Toward Digital Service-Sales Ambidexterity in Industrial Firms

A Microfoundations Perspective

DISSERTATION

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The President:

Prof. Dr. Bernhard Ehrenzeller

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Pursuing a PhD is like an endurance run. This metaphor is corny, yet it best describes my more than three-year journey as a research associate at the University of St.Gallen's Institute of Technology Management.

Starting line. To begin with, you need a start number; then, a signpost at every kilometer. I want to thank my thesis supervisor, Prof. Dr. Thomas Friedli, for granting me the greatest freedom in my research and project work. Without his trust the thesis would not have been possible in this form. In addition, I want to thank my co-supervisor, Prof. Dr. Christian Hildebrand. Your advice on conceptual frameworks and data visualization has greatly improved the clarity of this thesis. Special thanks go to Dr. Dominik Röck for blazing the trail from Karlsruhe to St.Gallen. From the many pieces of advice that you gave me, one piece would prove truly invaluable: *Ship it*.

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
B2B	Business-to-Business
CLV	Customer Lifetime Value
CMV	Common Method Variance
CR	Composite Reliability
CRM	Customer Relationship Management
CSM	Customer Success Manager
DC	Dynamic Capability
DSSA	Digital Service-Sales Ambidexterity
EaaS	Equipment-as-a-Service
ERP	Enterprise Resource Planning
FLE	Frontline Employee
HOC	Higher-Order Construct
IoT	Internet of Things
IT	Information Technology
KPI	Key Performance Indicator
KSAs	Knowledge, Skills, and Abilities
LOC	Lower-Order Component
LTO	Long-Term Orientation
MLMV	Measured Latent Marker Variable
MO	Market Orientation
MRQ	Main Research Question
NPS	Net Promoter Score
ns	not significant
OBC	Outcome-Based Contract
PD	Power Distance
PPP	Purchasing Power Parity
PLS-SEM	Partial Least Squares – Structural Equation Modeling

RBV	Resource-Based View
RQ	Research Question
SaaS	Software-as-a-Service
SE	Standard Error
SEA	Southeast Asia
SME	Small and Medium-sized Enterprise
SPC	Standardized Path Coefficient
SSA	Service-Sales Ambidexterity
SRQ	Sub-Research Question
UAV	Uncertainty Aversion
VBS	Value-Based Selling
VIF	Variance Inflation Factor
VRIO	Valuable, Rare, Imperfectly imitable, Organized

ABSTRACT

Industrial firms have embarked on service transition strategies for some time, but revenues are still lagging behind expectations. Although recent advances in digital technology enable new service offerings and commercial models, the salesforce struggles to realize the full potential of these opportunities. Similarly, frontline service employees are increasingly asked to engage in service and sales activities and, hence, to display service-sales ambidexterity (SSA). Despite the growing interest in SSA, the understandings of the concept, its outcomes, and antecedents remain limited.

This thesis is among the first to investigate SSA from the perspective of the increasing role of digital technology in industrial services. Specifically, it examines how industrial firms can successfully develop digital service-sales ambidexterity (DSSA).

The thesis comprises four studies. Study 1 merges interview and ethnographic data to identify revenue models that form microfoundations of DSSA. The results reveal that, in the digital era, indirect and freemium revenue models assist in achieving service outcomes and overcoming barriers to sales outcomes. Study 2 uses interviews with service salespeople and managers to explore the conceptualization of value-based selling (VBS). The findings point to a conceptualization of VBS as an organizational capability comprising six routine-based building blocks. They also suggest that VBS can be measured with a formative-formative higher-order construct. Study 3 applies partial least squares – structural equation modeling to survey data in order to examine the performance outcomes and organizational boundary conditions of VBS. The results show a positive link between VBS and salesforce performance. Moreover, the quality of the sales strategy and sales-related incentives – but not service-related incentives – are systematically linked to higher levels of VBS. In addition, formalization reduces the positive performance effect of VBS, but proactive market orientation does not have any moderating effect. Study 4 draws on interview data to explore organizational enablers of DSSA. Eight organizational enablers were found to operate at the macro-, micro- and mesolevel.

These findings have several theoretical and managerial implications. The thesis contributes to servitization, SSA, and VBS literature by adding 1) the DSSA concept, 2) digital service revenue model configurations, 3) a multi-dimensional conceptualization of VBS as organizational capability, 4) a higher-order VBS measure, 5) organization-level boundary conditions of VBS, and 6) organizational enablers of DSSA. The findings are consolidated in a managerial framework that charts the path toward DSSA in industrial firms.

ZUSAMMENFASSUNG

Industrieunternehmen setzen seit geraumer Zeit Strategien zur Servicetransformation um. Dennoch bleiben die Erlöse hinter den Erwartungen zurück. Obwohl jüngste digitale Technologien neue Serviceangebote und kommerzielle Modelle ermöglichen, kämpfen Vertriebsmitarbeiter damit, das volle Potenzial dieser Möglichkeiten auszuschöpfen. Ebenso wird von Servicemitarbeitern zunehmend erwartet, Service- und Vertriebsaktivitäten zu übernehmen und somit Service-Vertriebs-Beidhändigkeit (SVB) aufzuweisen. Trotz vermehrtem Interesse an SVB ist das Wissen über das Konzept, dessen Ergebnisse und Antezedenten begrenzt.

Diese Dissertation erforscht als eine der ersten SVB unter dem Gesichtspunkt der zunehmenden Rolle digitaler Technologien in industriellen Dienstleistungen. Insbesondere untersucht die Dissertation, wie Industrieunternehmen digitale SVB (DSVB) entwickeln können.

Die Dissertation umfasst vier Studien. Studie 1 kombiniert Interview- und ethnographische Daten, um Erlösmodelle zu identifizieren, welche Mikrofundamente von DSVB bilden. Die Ergebnisse offenbaren, dass im digitalen Zeitalter indirekte und Freemium-Erlösmodelle dazu beitragen, Serviceziele zu erreichen und Hürden zur Erreichung von Vertriebszielen zu überwinden. Studie 2 nutzt Interviewdaten, um zu ermitteln, wie wertorientiertes Verkaufen (WOV) konzeptualisiert werden kann. Die Ergebnisse deuten auf eine Konzeptualisierung als mehrdimensionale organisatorische Fähigkeit, welche auf sechs Blöcken von Routinen beruht. Dies weist ausserdem darauf hin, dass WOV mit einem formativen-formativen Konstrukt höherer Ordnung gemessen werden kann. Studie 3 wertet Umfragedaten durch Strukturgleichungsmodellierung mit dem Partial-Least-Squares-Ansatz aus, um Zusammenhänge zwischen WOV, Erfolgsvariablen und organisationalen Rahmenbedingungen des WOVs zu schätzen. Es zeigt sich ein positiver Zusammenhang zwischen WOV und Vertriebsmannschaftsleistung. Des Weiteren sind die Qualität der Vertriebsstrategie, verkaufsbezogene Anreize – aber nicht servicebezogene Anreize – mit verstärktem WOV verbunden. Ausserdem mindert Formalisierung den positiven Leistungseffekt des WOVs, wobei proaktive Marktorientierung keinen solchen moderierenden Effekt aufweist. Studie 4 untersucht organisatorische Befähiger von DSVB anhand von Interviewdaten. Acht organisatorische Befähiger, die auf der Makro-, Mikro- und Mesoebene wirken, werden identifiziert.

Diese Ergebnisse haben vielfache Implikationen für Theorie und Management. Die Dissertation trägt zur Servicetransformations-, SVB- und WOV-Literatur in sechsfacher Hinsicht bei. Die Ergebnisse werden in einem Ordnungsrahmen konsolidiert, welches Managern in Industrieunternehmen den Weg zur DSVB aufzeichnet.

1 Introduction

1.1 Managerial relevance

Now is the time for industrial firms to start their digital service growth engine. For laggards in this respect, the COVID-19 crisis has been a rude awakening. Almost overnight, service sales and delivery activities had to be moved to the digital world – something many industrial firms were unprepared for (McKinsey & Company, 2020). The resulting economic shock diverted executives' attention to cash preservation: almost 60% of manufacturers surveyed by Bain & Company (2020) cut their capital expenditure in 2020. This bolstered the trend of customers in the manufacturing sector to shift from capital to operational expenditure, thereby providing industrial firms the opportunity to develop new service business models supported by machine connectivity, digital technologies, and data analytics (Monitor Deloitte, 2020).

Nevertheless, the reality on the ground is bleaker. Rolls-Royce has long been considered a service transition pioneer with its TotalCare (alias "power-by-the-hour") long-term service agreements that use large amounts of jet engine data for maintenance activities, billed per flying hour (Rolls-Royce, 2017). But this model's revenues were severely hit by travel restrictions during the pandemic, forcing Rolls-Royce to axe 9,000 jobs (BBC, 2021). The industrial giant, General Electric, provides another cautionary tale. Announcing its intention in 2015 to become a "top 10 software company" by 2020, the company invested heavily in its GE Digital business, and then rushed into selling a premature offering that "sales teams weren't entirely confident about what [it] could do [and pitching] customers on a deep analytic software platform that was hard to understand and harder to explain" (The Wall Street Journal, 2020).

Indeed, the frontline is critical of the commercial success of service growth strategies. For the vast majority of industrial companies surveyed in a Swiss-based benchmarking study, the salesforce is the most important service sales channel (Friedli et al., 2019). But this focus comes at a cost. Managerial literature is replete with examples of manufacturers struggling to transform their salesforce into service sellers (e.g., Reinartz & Ulaga, 2008; Ulaga & Michel, 2018). Doubling down on cross-selling objectives for frontline service employees can also backfire, as evidenced by examples from the financial services sector (Hughes & Ogilvie, 2020; Panagopoulos et al., 2020). In short, it is of utmost importance that industrial firms' leaders, without jeopardizing their core business, adopt a service sales approach that seizes opportunities presented by digital technology.

1.2 Theoretical relevance

The scholarly focus on industrial firms' service transition is not new. Research on the topic emerged in the 1980s, with Vandermerwe and Rada (1988) coining the term "servitization" for the strategic shifts manufacturers undertake toward more service offerings. The body of literature has since increased to over 200 articles in scholarly journals (Raddats et al., 2019). Servitization has been linked to higher corporate valuation (Fang et al., 2008) and revenue (Böhm et al., 2017), although the impact on overall profitability is less clear (Eggert et al., 2014).

What is new, however, is the rewarding combination of service transition research and two adjacent fields. On the one hand, the increasing role of digital technology in service offerings and operations has ignited interest in a phenomenon called "digital servitization" (Kohtamäki et al., 2019). Once again, the salesforce's inability to sell these new services seriously impedes commercial success (Paiola & Gebauer, 2020). On the other hand, research momentum is gaining around service-sales ambidexterity (SSA), which is the "similar pursuit of service and sales goals" (Yu et al., 2013). Importantly, SSA offers opportunities in terms of higher sales performance and customer satisfaction (Jasmand et al., 2012). Nevertheless, there is also a "dark side" of SSA where frontline employees (FLEs) are subject to role conflicts between customer-oriented and selling-oriented behavior; with this dual focus taking a heavy toll on FLEs' time and resources (Gabler et al., 2017).

1.3 Research gaps and purpose

A literature review, summarized in Figure 1, reveals three research gaps. First, research has not evaluated digital servitization and SSA in combination. Not any of the SSA studies reviewed by Mullins et al. (2020) explicitly consider digital services. This is unfortunate. Since digital technology disrupts sales practices, there are plenty of innovative ways to organize and conduct sales (Singh et al., 2019), on which managers need guidance. Against this backdrop, this thesis is among the first to combine the perspectives of digital servitization and SSA to study *digital* service-sales ambidexterity.

Second, the microfoundations of SSA must be unpacked. Although recent literature has begun to identify some key underpinnings of SSA (Hughes & Ogilvie, 2020; Shiue et al., 2021), descriptions remain somewhat superficial. Insights into the microfoundations of SSA are important because they direct managers toward the set of frontline activities, skills, and control systems required to achieve superior service and sales outcomes.

Third, our understanding of organizational antecedents to SSA is still limited. Prior research has mainly investigated individual-level boundary conditions of SSA (Mullins et al., 2020). However, since SSA is based on interactions between organization-level and individual-level capabilities, more multilevel research on its organizational enablers is needed (DeCarlo & Lam, 2016; Rapp et al., 2017). This understanding is vital because it reveals the levers that managers can pull to boost their organization's SSA.

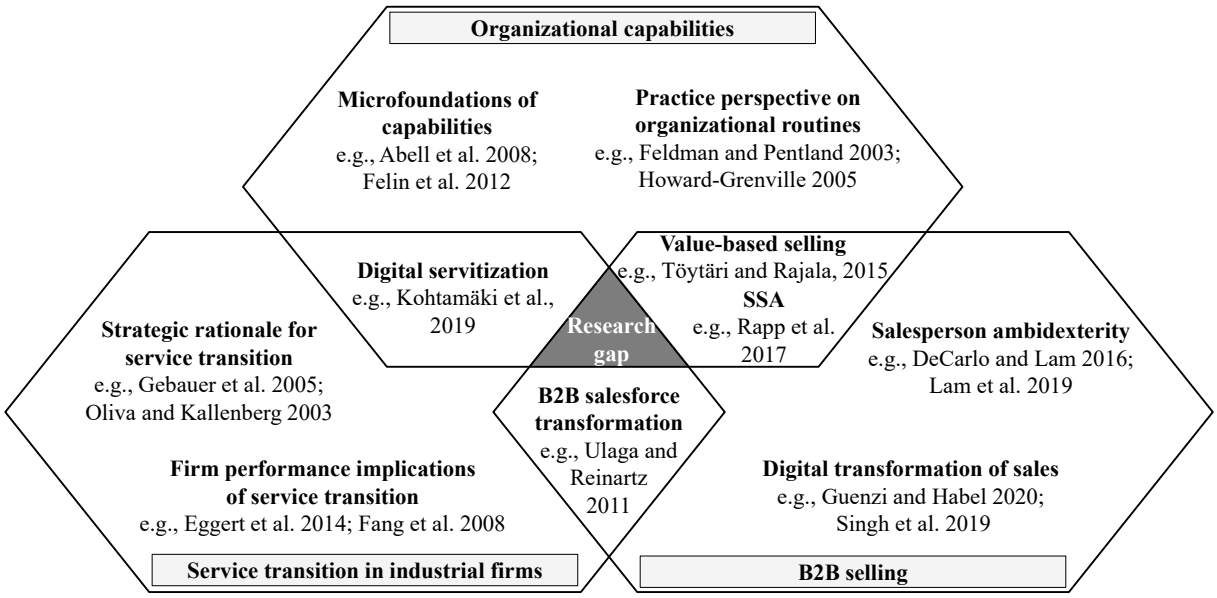

Figure 1: Literature summary and research gap

To bridge these research gaps, the purpose of this thesis is to examine how industrial firms can successfully develop digital service-sales ambidexterity (DSSA). To build theory around DSSA, it addresses three sub-research questions (SRQs) articulated in Table 1. SRQ1 serves to decompose and operationalize DSSA. Next, to determine whether DSSA can be a valuable firm asset, SRQ2 evaluates the relationship between DSSA and firm performance. Finally, under the tenet that DSSA is indeed valuable, SRQ3 examines organizational enablers that foster DSSA. The conceptual framework guiding the thesis is depicted in Figure 2 and is subsequently operationalized through terms defined in the Theoretical background section.

Table 1: Research questions

#	Research Question (RQ)
MRQ	How can industrial firms successfully develop digital service-sales ambidexterity?
SRQ1	How can digital service-sales ambidexterity in industrial firms be conceptualized?
SRQ2	How does digital service-sales ambidexterity affect firm performance?
SRQ3	What are the organizational enablers of digital service-sales ambidexterity?

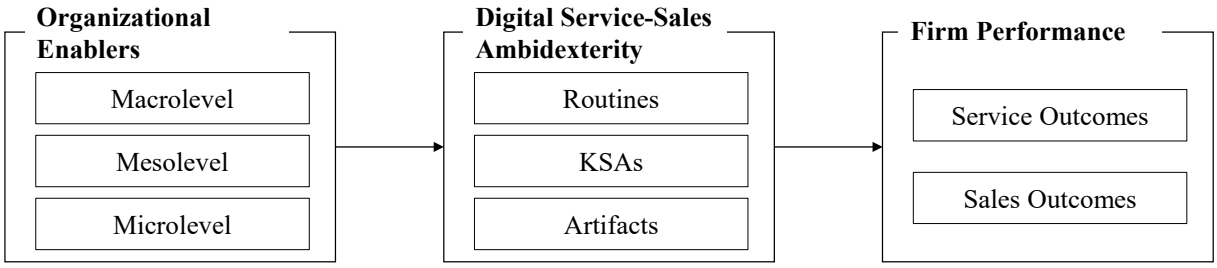

Figure 2: Thesis conceptual framework

1.4 Ontological and epistemological positioning

The thesis is based on a relativist and constructivist world view. I[1] adopt a relativist ontological stance, adhering to the view that "there is no single reality that can somehow be discovered" (Easterby-Smith et al., 2015, p. 49). As this implies the existence of multiple forms of DSSA, different perspectives are required to explore the phenomenon. Moreover, the thesis adopts a constructivist epistemology, owing to my belief in the crucial role of "meaning-making activities of groups and individuals" in judging social phenomena (Lincoln et al., 2018, p. 219).

The constructivist view has two consequences for the thesis' research design. First, the research is primarily inductive. As such, the research starts by collecting empirical data, initially to develop a rich understanding of the focal phenomenon (Deshpande, 1983) and subsequently to build theory (Eisenhardt et al., 2016; Glaser & Strauss, 1967). Case study research is suitable to achieve these results because it allows the development of theory on an emerging concept (Yin, 2018), such as DSSA. Second, the research relies on triangulation, that is, "the combination of methodologies in the study of the same phenomena" (Denzin, 2009, p. 297). Therefore, this thesis uses "within-method" triangulation for internal consistency of the qualitative studies and "between-method" triangulation to enhance external validity (Jick, 1979) of the combined qualitative and

[1] "I" refers to the author of the thesis. "We" is used in Section 3 to acknowledge team members' help in collecting empirical data.

quantitative studies. Accordingly, it follows Sieber's (1973) advice and uses qualitative research to contribute to survey design.

1.5 Thesis structure

Three sections follow this introduction. Section 2 reviews the background literature on organizational capabilities, the service transition in industrial firms, and business-to-business (B2B) selling. Section 3 presents the background, methodology, and findings of the four empirical studies. Section 4 concludes with a discussion of the findings' theoretical and managerial implications and indicates future research directions.

2 Theoretical background

This section uses literature on organizational capabilities, the service transition, and B2B selling to define the concepts used in the empirical studies.

2.1 Organizational capabilities

2.1.1 Resource-based view

This research is rooted in the resource-based view (RBV) of the firm. The *RBV* posits that valuable, rare, imperfectly imitable, and organized (VRIO; Kozlenkova et al., 2014) firm resources can be the source of sustained competitive advantage (Barney, 1991; Wernerfelt, 1984). An organization's *resource base* consists of "tangible, intangible, and human assets (or resources) as well as capabilities which the organization owns, controls, or has access to on a preferential basis" (Helfat et al., 2007, p. 5). An organizational *capability* is the "ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result" (Helfat & Peteraf, 2003, p. 999).

2.1.2 Dynamic capabilities view

The dynamic capabilities view extends the RBV. This view theorizes that firms need to renew their resource base to achieve a competitive advantage amidst rapidly changing technologies and market forces (Teece et al., 1997; Teece & Pisano, 1994). A *dynamic capability* (DC) is "the capacity of an organization to purposefully create, extend, or modify its resource base" (Helfat et al., 2007, p. 4). The DC view distinguishes between capability layers, where higher-order dynamic capabilities generate and change zero-level operational capabilities (Collis, 1994; Teece et al., 1997; Winter, 2003). Notable DCs include product development, strategic decision making, knowledge brokering, and resource allocation (Eisenhardt & Martin, 2000).

This research embraces the DC view for two reasons. Primarily, change is inherent to digital servitization. As industrial firms embark on a transformational journey, they must reconfigure their resource base (Kohtamäki et al., 2019). Furthermore, separating capability layers helps to distinguish between the studied phenomena. Morgan (2012) identifies four types of marketing capabilities; one is DCs (e.g., resource reconfiguration) and another is specialized capabilities (e.g., selling). Building on this distinction, this research explores DSSA as DC and its underlying operational capabilities.

DCs are notoriously difficult to operationalize. According to Teece (2007), DCs are inherently opaque because if not, they would be easy to replicate and, therefore, would not be a source of sustained competitive advantage. As a result, DCs are criticized as

being vague, tautological, recursive, and nonoperational (Eisenhardt & Martin, 2000). Helfat and Peteraf (2009) reject the concern of tautology but admit to the existence of conceptual issues that can be resolved by deepening the microfoundations of (dynamic) capabilities.

2.1.3 Microfoundations of capabilities

Microfoundations serve to unpack capabilities. Microfoundations are rooted in the principle of scientific decomposition, in which for "a phenomenon located at analytical level N at time t (N_t), […] a baseline micro-foundation for level N_t lies at level N-1 at time t-1" (Felin et al., 2012, p. 1353). In the context of organizational capabilities, *microfoundations* "serve as causal explanation for the creation of […] a capability" and include "constituent components (i.e. main effects) […] and interactions within and across components (i.e. interaction effects) […] that contribute to the aggregation and emergence of the collective constructs" (Felin et al., 2012, p. 1353). Importantly, microfoundations such as skills, processes, procedures, organizational structures, and decision rules support DCs and are therefore distinct from the capabilities as such (Teece, 2007). Microfoundations allow the study of the individual-level origins of organizational capabilities (Felin & Foss, 2005), including individual actions (Abell et al., 2008) and knowledge, skills, and abilities (KSAs; Barney & Felin, 2013). This research considers three groups of microfoundations: routines, KSAs, and artifacts.

Routines are the building blocks of organizational capabilities (Becker, 2008). Capabilities can be conceptualized as a high-level routine or a collection of routines (Collis, 1994; Winter, 2000). *Routines* are "repetitive, recognizable pattern[s] of interdependent actions, involving multiple actors" (Feldman & Pentland, 2003, p. 96). While different conceptualizations exist, prior literature agrees that routines are patterned, recurrent, collective, processual, context-dependent, path-dependent, and triggered by actors or external cues (Becker, 2004)

The dividing lines between organization-level and individual-level phenomena blur when studying routines. The traditional conceptualization of routines as collective, organizational entities (Cohen et al., 1996) has been challenged by Salvato and Rerup (2011), who noted the difficulty of separating routines from the individuals performing them, and who called for more multilevel research bridging both perspectives. Indeed, individuals and their interactions are crucial for understanding organizational phenomena like routines (Barney & Felin, 2013).

Agency determines routine performance (Salvato & Rerup, 2018). Individual *agency* "involves […] the deliberative ability to make choices and action plans" (Bandura, 2001, p. 8), entails "the capacity to transpose and extend schemas to new contexts" (Sewell, 1992, p. 18), and varies greatly between individuals. Agency is embedded in the

performative aspect of a routine, that is, "specific actions, by specific people, in specific place and times," complemented by the *ostensive aspect*, namely, its "ideal or schematic form" (Feldman & Pentland, 2003, p. 101). Individuals enact routines differently; some induce change in routines, while others do not (Howard-Grenville, 2005; Sonenshein, 2016).

The importance of agency leads to individual KSAs as a second group of microfoundations. Mainstream literature has long acknowledged the foundational role of KSAs for organizational capabilities (Parmigiani & Howard-Grenville, 2011). Simply put, routines are enacted by individual actions, the outcomes of which are determined by individual KSAs and motivation (Abell et al., 2008).

Artifacts, because they regulate agency, form a third group of microfoundations. *Artifacts* are "physical manifestations […] that deliberately attempt to capture or prescribe" organizational routines (Pentland & Feldman, 2005, p. 797), such as checklists, rules, scripts, software, or standard operating procedures (Feldman & Pentland, 2003; Pentland & Feldman, 2005). Depending on the context, artifacts influence routine performance by controlling or just informing individual action (Becker, 2004; Howard-Grenville, 2005). Because actors enact rules differently based on their idiosyncratic backgrounds, artifacts do not eliminate but rather regulate individual agency in routine performance (D'Adderio, 2011; Sonenshein, 2016). In sum, the suggested conceptualization of microfoundations is parsimonious because it comprises the essential components of capabilities (i.e., routines), the elements of agency (i.e., KSAs), and the mechanisms to regulate agency (i.e., artifacts).

2.2 Service transition in industrial firms

2.2.1 Servitization

Manufacturers pursue three main benefits by growing their service business. From a strategic perspective, manufacturers aim for competitive advantage. This assumes that services leverage VRIO resources as a source of competitive advantage (Barney, 1991; Eloranta & Turunen, 2015). From a customer relationship perspective, manufacturers pursue higher customer retention. Services address two important retention levers: customer satisfaction (Grönroos, 1998) and lock-in (Reinartz & Ulaga, 2008). From a financial perspective, manufacturers want to counter eroding margins in their equipment business by offering more services (Macdonald et al., 2016), which are said to generate high-margin, steady revenues (Oliva & Kallenberg, 2003; Wise & Baumgartner, 1999).

