reduce concerns about the relatively small number of informants (3).
3. We thank an anonymous reviewer for this insight.

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