It should be noted that retention and financial outcomes are linked (Rust & Chung, 2006). Retaining customers with positive *lifetime value (CLV)* – that is, customers generating a positive present value of future profits over their relationship with the

company – drives profitability (Kumar & Reinartz, 2016; Venkatesan & Kumar, 2004). Thus, CLV-maximizing service strategies and customer relationship management (CRM) practices increase in importance (Huang & Rust, 2017; Rust & Chung, 2006).

Two research streams explore the service transition (Stähle, 2020). The first focusses on the evolution of manufacturers' value proposition toward *product-service-systems*, which are "marketable set[s] of products and services capable of jointly fulfilling a user's need, [in which] the product/service ratio can vary, either in terms of function fulfilment or economic value" (Goedkoop et al., 1999, p. 18). The second investigates the organizational shifts underpinning the service transition. From the multitude of synonymous constructs employed in the literature and defined in Table 2, *servitization* is employed hereafter.

Table 2: Servitization and related constructs

Construct	Definition	Notable uses
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" (Kowalkowski et al., 2017, p. 8)	Brax (2005); Forkmann, Henneberg, et al. (2017); Forkmann, Ramos, et al. (2017)
Service transition	"… the infusion of services in addition to goods to a manufacturing firm's offering" (Josephson et al., 2016, p. 142)	Fang et al. (2008); Kowalkowski et al. (2015); Lütjen et al. (2017); Oliva and Kallenberg (2003)
Servitization	"… the innovation of an organisation's capabilities and processes to shift from selling products to selling integrated products and services that deliver value in use" (Baines et al., 2009, p. 547)	Macdonald et al. (2016); Vandermerwe and Rada (1988)

The relationship between servitization and firm performance is the subject of debate. The "Service Paradox" describes manufacturers' substantial investment in servitization without increasing their earnings (Gebauer et al., 2005). Fang et al. (2008) find that firm value increases with service transition, albeit only when service sales exceed a certain share of total revenue. Eggert et al. (2014) report that industrial firms with a broad service portfolio enjoy higher revenue, but also higher costs and therefore do not always realize higher profits. Böhm et al. (2017) find that service transition can increase the revenue of manufacturing firms in both strong and weak financial situations – given specific combinations of resources and knowledge sources. Nonetheless, the COVID-19 pandemic has challenged the understanding of services as a steady revenue generator, mainly due to the drop in service demand because of idle customer operations and travel restrictions (Bond et al., 2020).

2.2.2 Digital servitization

A new ecosystem of products – the Internet of Things (IoT) – has emerged from recent information technology (IT) innovation. The *IoT* consists of "various devices being connected to the Internet and to each other" (Rymaszewska et al., 2017, p. 94). *"Smart, connected" products* or assets form its core (Marinova et al., 2017; Porter & Heppelmann, 2014). Physical assets become smart by adding two groups of components to the basic mechanical and electrical parts: "smart" components such as sensors, data storage, and an embedded operating system; and "connectivity" components that enable connection with the asset (Porter & Heppelmann, 2014). Smart products are then integrated in the IoT using IT to transfer, convert, analyze, and store data. Important supporting IT includes big data analytics, cloud computing, and networking technology (Choi et al., 2018; I. Lee & Lee, 2015; Rust & Huang, 2014).

Digital servitization, 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), has paved the way for new service value propositions and business models (Coreynen et al., 2017; Suppatvech et al., 2019). Paschou et al. (2020) provide a comprehensive overview of value propositions enabled by digital servitization. They include optimized process performance (Allmendinger & Lombreglia, 2005), minimized downtime (Grubic & Peppard, 2016), faster service delivery (Marinova et al., 2017), guaranteed availability (Lenka et al., 2017; Lerch & Gotsch, 2015), lower risks (Ehret & Wirtz, 2017), and shorter lead times (Coreynen et al., 2017). However, given their novelty, these data-enabled services are inconsistently designated by varying terminology.

To address this shortcoming, Table 3 provides a non-overlapping classification of industrial services. The first distinction between *physical* (i.e., non-digital) and *digital services* rests on the nature of service delivery. Whereas physical services are delivered exclusively by physical means, digital services must include a digital component of service delivery. The second distinction – between *smart services* and *Software-as-a-Service (SaaS)* – is based on the role of smart products as service objects. While smart services require a smart product as service object, it is optional for SaaS[2] (Classen & Friedli, 2021a).

[2] Arguably, IT-powered devices such as personal computers or smartphones are required to deliver SaaS. However, these devices are not service objects, because service is performed *with* them and not *on* them.

Table 3: Classification of industrial services

	Physical services	**Digital services** (Raddats et al., 2019)	
		Smart services (Allmendinger & Lombreglia, 2005; M. Klein et al., 2018; Töytäri et al., 2018; Wünderlich et al., 2013)	**Software-as-a-Service** (Gebauer et al., 2020)
Aliases	*Basic installed base services,* (Paiola & Gebauer, 2020); *classic services* (Gebauer et al., 2020); *Non-digital services* (Raddats et al., 2019)	*Digital-enabled services* (Raddats et al., 2019); *digitalized product-service systems* (Lerch & Gotsch, 2015); *IoT-based solutions and services* (Hasselblatt et al., 2018; Rymaszewska et al., 2017)	*Asset-unrelated digital services* (Osterrieder, 2020)
Physical service delivery	Necessary	Optional	None
Digital service delivery	None	Necessary	Necessary
Smart product as service object	Optional	Necessary	Optional
Generic names	Field service; maintenance; repair; overhaul; installations; spare parts delivery	Fleet management (Leminen et al., 2020); remote services (diagnostics, maintenance, monitoring, repair) (Grubic, 2014; Grubic & Jennions, 2018b; Holtbrügge et al., 2007); telematics services (Cenamor et al., 2017; Leminen et al., 2020)	Software application stack (Gebauer et al., 2020); web applications (Coreynen et al., 2017)
Commercial names	Komax Inspection[6]; Sulzer contract maintenance[11]	ABB Ability[1]; Cat MineStar[3]; John Deere Operations Center[4]; MTU Go! Manage[8]; My Sandvik Insight[9]; Rolls-Royce TotalCare[10]	Bühler safefood.ai[2]; Grundfos GO Balance[5]; Hilti ON!Track[7]

Sources (all retrieved on 24 March 2021): [1]https://ability.abb.com/; [2]https://digital.buhlergroup.com/safefoodai/; [3]https://www.cat.com/en_US/by-industry/mining/minestar-solutions.html; [4]https://www.deere.de/de/campaigns/ag-turf/operations-center/; [5]https://mypump.info/; [6]https://www.komaxgroup.com/de-DE/Services/Services/Consulting-Installation/Komax-Inspection/; [7]https://www.hilti.ch/content/hilti/E3/CH/de/services/tool-services/on-track-21.html; [8]https://www.mtu-solutions.com/na/en/about-us/digital-solutions/digital-solution-range/digital-solution-go-manage.html; [9]https://www.rocktechnology.sandvik/en/parts-and-services/my-sandvik-digital-service-solutions/my-sandvik-insight/; [10]https://www.rolls-royce.com/media/our-stories/discover/2017/totalcare.aspx; [11]https://www.sulzer.com/de-ch/germany/shared/services/contract-and-predictive-maintenance.

Two examples from Table 3 elucidate this distinction. MTU Friedrichhafen's "Go! Manage" is a dashboard displaying status information about diesel engine fleets. Without diesel engines as a service object, the service loses its purpose. Conversely, Hilti's ON!Track is a cloud-based asset management software available via web interface or mobile application. Assets managed in ON!Track need not be smart, since ON!Track allows the management of assets solely equipped with barcodes and no other data-recording or sending components, such as safety helmets. Irrespective, it is difficult to clearly demarcate digital services, smart services, and SaaS. This thesis uses the most appropriate terminology for the respective context.

Digital services often entail new business models. A *business model* is "the system of interconnected activities performed by a focal firm (and often by users and partners) to create value, with part of that value captured by the firm" (McDonald & Eisenhardt, 2020; Tidhar & Eisenhardt, 2020, p. 2). *Value creation* is an "actor's attempt to increase value" and *value capture* is the "process of securing financial or nonfinancial return from value creation" (Chesbrough et al., 2018, p. 933). Digital services allow ongoing updates and, thus, may create more value over time; although this requires the continuous alignment of value capture mechanisms (Sjödin et al., 2020).

The fit of digital services and the underlying *revenue model*, which defines how value is captured from business models (Amit & Zott, 2001), is crucial for two reasons. First, innovative revenue models can unlock new revenue sources. Gebauer et al. (2020) describe compelling cases of firms attracting new customer segments by employing pay-per-use and freemium models. Second, new revenue models also come with pitfalls. Sjödin et al. (2020) provide cautionary tales of firms failing to adjust their revenue models to actual value creation and, thereby, worsening customer relationships and lifetime value. Their study highlights the importance of initially determining the value created by digital services and, subsequently, of the mechanisms that share the value with the customer. This casts the spotlight on the salesforce.

2.3 B2B selling

In digitally servitizing firms, "sales force transformation is at the moment one of the top priority changes" (Paiola & Gebauer, 2020, p. 14). This section elaborates why this is the case.

2.3.1 Service-sales ambidexterity

Servitizing manufacturers need a service sales capability, that is, they must be able to "deploy resources in routines generating service revenue" (Classen et al., 2021). An excellent salesforce can provide servitizing firms with a positional advantage (Ulaga & Reinartz, 2011) and higher returns on sales (Worm et al., 2017).

But selling services requires different KSAs than selling goods (Ulaga & Reinartz, 2011). Considerable research has been done on the exploration of the schematic "hunter–farmer" dichotomy that separates goods-centric and service-centric salespeople. While hunters seek to achieve sales goals by selling to new customers, farmers prefer leveraging existing customer relationships to reach sales goals (DeCarlo & Lam, 2016). Thus, hunters seem better suited for selling goods, while farmers appear more appropriate for selling services (Ulaga & Loveland, 2014). Many industrial firms lack this service-savvy salesforce and, therefore, fail to earn substantial returns from servitization (Reinartz & Ulaga, 2008; Ulaga & Michel, 2018; Ulaga & Reinartz, 2011)

Digital servitization reveals additional KSA gaps. There is mounting evidence that existing goods-centric salespeople struggle, foremost, to understand how digital services work and, thereafter, to explain their benefits to potential customers (M. Klein et al., 2018; Paiola & Gebauer, 2020; Töytäri et al., 2018). Similar issues are likely to arise with service FLEs. Often, FLEs provide excellent customer services, but are unable or unwilling to sell them (Gebauer et al., 2005; Gebauer & Friedli, 2005; Grönroos, 1998). With numerous digital services set to replace FLE intervention (Huang & Rust, 2017; Marinova et al., 2017), there are reasons to doubt that this situation will improve in the digital age.

The management of conflicting goals requires ambidexterity. The concept of ambidexterity is rooted in the exploration/exploitation dilemma in which firms must allocate resources to *exploration* – encompassing activities such as "search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (March, 1991, p. 71), and *exploitation* – which includes "refinement, choice, production, efficiency, selection, implementation, execution" (p. 71) – to ensure survival (O'Reilly & Tushman, 2013). Organizations capable of doing both simultaneously are called *ambidextrous* (Raisch et al., 2009; Tushman & O'Reilly, 1996). Organizational ambidexterity is a DC that can be achieved with structural mechanisms (called *structural ambidexterity*) or nurtured within an organizational entity (called *contextual ambidexterity*) (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2008).

This research investigates *service-sales ambidexterity*. SSA research emerged in a context of firms fostering cross-selling and upselling activities to increase profitability of their after-sales services (Jasmand et al., 2012). The research stream has since evolved; it now also considers *sales-service ambidexterity*, in which salespeople need to "both sell and service customer accounts" (Agnihotri et al., 2017; Mullins et al., 2020, p. 34). This thesis considers ambidexterity in both directions since, typically in industrial firms, both service FLEs and salespeople are responsible for selling services (Gebauer & Friedli, 2005; Paiola et al., 2013; Story et al., 2017).

SSA is a multilevel phenomenon. At the organizational level, SSA is an organizational unit's "simultaneous pursuit of service and sales goals" (Yu et al., 2013, p. 53). At the individual level, ambidextrous FLEs engage in "both customer service provision and cross-/up-selling during service encounters" (Jasmand et al., 2012, p. 22). In line with prior research, this thesis investigates individual SSA as behavior reflective of an underlying ability (Agnihotri et al., 2017; Mullins et al., 2020). Because individual-level and organization-level capabilities are interconnected, SSA can be conceptualized as a dynamic capability formed by individual behavior nested in the sales-service interface (Hughes & Ogilvie, 2020; Rapp et al., 2017).

This thesis addresses three SSA-related knowledge gaps. First, research has yet to consider the implications of digital servitization for SSA. Whereas calls to investigate the digitalization of sales have been voiced recently (Singh et al., 2019), extant literature focusses on the digital transformation of sales operations (e.g., Giovannetti et al., 2020; Guenzi & Habel, 2020) rather than the service portfolio. But digital services require updated-sales KSAs lacked by many goods-centric salesforces (Paiola & Gebauer, 2020; Töytäri et al., 2018). Therefore, the digitalization of services is likely to accentuate SSA-related goal conflicts (Jasmand et al., 2012) that warrant further research.

Second, the microfoundations of SSA are underexplored. Conceptualizing SSA as DC directs research attention to its microfoundations, that is, to its underlying organization-level and individual-level capabilities, the relationship between these capabilities, and firm-level outcomes linked to these relationships (Rapp et al., 2017). Although research has begun to outline some microfoundations of SSA (Hughes & Ogilvie, 2020; Shiue et al., 2021), much more needs to be known about their nature and mechanics. In this regard, this thesis seeks to explore how adjacent constructs could form microfoundations of SSA. This includes value-based selling, which aims to improve sales and customer relationship outcomes from industrial services (Raja et al., 2020), as well as revenue model design, which provides rules to align value creation and capture from services (Sjödin et al., 2020).

Third, there is a need for more multilevel research on SSA antecedents (Rapp et al., 2017). In general, multilevel research can help to understand "much of the nested complexity of real organizational life" (K. J. Klein & Kozlowski, 2000, p. 211). However, a literature review by Mullins et al. (2020) revealed that SSA research has hitherto focused on a single level of analysis, mostly the individual level. Arguably, individual self-regulation enables SSA (Yu et al., 2013), thus mitigating role ambiguity (Gabler et al., 2017). However, self-regulation depends on individual motivation and KSAs, which differ across FLEs (Jasmand et al., 2012; Yu et al., 2015). Therefore, it is also necessary to study the organizational forces shaping SSA. Meso-studies have only recently begun to integrate micro- and macro-perspectives to understand drivers of SSA

behavior (Panagopoulos et al., 2020). Nevertheless, there is room for more multilevel research on the organizational antecedents of SSA, such as training, resource deployment, performance management and control systems, structural design, and sales support (DeCarlo & Lam, 2016; Hochstein et al., 2021; Hughes & Ogilvie, 2020; Lam et al., 2019; Ruyter et al., 2020; Shiue et al., 2021).

This thesis explores two focal research objects that reflect the multilevel, nested nature of SSA (Rapp et al., 2017). The working definition of *DSSA* is *a firm's ability to simultaneously achieve service and sales outcomes with physical and digital services*. DSSA captures the main conflict that digitally servitizing manufacturers face, namely, the simultaneous exploitation of their core business and the exploitation of digital growth opportunities. Hence, DSSA is conceptualized as dynamic capability underpinned by *DSSA behavior*, in which FLEs engage in service and sales activities pertaining to physical and digital services (Classen & Friedli, 2021b).

2.3.2 Value-based selling

Customer value is fundamental to B2B marketing. The American Marketing Association (2017) defines marketing as the "activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have *value* for customers, clients, partners, and society at large" (emphasis added). The "customer-value-based theory of the firm" even posits that firms exist to create customer value (Slater, 1997; Woodruff, 1997).

But what is customer value? The concept of value can be traced to Adam Smith (Eggert et al., 2019) and even Aristotle (Eggert et al., 2018). Broadly speaking, value is the customer-perceived utility of an offering based on "what is received and what is given" (Zeithaml, 1988, p. 14). Customer value in business markets has been defined more narrowly as the "perceived worth in monetary units of the […] benefits received by a customer firm in exchange for the price paid" (J. C. Anderson et al., 1993, p. 5). This thesis, however, views *customer value* as "customers' net valuation of the perceived benefits accrued from an offering that is based on the costs they are willing to give up for the needs they are seeking to satisfy" (Kumar & Reinartz, 2016, p. 37).

VBS operationalizes a firm's value orientation at the salesforce level (Terho et al., 2017). Individual *VBS* behavior is "the degree to which the salesperson works with the customer to craft a market offering in such a way that benefits are translated into monetary terms, […] thereby convincingly demonstrating their contribution to customers' profitability" (Terho et al., 2012, p. 178). Since VBS serves to develop long-term partnerships based on joint value creation and innovation (Töytäri et al., 2018), it encompasses numerous activities. The most important are highlighted in Table 4 (for a comprehensive review, see Classen and Friedli (2019)).

Table 4: VBS activities

VBS activity	Source
Prioritizing customers	Terho et al. (2015)
Obtaining a thorough understanding of customer needs	Blocker et al. (2012)
Crafting customer-specific value propositions	Töytäri and Rajala (2015)
Estimating the financial benefits an offering provides to customers	Töytäri et al. (2011)
Defining value-sharing agreements	Liinamaa et al. (2016)
Value-based pricing	Töytäri et al. (2017)
Verifying the value created	Raja et al. (2020)

VBS seems to pay off. Arguably, VBS is complex and time-consuming (Terho et al., 2017). But in B2B markets, vendors must be able to demonstrate a solution's value to engage with buyers in the first place (Blocker et al., 2012). Echoing this contention, empirical studies have associated VBS with higher levels of sales performance (Kienzler et al., 2018; Terho et al., 2012; Terho et al., 2015) and new product adoption (Mullins et al., 2019). In times of crisis, VBS also allows the salesforce to switch to value propositions that emphasize quick wins in the form of reduced costs and tied-up capital, and revenue increases (Keränen et al., 2020).

VBS should enable SSA. By nurturing and developing customer relationships, the salesforce naturally engages in service behaviors (Ahearne et al., 2007). The profound understanding of a customer's business model gained through VBS allows tailoring hybrid product-service offerings to customer demands (Ulaga & Loveland, 2014). Thus, VBS facilitates selling services in situations where other selling approaches would have considered physical goods only (Raja et al., 2020). VBS also emphasizes adjusting offerings to actual customer needs – even if this entails a smaller-sized solution than initially requested by customers – to improve customer relationships and loyalty (Terho et al., 2012; Ulaga & Loveland, 2014). In short, VBS assists in achieving service and sales goals, such as customer relationship performance and outcome performance.

More specifically, VBS should facilitate DSSA. In a digital age, the salesforce has to select goods and services from the physical and digital world that create the most customer value and, subsequently, sell that value (Töytäri et al., 2018). To do so, the salesforce must map the full value-creation potential of digital services to customer value drivers (Hasselblatt et al., 2018). Therefore, VBS can be seen as an operational capability underpinning DSSA. Because this argument is mainly conceptual at this stage, empirical research is needed to bolster this claim.

3 Empirical studies

3.1 Overview of the studies

Four studies were implemented over 18 months (Table 5). The predominance of qualitative (3) over quantitative (1) studies reflects the aim of this thesis, namely, to build initial theory around DSSA. By examining the conceptual foundations, performance implications, and organizational enablers of DSSA, the studies answer the RQs posed at the outset of the thesis.

Table 5: Four empirical studies

#	Type	Purpose	Data collection	SRQs addressed
1	Qualitative	Explore service outcomes and barriers to sales outcomes in the digital era Identify revenue models that form microfoundations of DSSA	10/2019 – 12/2019	1; 2
2	Qualitative	Conceptualize VBS for industrial services Develop a VBS measure	07/2019 – 08/2020	1
3	Quantitative	Validate the VBS measure Assess the link between VBS and salesforce performance Determine the role of the organizational enablers of VBS	08/2020 – 11/2020	2; 3
4	Qualitative	Explore the organizational enablement mechanisms of DSSA	08/2020 – 02/2021	3

The primary data source was an 18-month research project (the *Project*). From May 2019 until October 2020, I collaborated with five industrial firms pursuing digital servitization. The Project aim was to develop approaches to sell digital services while stabilizing physical service revenue. Because the firms were in different stages of digital servitization and sold services in different ways, contrasting patterns emerged between the cases, thus promoting theory building (Eisenhardt & Graebner, 2007). Each firm assigned an individual manager to the Project who acted as a gatekeeper by granting access to additional informants within the firm or to some of its customers.

Data were triangulated (Jick, 1979) using complementary data sources. Study 1 and 4 drew on additional interview data obtained from five more companies. The interviews of Study 1 were triangulated with field data from customer visits. Survey data for Study 3 were obtained using a proprietary contact list of firms spanning several industries and countries. These measures increase confidence that the thesis' findings might also apply to other contexts.

Table 6 provides background information about the firms participating in the empirical studies, followed by the findings of each study.

Table 6: Case companies

Firm (Pseudonym)	Core products	Services*	Revenue [EUR m]	Employees	Part of study #	Part of Project
IndustrialCo	Industrial automation components	Predictive maintenance, cyber-security solutions	737	2,243	2; 3; 4	Yes
RailCo	Rolling stock, rail automation & electrification	Full-service contracts, predictive maintenance	284	949	2; 3; 4	Yes
E&E&Co.	Elevators, escalators	Full-service contracts, remote monitoring, digital advertising services	10,340	66,306	1; 2; 3; 4	Yes
TexCo	Textile machinery	Remote monitoring	1,200	5,500	1; 2; 3; 4	Yes
MachineCo	Laser systems, machine tools	Remote monitoring	3,231	14,325	1; 2; 3; 4	Yes
EngineCo	Diesel & gas engines	EaaS, remote monitoring	3,900	10,500	1	No
HeavyCo	Construction & agricultural machinery	Digital asset management	10,600	46,000	1	No
WireCo	Wire processing machines	Remote monitoring	444	2,000	1; 3	No
PowerToolCo	Power tools	EaaS, fleet management, asset management SaaS	4,910	30,000	3; 4	No
PrintCo	Offset printing presses	EaaS, predictive monitoring, performance consulting	2,349	11,500	3; 4	No

*All companies offered spare parts delivery, repair, and reactive maintenance services.
EaaS: Equipment-as-a-Service.

3.2 Study 1: Qualitative study[3]

3.2.1 Background

Pacific Asia, encompassing East and Southeast Asia (SEA) (Thompson, 2004), presents an attractive study of digital servitization. The World Economic Forum's Global Competitiveness Report 2019 considers Pacific Asia as the most competitive region worldwide, with Singapore as its first-ranked country (Schwab, 2019). Pacific Asia is a manufacturing powerhouse, accounting for more than 40% of global manufacturing value added (UNIDO, 2020), and home of technology giants such as Huawei, Mitsubishi, and Samsung (Ulrich, 2019). To remain competitive, the local manufacturing industry is shifting toward a stronger service orientation (Wu et al., 2018) and digitalization (Xu et al., 2020).

However, studies of servitization beyond Western countries (Paschou et al., 2020; Rabetino et al., 2018; Suppatvech et al., 2019) and, more specifically, in Pacific Asia (Raja et al., 2017; Wang et al., 2016) are scant. Research on services in Pacific Asia has mainly investigated how customer behaviors and expectations differ from those in Western countries (Donthu & Yoo, 1998; Furrer et al., 2000; Laroche et al., 2004; B. S.-C. Liu et al., 2001; Mattila, 1999). Prior servitization studies also focused on single countries, notably China (Bao & Toivonen, 2015; Gebauer & Fischer, 2009; Gebauer & Zedtwitz, 2007; Raja et al., 2017) and Japan (Kim & Toya, 2019; Yorozu & Shi, 2014). Thus, there is a lack of servitization research on different or multiple countries in the region (Lin & Chen, 2018).

Cultural values in Pacific Asia can impede the simultaneous pursuit of service and sales goals. The region is considered to be "fundamentally a service culture" (Laroche et al., 2004, p. 61) and Japan, in particular, has built its reputation on very high service expectations (Deshpande et al., 1993). High levels of intra-regional power distance – the extent to which power differences are accepted in a country (Hofstede et al., 2010) – suggest that service FLEs, due to their lower status, should provide high levels of service (Mattila, 1999). The cultural backdrop might also explain why Western manufacturers struggle to increase service revenue in the region. Confucian principles, among others the granting of favors to nurture long-term relationships, are presented as a reason for the provision of free-of-charge industrial services in China (Bao & Toivonen, 2015).

This argument is echoed by Gebauer et al. (2007) who studied the influence of three cultural values – uncertainty avoidance (UAV), power distance (PD), and long-term orientation (LTO) – on service revenue. Table 7 summarizes their results, which relate

[3] Parts of this chapter, which are not further demarcated in the text, were initially published in Classen and Friedli (2021a).

higher levels of these cultural values to lower service revenue. However, since this study preceded the digital era and the emergence of digital services, it only considered the provision of physical services in China. Therefore, exploring whether these authors' findings hold true in other countries in Pacific Asia and in the digital era would enhance the understanding of DSSA in the region.

Table 7: Negative link between cultural values and service revenue in Pacific Asia

Cultural value	Definition*	Tendency in Pacific Asia*,§	Link to industrial service revenue†	Rationale†
UAV	"… the extent to which the members of a culture feel threatened by ambiguous or unknown situations" (p. 191).	**High**: Japan, South Korea **Medium**: China **Low**: Singapore	Negative	The risk aversion of customers impedes availability-based price metrics
PD	"… the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (p. 61).	**High:** East Asia and Singapore	Negative	Service FLEs and managers are not empowered to sell services proactively
LTO	The degree to which cultures foster "virtues oriented toward future rewards—in particular, perseverance and thrift" (p. 239).	**High**: China, Hong Kong, Japan, South Korea, Singapore, Taiwan	Negative	Service offered for free to foster long-term personal relationships

Sources: *Hofstede et al. (2010); §Hofstede and Bond (1988); †Gebauer et al. (2007).

Innovative revenue models can show a way out of this conundrum. Ad-sponsored revenue models allow customers to access free services, with third parties monetizing the offering (Casadesus-Masanell & Zhu, 2010). Freemium models – offering free contracts and premium contracts – seek to incentivize word-of-mouth to attract additional users, of whom only a fraction pays for the premium offering (Kamada & Öry, 2020). Since word-of-mouth is important to attract new industrial service customers, especially in Japan (Money et al., 1998), freemium models can serve broad customer bases *and* secure fair returns. Revenue models that are new to the industry, such as performance-based or subscription-based models, offer revenue growth opportunities for digital services as well – if they align with other provided offerings (Gebauer et al., 2020).

But our understanding of revenue models is still limited (for a detailed review, see Classen and Friedli (2021a)). Generally, revenue model research suffers from a lack of theorizing (Tidhar & Eisenhardt, 2020). Moreover, revenue model research has for long focused on information goods and consumer markets (e.g., Casadesus-Masanell & Zhu, 2010, 2013; Chen et al., 2016; Eckhardt, 2016; Gu et al., 2018) and only recently turned to digital industrial services (e.g., Gebauer et al., 2020). A better understanding of revenue model configurations fitting the present context would guide industrial firms when navigating the thin line between, on the one hand, the cannibalization of existing offerings and, on the other hand, increased revenues and customer value (Li et al., 2019; Shi et al., 2019).

The objective of Study 1 is to identify revenue model configurations that form microfoundations of DSSA in Pacific Asia. In order to attain this objective, three questions must be answered:

1) What service outcomes – in the digital era – matter for business customers in Pacific Asia?
2) What barriers – in this context – prevent the achievement of sales outcomes?
3) Which revenue models assist the achievement of service and sales outcomes?

To generate these insights, we studied the cases of six manufacturers seeking to expand their service business in Pacific Asia. We found that certain customer-desired service outcomes – high levels of customer service, operational improvements, transparency, and relationship quality – are more difficult to achieve in the digital era. The findings nevertheless suggest that technological, economic, and cultural barriers impede digital service sales more than do physical service sales. We also found that indirect and freemium models help to achieve service and sales outcomes and, therefore, constitute important microfoundations of DSSA.

3.2.2 Methodology

Given the scarcity of theory on DSSA, we applied a multi-case theory-building approach (Eisenhardt, 1989). Since we study a novel phenomenon (i.e., DSSA) subject to contextual conditions (Pacific Asia), exploratory case study research is appropriate (Yin, 2018). Moreover, the use of multiple cases is likely to yield a more robust theory than single-case research (Eisenhardt & Graebner, 2007).

Cases were selected based on three criteria: the topicality of digital servitization, the footprint in Pacific Asia, and access to informants. We selected six Western European manufacturers. Three of them participated in the Project (E&E&Co., TexCo, and MachineCo). The remaining three companies (EngineCo, HeavyCo, and WireCo; see

Table 6) pursued digital servitization in different industries. The duality of this selection mitigates concerns of industry bias.

3.2.2.1 Data collection

Data were collected through in-depth interviews and participant observation. Interviews provide an understanding of how actors, located in the focal region, see and make sense of the world (MacCracken, 1997). The 19 informants, introduced in Table 8, were interviewed in accordance with semi-structured interview guidelines. Sixteen of these informants worked for the case companies and three worked for Singaporean customers of E&E&Co, namely, the real estate developers PropertyAlpha and PropertyBeta (pseudonyms). The interviews lasted between 60 and 90 minutes and were conducted face-to-face or by phone. All interviews, except for two, were audio recorded and transcribed.

Data were triangulated using elements of market-oriented ethnography (Arnould & Wallendorf, 1994). I joined Min (pseudonym), a service technician of TexCo, on customer visits of nine weaving mills in Jiangsu province, Mainland China. I engaged in participant observation by conversing with Min, observing weaving mill operations, drinking tea with administrative staff, and sharing meals with mill owners. The field work produced a rich dataset of notes, photographs, and videos (see Figure 3).

Figure 3: Weaving mills visited during field work

3.2.2.2 Data analysis

Data were analyzed in three steps using ATLAS.ti. The first step centered on an in-depth analysis of raw data. We repeatedly read the interview transcripts and notes, flagging quotes relevant to the research objectives. We applied inductive coding (Glaser & Strauss, 1967) to the data to allow the emergence of first-order codes. As the data analysis progressed, codes were iteratively added, deleted, and refined. The second step involved the distillation of thematic patterns from the data. The analysis of links and patterns between first-order codes yielded second-order themes, which were refined based on prior literature. The third step generated a set of aggregate dimensions. The formation of the dimensions was based on the second-order themes and guided by constructs developed in prior literature. We identified three aggregate dimensions grounded in empirical data and theory, namely service outcomes, barriers to sales outcomes, and revenue models (see Figure 4).

Table 8: Study 1 interview informants

#	Informant (Pseudonym)	Function	Firm	Territories informant served
1	Yong	Senior Manager Textile After Sales Department	TexCo	CN; HK; ID; MY; TW; VN
2	Tom	Regional Head of Service Sales Eastern Europe & Asia	MachineCo	CN; JP; KR
3	John	Business Development Smart Services Laser	MachineCo	CN; JP; KR; VN
4	Ajai	Head of Customer Service	HeavyCorp	ID; MY; PH; SG; TH; VN
5	Peter	Sales Manager	HeavyCorp	ID; MY; PH; SG; TH; VN
6	Marc	Head of Customer Service Maritime Cranes	HeavyCorp	ID; MY; PH; SG; TH; VN
7	Cheng	Senior Manager, Retail Operation Engineering	PropertyAlpha	SG
8	Raja	Lead Retail Experience	PropertyBeta	SG
9	Mohd	Facility Operations Manager	PropertyBeta	SG
10	Liam	Head Sales & Service, Area Sales Manager SEA	WireCo	ID; MY; PH; SG; TW; VN
11	Bob	Director Digital Business & Customer Experience	E&E&Co.	HK; ID; MY; PH; SG; TH; TW; VN
12	Linda	Head of Digitalization, Asia Pacific	E&E&Co.	HK; ID; MY; PH; SG; TH; TW; VN
13	Lei	Head of Digitalization, Group	E&E&Co.	HK; ID; MY; PH; SG; TH; TW; VN

14	Kate	Manager, Sales Service (Asia) Power Generation	EngineCo	CN; ID; JP; KR; MY; PH; SG; TH; TW; VN
15	Zhuo	Manager, Sales Service (Asia) Marine	EngineCo	CN; ID; JP; KR; MY; PH; SG; TH; TW; VN
16	Fang	Service Manager Domestic	WireCo	CN
17	Ji-ho	Group Manager Service Laser Technology	MachineCo	KR
18	Seo-jun	Head Application & Marketing	MachineCo	KR
19	Wei	Service Manager	WireCo	CN

CN = Mainland China; HK = Hong Kong; ID = Indonesia; JP = Japan; KR = South Korea; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; TW = Taiwan; VN = Vietnam.

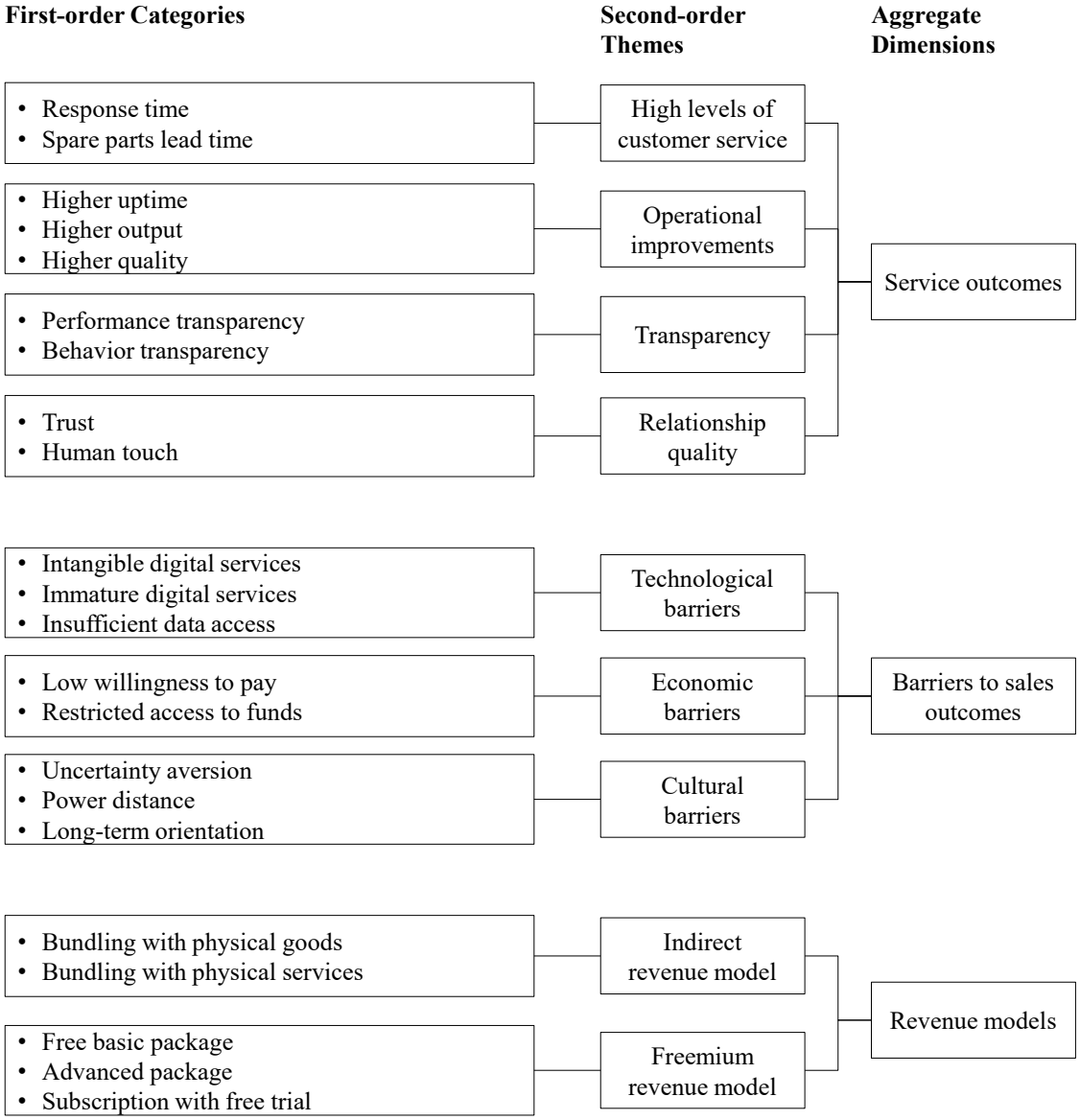

Figure 4: Study 1 data structure

3.2.3 Findings

3.2.3.1 Service outcomes in the digital era

The data revealed four main service outcomes sought by customers in Pacific Asia from industrial services: high levels of customer service, operational improvements, transparency, and relationship quality. These outcomes are summarized in Table 9 and described thereafter.

Table 9: Four service outcomes in the digital era

Service outcome	Description	Emphasis in Pacific Asia	Key considerations in the digital era
High levels of customer service	Fast and effective support in response to customers' requests	High expectations of FLE responsiveness and commitment	Increased expectations of FLE responsiveness through digital channels
Operational improvements	Improved asset productivity through higher uptime, output, and quality	Uptime, output, and quality prioritized differently by companies, industries, and countries, respectively	Evidence is required of digital services' contribution to operational improvements
Transparency	Knowing the status of assets and the reasons for and implications of this status	Appetite for behavioral transparency	Remote monitoring enables new levels of transparency
Relationship quality	Customer-provider relationship is based on mutual trust and long-term cooperation	Relative weight of individual relationships	Increasing the digitalization of services might compromise the "human touch"

High levels of customer service matter in Pacific Asia. While Kate highlighted the belief in "one hundred percent service" in Japan, informants in other countries equally emphasized the utmost importance of high responsiveness to customer inquiries and low lead times in spare parts delivery. FLEs were expected to be devoted to customers and display superior ad hoc, problem-solving skills:

> Most of the customers, if their machine has no problem, […] will not phone us. So, if we receive their phone call, [it] means that their machine has a problem and that maybe it's urgent. So, they request our professional service. [Being] professional means that we can solve the problem in [a] short time. (Yong)

High mobile penetration rates increased expectations of FLE responsiveness. Ubiquitous mobile devices and generous data plans granted the vast majority of the region's inhabitants permanent access to messaging services. Customers often used these services as the main communication channel to FLEs and expected high responsiveness. For instance, many of Min's most recent WeChat discussion threads on his personal phone featured local customers. Yong elaborates:

> In Southeast Asia, or even China, [it is] all the same – now they request us to provide quick feedback and suggestions. Let's say for example the machine has some problem. So, they will phone us or maybe by WhatsApp or [a] different kind of communication app […] send their message to us, and then request a quick feedback or some suggestion, so as to solve the problem immediately through the phone call.

Three **productivity** drivers mattered most to B2B service customers in Pacific Asia. First, *higher uptime*. Customers across industries – hospitality, manufacturing, mining, retail, shipping, and transportation, to name but a few – mainly valued services that got their assets up and running again, or systematically reduced the length and frequency of downtimes, for instance by better maintenance planning. Second, *higher output*. This specifically mattered to customers manufacturing diverse goods in the region, including wire harnesses in Thailand, textiles in China and SEA, or displays in South Korea (hereafter Korea) and beyond. Third, *better quality* manufactured goods. However, the importance customers attached to quality varied greatly, even within a given country or industry. Some informants differentiated clearly between "higher-quality" and "lower-quality" customers:

> For some of the local and larger customers […] the kind of buying behavior started to change a little bit in China. They understand that if you're providing a certain quality, this must be linked to a price tag. [For] the small customers, it will very much depend on the owner. It depends on the organization itself, how they organize themselves. Some of them […] appreciate the high quality. Some of them [... in] the end, […] don't have really high quality requirements. So, they run the machine 'till it doesn't work; then they want [a] low price just to fix it, to get it to run again. (Wei)

> It depends on the customer. If [they] are multinational companies, quality aspects are a little bit more important. Whereas [for] smaller SMEs [small and medium-sized enterprises], a lot of times the boss will need to take a look at the price, because we have some customers who are not willing to spend money on [the] equipment, but […] prefer to use the money to buy the brand new Mercedes. That, to them, is more important. (Liam)

Against this backdrop, credible evidence of operational improvements was essential for new digital services to succeed in the market. According to Lei, customers in Pacific Asia were "driven by return-on-investment [and] numbers." In contrast to physical services that responded to urgent customer needs, digital services created value indirectly, since operational improvements unfolded over a longer period. Evidence of this value was critical to convince customers to pay for digital services:

> The most important [reason] why a customer in Asia purchases something is that he must [ensure] a positive outcome. [It] means [that] if he invests [in] a smart service, he will only pay for it if he really sees the benefits of it in terms of usage or in terms of production. (Ajai)

Digital services' promises of greater **transparency** resonated with customers in two ways. Foremost, there seemed to be an uncovered demand to identify inefficiencies in operational processes using digital services. Features such as equipment status visualization and fault trending were requested by customers seeking to increase operational performance. Moreover, there was an increase in the demand for the remote monitoring of employee behavior. The acceptance of these practices seemed higher in Pacific Asia than in Europe:

> For [our digital service] it is interesting to see what is happening at other sites. There is not the same maintenance expertise across sites. For example, there is a manufacturing subsidiary in Vietnam. However, it is managed from Korea and the Koreans find it interesting to keep a sharp eye on the Vietnamese with their 15–20 lasers and take note of error messages which the Vietnamese operator would not inform them of. The Vietnamese operator would only report in the event of a malfunction, which means that it is not possible to act as proactively as when the Korean maintenance specialist can already observe via [the digital service] that there is an increase in the number of notifications. (John)

> In China, in particular, there is more of a hierarchical understanding of workers. Saying 'That's my factory, dear worker. You come in and hand over your data at the front door and I can then use it for my own purposes' is more pronounced in the conversations I have experienced than it would, for example, be in Germany. (Tom)

Relationship quality hinged on individual FLEs. Informants concurred on the fundamental importance of personal relationships when doing business in Pacific Asia. FLEs need to establish and maintain personal rapports with customers. Min's routine customer visits were revealing. After inspecting the equipment's condition, Min spent substantial time conversing informally with mill workers, drinking tea with office staff, and eating with owners. Establishing trust was time-consuming for service and sales FLEs but essential to secure subsequent business:

> In Vietnam you have to go for discussion first: negotiate, make contracts, and try to [become] friends; drink with them, more social activities, you have to entertain customers more. They always like to invite you, [be] friendly, and [build] close relationships. […] I'm After Sales, but I only sell spare parts. So, for me it's going to be much easier than a sales guy, because they need me. […] If you go there, if you're friendly, once they trust me – that means, okay, this guy doesn't cheat on me – then it's easy to do business with them. Vietnam […], if you go there, then you have to make them believe [in] you first. So, for me it's easy, because – already – the sales guy did that; then for me, they badly need me, so it's easy for me. (Ajai)

The "human touch" was expected to remain paramount in the digital age[4]. Periodic face-to-face meetings were considered essential to maintain relationships and trust:

> I've seen the transition from – 10 years ago – a very face-to-face, human touch kind of business to – in the last three to four years – moving to the digital world. The con is, and I really see this as a con, the lack of face-to-face discussion... you don't need a face-to-face at all for everything based on data. I would say, in general, Asia is very much still face-to-face, especially for developing countries.
> Yesterday, we had a Skype meeting with Thailand, our distributors. They keep asking us to visit their Navy just to give them the assurance of proving what we can

[4] Interviews were conducted in Fall 2019, a few months before the global Coronavirus outbreak and the subsequent democratization of video conferencing for B2B sales interactions (Hartmann & Lussier, 2020). Investigating this shift in Pacific Asia provides an interesting opportunity for future research.

> perform. Certain countries, it's just that… sometimes you just have to show face and... you know... present yourself, and people will have the assurance. (Zhuo)

3.2.3.2 Barriers to sales outcomes

The barriers that the firms faced when they attempted to sell services can be grouped into three clusters: technological, economic, and cultural. Table 10 and the remainder of this section elaborate why several barriers impacted digital service sales more than physical service sales.

Table 10: Three clusters of barriers to sales outcomes

Barrier cluster	Barrier	Impact on physical service sales	Impact on digital service sales
Technological	Intangible digital services	◌	●
	Immature digital services	◌	●
	Insufficient data access	◌	●
Economic	Low willingness to pay for services	○	●
	Restricted access to funds	○	●
Cultural	Uncertainty aversion (UAV)	◌	●
	Power distance (PD)	●	○
	Long-term orientation (LTO)	◌	○

◌ no barrier ○ minor barrier ● major barrier

Technological barriers

Digital services suffered from their *intangibility*, compared to physical services. First, customers associated FLE visits with value. Some customers even considered the reduction of field interventions through digital services as value-destroying:

> If I go to a customer and say, 'OK, I now want a performance-based [maintenance contract], but I'm not going to give you the same fulfillment. I'm not going to come every month, I'm not going to do this, I'm not going to do that. But I will maintain a certain performance,' they will expect a price reduction. 'But now you're not coming every month. I don't see your men every month.' This is their perception of value. (Bob)

Second, there seemed to be a general resistance against paying for digital services. Seo-jun explained this phenomenon with reference to the apparent similarity between digital services and traditional information goods, such as machine software:

> This is the typical mindset that these kind of services, intangible services, mean for free in Korea, somehow. […] For example, software and punching tools are totally different. Software, it means, for free. And [for] bending tools or punching tools, [the customers] can pay. […] Because nobody can see the real product, something like that. So, it's very difficult to sell licenses or this kind of intangible services with a charge. It is very difficult. […] For example, in China, just like a license, or a book or certain things – everybody can copy that. Before, it was similar in Korea. Now it's totally changed, but still …

Moreover, many digital services were *immature*. At the time of the research, most digital services were still being tested with pilot customers. Decision engines underpinning "smart" services required data that had yet to be collected in the field. Consequently, digital services reached the market with less maturity than what customers were accustomed to in respect of physical goods and services. Some early-stage digital services failed to deliver on their promises:

> *Bob*: The very first video that [E&E&Co.] put out about remote monitoring: 'Real time, real time, real time.' Constantly real time! What is real time? You tell me. What's real time?
>
> *Interviewer*: Now.
>
> *Bob*: OK. Even by your perception, right, I would say even by your perception, your European perception, [it] is 'now.'
>
> *Interviewer*: That's the word. That's essentially the word.
>
> *Bob*: But I gave you an example just before, where the logic of the system was programmed to only send an alert after 30 minutes.
>
> *Interviewer*: That's not real time.
>
> *Bob*: [laughs] That's not real time. We didn't know that. So, we did it, we were not... we didn't know that until we installed it, then we started to get the first issues. And then we go: 'Oh sh--! There is a bloody 30 minute delay on this!' So, then we had to go and change it. But we didn't know that when we were selling it to the customer.

Two fears constrained the required *access to data* for digital service delivery. First, a fear of cyber-attacks. Customers believed that connecting their assets to an external network would make them more vulnerable to potential external attacks. This, in particular, prevented governmental customers from using digital services. Second, a fear of knowledge dissipation. Customers were concerned that sensitive product or process information would leak to third parties, notably competitors:

> Smart services, you know, […] means everything is recorded and everybody is a bit afraid of those things. So [it] means, they also feel that we could record too much information and then transfer it to one of their competitors, for instance. That means if we have operational information, which then tells us 'This machine [dug] 120 meters in this and this time,' this could be valuable for another customer. So, of course, […] you have to be careful [with these things]. (Ajai)

Economic barriers

Willingness to pay for services differed between countries but was particularly low for digital services. Table 11 indicates a predominantly low willingness to pay in the region, except for the advanced economies of Japan and Singapore.

Table 11: Varying willingness to pay for services in Pacific Asia

Willingness to pay for services	*Higher*					*Lower*
Territory	**Japan**	**Singapore**	**Korea**	**China**	**Vietnam**	**Rest of SEA**
Illustrative quote	"[Japanese] customers are paying fully because they believe in one hundred percent service." (Kate)	"If we were to send a capable guy and if he's doing his job in the right time, then they will accept, no doubt." (Ajai)	"Whenever we are offering any services, service agreements or any services, then the first response or reaction from the customer is trying to get it for free." (Seo-jun)	"Most of the local customers, they are still thinking the service should be free. This is like a culture." (Fang)	"Vietnam is difficult. Vietnam, they're actually not willing to pay for services." (Marc)	"Good service in their mind is a must. But they will not pay any additional [fee] for it." (Yong)

Two local factors exerted downward pressure on digital service prices. First, preventive maintenance diligence was inconsistent. Informants suggested that customers in Pacific Asia were reluctant to pay for a service they would eventually not need. This constrained the commercial success of preventive services, which includes many of the digital services studied. This observation fits into the wider context of weak adherence to preventive maintenance standards in the region:

> The concept of periodical maintenance for the Europeans is much stronger than [for] Asians. They have enough […] spare parts – I mean the Westerners, Europeans – and also focus on the quality of maintenance. You know, in Asia – in Asian factories, the workers, they will say they are doing maintenance. But they will just do it in a very common way, and then reply [to] their boss: 'Ah, I did it!' [laughs] But when our engineers check on a machine […] the maintenance is sh--. (Yong)

Second, cheap labor abounded. Wages differed within the region, with rates for physical service interventions ranging between "$180 in Singapore [and] only $60 in Malaysia" (Ajai). But generally, service FLEs' wages were estimated to be lower than those in Western countries. To substitute physical work, digital services should compete with the price levels of the former:

> We are charging SGD 50 per month per equipment for this [remote monitoring service]. But in Indonesia, the cost of having one person sit there for eight hours monitoring this, plus he can do other things, is about USD 100 a month. So, the cost of very cheap labor is one reason why they might not use it. Because it's cheaper for me to sit the guy there and I can get him to clean up when he is not doing anything. Your app is not going to clean up. (Bob)

Some customers, even if willing to pay, were unable to *unlock the required funds*. Particularly, multinational companies' subsidiaries in SEA were the "receiving end" (Liam). Because major decisions were taken at headquarters in Europe, the United States, or Japan, it was challenging to obtain approval for investments in digital service infrastructure. Similar obstacles could confront local players, for instance, in Singapore:

> Only for three [connected assets do] they have to write a paper... and the whole cost investment would be about SGD 15,000 to install and maintain and to have a subscription. I reckon the amount of time they have spent to write the paper would have been three times that already, in man-hours and everything. (Bob)

Cultural barriers

Customers shunned the downside and upside *uncertainty* stemming from digital services. Downside uncertainty was twofold. The financial downside was uncertain because customers, after paying set-up fees for edge devices and installations, struggled to assess the downstream costs of digital service delivery. This was compounded by substantial technological downside uncertainty:

> Singapore is known as [an] early adopter. They wanna be the first, but they also wanna be the first with caution. So, if they think they are going to get killed, they'd never want to be the first. Right, if they think the technology is really not proven. But if they have a lot of trust and they have good references and there [are] people [who] have a proven track record, then they wanna be the first. So, this is why we have had customers from here go to Europe, Germany, and Switzerland to see our technology, get comfort... but then they wanna be the first to do it here. (Bob)

Conversely, there was substantial upside uncertainty regarding the value of digital services. Most were recently launched, and documented evidence of their value was scarce. In the absence of such evidence, customers were reluctant to become pilot users:

> 'We don't wanna be guinea pigs.' We hear that a lot. But you know, in reality, right now what we are doing – with [our digital service] – we are trying to set this expectation – […] we are tweaking it all the time. This symptom happened. OK, we need to manage that better. In kind of this scenario, when there was no alert, OK, we have to change that … (Bob)

Power distance accentuated the hierarchy between service customer and provider, thereby creating opportunities for digital services. In Korea and China, the inferiority of service providers relative to customers seemed generally accepted:

> The customer is the master, and the supplier is the sub. (Seo-jun)

> In China, the service technician is worth nothing; he has a low status. I was once yelled at by a customer. The customer expects [the service technician] to do what he tells him to do. (John)

In Singapore, the socioeconomic background of service FLEs accentuated power distance. Average wages in Singapore were higher than in neighboring countries, for example, in Malaysia or Indonesia. This attracted a substantial number of migrant workers to what the local Singaporean population consider substandard occupations – for instance, elevator service technicians. Hierarchies between service FLEs and customers were pronounced:

> The paymasters in Singapore are generally Chinese Singaporeans. Very wealthy, very well-educated. The workers are foreigners [who] maybe have very, very, limited education. So, in Australia you have a technician, who has probably more education and is more assertive and gets paid higher than the guy who is managing him. In Singapore, you have the customer [up here] and the technician [down] here. It's a huge gap. So, the paymaster does not trust what this guy is saying. The paymaster also believes: 'You know, I'm a highly educated Chinese Singaporean. I demand a certain level of respect that you as a worker must show me.' So, the way they treat them sometimes is not so nice. (Bob)

The lack of trust in service FLEs increased the chances of selling digital services, albeit with some pitfalls:

> Technology is quite trusted in a sense that [E&E&Co.] – [a] global company, [European] – their technology must be good. I believe more what their technology can achieve than what their people will do. Yesterday I had a customer from [a Singaporean land developer], Chief Development Officer, very highly ranked guy. These were his exact words: 'I believe your technology, it's fantastic, it's all gonna work. But your guy on the site – if it's up to his discretion – when he will go and check on that symptom? Which job he will prioritize? How well [does he do] that job? He's the one that I am concerned [about]. How are you going to address your people issue?' (Bob)

Moreover, digital service sales suffered from a mismatch between *long-term orientation* and short-term revenue objectives. As many services were only recently introduced, the user bases were embryonic. Digital services were expected to get "smarter" and create superior value once extensive data were collected from the field. However, not all European manufacturers considered the long-term horizon required to capitalize on CLV:

> Whenever we come up with a digital product, we want to see results right in the third year. Even though there is no value to the customer, we just have to sell. Ideally, you are supposed to give the customer the value, because once the customer sees the value, he will stick with you [for] a longer period. But, somehow, the company may not look at that kind of long run. Because they are looking at revenue. I may say there is a gap here. On the one hand, we need to hit the target. On the other hand, we are talking about value. And the value can be a long process; it's not just a short process. (Zhuo)

3.2.3.3 Revenue models for achieving service and sales outcomes

Two revenue models that facilitate the achievement of service and sales outcomes, namely indirect and freemium, emerged from the data. In *indirect* revenue models, no direct charge is levied for digital services. Instead, revenues originate from additional physical goods or services sales. The *freemium* revenue models charge direct service fees and consist of two or more bundles: one bundle is provided for free; the other bundles are sold at a positive price. Being based on recurring fees, the freemium model is a variant of the subscription model. Table 12 and the remaining section explain how indirect and freemium revenue models contribute to service and sales outcomes.

Table 12: The contribution of indirect and freemium revenue models to service and sales outcomes

Revenue model	Contribution to service outcomes	Contribution to sales outcomes
Indirect	Enhances outcomes from physical goods and services	Increases revenue from physical goods and service sales
Freemium	Allows time to build trust in a digital service before billing for its usage	Enables recurring service revenues when customers select a paid tier

Indirect revenue model

Many digital services were deemed to *enhance existing physical goods and services*. Yong shared feedback collected from Asian customers during a major textile exhibition:

> Most of the comments were [of the opinion] that 'This function should be included in machine selling price.' [laughs] They […] also commented that it becomes an additional value for our machines in the current competitive market. [It] means that they will treat it as an additional function of our machine. So why

> do they choose to use our machines is maybe because of this additional value. [It] means that most of the end-users will not pay [for] it separately.

Complementarities between digital and physical services were equally important. Remote services, in particular, were estimated only as effective as the subsequent field service deployed to replace components. Given the importance of personal relationships in the region, digital services were considered to enhance, not replace physical services:

> Our service consists of more than data collection and all those things. Because [digital] services are an added value. An added value to our service to the customers. But the normal people-to-people contact […] is still very much higher, as compared to the [digital service] that we are giving to the customers. These are added services where we can minimize or try to minimize the cost of things happening. (Kate)

Indirect revenue models were used to *increase revenue from physical goods and service sales*. There were two ways to augment new equipment sales revenue. The first was to dissimulate service fees in larger transactions:

> If we buy air-conditioning for our home, in Asia, you just buy the devices and then they will be installed. In the Western world, you buy an air conditioner, and that device is the physical product; also, you have a line for installation, a separate line to be charged. But here… very simply, you don't see it. Maybe it has been combined to get into this physical product, but that's the mentality. People don't really charge for this kind of service. In our quotation, you don't see this line. Even, somehow, we find a way to put it into the machine price, but you don't get this line. If you have this line showing up, except for a very, very special machine, this will be the first discussion and item that will be kicked out. (Wei)

The second was to bundle digital services with new equipment sales, albeit in a transparent manner:

> We are trying to make packages or bundles to sell such a smart service with a machine or system. This is [a] typical selling strategy in Korea because this is easier to sell, not trying to [convince customers of buying separate services]. (Seo-jun)

There were three options to increase physical service revenue by using digital services. The first option was the monetizing of digital services through additional spare parts sales. A way of generating additional revenue was to sell spare parts through digital services at a premium. Another way was to drive the penetration of digital services that recommended spare parts, for which price elasticity was low:

> [Customers in Vietnam, Taiwan, and Indonesia] would keep their spare parts inventory as low as possible and only request our quick supply for the spare parts. Today, we may just receive a phone call from them: 'Ah [Yong], we need this spare part quickly, I can pay, but please send [it to] me tomorrow!' [laughs] (Yong)

The second option foresaw the bundling of digital services with maintenance contracts. The inclusion of remote monitoring in full-service contracts was attractive for both sides. For providers, it enabled preventive action, thereby reducing service cost. For customers, it provided peace of mind:

> [A customer in the Philippines] signed a [long-term service agreement] for 16 years with our service partner […]. They also inquired about remote service. [This…] is very important [to them] because they are selling power to the end customers. So, they need [EngineCo] to really take care of the engine and ensure that power is running, because if they don't get power to the customer, they have to pay a penalty. […] To them, getting the [remote service] is important because anything happening to the engine you have to know, and you have to be proactive and take care of the engine. (Kate)

The third option used digital services as an enabler of outcome-based contracts. Akin to the second option, remote monitoring was included in service agreements to facilitate preventive action. However, under outcome-based contracts, asset availability mattered even more to providers because it determined their remuneration:

> We have customers, ferry operators, [who] only pay by running hours – [it] means [that] if the engine runs at 800 hours, [EngineCo] is paid 800 hours by [x] dollars. We call it 'power-by-the-hour.' We always make sure we maintain all the things and they only pay us [for] the running hours of the engines. (Kate)

Freemium revenue model

Free basic packages were necessary to reduce uncertainty and *build trust in new digital services*. Given high levels of uncertainty aversion in the region and the technological immaturity of many digital services, free basic packages, which allow customers to build trust in the service at no cost, were essential:

> I have this idea for the digital service, you just provide the basic for free. So then, we will get the customers quite familiar to using it. And we might have the basic fundamental infrastructure for them. And they know what it is, then, on top of that, we can charge them for the other elements, for other things. So, for instance, [WireCo's digital service], if it was me, I will suggest that we provide the [monitoring feature] for free. In this case, we can establish the infrastructure for them, and we can start to get data, we can start to get their feedback. Then, this feedback will help us to improve [the monitoring feature] and also we know the customer needs for it. Then we can improve it, right? So, on top of that, we can provide value-added services. Then we can charge for that part. It's not like we can charge for everything. (Fang)

Subsequently, advanced packages served to generate revenue. For this model to work, the advanced packages had to contain exclusive features that provided a clear superior value over the free basic packages. If the features' contribution to operational improvement was evident, customers seemed willing to pay:

> If we can improve their quality, improve their yield rate, I think, for such service, they're willing to pay. (Wei)

> They're willing to pay something. So, we've sold it, but then they expect much, much, better performance. So, if today, the lift is breaking down once a month, I put this remote monitoring in, I should be able to get [breakdowns down to only] once every two months or three months. They really wanna see a visible performance. (Bob)

Freemium models based on recurring fees were particularly compelling. Providers strived to depart from discrete and hardly predictable revenues from ad hoc service interventions. Subscription models, as known from consumer markets, promised steady cash inflows from monthly or yearly recurring fees. Customers were expected to remain subscribed if digital services provided enduring value:

> If [customers] say they can see that they are enjoying the benefit, why should they cancel? The reason why people cancel Spotify or Netflix – it's because they probably no longer need it. Or they don't see that they will get benefits out of it. That's why they probably think that it is good to cancel. For example, I'm personally subscribed to [Microsoft 365]. So, every year I pay SGD 148 without question, because I need it. (Liam)

3.2.4 Key takeaways

Western manufacturers have long struggled to achieve service and sales outcomes in Pacific Asia. While high levels of service are appreciated and often expected in the region, cultural values seem to prevent manufacturers from capturing their share of the value created. The ongoing digitalization of services provides an incentive to revisit these long-held assumptions. The objective of Study 1 was to identify revenue model configurations that form microfoundations of DSSA in Pacific Asia. The key takeaways are threefold:

- Customers in Pacific Asia seek four main service outcomes: high levels of customer service, operational improvements, transparency, and relationship quality. Digital technology raises expectations of responsiveness, productivity, and transparency, but can jeopardize relationship quality.
- Technological, economic, and cultural barriers hinder the achievement of sales outcomes. The technological barriers are specific to digital services. Economic and cultural barriers impact digital service sales more than physical service sales.
- Indirect and freemium revenue models promote the achievement of service and sales outcomes, and thus form important microfoundations of DSSA in Pacific Asia.

3.3 Study 2: Qualitative study[5]

3.3.1 Background

The COVID-19-induced crisis has prioritized DSSA by elevating it to the top of the CEO agenda in many industrial firms. Physical service operations have been hit hard by mobility restrictions, as FLEs were unable to travel for field service and spare parts shipments were delayed (Bond et al., 2020). Salespeople faced similar challenges and, in addition, were required to perform more service-related tasks, such as responding to customer inquiries regarding changes in product and service delivery (Hartmann & Lussier, 2020). These circumstances have been a wake-up-call for executives to deploy remote monitoring and interaction solutions in order to serve business customers amidst and beyond the crisis (McKinsey & Company, 2020).

But travel restrictions were not the only reason why service sales goals were in peril. The temporary shutdown of many industries and subsequent lower equipment utilization have caused a drop in service demand (Rapaccini et al., 2020). Jet engine manufacturers, for example, saw sharp declines in revenues from power-by-the-hour contracts following the grounding of commercial aircraft (Bond et al., 2020).

Against this backdrop, VBS plays a major role in safeguarding manufacturers' revenues. Since customers must secure liquidity and reduce costs in the short term, VBS can assist them in identifying revenue increasing or cost saving opportunities (Keränen et al., 2020). While joint value creation is a central tenet of VBS, manufacturers struggle to adapt their resources and capabilities to these new demands (Töytäri et al., 2018). To confront this issue, a better understanding of VBS is critical. A review of empirical VBS studies, presented in Table 13, reveals two limitations that warrant further investigation.

First, the nature of VBS is disputed. In general, VBS literature is fragmented and uses different terms for interchangeable concepts (Classen & Friedli, 2019). More specifically, prior literature has conceptualized VBS in two ways. At the individual level, VBS has been defined as salesperson behavior (Terho et al., 2012). As such, it is subject to individual-level KSAs and discretionary inputs that determine the level of engagement in VBS (Mullins et al., 2019; Salonen et al., 2020; Terho et al., 2017). At the organizational level, VBS has been defined as a single capability (Jaakkola et al., 2015) or a bundle of capabilities (Raja et al., 2020; Töytäri & Rajala, 2015).

[5] Parts of this chapter, which are not further demarcated in the text, were initially submitted for publication in Classen et al. (2021).

Table 13: Empirical VBS studies

Authors	Nature of VBS	VBS measure
Terho et al. (2012)	Individual selling behavior	–
Töytäri and Rajala (2015)	Bundle of organizational capabilities	–
Terho et al. (2015)	Individual selling behavior	Single construct based on reflective scale*
Liinamaa et al. (2016)	Marketing practice	–
Terho et al. (2017)	Individual selling behavior	From Terho et al. (2015)
Kienzler et al. (2018)	Sales process	Three constructs based on reflective scales*
Mullins et al. (2019)	Individual selling behavior	From Terho et al. (2015)
Raja et al. (2020)	Bundle of organizational capabilities	–
Jong et al. (2021)	Sales practice	Reflective-formative higher-order construct*
Current study	Organizational capability	Formative-formative higher-order construct

*The studies do not explicitly state the measurement model of their VBS measures. The formulation of items and assessment of internal consistency reliability, however, suggest reflective scales (Jarvis et al., 2003).

Although important, little research has been done on the bridging of individual and organizational perspectives (for an exception, see Töytäri et al. (2017)). Foremost, as Table 14 shows, VBS fulfills the VRIO criteria to qualify as capability. However, since capabilities are "assemblages of organizational routines" shaped by individual actions (Salvato & Rerup, 2011, p. 478), more light needs to be shed on VBS routines. Nonetheless, there is a paucity of research using the routines lens to bridge the individual and organizational perspectives on VBS. This focus is important because it can elevate VBS from an individual behavior to a collective, inimitable pattern of action that may lead to superior firm performance (cf. Parmigiani & Howard-Grenville, 2011). Thereby, VBS would form a key microfoundation of DSSA.

Table 14: VBS fulfills VRIO conditions

Condition	How VBS fulfills conditions
Valuable	VBS is associated with sales performance (Kienzler et al., 2018; Terho et al., 2015; Terho et al., 2017) and new product adoption (Mullins et al., 2019)
Rare	VBS is seldom put into practice (Terho et al., 2015; Terho et al., 2017)
Imperfectly imitable	VBS is complex and resource-consuming (Terho et al., 2017)
Organized	VBS requires idiosyncratic processes and management practices (Töytäri & Rajala, 2015)

Second, the literature lacks a measure that captures the domain of the multi-faceted VBS construct. The extant VBS scales indicated in Table 13 are reflective, that is, measured by correlated and interchangeable indicators (Jarvis et al., 2003). However, VBS unfolds in several stages encompassing distinct activities (see section 2.3.2). We believe constructs capturing each stage – and indicators measuring each activity – need not covary. Hence we suggest conceptualizing VBS as a formative-formative higher-order construct (HOC; Hair et al., 2017; Ringle et al., 2012). Although such a measure does not exist, it would enable practitioners to allocate resources to the most crucial VBS activities (Y. Liu & Zhao, 2020).

To address these limitations, the purpose of Study 2 is to develop a conceptualization of the VBS of industrial services. In doing so, we draw on both the capabilities and the practice perspective of organizational routines (Parmigiani & Howard-Grenville, 2011). The results show that the VBS of industrial services is an organizational capability that can be conceptualized as formative-formative HOC formed by six building blocks of organizational routines.

3.3.2 Methodology

3.3.2.1 Data collection

Study 2 was carried out between July 2019 and August 2020. The five companies taking part in the Project (i.e., IndustrialCo, RailCo, E&E&Co., TexCo, and MachineCo) were selected on the basis of their intention to implement VBS for their services. Importantly, intention levels contrasted sharply with their current status quo. Most firms had yet to become proficient value sellers; one firm did not even sell services proactively. These performance differences feed the present research with “polar type cases” that are likely to reveal contrasting patterns (Eisenhardt & Graebner, 2007).

Data were collected from 17 semi-structured interviews with service salespeople and managers (see Table 15). Interview guidelines focused on VBS routines, enablers, and barriers. The telephone and face-to-face interviews lasted between 25 and 94 minutes. All interviews were recorded and transcribed.

3.3.2.2 Data analysis

The data were analyzed following the approach used in Study 1 (see 3.2.2.2). Again, open coding was applied to the raw data to allow the emergence of first-order codes. We engaged in axial coding (Gioia et al., 2013) to identify links and patterns between first-order codes, eventually clustering routines into second-order themes. These six themes are the building blocks of VBS, being the aggregated dimension of our data structure.

Table 15: Study 2 interview informants

Firm	Pseudonym, function	#Interviews*
E&E&Co.	Al, Commercial Deployment Manager	4
	Barbara, Global Sales Operations Manager	1
	Claudia, Pricing & Revenue Manager	1
	Dan, Service Portfolio Manager	1
	Ed, Global Head Portfolio Management	1
IndustrialCo	Frank, Service Sales Specialist	1
	Gary, Service Sales Specialist	1
	Hank, Head of Sales & Marketing, Customer Service	2
	Ian, Service Business Administration Office	1
MachineCo	Jack, Business Developer Smart Services	1
	Kenneth, Services Consultant	1
RailCo	Larry, Sales Consultant	3
	Mary, Senior Sales Manager	1
	Nathan, Service Business Administration Office	1
TexCo	Oliver, Area Sales Manager	2
	Paul, Key Account Manager	1
	Quentin, Head of Customer Service	1
	Robert, Marketing & Sales Specialist	1

*The total number of informants is more than 17 since some interviews involved multiple informants.

3.3.3 Findings

We identified six building blocks of VBS routines. They are presented in Table 16 and are subsequently unpacked.

Table 16: The six VBS building blocks

#	Building block	Routines
1	**Value discovery**	Assessing the condition of the customer's installed base
		Assessing changes in the customer's business model
		Proactively targeting customers
		Assessing the criticality of the customer's operations
		Pinpointing performance improvement opportunities
2	**Value co-creation**	Analyzing the customer's value chain
		Identifying the customer's pain points
		Co-creating solution with the customers
		Adapting solutions based on customer needs
3	**Value quantification**	Assessing the customer's current operational performance
		Quantifying operational improvement opportunities for customers
		Conducting a return-on-investment calculation for customers
4	**Value-based pricing**	Identifying the customer's willingness to pay
		Configuring the offering to customer-specific needs
		Pricing service based on the customer's cost savings

5	**Value communication**	Communicating the service's strategic value for customers Communicating the improvement of the customer's operational performance Communicating success stories to customers
6	**Value learning**	Feeding CRM with data from customer touchpoints Debriefing results with other departments Assessing quantitatively the created customer value Adjusting service prices based on realized value

Value discovery encompasses mindless and effortful routines (cf. Becker, 2004) to discover value creation opportunities in customer operations. *Mindless value discovery* usually occurred during field interventions. TexCo, for example, relied on serendipity instead of formalized service sales processes. Field technicians repaired defective machines but also inspected adjacent machines. Informal discussions with customers' operators revealed further service needs:

> We benefit from the visit to have a global check: Do you grease […] the machine? How often are you doing it? How are your guys doing the maintenance? (Paul, TexCo)

Others engaged in more *effortful, proactive routines*. Frank (IndustrialCo) cold-called customers to provide just enough improvement perspectives to obtain first in-person meetings. In these meetings he elaborated on opportunities to stabilize customer operations hinging on the availability of critical equipment. In some cases, salespeople identified critical equipment simply by asking targeted questions. In other cases, value creation opportunities were discovered with advanced data analytics:

> Many customers, of course not all of them, are already quite advanced. They have exhausted much of the potential in their production process. Now, especially with digitalization, data, and simulation, we can actually go one step further and identify potential [in conjunction] with [them]. Now we have projects in which we can create a digital twin of [their] production and run simulations to find bottlenecks. (Gary, IndustrialCo)

E&E&Co. relied on the continuous monitoring of elevators and escalators, connected to the internet. Changes in key performance indicators (KPIs) revealed value creation opportunities:

> We look at the number of rides. Of course, we also evaluate the number of visits. So, there are various KPIs that are also evaluated from the service viewpoint and used to initiate further steps and actions. (Al, E&E&Co.)

Value co-creation consists of problem-solving routines in which actors, from vendors and customers, jointly design service solutions. Two subsets of co-creation routines surfaced: problem space analysis and solution space design. Each subset employs different artifacts. During *problem space analysis*, E&E&Co. ran scripted focus groups and invited customers to imagine situations in which operations were interrupted by equipment breakdowns:

> The script then goes on to ask: 'As property manager – when disruptions come, how does your process work?' – 'The tenant calls me, then I have to make a phone call to [E&E&Co.]. That's a bit like Chinese telephone, I also don't know exactly what the tenant said and where the incident is… hopefully I know the right building, the right elevator… that's always very inconvenient; it costs me an insane amount of time. Then another four tenants are calling with the same notification; so, every incident always keeps me busy for an hour. Every incident probably keeps me busy just as long as [E&E&Co.].' You find out the pain points very quickly. (Ed, E&E&Co.)

Frank (IndustrialCo) ran through a checklist on his smartphone for prospects to reveal their pain points. The list contained open questions on typical issues prospects faced in their daily work. Similarly, RailCo's salespeople had access to written procedures to analyze buying centers and manage the sales funnel. However, salespeople could forego using these artifacts since "the way I get [to the sale], as long as I am compliant, is up to me" (Larry).

Solution space design involves different artifacts. Larry used business model or value proposition canvasses to draft service concepts in interactive workshops. To build the bridge between hardware technology, data science, and commercial terms, co-creation routines involved multiple actors from both sides:

> This includes technical parties, from the customer side, but also from [RailCo's] side. They are engineers, interlocking specialists. They meet with data scientists, because of course when we [...] talk about prediction models, we are talking about algorithms that have to be developed, about data that have to be evaluated. And the data scientists do not understand the logic of the first step. This means that somehow all the stakeholders are brought together; the engineers, the data

> scientists, the project managers, and then we workshop together. It means that we look at the process chain, what we want to achieve, and how we can achieve it. (Larry, RailCo)

Thereafter, customer needs identified in the workshops were reflected against the provider's portfolio and capabilities. Solutions were typically developed based on a modular portfolio of physical and digital service components adapted in size and scope to customer needs. IndustrialCo's and RailCo's salespeople engaged in various subroutines, including screening service component catalogs, selecting relevant services, and commissioning internal experts for software customization.

Value quantification encapsulates all the routines to value a service's operational benefits. The main routines are threefold. First, routines to *assess a customer's current operational performance*. Most customers focused on a limited set of operational metrics consistent across industries, notably equipment uptime and output quality or quantity. Additional industry-specific metrics included foot traffic (E&E&Co.), reloading times (IndustrialCo), minutes of train delays (RailCo), and the number of warp breakages (TexCo). These metrics were assessed using multiple sources. Although customers were the most convenient source of information, they were often unable or unwilling to share the required data. In these cases, vendors resorted to alternative mechanisms, such as manual counts of foot traffic in malls (E&E&Co.) or spreadsheets assessing current loom performance (TexCo):

> Where is [the customer] located? How many working days does he have? How high are the salaries? What is he producing? How many looms does he have? How large is his production? (Oliver, TexCo)

Second, routines to *quantify a service's improvement potential*. Quantification routines focused predominantly on operational metrics since most services aimed to reduce the length or frequency of undesirable events:

> We asked the customer where time expenditures currently arise – for example, search times. When they need some information, they need to go to the shop floor, walk to each laser device and retrieve the information directly from the machine control. [We asked them] what […] the benefit would be of having all this information available digitally at any place. (Jack, MachineCo)

Simple heuristics were used to quantify operational improvements. In manufacturing settings, downtime reductions were valued by multiplying time savings with average downtime costs, including direct labor and overheads. In retail settings, the main value driver was the number of shoppers:

> As long as your elevators and escalators are running, you have X visitors on the third and fourth floors. If only one escalator fails, the number of visitors is reduced by Y. And that, of course, generates a pretty simple, striking image for a mall owner who needs to rent out stores to tenants based on fees per square meter. (Al, E&E&Co.)

Third, routines to *calculate return-on-investment (ROI)*. These routines were run to demonstrate how sizeable investments made by customers were offset by a service's projected financial benefits:

> [A customer] had a sprinkler system somewhere in a large building. There was a man just busy reading the parameters of this sprinkler system on a regular basis. And now we've solved this [task] with an Internet of Things solution, so that the sprinkler system becomes intelligent, sends data to the cloud, and... yes, it's a bit hard, but it makes this man superfluous. At least this works because he can then do something else. And through such mechanisms, I can of course calculate the ROI pretty quickly. (Gary, IndustrialCo)

Value-based pricing is the set of routines to derive service prices based on customer value. Customers' willingness to pay depended on industry margins, firm liquidity, and the budget decision makers could spend. Willingness to pay was assessed using tacit knowledge within the vendor organization – or by directly asking customers:

> I have colleagues who ask customers: 'How much are you willing to pay for this?' Really, that the customer should say a sum. (Frank, IndustrialCo)

Subsequently, offers were structured according to customers' needs and willingness to pay. To balance these typically conflicting objectives, salespeople fine-tuned margin expectations, and offered components and service levels:

> Optimization can take place in the price itself. So, we take some of the margin out. Or we look at the service package to see if we can take something out of it – for example, instead of 7×24, we do only 5×8 hours. (Ian, IndustrialCo)

Prices were seldom strictly value based. Costs of service operations dominated most pricing routines in all case firms. Still, E&E&Co. priced its remote monitoring service based on the value customers received by avoiding maintenance visits:

> [The customer] saves an hour of time, and an hour costs EUR 100. Then they say, 'I pay a maximum of EUR 100 for this service.' You understand very well how this dollarization works in the customer's mind. (Ed, E&E&Co.)

Generally, the links between service prices and customers' financial outcomes were rather tenuous. The interviews produced no evidence of performance clauses tying payments to actual cost savings. Increased customer revenue also seemed irrelevant for pricing. Informants objected to the fact that higher production capacity enabled by higher equipment uptime did not automatically result in higher revenue; demand, customer's stock policy, and other exogenous factors were equally influential.

Value communication encompasses routines to communicate a service's benefits to customers. Three communication themes emerged. *Strategic benefits* resonated with customers considering digital services as critical stepping stones in their digitalization journey:

> Often we say that this [digital service] is not a stand-alone solution, but actually part of a holistic digitalization strategy – a first step in that direction, a module that could be expanded later. (Gary, IndustrialCo)

Operational benefits were the most compelling for the majority of decision makers. MachineCo limited communication with production and maintenance managers exclusively to the improvement of operational metrics:

> 'With condition monitoring, you would have known about that [equipment breakdown] in advance. You would have been able to produce 16 hours earlier.' This is the figure communicated to customers. (Kenneth, MachineCo)

Sometimes, operational improvements were translated into financial terms. Such arguments resonated most with decision makers distant from operations, notably those in financial or managerial positions:

> I was standing there in the front, holding my presentation. People continued writing e-mails without restraints. Once I got to the business case, their ears pricked up. The result was positive and – bang! – I had their attention. At the end

> of the day, it's not about whether it works technologically, but above all economically. (Larry, RailCo)

However, salespeople typically avoided mentioning possible headcount reductions in discussions with European customers, fearing that this argumentation could backfire. Similarly, many salespeople refrained from translating operational improvements into monetary equivalents, arguing that "customers need to assess for themselves what an hour of downtime costs" (Kenneth, MachineCo).

Finally, *success stories* were communicated externally and internally to build trust in new services. Important subroutines include the collection of written and visual evidence from pilot customers and the consolidation thereof in sales material such as presentations, flyers, videos, and webinars.

Value learning encompasses all routines that generate knowledge about and react to a service's actual value creation. Two deliberate learning routines (Zollo & Winter, 2002) stand out. First, routines to *feed CRM systems* with data from customer touchpoints. TexCo's FLEs manually uploaded activity reports from field interventions to the CRM. E&E&Co.'s CRM ran automated routines monitoring the number of incoming calls and spare parts orders per customer. Second, *routine meetings* served to disseminate knowledge throughout the organization. TexCo used the field reports to debrief customer visits in meetings involving sales, research & development, quality, and other stakeholders. RailCo's salespeople joined periodic phone conferences and expert groups to report on recent customer interactions.

Finally, firms needed to *verify* the actual value creation during service delivery and react accordingly. This was critical for digital services as their underlying algorithms still needed to learn from field trials. Value evidence benefitted two stakeholders. Customers were reassured about a service's value as they switched from free trials to paid plans. Go-to-market teams ran verification routines to validate hypotheses about benefits, prices, and costs of new services before approaching new customers:

> It was an iterative process. We carried out the first pilots free of charge, in which we learned a lot about the actual value generated for the customers. We could also see what costs we actually incur. Then we were able to validate our initial estimate of costs and set a first price. This was our starting point to contact additional customers, during which we also adjusted the price over time. (Jack, MachineCo)

In sum, the findings support two basic tenets of Study 2. First, VBS can be conceptualized as organizational capability. Based on our qualitative insights, we define

VBS capability for industrial services as *a firm's ability to deploy a set of customer-value-oriented routines that achieve superior service and sales outcomes*. Second, VBS can be conceptualized as formative-formative HOC. Table 17 shows that the current conceptualization fulfills all four decision criteria of Jarvis et al. (2003) to qualify as a formative-formative (Type IV) HOC.

Table 17: Current VBS conceptualization qualifies as a formative construct

Decision rule to qualify as a formative construct (Jarvis et al., 2003, p. 203)	How suggested VBS conceptualization fulfills rule…	
	…at first order (routines/indicators)	**…at second order (building blocks/constructs)**
"Direction of causality is from items to construct"	Each indicator corresponds to a routine distilled from the raw data	Each building block corresponds to a cluster of second-order themes
"Indicators need not be interchangeable"	Routines to assess customers' current operational performance differ from those quantifying improvement opportunities	Value co-creation differs from value quantification
"Not necessary for indicators to covary with each other"	Depending on the customer faced, salespeople might communicate strategic or operational benefits	Salespeople might communicate the service's value without having quantified it precisely
"Nomological net for the indicators may differ"	Higher (lower) rank of the decision maker within the customer organization might drive more strategic (operational) value communication	Value co-creation might lead to higher customer satisfaction; value-based pricing to higher revenue

3.3.4 Key takeaways

To stabilize service revenue, even in times of a crisis, industrial firms should develop a VBS capability. Although prior research has established a first understanding of the VBS construct, its exact nature and measurement remain unclear. Thus, the objective of Study 2 was to develop a conceptualization of the VBS of industrial services. The key takeaways can be summarized as follows:

- The VBS of industrial services is an organizational capability that can be conceptualized as an HOC formed by six building blocks of routines.
- VBS routines are complex and consume scarce organizational resources. Therefore, organizational enablers must facilitate the channeling of these resources to the most promising customers.
- VBS routines aim at sales (e.g., value-based pricing) and service outcomes (e.g., value co-creation), thus forming a vital microfoundation of DSSA.

3.4 Study 3: Quantitative study[6]

3.4.1 Background

Conceptualizing VBS as a microfoundation of DSSA warrants a closer look at VBS outcomes. Table 18 indicates that prior VBS research mainly focused on *sales* performance as an outcome variable. Since we study VBS from a DSSA perspective, service results are equally important. Thus, we should investigate *salesforce* performance as an outcome variable. This distinction is fundamental since salesforce performance measures the achievement of organizational SSA goals in terms of sales outcomes and customer relationship performance (Panagopoulos et al., 2020; Panagopoulos & Avlonitis, 2010).

Moreover, conceptualizing VBS as a capability shifts the emphasis to its organizational enablers. A capability may generate a sustained competitive advantage only if supported by appropriate organizational mechanisms (Kozlenkova et al., 2014). However, quantitative VBS studies of variables under managerial control (cf. Lindgreen & Di Benedetto, 2020) are scarce (see Table 18). This is an important research issue. Because VBS is complex and time-consuming (Terho et al., 2015; Terho et al., 2017), organizational enablers of salesforce engagement in VBS require further investigation (Mullins et al., 2019).

Table 18: Quantitative VBS studies

Authors	Performance outcome	Individual-level boundary conditions	Team-level boundary conditions	Organization-level boundary conditions
Terho et al. (2015)	Salesperson's selling performance; market performance	Customer orientation	–	Selling models; customer prioritization; segmentation
Terho et al. (2017)	Salesperson's selling performance	Learning orientation; customer networking; internal networking	–	Value assessment tools; customer reference marketing; customers' value demandingness
Kienzler et al. (2018)	Sales performance	Experience; learning orientation	–	Managerial support
Mullins et al. (2019)	Customers' adoption of new products; sales	Promotion focus; prevention focus; salesperson-	Sales team monitoring climate; sales	–

[6] Parts of this chapter, which are not further demarcated in the text, were initially submitted for publication in Classen et al. (2021).

	team % of quota achievement	perceived empowering of customer and leader behaviors	team goal pursuit	
Jong et al. (2021)	Sales growth	–	–	VBS
Current study	Salesforce performance	–	–	Sales strategy quality; sales- and service-related incentives; proactive market orientation; formalization

To address these research gaps, Study 3 examines two questions: 1) How does VBS of industrial services affect salesforce performance? 2) What organizational enablers facilitate VBS? The results show that the quality of the sales strategy and sales-related incentives, but not service-related incentives, drive VBS. Furthermore, formalization weakens the positive performance effect of VBS, but proactive market orientation does not have any interaction effect.

3.4.2 Hypotheses development

The conceptual model of Study 3 (see Figure 5) links the antecedents, moderators, and outcomes of VBS. Its underlying hypotheses are subsequently developed.

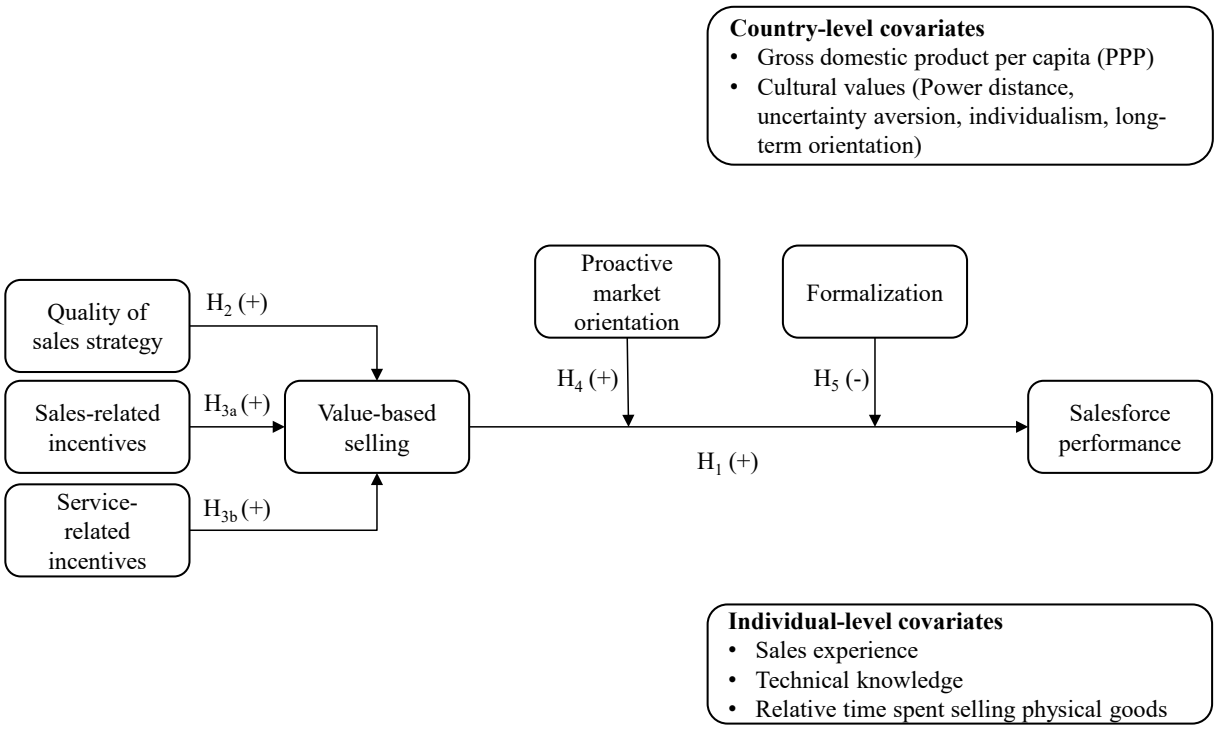

Figure 5: Study 3 conceptual model

3.4.2.1 Direct effect of VBS on salesforce performance

The relationship between individual-level VBS and *sales* performance is well-established. Proficient value sellers should be able to demonstrate, convincingly, how a service increases customer profitability and thus sell more higher-value services and increase customer satisfaction (Terho et al., 2012). Prior empirical studies have linked VBS behavior to higher sales performance (see Table 18).

A multilevel perspective on organizational capabilities (Salvato & Rerup, 2011) necessitates the studying of individual action to assess the relationship between VBS (as organizational capability) and superior performance. As Abell et al. (2008, p. 494) note, "a firm can be described as possessing the capability to realise a routine to the degree that it can repeatedly internalise a pattern of individual level external productivity effects," hence, "why a certain routine may be a source of superior performance requires taking a starting point in individual action and interaction." This principle should also apply to VBS. Study 2 exposed VBS as set of routines performed by actors from sales, service, and other functions. Thus, an organization only possesses a VBS capability if individuals perform the routine "in practice" (Feldman & Pentland, 2003) in ways that contribute to organizational objectives, notably *salesforce* performance. Taken together, we posit:

H_1: VBS is positively related to salesforce performance.

3.4.2.2 Antecedents

Quality of sales strategy. Resources and capabilities must be leveraged effectively by the organization to generate a sustained competitive advantage (Kozlenkova et al., 2014). In this vein, an effective sales strategy encompasses "activities and decisions regarding the allocation of scarce sales resources […] on the basis of the value of each customer for the firm" (p. 48) and matches suitable selling models (Panagopoulos & Avlonitis, 2010). More precisely, a strong sales strategy facilitates VBS by channeling sales resources to prioritized customers (Terho et al., 2015). A high-quality sales strategy should prescribe the set of customers to engage in, say, value co-creation routines (Jong et al., 2021), thereby reducing salespeople's uncertainty about when to allocate efforts to VBS. Thus:

H_2: The quality of sales strategy is positively related to VBS.

Incentives. Incentives are another capability-enabling organizational mechanism (Kozlenkova et al., 2014). Outcome-based, revenue-focused control systems have traditionally dominated sales compensation plans (E. Anderson & Oliver, 1987; Churchill et al., 1985). But sales compensation plans should foster both short-term revenue objectives and long-term relationship goals (Pullins, 2001). That is, incentive

systems should go beyond revenue targets to encourage salespeople to experiment with new selling approaches (Katsikeas et al., 2018) and, ultimately, transform the salesforce into "value merchants" (J. C. Anderson et al., 2007, 2008). Still, their specific design is unclear (Mullins et al., 2019).

Sales-related and service-related incentives should encourage VBS. SSA literature has shown the importance of blended incentives to enable ambidexterity and, thereby, foster service and sales outcomes (Panagopoulos et al., 2020). A similar rationale applies to this research. Study 2 identified VBS as a multidimensional concept that encompasses routines aimed at sales (e.g., value-based pricing) and service outcomes (e.g., value co-creation). Conceptualizing VBS as formative-formative HOC entails that its routines and building blocks are not interchangeable and might be driven by different factors. Therefore, while sales- and service-related incentives might encourage different VBS building blocks, both should overall motivate the salesforce to engage in VBS. Therefore, we expect:

H_{3a}: Sales-related incentives are positively related to VBS.

H_{3b}: Service-related incentives are positively related to VBS.

3.4.2.3 Moderating effects

Proactive market orientation (MO). MO can be conceptualized as higher-order marketing capability. MO is the "the extent to which a firm engages in the generation, dissemination and response to market intelligence pertaining to current and future customer needs" and provides the market knowledge required to build operational marketing capabilities such as selling (Kohli & Jaworski, 1990; Morgan et al., 2009, pp. 910–911). When combined with operational capabilities, MO can generate superior firm performance (Morgan et al., 2009) and, ultimately, sustained competitive advantage (Menguc & Auh, 2006).

We expect proactive MO to positively moderate the link between VBS and salesforce performance. Proactive MO exists when "a business attempts to discover, understand, and to satisfy the latent needs of customers" (Narver et al., 2004, p. 335) to create long-term customer value (Slater & Narver, 1998). Proactive MO, as dynamic capability, should provide the market knowledge required to develop operational capabilities (Barrales-Molina et al., 2014) such as VBS (Raja et al., 2020). Indeed, salespeople engage in VBS to uncover needs which business customers cannot articulate (Blocker et al., 2012; Terho et al., 2012; Tuli et al., 2007). Taken together, salespeople in firms with higher proactive MO should better understand customer needs (value discovery), craft higher-value offerings (value co-creation, quantification, and pricing),

communicate value more persuasively, and, ultimately, perform better (Lam et al., 2010). Hence:

> H_4: The stronger an organization's proactive MO, the stronger the positive relationship between VBS and salesforce performance.

Formalization. Capabilities unfold their full potential only when organizational elements are appropriately designed (Kozlenkova et al., 2014). The degree of formalization is one of these elements (J.-Y. Lee et al., 2015). Formalized sales activities are guided by clear rules and processes (Böhm et al., 2020; Homburg et al., 2008). However, high degrees of sales formalization might stifle employee empowerment (Auh & Menguc, 2007) and the absorption, interpretation, and application of customer information (Ahearne et al., 2010; Böhm et al., 2020; Jaworski & Kohli, 1993; Kohli & Jaworski, 1990).

Formalization is also likely to dampen the positive performance effects of VBS. In general, routine performance is agentic (Feldman & Pentland, 2003) because actors must "select from a large repertoire of action" (Parmigiani & Howard-Grenville, 2011, p. 416) built upon artifacts and personal experience (Sonenshein, 2016). Agency is critical in the present context because VBS requires flexibility to deal with uncertain and complex sales settings (Luotola et al., 2017). The VBS routines identified in Study 2 illustrate this contention. The artifacts that best suit value co-creation and quantification are determined anew for each routine performance. Similarly, market feedback determines how often value-based pricing and learning routines are iterated. Prescribing a fixed choice of artifacts or number of iterations in a standard operating procedure could systematically misdirect sales personnel or prevent the finding of a price that aligns value creation and capture. Thus:

> H_5: The stronger the formalization, the lower the positive relationship between VBS and salesforce performance.

3.4.3 Sample and data collection

We collected data using survey research. We distributed surveys to service managers, sales managers, and salespeople through two channels. First, five gatekeepers – one per company participating in the Project – notified key informants within their global service and sales organization of the survey. Second, we distributed the online survey using a proprietary contact list that we compiled for this study. The list contained service managers, sales managers, and salespeople from industrial firms who had collaborated with our research institution during the three years prior to the study. In total, 111 responses were retained for subsequent use, for a response rate of 19% (see Table 19).

The respondents worked in diverse industries for globally operating firms headquartered in Europe (see Table 20) and had an average sales experience of 11.3 years (standard deviation = 8.0).

Table 19: Survey response rate

Channel	#Surveys distributed	#Usable responses	%Usable responses
1	65	52	80%
2	516	59	11%
Total	581	111	19%

Table 20: Survey sample composition

Industry	%	Operating Area	%	Operating Area (ctd.)	%
Industrial Machinery	57	Switzerland	45	Turkey	1
Automobiles & Components	6	Germany	20	Brazil	1
Construction & Engineering	6	Austria	9	Vietnam	1
Health Care Equipment & Supplies	5	Singapore	6	Mexico	1
Technology Hardware & Equipment	5	Italy	2	Thailand	1
Building Products	4	China	2	Netherlands	1
Other	18	Sweden	2	United States	1
		Hong Kong	2	France	1
Role	**%**	India	2	Korea, Rep.	1
Sales manager	46	Japan	2	Canada	1
Salesperson	29				
Service manager	25				

3.4.4 Measures

Except for the VBS measure that we developed, we used existing scales or measures adapted from existing scales, listed in Table A 1. We followed recommendations made by Diamantopoulos and Winklhofer (2001) to specify the VBS measure's content and indicators. The VBS routines from Study 2 constituted the measure's domain of content and formed an initial set of 34 indicators. In two Project workshops, we required service and sales managers to rate the indicators' wording and relevance for VBS. Between workshops, we adjusted formulations and removed irrelevant and added pertinent indicators. Twenty-four indicators were eventually retained.

We control for country-level and individual-level covariates. At the country level, we control for economic and cultural differences between countries in the sample. Customers in developing economies, such as China, tend to show higher price sensitivity and demand for basic services (Gebauer & Fischer, 2009), potentially leading to systematically lower sales outcomes. To control for economic development, we covary the per capita gross domestic product (GDP) at purchasing power parity (PPP) of the participants' countries, using public data from the World Bank (2019). Moreover, Study 1 and Donthu and Yoo (1998) indicate that cultural values may account for differences in service and sales outcomes. Thus, we control for power distance, uncertainty avoidance, individualism, and long-term orientation using the countries' index scores obtained from Hofstede et al. (2010).

At the individual level, we control for sales experience (in years), technological knowledge, and time spent selling physical goods. We covary sales experience to rule out higher salesforce performance stemming from higher efficacy (Mullins et al., 2019), contextual intelligence (Ahearne et al., 2010), or better customer relationships. Technical knowledge of products and services – critical for selling industrial services – is another possible cause of heterogeneous salesforce performance controlled for. Finally, not all salespeople only sell services; some mainly sell equipment. Reinartz and Ulaga (2008) suggest that equipment sales often yield higher revenue than service sales, so goods-centric salespeople might enjoy systematically higher sales results. As a proxy for their goods-centricity, participants were asked to indicate the relative amount of time spent on selling physical goods, physical services, and digital services. The percentage share spent on selling physical goods serves as a covariate.

3.4.5 Measurement model

We use partial least squares – structural equation modeling (PLS-SEM) with SmartPLS3.3.2 (Ringle et al., 2015) to assess the measurement and structural model. We chose PLS-SEM because of our research purpose of exploration and theory development, use of formative and reflective indicators, and small sample size (n = 111) (Hair et al., 2012).

We first evaluated the reflective measurement model. Results (Table 21) show adequate fit. Composite reliabilities (CR) were well above 0.70, providing evidence of internal consistency reliability. The average variance extracted (AVE) for each construct exceeded 0.50, indicating convergent validity. Finally, the heterotrait-monotrait (HTMT) ratios for all pairs of constructs were below the conservative threshold of 0.85 (Table A 2), suggesting discriminant validity (Henseler et al., 2015).

Table 21: Correlation matrix and measurement assessment

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. SALSSTRAT	-																			
2. SALSMTR	0.33	*0.85*																		
3. SERVMTR	0.30	0.61	*0.96*																	
4. VADISC	0.42	0.35	0.14	-																
5. VACOCR	0.38	0.41	0.20	0.80	-															
6. VAQUAN	0.35	0.41	0.15	0.70	0.73	-														
7. VAPRIC	0.45	0.29	0.22	0.66	0.73	0.62	-													
8. VACOMM	0.37	0.40	0.18	0.66	0.67	0.64	0.60	-												
9. VALRNG	0.34	0.47	0.23	0.56	0.64	0.61	0.59	0.62	-											
10. MOPRO	0.37	0.32	0.09	0.38	0.37	0.32	0.35	0.28	0.28	*0.91*										
11. FORMAL	0.32	0.29	0.28	0.20	0.20	0.25	0.31	0.25	0.33	0.23	*0.84*									
12. GDP_PPP	-0.14	-0.02	-0.23	0.16	0.06	0.11	0.01	0.15	0.04	-0.19	-0.10	-								
13. PD	-0.07	0.06	0.26	0.00	0.09	-0.01	0.12	0.02	0.13	0.10	-0.03	-0.22	-							
14. UAV	0.05	-0.18	-0.08	-0.07	-0.05	-0.15	-0.06	-0.09	-0.12	0.00	-0.14	-0.41	-0.36	-						
15. IND	0.03	-0.02	-0.11	-0.13	-0.15	-0.12	-0.24	-0.12	-0.16	-0.13	-0.05	0.12	-0.68	0.46	-					
16. LTO	-0.08	-0.04	-0.15	0.13	0.05	0.02	-0.12	0.08	0.00	-0.07	-0.19	0.29	-0.14	0.07	0.14	-				
17. SALESEXP	0.23	-0.02	0.06	0.01	0.09	-0.06	0.08	-0.05	0.09	-0.05	0.21	-0.08	0.16	-0.08	-0.13	-0.12	-			
18. TECHKNO	0.37	0.23	0.11	0.30	0.39	0.36	0.34	0.30	0.29	0.15	0.29	0.06	-0.09	-0.12	-0.04	-0.10	0.09	*0.83*		
19. TIMGOD	0.02	-0.09	0.04	0.01	0.11	0.02	0.16	-0.04	0.07	0.15	0.05	-0.12	0.08	0.04	-0.04	-0.15	0.16	0.07	-	
20. SALSPERF	0.46	0.28	0.29	0.40	0.49	0.42	0.45	0.32	0.43	0.33	0.37	-0.10	0.12	-0.05	-0.11	-0.24	0.25	0.31	0.27	*0.89*
CR	-	0.89	0.97	-	-	-	-	-	-	0.92	0.89	-	-	-	-	-	-	0.90	-	0.91
AVE	-	0.58	0.92	-	-	-	-	-	-	0.61	0.67	-	-	-	-	-	-	0.75	-	0.57

Cronbach α's are on the matrix diagonal. CR and AVE cannot be computed for formative and single-item measures.
SALSSTRAT = Quality of sales strategy; SALSMTR = Sales-related incentives; SERVMTR = Service-related incentives; VADISC = Value discovery; VACOCR = Value co-creation; VAQUAN = Value quantification; VAPRIC = Value-based pricing; VACOMM = Value communication; VALRNG = Value learning; MOPRO = Proactive market orientation; FORMAL = Formalization; GDP_PPP = Gross domestic product per capita (at PPP); PD = Power distance; UAV = Uncertainty aversion; IND = Individualism; LTO = Long-term orientation; SALESEXP = Sales experience; TECHKNO = Technical knowledge; TIMGOD = Relative time spent selling physical goods; SALSPERF = Salesforce performance.

Next, we evaluated the formative measurement model. First, potential indicator collinearity was checked by computing inflation factors (VIFs) for all first-order constructs. The maximum VIF is 3.74, below the acceptable threshold of 5 (Hair et al., 2017), indicating low levels of collinearity. Second, we assessed indicator significance and relevance. All indicator loadings are above the 0.50 cutoff (Hair et al., 2017). Hence, we retained all formative indicators.

To vet our conceptualization of VBS as formative-formative HOC, we implemented an extended repeated indicators procedure (Hair et al., 2017; Sarstedt et al., 2019). First, we assessed the HOC's convergent validity through redundancy analysis. The question "How frequently do you communicate the service's financial benefits for customers?" (1 = never, 7 = every time) was used as a global item (Diamantopoulos & Winklhofer, 2001) to validate the formative-formative, higher-order measurement of VBS. Redundancy analysis yielded a path coefficient of 0.85, well above the recommended threshold of 0.70 (Hair et al., 2017), thereby providing support for the HOC's convergent validity.

Second, we ran bootstrapping (5,000 samples; no sign change) to assess the significance and relevance of relationships between the six lower-order components (LOCs) and VBS. The weights of VACOCR and VALRNG are pronounced and significant; the other weights are smaller and nonsignificant (see Table A 3). Accordingly, we assessed the outer loading of VADISC, VAQUAN, VAPRIC, and VACOMM on VBS. Bivariate correlations of all indicators are greater than or equal to 0.50, so we retained all VBS LOCs. These results support the validity of our formative-formative HOC.

3.4.6 Common method variance (CMV)

Because all data in Study 3 come from a single survey instrument, results might suffer from CMV (Podsakoff et al., 2003). To minimize concerns of CMV bias, we implemented a measured latent marker variable (MLMV) model (Chin et al., 2013). A theoretically unrelated three-item construct "perceived value of digital products & services" served as the marker variable in the MLMV model. Estimation results are equal between the original research model and the MLMV model. Hence, we report results from the original model and conclude that CMV bias is a minor concern.

3.4.7 Endogeneity

VBS could be endogenous to our model because salespeople might engage in VBS expecting high levels of performance (Mullins et al., 2019). Using cross-sectional survey data, we might also fail to detect dynamic endogeneity in which "past realizations of the dependent variable can influence current realizations of […] the independent

variables" (Zaefarian et al., 2017, p. 41). In other words, salespeople performing high in t_0 may engage in VBS in t_1 and subsequently perform even higher in t_2.

We evaluated three approaches to address endogeneity (Hult et al., 2018). Initially, we considered using Gaussian copulas. Accordingly, we ran a Kolmogorov–Smirnov test with Lilliefors correction (Sarstedt & Mooi, 2014) using the "KScorrect" package in R (Novack-Gottshall & Wang, 2019). Results, which were cross-validated using IBM SPSS 27, show that the nonnormality assumption of the (potentially) endogenous regressor does not hold; so we were unable to use Gaussian copulas (Park & Gupta, 2012). Next, we evaluated the implementation of a two-stage least squares approach. None of the survey measures fulfilled both the relevance and exclusion criteria to qualify as an instrumental variable (Hult et al., 2018). Thus, this approach was unfeasible. Finally, the control variables used in our model should, at least to some extent, alleviate endogeneity concerns.

3.4.8 Model estimation

We computed VIFs for each predictor to assess collinearity. The maximum VIF (2.14) is below the acceptance threshold of 5 (Hair et al., 2017), confirming the absence of multicollinearity issues.

Subsequently, we estimated our model. Table 22 provides the resulting parameter estimates. VBS is related significantly to salesforce performance (β=0.41; $p<0.01$) and sales strategy quality is related significantly to VBS (γ=0.32; $p<0.01$), indicating support for H_1 and H_2. Sales-related metrics show a significant positive effect on VBS (γ=0.37; $p<0.01$), while service-related metrics do not (γ=−0.09; ns); this provides support for H_{3a} but not H_{3b}. Proactive MO displays no moderating effect between VBS and salesforce performance (γ=0.00; ns) whereas the interaction effect of formalization is negative (γ=−0.20; $p<0.05$), thus supporting H_5 but not H_4. Figure 6 shows the simple slope plots for the moderating effect of formalization. The model explains over half (R^2=0.51) of the variance in salesforce performance.

We evaluated our model's predictive relevance by examining Stone-Geisser's Q^2 (Geisser, 1974; Stone, 1974). Blindfolding (omission distance 7) yields a Q^2 value well above 0, indicating our model's predictive relevance for salesforce performance (Hair et al., 2017). Figure 7 depicts all results.

Table 22: PLS results

		Original research model		MLMV model	
H	**Path**	**SPC**	**SE**	**SPC**	**SE**
	Hypothesized relationships				
H_1	VBS → Salesforce performance	0.41**	0.09	0.41**	0.09
H_2	Quality of sales strategy → VBS	0.32**	0.12	0.31**	0.12
H_{3a}	Sales-related incentives → VBS	0.37**	0.13	0.38**	0.13
H_{3b}	Service-related incentives → VBS	−0.09	0.11	−0.09	0.11
H_4	VBS × Proactive MO → Salesforce performance	0.00	0.09	−0.01	0.09
H_5	VBS × Formalization → Salesforce performance	−0.20*	0.09	−0.20*	0.10
	Controlled relationships				
	GDP → Salesforce performance	−0.04	0.11	−0.05	0.12
	Power distance → Salesforce performance	0.07	0.10	0.07	0.10
	Uncertainty aversion → Salesforce performance	0.01	0.13	0.01	0.13
	Individualism → Salesforce performance	0.07	0.10	0.07	0.10
	Long-term orientation → Salesforce performance	−0.12	0.07	−0.12	0.07
	Sales experience → Salesforce performance	0.15*	0.07	0.15*	0.07
	Technical knowledge → Salesforce performance	−0.02	0.09	−0.02	0.10
	Relative time spent selling physical goods → Salesforce performance	0.11	0.08	0.11	0.08
	R^2	0.51		0.51	
	Q^2	0.25		0.25	

H = hypothesis. SPC = standardized path coefficient. SE = standard error. T values calculated from 5,000 bootstrapped samples for two-tailed tests. *p<0.05; **p<0.01.

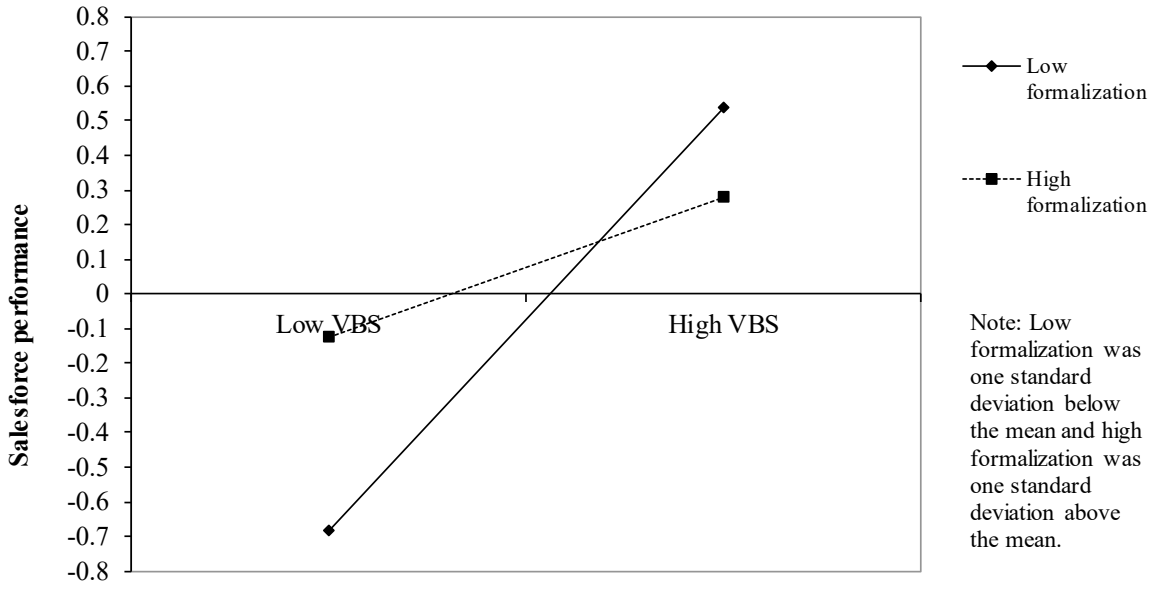

Figure 6: The impairing effect of formalization on the relationship between VBS and salesforce performance

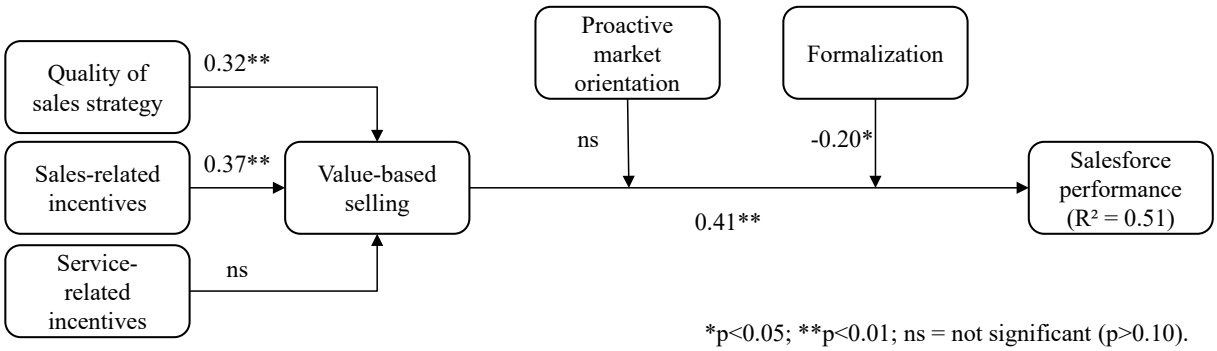

Figure 7: Study 3 structural model

3.4.9 Key takeaways

To balance conflicting exploitation/exploration goals in their service business and to achieve their service and sales objectives, industrial firms must ensure that VBS is performed. Hitherto, research has only studied VBS outcomes from a narrow sales-results perspective and mainly focused on the boundary conditions that sales executives, at best, can indirectly act on. Thus, the objective of Study 3 was to examine the relationship between VBS and salesforce performance, and the role of organizational enablers. Three key takeaways are offered:

- VBS is positively linked to higher salesforce performance.
- Quality of sales strategy and sales-related incentives – but not service-related incentives – are systematically linked to higher levels of VBS.
- Formalization dampens the positive performance effect of VBS, but proactive MO does not have any emphasizing effect.

3.5 Study 4: Qualitative study[7]

3.5.1 Background

Although Studies 1, 2, and 3 expanded our understanding of DSSA and its microfoundations, they suffer from at least two limitations that warrant further inquiry. At the organizational level, we only superficially dealt with the DSSA enablers. Study 3 has demonstrated the importance of sales strategy quality and incentives to boost VBS and, therefore, DSSA behavior. However, little is known about the specific configuration of these organizational enablement mechanisms. Moreover, the quantitative survey design of Study 3 has seriously limited the number of investigated organizational enablers. There are additional structural and other organization-level design elements (J.-Y. Lee et al., 2015) which could enhance DSSA. These elements should be examined.

At the individual level, we have only started to unpack the role of FLEs in achieving DSSA. It was established that FLEs remain pivotal in achieving service and sales outcomes in the digital age (Study 1) and that they are the main actors in VBS routines (Study 2). Nevertheless, the organizational roles that could best perform these routines and how these roles are embedded in the organization remain unclear. Furthermore, the KSAs required to successfully perform these routines and mechanisms – in order to enhance these KSAs – have not been sufficiently examined. These are important aspects because FLEs are the main bottom-up driver of organizational SSA development (Ruyter et al., 2020).

Calls have indeed been made for more multilevel research on the organizational enablers of SSA (DeCarlo & Lam, 2016; Hughes & Ogilvie, 2020; Lam et al., 2019; Rapp et al., 2017). However, the responses have been unsatisfactory in terms of the sheer number and consideration of digital servitization. This particular focus is essential to guide industry managers to choose what to do when developing DSSA in their organizations.

In light of this discussion, the objective of Study 4 is to examine organizational enablers of DSSA. This exploratory inquiry identifies eight critical mechanisms that industrial firms can use to exploit their established business and explore new digital growth paths.

3.5.2 Methodology

Study 4 seeks to expand the emerging theory on DSSA using a multiple case approach (Eisenhardt & Graebner, 2007). The five companies participating in the Project (i.e., IndustrialCo, RailCo, E&E&Co., TexCo, and MachineCo) were selected on the basis of

[7] Parts of this chapter, which are not further demarcated in the text, were initially published in Classen and Friedli (2021b).

their ongoing efforts to transform their service and sales organizations under digital servitization. Two more companies were selected for theoretical sampling purposes (Corbin & Strauss, 2008). We selected PowerToolCo and PrintCo (for details, see Table 6) because of their high performance in the survey (Study 3), which promised the garnering of valuable insights from companies that previously displayed relatively high levels of DSSA.

3.5.2.1 Data collection

Data were gathered through semi-structured interviews. We interviewed 52 sales and service managers and FLEs between August 2020 and February 2021 (see Table 23). Interviews lasted between 52 and 117 minutes (81 on average) and were conducted face-to-face and via video conferencing. All interviews, except for two, were recorded and transcribed.

Table 23: Study 4 interview informants

Firm	#Informants	Informants' roles
IndustrialCo	10	Head of Sales & Marketing, Head of Service, Industry Services Consultant
RailCo	7	Business Unit Head, Director Services, Head of Sales, Senior Account Manager, Sales Manager
E&E&Co.	13	Global Sales Manager, Commercial Deployment Manager, Sales & Process Manger, Service Leader, Service Sales Manager, Key Account Manager, Region Manager
TexCo	17	Head of Customer Service, Division Manager, Area Sales Manager, Service Manager
MachineCo	3	Business Developer Smart Services, Sales Manager, Service Manager
PowerToolCo	1	Head of Marketing
PrintCo	1	Head of Subscription Sales & Customer Success

3.5.2.2 Data analysis

We analyzed our data in three steps. Drawing on the raw interview data, we first generated first-order codes that were iteratively refined, expanded, and consolidated. Saturation (Glaser & Strauss, 1967) was achieved once reviewing the data did not yield any further insights. After comparing and establishing relationships between the first-order codes, we created 14 initial second-order themes.

Next, we discussed the emerging results with practitioners. To ensure the internal consistency of our findings, we successively presented intermediate results to four of the Project firms. We refined the second-order themes between each presentation, based on the feedback. Following these iterations, we presented our results – in an online

seminar – to over 75 practitioners representing a broad range of industries. The seminar feedback enhances confidence in the transferability (Miles et al., 2014) of our findings.

Subsequently, we entered the theoretical realm by comparing our second-order themes to the literature. Constant comparison and theoretical abstraction reduced the number of second-order themes to eight. An ongoing dialogue between our data and extant literature finally led to three aggregate dimensions of organizational enablement mechanisms for DSSA. Figure 8 presents our data structure.

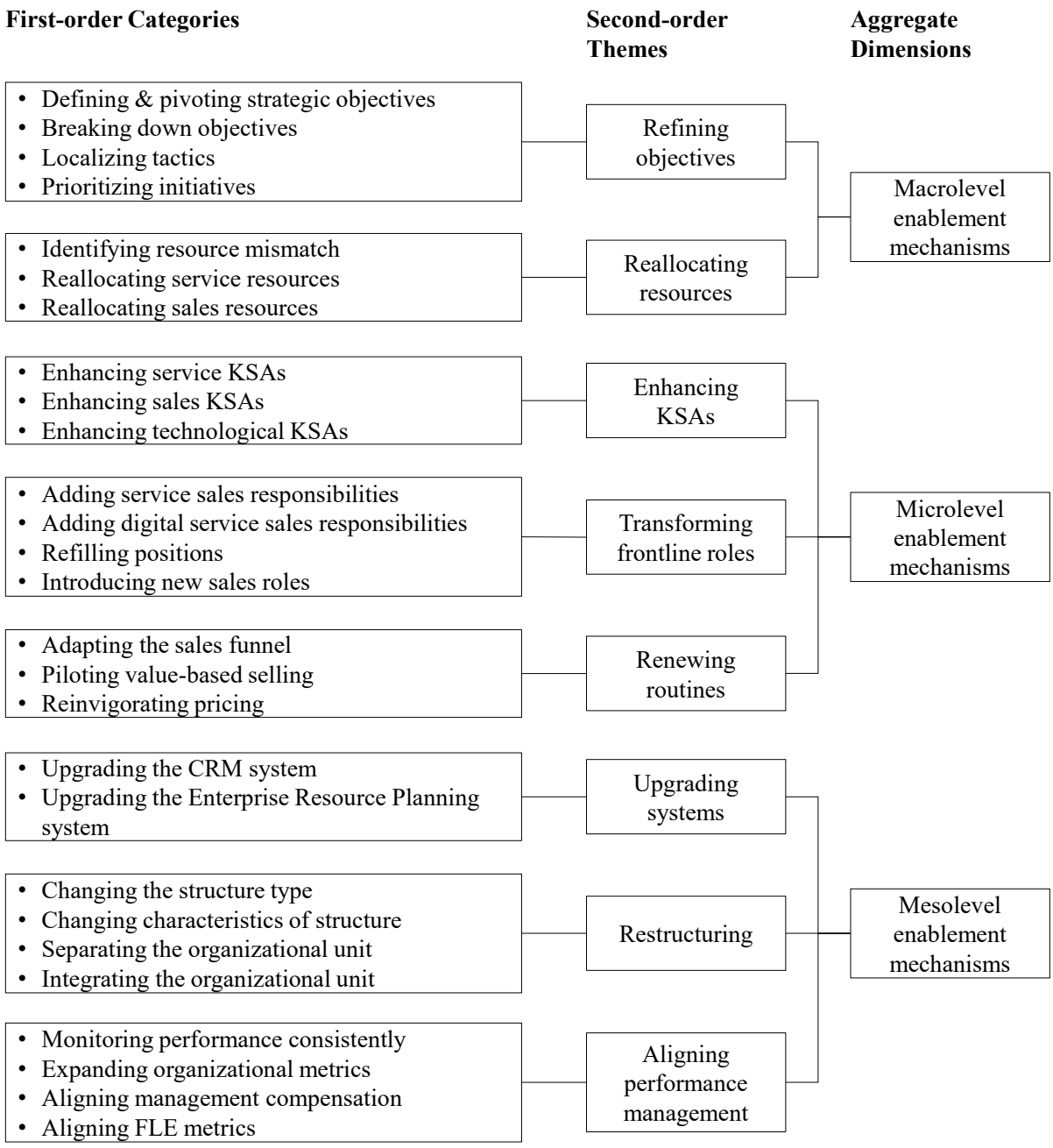

Figure 8: Study 4 data structure

3.5.3 Findings

We identified eight organizational enablement mechanisms for DSSA operating at the macro-, micro-, and mesolevel (see Figure 9). We use numeric codes to designate the informants in the description of our findings.

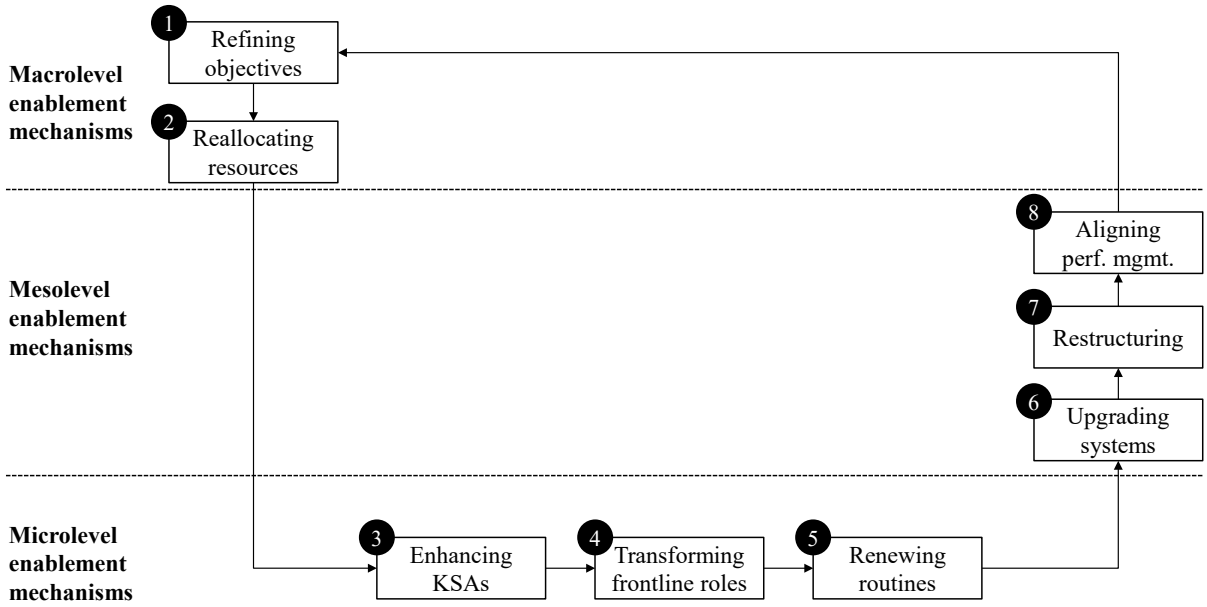

Figure 9: Eight organizational enablement mechanisms facilitating DSSA

3.5.3.1 Macrolevel enablement mechanisms

Refining objectives

Tradeoffs between the exploitation of established physical offerings and the exploration of digital service opportunities emerged early during the strategy definition. All firms had defined digitalization strategies to increase the proportion of digital elements in their portfolio, operations, and revenue. Managers 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. Pure digital offerings just make up for a small, an extremely small share of revenue at the moment. 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. (IndustrialCo, 10)

Strategies underwent major shifts along the way. Initially, the firms set aggressive revenue objectives for their digital business. However, market feedback from initial digital service offerings indicated that most revenue objectives were overambitious. Consequently, managers gradually shifted from a narrow focus on digital 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 (TexCo), consumables (PrintCo), or maintenance contracts (E&E&Co.). IndustrialCo 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. (IndustrialCo, 07)

PowerToolCo, arguably, took the biggest leap forward by establishing a customer-centric strategy. It initially defined an annual number of new digital service users as a strategic target. This approach proved short-sighted, as many initial customers churned too soon. Subsequently, PowerToolCo shaped its sales strategy around the goal of developing a set of customers as "partners." Putting the customer at the center was expected to drive sustainable growth:

> We deliberately go for an increase in the number of partner customers as the overall objective. We know that if we increase the number of partner customers, then we also increase our sales disproportionately, so there is a direct link. (PowerToolCo, 01)

In the other firms, sales strategies were operationalized at the FLE level in three steps. First, objectives were broken down to service types. TexCo distinguished between maintenance and spare parts sales targets because of the relative difficulty of selling maintenance in many of its core Middle and Far Eastern markets. To lay the foundation for digital service growth, E&E&Co. defined the share of connected assets on total equipment sales transactions that subsidiaries had to fulfill. This share was successively broken down by regions and sales territories.

Second, sales approaches were localized. The firms' market share and brand strength could vary significantly from one country to another. 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]" (TexCo, 15). Revenue objectives had to be adjusted accordingly to gain frontline acceptance.

Third, sales initiatives were consequently prioritized. Services were mainly sold to existing customers. Thus, salespeople had to examine an account's full revenue potential across offerings before targeting customers with 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 CHF 10,000 and ruin my million-francs business. (RailCo, 04)

Reallocating resources

The exploitation/exploration dilemma was reinforced by the unequal resource demands imposed by selling physical and digital services. A case in point is E&E&Co. Because many countries mandated elevator maintenance by law, bundling contracts with new equipment sales almost effortlessly generated revenue. By contrast, selling digital services consumed substantial resources, given the time needed 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. (E&E&Co., 06)

Resource reallocation facilitated DSSA. E&E&Co. started experimenting with hybrid sales structures to overcome resource bottlenecks in frontline sales. Tele-sales were deployed to identify leads for digital services, thereby freeing up 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. Some of them better than we do. 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 salesforce comes in. What are the advantages of that? They can focus on selling, in the 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. (E&E&Co., 07)

This hybrid sales approach worked under two conditions. First, the target market had to be large enough in terms of revenue potential and sales territory to justify building tele-sales resources. Second, the digital service should not be too complex. Advanced digital services that required deeper technical knowledge and detailed explanations were beyond the capabilities of tele-sales:

> A call center just calls people. […] Right now, our digital services, simply speaking, just transmit elevator information. That's easy to explain. But the more complex it gets, with elevator calls, applications, and integration, you're not going to be able to do that with tele-sales. (E&E&Co., 07)

3.5.3.2 Microlevel enablement mechanisms

Enhancing KSAs

To achieve service and sales objectives, FLEs should improve customer service, sales, and digital technology KSAs. First, excellent customer service was foundational for subsequent sales. This principle, while intuitively appealing, was applied inconsistently across the frontline. Service quality was subject to substantial 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. (TexCo, 06)

Second, both service and sales FLEs had sufficient room to improve service sales KSAs. Service FLEs, having frequent interactions and close relationships with customers, were in a prime position to sell services. The intimate knowledge of customer needs allowed service FLEs to recognize natural up-selling and cross-selling opportunities:

> If a service employee is at a customer site and, for example, gives […] follow-up training to the mechanics on how to use the software and then realizes, 'Oh, there are still entire departments that don't use the software at all and in which there

> would be a lot of potential', then he is super good at recognizing it and also telling the customer: 'Hey, look, we could also do all that and it would be much better for you, for such and such reasons.' (PowerToolCo, 01)

However, service FLEs seldom fully exploited their respective positions' potential. Many were unwilling or underqualified to assume 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. (IndustrialCo, 09)

> I have a salesman 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. (TexCo, 03)

Similarly, many goods-centric salespeople still had to become service sellers. Foremost, 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" (TexCo, 10). Additional KSA gaps emerged around the following aspects: 1) selling services proactively, 2) recognizing performance improvement opportunities in customer operations, 3) identifying and creating the need for digital services, 4) feeding these needs back into the organization, and 5) understanding new service-related revenue models:

> [Some salespeople] didn't understand the subscription model. That was the biggest hurdle. Our salespeople basically said: 'The customer gets a cheaper machine with a subscription,' which is not the case. And there were some who understood that. And then there are some who didn't get it. Those who do understand are happily selling subscription contracts. The ones who don't get it say, 'Subscription is too expensive and not worth it for customers.' (PrintCo, 01)

Third, FLEs had to enhance their understanding of the digital technology embedded in new service offerings. 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. (E&E&Co., 03)

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 hands-on 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 were even more important, such as role plays to recognize use-cases in customer interactions. Intuitive sales brochures – the second enabler – were essential if the training knowledge were to stick. Unfortunately, most brochures emphasized technical details over tangible customer benefits, thereby failing to gain frontline acceptance. To overcome these challenges, PrintCo developed comprehensive sales "playbooks" that included descriptions of key customers, advantages and drawbacks of the service, and sales arguments. To complement the brochures and to drive FLE knowledge and commitment, an E&E&Co. subsidiary installed showrooms displaying digital services at its headquarters.

Transforming frontline roles

Frontline roles underwent four transformational changes as service portfolios evolved. First, existing frontline roles were expanded with service sales responsibilities. TexCo's salesforce'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 E&E&Co. salespeople deliberately refrained from promoting services:

> Every salesperson avoids talking about [maintenance contracts], because we are upper league, pricewise. Some small shops charge 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. (E&E&Co., 05)

Second, dedicated service sales roles were introduced. At IndustrialCo and E&E&Co., service salespeople were assigned to sales territories where they operated alongside equipment salespeople. Both salesforces were subsequently tasked with the selling of digital services. This seemed like a natural option given their geographic coverage. However, some salespeople, especially those with significant 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. (IndustrialCo, 07)

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

> Those who have a great affinity for these [digital] topics, who absorb them and love them, also love to sell them and are totally good at doing it. (PowerToolCo, 01)

Third, new frontline, intermediary, and backend roles were introduced for digital service sales. These new roles included digital service sales specialists and business developers. This role configuration combined depth – with a single, dedicated role focusing on digital expertise, and breadth – with traditional roles covering sales territories. Striking a balance between depth and breadth was critical for success:

> In market organizations that have dedicated [digital service sales] resources, it is of course easier. In this case, you assign them precisely to territories and recruit the right people, who then have a certain geographical coverage. And that's when the trade-off comes in. If I have too few of them and they have to cover huge geographical areas, it doesn't make much sense. (PowerToolCo, 01)

Digital service champions played a pivotal intermediary role. These champions worked closely with corporate headquarters to boost the adoption of digital services in subsidiaries. Champions trained local salesforces, accompanied customer visits to present digital services, and fed market information back to the organization:

> The [champion] is responsible to feed new requirements from the market back to us: 'We can't sell subscription. But if feature X, Y, and Z is included, then we'd have a good chance there.' That's basically our point of contact in the region for everything subscription. So, when we say, 'We need to push this now. Please help us with that,' then he helps pushing. If there are questions on how to improve it, that's our contact. If the numbers are not what they should be, then that's our contact as well. (PrintCo, 01)

New backend roles updated sales processes and systems for digital services. E&E&Co. introduced a process manager role in charge of forecasting and tracking digital service revenues. This role also ensured that digital services were implemented in the ERP, which 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 salesforce 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. (E&E&Co., 03)

Fourth, ambidextrous Customer Success Managers (CSMs) were introduced. This particular role inspired by SaaS pioneers such as Salesforce, targeted subscription customers' enduring satisfaction. PrintCo introduced CSMs to commit to a single role that ensures service and sales objectives. At the time of the research, CSMs primarily fulfilled service-related tasks, but additional sales-related tasks were planned for the future:

> We need dedicated subscription salespeople. I don't really care whether they are account managers or come from the service function. […] Once a subscription project goes on, we have these [CSMs] who continuously support customers. [CSMs have monthly calls with customers], thus know what the current issues are. [CSMs could react] by suggesting a possible solution and, hence, cross-selling. That's why I think for dedicated customers, we should theoretically have CSMs that sell products such as subscriptions. [Now] we have CSMs, but they don't sell. CSMs take care of customers in terms of service, consumables, and overall satisfaction. CMSs are the ones who organize these monthly calls, which salespeople often join. But selling is the salesperson's job, while the CSM is in charge of other things, like saying 'This service hasn't been done' and then ensuring [that] internal processes are triggered so that everything is really done. (PrintCo, 01).

Renewing routines

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

> 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 salesforce, that is, product sales. (IndustrialCo, 06)

> 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. (IndustrialCo, 10)

VBS gained traction with service digitalization. Ordinary maintenance interventions and contracts were typically mandated by urgencies or law. Thus, their benefits required limited explanation. Digital services, by contrast, were often considered as discretionary spending. Salespeople had to demonstrate 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 percent, thanks to this. And if you now convert this into passenger delay minutes that have improved, it has a financial impact. (RailCo, 05)

Innovative artifacts supported VBS routines in achieving service and sales objectives. PrintCo used value calculators to demonstrate how services reduced customers' costs:

> We have developed a 'quick-and-dirty' calculator based on average values known to us. And we set it up with the thought already in mind that the customer is going to say, 'That's way too expensive.' Then the salesperson opens another column and says, 'That's all well and good, we know that. But we don't know your actual values. Let's sit down really quick and put the five values in there.' So, we boiled it down to these five biggest influencing factors that are involved. And typically,

> if the customer wants a higher performance, it always works out that we are cheaper. (PrintCo, 01)

Similarly, PowerToolCo used advanced artifacts to ensure that service and sales goals were met throughout the customer relationship. PowerToolCo's multi-step sales approach included a proprietary "sales pitch" with a detailed value quantification tool that estimated the financial benefits of implementing a digital service. Software use was regularly monitored across the user base to mitigate the risk of inactive users churning. Toward the end of subscription terms, PowerToolCo produced reports that provided evidence of customer value:

> Fleet contracts are renewed every [n] years. And then of course comes this question… every customer, including SMEs, wants to know: 'Is it still worth for me? Has it paid off in the last [n] years?' We have a very good ratio here. That is also our goal, of course, to keep churn as low as possible. We also do a lot to make it transparent to customers how much they benefit. […] [We report] on the promises we made at the beginning: savings on repairs, savings on handling costs. […] The same with software: how much it was used, how many transfers. This can be shown very transparently. (PowerToolCo, 01)

Innovative revenue models also required reinvigorated pricing routines. The firms relied predominantly on rigid pricing routines using the cost of service delivery and macroeconomic factors as main input. To transition to innovative revenue models, such as subscription, freemium, or pay-per-x, pricing routines had to become more flexible. Multiple iterations were required 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. (E&E&Co., 03)

3.5.3.3 Mesolevel enablement mechanisms

Upgrading systems

The transparency of the installed base was essential to identify service sales leads. CRM systems served to store and retrieve data about customer relationships, including details about visits, contracts, and the installed base. Advanced CRM systems combined this information with customer behavior data for even more granular identification of service sales leads:

> To identify customers for subscription services, we have two tools. The first is [Tool A]. It provides all customer-related data from the machine. So, we have all machines connected and there I can see how much each customer prints, what is their ink consumption, etc. The second [is Tool B]. There I can see my share of wallet with a customer. An ideal customer is obviously someone with low performance – I get that from [Tool A] – and a low share of wallet. Then I can approach them and say, 'Look, if you buy everything from us, we improve your performance.' And I can also easily make an ROI calculation. (PrintCo, 01)

Information about the location, number, type, and age of the installed equipment was particularly important. For physical services, this information was screened for opportunities to renew maintenance contracts or cross-selling 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 asset 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. (E&E&Co., 05)

CRM-enabled DSSA evolved in four stages. First, access barriers to CRM systems had to be lowered. Informants suggested 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, several companies had recently launched or were about to launch new CRM systems.

Second, managers and FLEs had to buy in. Informants admitted not using their CRM, perceiving too few benefits compared to the effort required to feed 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 leader 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 doing it. So, this was how I failed. (E&E&Co., 13)

FLE buy-in was easier to obtain when CRM-based solutions replaced painstaking workarounds:

> What used to be an Excel list is now nicely in the CRM […]. That is, we [already] had many of these mechanisms […], before, but implemented in a totally handmade way, and not as it is right now, state of the art. […] Transferring these handmade solutions to the new [CRM] system is relatively easy. This is then also gratefully accepted, because it is of course much easier for the sales department to work in one system than in one hundred. (PowerToolCo, 01)

Third, CRM data had to be exploited. Some FLEs fed the CRM with data, ignoring how the data would subsequently be used or how they would 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. (TexCo, 15)

Fourth, CRM-based sales activity management was imperative. Leaders in this domain considered the planning, execution, and monitoring of sales activities based on up-to-date CRM data as "core of the core" (PowerToolCo, 01). State-of-the-art CRM systems provided end-to-end coverage across the sales funnel:

> There is this lead engine that generates leads. […] Since we have all the data, we run analytical routines on the data. This generates dashboards and lists that are available from a single source. Now we have introduced this new CRM system, allowing us to work lead-based. The lead source can be anything. [It] can be the engine, but it can also be something else. […] These leads can then be directly used for customer visit planning. There aren't any more system breaks. […] [The salesperson] can then invite other people to work on the lead and evaluate the entire thing. So, we also know what's in the pipeline and when it's coming. (PowerToolCo, 01)

Conversely, laggards bemoaned the lack of active management of digital service sales:

> In terms of CRM-based sales, we're still in the Middle Ages at [E&E&Co.]. 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 – this is not the right approach. (E&E&Co., 01)

Moreover, ERP systems required upgrades to enable new pricing mechanisms. MachineCo was unable to introduce features-on-demand for its digital services because the ERP did not allow a temporary limiting of feature access. E&E&Co. was unable to apply pay-per-use pricing for a digital service because of 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. (E&E&Co., 08)

Restructuring

Diverse structural mechanisms served to facilitate DSSA. MachineCo formed a cross-functional team to ramp up digital services. The team drew resources from different organizational units, notably After-sales or Development, but had no profit and loss accountability. RailCo introduced digital service sales roles within the existing Customer Service organization. They approached customers in parallel through two goods-centric sales units. To avoid overwhelming customers with competing salesforces, organizational integration was considered:

> 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 [RailCo] sales organization selling solutions to the customer. But we haven't got that far yet. (RailCo, 05)

Other firms fostered ambidexterity within existing structures. At IndustrialCo, ambidextrous salespeople for physical and digital services were part of the Customer Service organization. Additional dedicated digital-service-sales specialists were introduced in a recently formed digital unit. Conversely, E&E&Co. and PrintCo re-integrated their units dedicated to digital services and subscription services, respectively, after a few years of separation. The re-integration was intended to drive "customer-centricity" (E&E&Co., 07) and synergies between the physical and digital service business:

> At some point, [subscription] is the standard and I don't need to build up parallel structures. Because in the end, we also need product management, a customer service, and sales support. Today, these functions already exist everywhere, and we don't need to build them up another time. (PrintCo, 01)

> 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. (E&E&Co., 07)

Aligning performance management

An objective fact base was deemed to be essential for performance management. Measuring service profitability was an initial step in this direction. Some companies had achieved this since the early 2000s to enhance "professionality in services" (IndustrialCo, 09). Conversely, TexCo still had to take this step, following a strategic transformation plan to drive the competitiveness of its service business:

> Because [TexCo] today… In China we say it's like a state-owned company. (TexCo, 16)

The monitoring of financial and non-financial metrics evolved alongside portfolios. Revenue and profitability measures were typically grouped in three baskets: maintenance, spare parts, and digital services. Sometimes, to track recurring revenues, maintenance was broken down into field interventions and contracts. Monitoring non-financial metrics was equally important. Connectivity rates of newly sold equipment were measured to facilitate 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):

> Of course, we have NPS, but we also have a few other questions – based on which we evaluate customer feedback. […] Some time ago we defined the 'moments of truth' in our processes, together with customers. […] Then there is an allocation formula, based on which customers are surveyed. Then [customers] are called and asked for feedback – what went well, what went bad. When there are complaints or if there is [a] certain rating… like detractors, they are always called. It's relatively systematic and there are monthly reports. (E&E&Co., 07)

Behavior-based metrics gained in importance as revenue models evolved. PowerToolCo closely monitored churn rates for its subscription services, considering it the ultimate measure of customer satisfaction:

> NPS is not that important for us because we're more interested in the actual behavior, which the churn rate ultimately depicts. […] The churn rate for [our fleet service] is important, [especially] to know how satisfied our customers are. And then you see very clearly in the numbers if they aren't satisfied anymore. Finding out why this is [the case] requires additional analysis, but of course this has a direct impact on our business. This link can be established much more directly than with NPS or any more abstract satisfaction metrics. (PowerToolCo, 01)

Incentives were a crucial organizational enabler of DSSA. At the time of the research, physical goods and services generated substantially 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.' (IndustrialCo, 04)

The alignment of managerial and FLE incentives fostered DSSA behavior. Managerial compensation in RailCo's service sales organization was tied to a broader set of metrics. To balance sales-related and service-related behavior, these metrics included order intake, sales expenses, profitability, and NPS. However, to drive DSSA behavior across the organization, incentives had to be cascaded over several levels to the frontline:

> [Service] contract targets must be included in the balanced scorecard of the head of the [regional] cluster. This is already the case today, and [these targets] must trickle down to the regional managers. And it has to hurt if they don't achieve it. And if it doesn't hurt, then you can imagine how they'll take care of it. […] If [these targets] are not in the goal agreements of the salesforce, then it doesn't matter [to them]. (PrintCo, 01)

FLE incentives were aligned in four ways. First, by streamlining incentives across physical goods, services, and digital service sales roles:

> The [head of service sales] and [digital service sales specialist] 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.' (RailCo, 05)

Second, by introducing team-level incentives. The underlying rationale was that selling digital services was inherently a team effort:

> Our offering is becoming increasingly complex. A salesperson cannot anymore be the expert for everything; [that is why] this team collaboration is needed. They need the help of champions and we have champions for diverse topics. At the end, you're only really successful together. And that's exactly what we want to reflect and promote with these team incentives. (PowerToolCo, 01)

Third, by adding specific digital service sales incentives. At IndustrialCo, the relative importance of such incentives ranged from "a small percentage share" (06) for area sales managers, through "a small factor" (05) for service salespeople, to "50/50" (10) for digital service sales specialists. E&E&Co. piloted similar incentives in its salesforce. For equipment salespeople, a certain share of sold elevator and escalator deals had to include digital services. Compensation plans for service salespeople were revamped at the time of the research and included incentives to sell maintenance contracts and digital services.

Fourth, by aligning incentives to revenue models. PowerToolCo initially used incentive multipliers to spur the growth of its subscription-based fleet management and digital services. However, after user numbers reached a tipping point, incentives were revamped. To achieve congruence with the organization-level goal of customer retention and, ultimately, increased lifetime value, salespeople were paid a commission on recurring revenues:

> Now, [revenue is credited just like customers pay]. This is of course lucrative for our employees who have been in sales for a long time because revenues from past work are now credited to them. So, at the first of the month, they already automatically have revenues booked in their territory without having done anything for it, because the work has been done in the past. For employees with a longer time horizon, this is quite attractive. For employees with a very short time horizon, not so much. (PowerToolCo, 01).

3.5.4 Key takeaways

Industrial firms pursue DSSA to earn revenues from established physical services, while simultaneously growing their digital service business. To achieve this goal, more light must be shed on the organizational enablers of DSSA. Study 4 contributes to this emerging discussion by exploring organizational enablers of DSSA in seven industrial firms. There are four key takeaways from Study 4:

- Eight organizational enablement mechanisms, operating at the macro-, micro-, and meso-level, facilitate DSSA.
- At the macrolevel, strategies must define and operationalize objectives for both physical and digital services, considering that currently, additional resource demands imposed by digital services are not offset by commensurate revenue.
- At the microlevel, sales routines can be updated for the digital age only when accompanied by KSA enhancement mechanisms and frontline role overhauls.
- At the mesolevel, state-of-the-art IT systems, structural changes, and aligned performance management mechanisms are essential to direct managers and FLEs toward DSSA behavior.

4 General discussion

4.1 Toward digital service-sales ambidexterity in industrial firms

The increased commoditization of goods, compounded by digital technology innovation, fuels the service transition of industrial firms. Nonetheless, selling industrial services remains a major practical challenge. Although research on SSA – the simultaneous pursuit of service and sales goals at organizational and individual levels – has recently gained traction, three noticeable knowledge gaps remain. Research has failed to evaluate digital servitization and SSA in combination, to examine the microfoundations of SSA in depth, and to explore organizational enablers of SSA across multiple levels. A focus on digital SSA is critical because the simultaneous exploitation of physical service opportunities and the exploration of digital service opportunities have long-term implications for firm profitability and frontline management. Therefore, the purpose of this thesis was to examine how industrial firms can successfully develop DSSA. The empirical studies were undertaken to answer three important questions.

How can digital service-sales ambidexterity in industrial firms be conceptualized?

DSSA can be conceptualized at two levels. At the organizational level, DSSA is a DC reflecting a firm's ability to reconfigure its resource base in order to achieve service and sales outcomes of physical and digital services. In the digital era, customers desire the following service outcomes: high levels of customer service, operational improvements, transparency, and relationship quality. DSSA's main sales outcomes are revenue from physical and digital services (in the short term) and CLV (in the long term).

At the individual level, DSSA behavior reflects an FLE's engagement in service and sales activities pertaining to physical and digital services. These activities form the main microfoundations of DSSA and are based on three components: routines, KSAs, and artifacts.

VBS routines constitute a vital microfoundation of DSSA. There are six building blocks of VBS routines: value discovery, value co-creation, value quantification, value-based pricing, value communication, and value learning. VBS routines are multilevel phenomena because they require individual actors from different organizational units to engage in patterned and coordinated activities in order to achieve firm-level outcomes, namely, service and sales results.

Three pivotal KSAs underpin DSSA. First, service KSAs remain crucial in the digital age because they provide the foundation for close and long-term customer relationships and, thereby, facilitate service sales. Second, service sales KSAs are essential to ensure that DSSA yields revenue. They include selling services proactively, recognizing performance improvement opportunities, identifying and creating the need for digital services, feeding these needs back into the organization, and understanding new service-

related revenue models. Third, digital technology KSAs are essential to sell digital services. A basic understanding of the data capturing, processing, analysis, and visualization mechanisms of digital service operations is required to demonstrate the value digital services can create for customers.

Artifacts in the form of written procedures, software, and monetization rules undergird DSSA. Written procedures shape individual routine performance, notably in VBS. These procedures stem from managerial initiatives (e.g., buying center analysis procedures, value co-creation canvasses) or individual initiatives (e.g., checklists, scripts). Software is used to demonstrate a service's value at an initial offering stage (e.g., value and ROI calculators) and during the customer relationship (e.g., digitally generated reports on promises made). Monetization rules deconstruct revenue models to the individual FLE level by prescribing feasible bundles of physical and digital offerings, preferred pricing logics, and acceptable price levels.

How does digital service-sales ambidexterity affect firm performance?

The positive relationship between DSSA and firm performance can be attributed to at least two factors. Quantitatively, VBS – a key microfoundation of DSSA – is associated with higher levels of salesforce performance (an organization-level measure of service and sales performance). This positive link remains significant when controlling for country-level (GDP per capita; cultural values) and individual-level (sales experience; technical knowledge; relative time spent physical goods) covariates.

Qualitatively, revenue model configuration plays an important role in achieving service and sales outcomes. Indirect revenue models use digital services to enhance service and sales outcomes from physical goods and services. Freemium revenue models use free basic packages that allow customers to experiment with digital services at no cost and paid advanced packages to generate recurring revenues in respect of these offerings.

What are the organizational enablers of digital service-sales ambidexterity?

Eight organizational enablers of DSSA unfold at the macro-, micro-, and mesolevel. At the macrolevel, a clear sales strategy is required to define, operationalize, and readjust objectives for physical and digital offerings. Scarce sales resources must be allocated to the most promising customers to justify the effort required from VBS, especially for digital services.

At the microlevel, updated KSAs, roles, and routines facilitate DSSA. Importantly, KSA enhancement is based on regular, role-specific, and hands-on training for the entire frontline, and on customer-centric, actionable, and regularly updated sales material. Moreover, existing frontline roles can be expanded with service sales responsibilities or through the creation of entirely new roles. While there are many role configurations, all of them include responsibilities for service and sales activities. Additionally, the

overhaul of routines along the sales funnel can be accelerated with lead programs, software artifacts, and innovative pricing mechanisms.

At the mesolevel, three mechanisms encourage managerial and frontline DSSA behavior. First, updated IT systems. Most importantly, state-of-the-art CRM systems create transparency about the installed base, customer behavior, and customer needs, thereby facilitating targeted service sales initiatives. Second, different structural mechanisms can enable DSSA. Organizational separation may help reduce the ambiguity of frontline roles, while integration advances synergies between the physical and digital businesses. Third, updated performance management approaches across hierarchical levels can encourage DSSA. Managerial compensation can be linked to service- and sales-related outcomes, while FLE incentives can include specific rewards to boost digital service sales.

4.2 Theoretical implications

This thesis makes six contributions to the literature on service and sales. More specifically, this research adds to the servitization, SSA, and VBS literature streams.

DSSA concept

This research is the first to theorize the DSSA concept. While SSA research has burgeoned recently (e.g., Giovannetti et al., 2020; Panagopoulos et al., 2020), service digitalization has not received much attention. This neglect is critical because digital services are engrained in industrial firms' growth strategies and are likely to exacerbate frontline role ambiguity. By integrating the digital servitization and SSA literature, the thesis extends previous definitions of SSA (Rapp et al., 2017) and proposes DSSA as DC. As with any research drawing on the DC view, it is essential to avoid vagueness and insufficient operationalization (Eisenhardt & Martin, 2000). The conceptualization of DSSA based on routines, KSAs, and artifacts advanced in this study responds to calls that the microfoundations of SSA should be explored in more depth (Hughes & Ogilvie, 2020; Shiue et al., 2021).

Digital service revenue model configurations and boundary conditions

The findings provide a more nuanced understanding of digital service revenue models. Earlier servitization research tended to assume mutual exclusivity of zero and nonzero service prices. In particular, prior servitization literature emphasized the importance of offering free services to sustain personal relationships in China (Bao & Toivonen, 2015; Gebauer et al., 2007) or to sell more equipment (Gebauer et al., 2005). Despite recent efforts (e.g., Gebauer et al., 2020), revenue model configurations for B2B services remain underexplored. This thesis fills this void by operationalizing two revenue model

configurations (indirect; freemium) and shedding light on their role in achieving service and sales outcomes.

Furthermore, the thesis extends the nomological network of revenue model configuration with cultural values. Although literature exists on the role of cultural values in service (e.g., Mattila, 1999) and on boundary conditions of revenue model configurations (e.g., Tidhar & Eisenhardt, 2020), there is, to the best of my knowledge, none that combines both perspectives. The role of cultural values for revenue model configuration, proposed in this thesis, provides new research avenues toward understanding the commercial success of servitization strategies around the globe.

Multi-dimensional conceptualization of VBS as organizational capability

This thesis expands prior conceptualizations of VBS as organizational capability. VBS research has not yet reached an agreement on whether VBS is a single capability (Jaakkola et al., 2015) or a bundle of several capabilities (Raja et al., 2020; Töytäri & Rajala, 2015). Clarifying this issue would inform sales leaders whether investing in VBS can create a sustained competitive advantage. The thesis' findings suggest that VBS should be defined as an organizational capability reflecting a firm's ability to deploy a set of customer-value-oriented routines that achieve superior service and sales outcomes. This conceptualization enhances our understanding of VBS in two respects.

First, importantly and consistent with previous research (Mullins et al., 2019; Terho et al., 2015; Terho et al., 2017), the results confirm a positive relationship between VBS and performance outcomes. The identified positive link with salesforce performance suggests that VBS is valuable. VBS is also rare because successful routine performance hinges on specific actors from the sales, service, and other organizational units using proprietary artifacts, such as value calculators (Pöyry et al., 2021).

Second, this research is among the first to theorize the role of routines in VBS results. Prior VBS studies have used the term "routines" as a synonym for activities (Raja et al., 2020; Töytäri & Rajala, 2015), without clarifying their link to firm performance. The thesis enriches this discussion by proposing that only a combination of VBS routines can create a sustained competitive advantage. It is readily apparent that only the conjunction of VBS building blocks can result in superior firm outcomes. In other words, value discovery is only valuable if complemented by other VBS building blocks, like value communication. Moreover, it seems that only the intricate interweaving of routines creates the causal ambiguity for VBS to qualify as a capability. From the outside, it is difficult to determine whether value discovery or value-based pricing is the main salesforce performance driver. If VBS was a bundle of separate, clearly defined capabilities, as proposed by Töytäri and Rajala (2015), the source of competitive advantage would be less opaque and, therefore, potentially easier to imitate.

Higher-order VBS measure

The thesis offers a formative-formative measure of VBS. Recent literature has called for new measures reflecting the multi-dimensional, processual nature of VBS (Kienzler et al., 2018; Y. Liu & Zhao, 2020). It responds to these calls by developing a formative-formative, higher-order VBS measure. In line with prior work (Liinamaa et al., 2016; Raja et al., 2020), this research finds that VBS encompasses distinct yet complementary activities. But these activities need not covary. Salespeople may choose to allocate time to some routines (e.g., co-creating solution with customers) and not to others (e.g., debriefing results with other departments). The same applies to entire building blocks of VBS: value quantification need not entail value-based pricing. Hence, following Jarvis et al. (2003), a formative measure of VBS is suitable. The higher-order conceptualization developed in this thesis enables future parsimonious path modeling using the HOC (Hair et al., 2018) or a detailed estimation of VBS performance drivers based on its LOCs.

Organization-level boundary conditions of VBS

The quantitative study shifts the focus of VBS research to organization-level boundary conditions. This shift matters in two respects. From an academic perspective, VBS can only be a source of sustained competitive advantage if enabled by organizational mechanisms (Kozlenkova et al., 2014), which therefore deserve more attention. From a practical perspective, sales leaders must stipulate appropriate conditions for salespeople to engage in complex and time-consuming VBS activities (Mullins et al., 2019; Terho et al., 2015; Terho et al., 2017).

The results highlight two VBS drivers. Foremost, they bolster the role of high sales strategy quality to channel sales resources (Panagopoulos & Avlonitis, 2010) to customers who are receptive to VBS *and* who offer sizeable long-term revenue opportunities (Terho et al., 2015). Furthermore, the subsequent findings underscore the function of outcome-based sales control systems (E. Anderson & Oliver, 1987; Churchill et al., 1985). Sales-oriented incentives seem conducive to VBS in that they motivate salespeople to allocate efforts to VBS when opportunities for revenue generation – and, therefore, personal compensation – are highest (Ahearne et al., 2010). Somewhat surprisingly, service-related incentives are found not to play a significant role in driving the VBS of industrial services. Perhaps, salespeople perceive customer relationship performance to be too subjective (Hughes & Ogilvie, 2020) or to be influenced by too many additional stakeholders, notably within the service function, with the result that service-related incentives are ineffective in steering their behavior.

Further, the impairing effect of formalization on the link between VBS and salesforce performance contributes to an ongoing discussion in sales research. Previous studies of formalization in sales have been inconclusive (J.-Y. Lee et al., 2015). Proponents of a negative link between formalization and sales performance have suggested lower employee empowerment and inhibited absorption of customer information as possible causes (Auh & Menguc, 2007; Jaworski & Kohli, 1993; Kohli & Jaworski, 1990). The present findings suggest that although sales artifacts are vital to inform VBS, salespeople need enough flexibility to deal with customer-specific sales situations. Indeed, salespeople must choose situationally which actors and artifacts to involve in VBS routines, with the result that strong formalization could dampen their effectiveness. Taken together with the motivating role of sales-related incentives, the results confirm that sales managers should avoid micromanaging salesperson behavior (Ahearne et al., 2010).

Finally, the findings on proactive MO contrast with previous research. The results suggest that proactive MO does not strengthen the link between VBS and salesforce performance. This contradicts Terho et al.'s (2015) findings that customer orientation, a key dimension of MO (Narver & Slater, 1990), acts as work value directing salespeople's VBS behavior. A possible explanation of these mixed findings is that although responsiveness to latent needs enhances customer value creation (Blocker et al., 2011), its impact on salesforce performance might be more multifaceted. The salesforce performance scale used in this thesis aggregates sales and customer relationship outcomes in a single cross-sectional measure. Perhaps this masks nuanced effects in which proactive MO strengthens the VBS–customer relationship and inhibits the VBS–sales performance link, at least in the short term. Indeed, VBS entails downsizing proposed solutions if it better reflects actual, not expressed needs (Terho et al., 2012), thereby trading immediate revenue against CLV (Saxe & Weitz, 1982). Nevertheless, no hasty conclusion should be made in the absence of supporting evidence. Further research is required to examine this issue.

Organizational enablers of DSSA

This thesis expands the prior understanding of organizational enablers of SSA. Given the reciprocal effects between organization-level and individual-level SSA, it is necessary to develop a multilevel perspective on the organizational enablers of SSA (DeCarlo & Lam, 2016; Lam et al., 2019; Rapp et al., 2017). However, extant research has mainly investigated individual-level boundary conditions of SSA (Mullins et al., 2020). The thesis addresses this knowledge gap by identifying and operationalizing eight organizational enablers of DSSA.

In doing so, the thesis underscores the importance of structural and contextual approaches to ambidexterity. Structural approaches seek to overcome service-sales-related role ambiguity by creating separate organizational units or roles (Gabler et al., 2017; Rapp et al., 2017). This research found evidence supporting both approaches. First, consistent with Stähle (2020), the results illustrate that B2B firms create separate units to explore digital or subscription-based services. The thesis extends this understanding by showing that these units may be reintegrated once they have gained traction (O'Reilly & Tushman, 2013). Second, the results indicate that industrial firms use separated roles like those of CSMs or salespeople for digital services to drive structural ambidexterity. This finding resonates with Hochstein et al. (2021) who argue that structural ambidexterity based on specialized roles, rather than on individual ambidexterity, is effective in supporting customers to continuously realize value from subscription-based services.

Nevertheless, the results suggest that contextual mechanisms also matter. Because traditional service and sales FLEs still outnumber digital service salespeople, additional mechanisms are needed to instill DSSA behavior in the frontline. Insights into the organizational enablers of contextual ambidexterity (Gibson & Birkinshaw, 2004) are vital because, eventually, FLEs need to tackle the challenges posed by the pursuit of conflicting goals on their own (Jasmand et al., 2012; Yu et al., 2015). By unpacking organizational systems and processes such as resource reallocation, KSA enhancement, or CRM system upgrades, this research contributes to the bourgeoning SSA enablement literature (Hughes & Ogilvie, 2020; Mullins et al., 2020; Panagopoulos et al., 2020) and provides managers with practical advice on how to cultivate DSSA within existing structures.

4.3 Managerial implications

Figure 10 consolidates the hitherto discussed findings in a managerial framework. The framework charts the path toward DSSA by answering six critical questions.

	I Protect	II Grow	III Nurture
① **Goal**	Exploitation	Exploration	Exploitation & exploration
② **KPIs**	Service share of total revenue Customer satisfaction (NPS)	Connectivity rate of installed base Attach rate	CLV
③ **Roles**	Existing frontline roles	Dedicated service salespeople Digital service champions	CSM
④ **Incentives**	Lead programs	Outcome-based compensation with multipliers	Commission on recurring revenue
⑤ **Revenue Model**	Indirect	Freemium/Subscription	Freemium/Subscription OBC
⑥ **Enablers**	Training	Sales tools	CRM system

Figure 10: Managerial framework to develop DSSA in industrial firms

(1) What should the strategic goal of a service sales strategy be?

The three stages toward DSSA emphasize different goals. Initially, industry executives should secure the viability of their existing service business. Service revenues need to be safeguarded, even when under pressure of external shocks such as economic crises and new entrants. Having achieved this goal, executives can launch service growth initiatives fueled by digital services. This stage is highly explorative, so executives must place wagers on multiple services, of which only a limited number will succeed. These winners form the core of the third stage. During this stage, services are continuously updated to nurture a slowly but steadily growing user base. In parallel, executives should foster selected, more radical service innovations that, at some point, can replace outdated physical and digital service portfolio elements.

(2) Which KPIs should be monitored to manage service sales performance?

KPIs evolve along the three stages of DSSA development. To begin with, it is essential to monitor both service and sales KPIs. The services' share of total revenue measures the importance of services in a goods-centric business. Nevertheless, service revenue

growth should not come at the expense of service quality. If not already part of the corporate DNA, industrial firms should routinely measure customer satisfaction. Well-established metrics such as the NPS facilitate the gauging of overall satisfaction and the tracking of dissatisfied customers. Systematic follow-up practices should be in place to pinpoint and address root causes of dissatisfaction since, after all, retention is a key revenue driver in many stagnant industries.

As the firm begins to explore digital growth paths, non-financial metrics deserve closer scrutiny. In most industries, the installed base serves as a starting point for digital service growth, so action needs to be taken to increase its connectivity rate. More specifically, fully operating connectivity is required and not only a connectivity capability. This distinction is crucial because many industries, such as automotive or high-tech electronics manufacturing, are notoriously averse to connect their production assets, even if technically feasible. Managers should also closely monitor the attach rate, that is, the percentage of equipment sold that includes a service contract. Given the difficulty of selling services during the later stages of the equipment lifecycle, managers must ensure that this initial opportunity is seized whenever possible.

Further down the line, managers should zero in on CLV as an integrative, forward-looking measure of service and sales performance. CLV indicates a firm's ability to acquire, increase, and retain customers in a profitable manner (Venkatesan & Kumar, 2004). As subscription-based revenue models gain traction across industries, CLV is becoming an important input variable for CRM and corporate valuation (Hochstein et al., 2021; McCarthy et al., 2017). In this respect, industrial firms seeking to generate stable, recurring, and profitable revenue from their physical and digital service business should monitor CLV to gauge the success of servitization efforts.

(3) Which roles should primarily involve the selling of digital services?

Existing frontline roles should include the selling of early-stage digital services. The results show that many industrial firms begin their digital journey with services that complement their physical goods and services, notably remote monitoring. Given this complementarity and the often-disputed value of these services, industrial firms should limit initial resource expenditure and start by expanding the sales responsibilities of those who have the closest customer relationships, that is, service FLEs and, to a lesser extent, equipment salespeople.

If a firm has already established a strong service business and a specialized salesforce, the situation is different. In this case, managers should consider a best-of-breed approach and combine the geographical coverage of their service salesforce and the technological expertise of dedicated digital service sales champions. This thesis has exposed some goal conflicts that the service salesforce faces following the introduction of digital services.

Digital champions can defuse this conflict by providing critical resources in the form of time, knowledge, and sales material. They are also required to consolidate the feedback of pilot customers in different markets and to report it to their headquarters. If required, this allows executives to course-correct their digital service strategy at an early stage.

However, to reach true DSSA, firms should bundle certain service-related and sales-related activities within a CSM role. The PrintCo case has illustrated that the dividing lines between the two domains blur once a manufacturer establishes subscription-based services. CSMs should know best which bundles of physical and digital offerings suit customer needs. Therefore, CSMs are well-positioned to identify cross-selling and upselling opportunities and new leads and to forward them to the salesforce. However, as CSMs systematically check with customers to monitor their success and satisfaction, selling subscription contracts only marks the beginning of the journey. CSMs act as the customer's voice in the service and sales organization and, thus, should assume responsibility for outcomes in both domains.

(4) How to motivate FLEs to sell services?

Frontline incentives must support the strategic goals at each stage. Consistent with the previously suggested role evolution, managers should first establish lead programs to reward existing frontline roles for cross-selling and up-selling services. Lead programs should also encompass digital services once they enter the market.

To change their digital service growth plans into a higher gear, leaders should introduce additional incentives. Multipliers on digital service revenue can turbocharge growth when user numbers are still embryonic. At this stage, this approach can overcome the limited motivation of salespeople to sell services that contribute virtually nothing to revenue targets.

Once the user numbers of a digital service reach a tipping point, managers should change gears. Using incentive boosters to subsidize digital services with razor-thin margins is unlikely to be financially viable in the long run. Instead, managers must re-align incentive plans to better reflect long-term value creation. Commissions on recurring cash inflows from subscription-based services should motivate the salesforce to build and nurture customer relationships that drive sustainable profitability.

(5) Which revenue models support the achievement of service and sales outcomes?

Revenue models should be aligned with the value created by digital services. Many customers consider early-stage digital services as mere add-ons to existing physical goods and services. If the customer value of, for example, a remote monitoring service is indeed low, managers could consider using indirect revenue models. By focusing on revenue generation from physical goods and services, industrial firms can slowly but

steadily increase the connectivity of their installed base, thereby laying the foundation for future digital service opportunities.

Once the installed base connectivity ratio has exceeded a certain threshold, managers can start experimenting with freemium models. Free basic packages are important to lower the hurdles for customers to experiment with digital services. At this point, bundles must be carefully crafted to provide a compelling incentive for customers to switch to paid packages.

Firms that have reached an advanced stage of DSSA can also complement subscription-based models with outcome-based contracts (OBCs). This thesis has shown that industrial service customers often seek performance improvements. OBCs link payments to equipment availability or economic results and, therefore, align the goals of customers and providers (Grubic & Jennions, 2018a). Nevertheless, providers must achieve a high level of service excellence and digital maturity to ensure that they comply with the strict performance outcomes warranted by OBCs. At present, only a few genuine OBCs exist apart from Rolls-Royce's notorious TotalCare/Power-by-the-hour (Grubic & Jennions, 2018a). Although an investigation of the OBCs' mechanics is beyond the ambit of this thesis, it presents an important managerial enquiry that offers an exciting avenue for future research.

(6) Which enablers facilitate service sales excellence?

Three enablers should be improved on a continuous basis to drive service sales excellence. First, all FLEs should receive regular service sales training. At the start of a firm's service transformation, training is crucial to embark the equipment salesforce on the servitization journey and to convince service FLEs that not all services must be provided free of charge. As firms develop go-to-market plans for their first digital services, it is important to get the entire frontline "up to speed." While not all FLEs will become digital service sellers and advocates, it is important for the entire service and sales organization to develop a basic understanding of the technology and customer value behind digital services. To achieve this, leaders must ensure that training is tailored to different frontline roles, a healthy balance is maintained between technical features and customer benefits, and FLEs engage in hands-on simulations of customer interactions.

Second, sales leaders must develop a comprehensive set of sales tools. Whereas the overly strong formalization of sales activities is likely to backfire, a wide range of sales tools is required to unlock the full potential of the frontline. Advanced, yet simple-to-use value calculators are the backbone of any VBS approach. More than ever, they are required to demonstrate the value that digital services create for customers. Value quantification is not a once-off exercise; rather, it must be done periodically to ensure the retention of customers. These efforts must tie in with the development of sales

material actually used by the salesforce. Page-long, technical descriptions of service features will not suffice. Instead, sales leaders should craft "playbooks" to provide the salesforce with easily digestible advice on how to identify customers, address different decision makers, and deliver a winning sales pitch that translates digital service features into customer benefits.

Third, executives should make their CRM systems the backbone of all service and sales activities. Importantly, executives must go beyond mere lip service to ensure buy-in throughout the organization. The use of CRM systems cannot be a one-way street in which FLEs only report data or, even worse, reject the system's use because they feel too closely monitored. Instead, a state-of-the art CRM system should provide FLEs with complete transparency of the installed base, past customer interactions, and actionable physical and digital service-sales leads. Only when the salesforce stops "flying blind" will leaders be able to marshal and channel scarce resources to customers, in the process promising the greatest lifetime value.

4.4 Research directions

This thesis is not devoid of limitations of scope, methodology, and sample. The principal scope of this thesis was the service and sales frontline of industrial firms. This focus suffers from two limitations. First, the thesis does not address the role of digital channels in hybrid sales organizations, which are becoming increasingly prevalent (Singh et al., 2019), especially in the aftermath of the COVID-19 crisis (Hartmann & Lussier, 2020). More research is needed to examine how hybrid sales organizations – in which inside salespeople enhance the productivity of the outside salesforce (Sleep et al., 2020) – can alleviate goal conflicts inherent to DSSA. Second, the focus on industrial firms with a strong manufacturing footprint implies that other sectors have not been scrutinized. For instance, the software industry pioneered innovative sales approaches such as subscription revenue models (Tidhar & Eisenhardt, 2020) and CSMs (Ulaga et al., 2020). It would be useful to explore how SSA management practices observed in SaaS companies can be applied to industrial firms.

Furthermore, the qualitative and quantitative studies have methodological limitations. This thesis predominantly relied on qualitative case study research, so the usual caveats about generalizability apply. The quantitative study draws from cross-sectional, subjective survey data. Therefore, concerns of CMV bias and endogeneity cannot be resolved altogether. To further confirm the results and to clarify interaction effects between VBS and salesforce performance, future studies should include instrumental variables in the survey instrument, use additional multilevel covariates, and collect objective performance data over multiple periods.

Lastly, this research's sample suffers from at least three limitations. First, although interview data were collected from Europe, Asia, and the Americas, the qualitative sample only included European companies. More research on firms headquartered in different continents is recommended to identify additional country-, firm- and individual-level boundary conditions of DSSA. Second, only two of the ten companies in the qualitative sample were selected for their superior performance; the remainder were selected on account of their willingness to grant access to key informants. The conceptualizations of VBS and DSSA developed in this thesis should be expanded by studying companies performing well in both domains. Third, although this research was exploratory, the quantitative sample size is still small, also considering that resource restrictions prevented the use of separate samples for measure validation and model estimation. Future research should survey larger samples to refine the formative-formative VBS measure. With these limitations in mind, this thesis is an initial foray into the domain of DSSA; an exciting and rewarding topic that deserves more scholarly and managerial attention in the future.

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APPENDIX

Table A 1: Measures, items, and sources

Measure
VBS
Formative measure, 7-point scale (never, every time); new measure
How frequently do you engage in the following activities when selling services?
Value discovery (VADISC)
VADISC1: Assessing the condition of customers' installed base
VADISC2: Assessing changes in the customers' business model
VADISC3: Proactively targeting customers most likely to require services
VADISC4: Assessing the criticality of customers' operations
VADISC5: Pinpointing performance improvement opportunities
Value co-creation (VACOCR)
VACOCR1: Analyzing the customer's value chain
VACOCR2: Identifying customers' pain points
VACOCR3: Systematically assessing customer needs
VACOCR4: Co-creating solution with customers
VACOCR5: Adapting solutions based on customer needs
Value quantification (VAQUAN)
VAQUAN1: Assessing customers' current operational performance
VAQUAN2: Quantifying operational improvement opportunities for customers
VAQUAN3: Conducting return-on-investment calculations for customers
Value-based pricing (VAPRIC)
VAPRIC1: Identifying customers' willingness to pay
VAPRIC2: Configuring the offering to customer-specific needs
VAPRIC3: Pricing service based on customers' cost savings
Value communication (VACOM)
VACOM1: Communicating the improvement of customers' operational performance
VACOM2: Communicating the service's strategic value for customers
VACOM3: Communicating success stories to customers
Value learning (VALRNG)
VALRNG1: Feeding CRM with data from customer touchpoints
VALRNG2: Debriefing results of customer interactions with other departments (e.g., sales, R&D, quality, after-sales)
VALRNG3: Assessing quantitatively the customer value created by the service
VALRNG4: Adjusting service prices based on realized value
Quality of sales strategy
Formative measure; 7-point scale (very poor, exceptional); Menon et al. (1996)
How would you evaluate your sales strategy with regard to…
... the quality of formulation?
... the quality of implementation?
... innovativeness?
... comprehensiveness?
... the quality of execution?

Salesforce performance
Reflective measure; 7-point scale (much worse, much better); Panagopoulos et al. (2020); Hunter and Perreault (2007); Babakus et al. (1996)
Compared to other salespeople working for your company, how would you evaluate your overall performance with regard to…
... contributing to our firm's market share?
... generating a high level of (Euro) sales?
... quickly generating sales of newly introduced products/services?
... exceeding annual sales targets and objectives?
... assisting my supervisor meeting his or her goals?
... maintaining good customer relations?
... satisfying my customers?
... providing high levels of customer service?
Sales-related metrics and incentives
Reflective measure; 7-point scale (not at all, to a very great extent); Panagopoulos et al. (2020)
To what extent are sales force incentives rewarded on each of the following metrics?
New customer acquisition
Sales expenses
Revenue
Profits
Market share
Cross-selling
Service-related metrics and incentives
Reflective measure; 7-point scale (not at all, to a very great extent); Panagopoulos et al. (2020)
To what extent are sales force incentives rewarded on each of the following metrics?
Customer satisfaction
Customer relationship quality
Customer service
Proactive MO
Reflective measure; 7-point scale (strongly disagree, strongly agree); Narver et al. (2004)
To what extent do you agree with the following statements?
We help our customers anticipate developments in their markets.
We continuously try to discover additional needs of our customers, of which they are unaware.
We incorporate solutions to unarticulated customer needs in our new products and services.
We brainstorm how customers use our products and services.
We innovate, even at the risk of making our own products obsolete.
We search for opportunities in areas where customers have a difficult time expressing their needs.
We work closely with lead users who try to recognize customer needs months or even years before the majority of the market may recognize them.
We extrapolate key trends to gain insight into what users in a current market will need in the future.
Formalization
Reflective measure; 7-point scale (strongly disagree, strongly agree); Böhm et al. (2020); Homburg et al. (2008)
To what extent do you agree with the following statements?
We rely on clearly defined sales processes.
Our sales processes are documented in a written form.
There is a “standard operating procedure” for major sales-related decisions.
There are rules and procedures for most sales activities.

Selling experience (Homburg et al., 2010)
Please indicate how long you have been in sales. [years]
Technical knowledge
Reflective measure; 7-point scale (strongly disagree, strongly agree); Böhm et al. (2020); Behrman and Perreault (1982)
To what extent do you agree with the following statements?
In my job, I am recognized as being skilled in…
... knowing the design and specifications of our company products/services.
... knowing the applications and functions of our company products/services.
... keeping informed of our company's production and technological developments.

Table A 2: HTMT ratios of reflective constructs

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SALSMTR													
2. SERVMTR	0.67												
3. MOPRO	0.37	0.14											
4. FORMAL	0.33	0.31	0.28										
5. GDP_PPP	0.11	0.24	0.21	0.11									
6. PD	0.16	0.27	0.12	0.10	0.22								
7. UAV	0.20	0.08	0.07	0.15	0.41	0.36							
8. IND	0.10	0.11	0.14	0.05	0.12	0.68	0.46						
9. LTO	0.06	0.15	0.11	0.21	0.29	0.14	0.07	0.14					
10. SALESEXP	0.09	0.06	0.10	0.24	0.08	0.16	0.08	0.13	0.12				
11. TECHKNO	0.27	0.13	0.17	0.35	0.07	0.10	0.14	0.06	0.10	0.09			
12. TIMGOD	0.09	0.05	0.16	0.08	0.12	0.08	0.04	0.04	0.15	0.16	0.08		
13. SALSPERF	0.32	0.31	0.34	0.42	0.10	0.12	0.06	0.13	0.26	0.27	0.36	0.28	

SALSMTR = Sales-related incentives; SERVMTR = Service-related incentives; MOPRO = Proactive market orientation; FORMAL = Formalization; GDP_PPP = Gross domestic product per capita (at PPP); PD = Power distance; UAV = Uncertainty aversion; IND = Individualism; LTO = Long-term orientation; SALESEXP = Sales experience; TECHKNO = Technical knowledge; TIMGOD = Relative time spent selling physical goods; SALSPERF = Salesforce performance.

Table A 3: Assessment of VBS HOC

LOC	Indicator	Indicator VIFs	Outer weights	p-value (outer weight)	Outer loadings	p-value (outer loading)	Outer VIF
Value discovery	VADISC1	2.67	−0.04	0.85	0.56	0.00	3.29
	VADISC2	2.93			0.60	0.00	
	VADISC3	2.14			0.52	0.00	
	VADISC4	3.64			0.66	0.00	
	VADISC5	3.61			0.63	0.00	
Value co-creation	VACOCR1	3.40	0.55	0.03	0.68	0.00	4.04
	VACOCR2	3.68			0.55	0.00	
	VACOCR3	3.74			0.67	0.00	
	VACOCR4	2.53			0.75	0.00	
	VACOCR5	2.67			0.79	0.00	
Value quantification	VAQUAN1	2.45	0.16	0.48	0.67	0.00	2.66
	VAQUAN2	2.84			0.69	0.00	
	VAQUAN3	2.22			0.50	0.00	
Value-based pricing	VAPRIC1	2.55	0.32	0.13	0.71	0.00	2.57
	VAPRIC2	2.59			0.69	0.00	
	VAPRIC3	2.20			0.69	0.00	
Value communication	VACOM1	2.75	−0.26	0.20	0.51	0.00	2.33
	VACOM2	3.43			0.55	0.00	
	VACOM3	3.13			0.52	0.00	
Value learning	VALRNG1	1.57	0.36	0.04	0.40	0.00	2.18
	VALRNG2	1.90			0.46	0.00	
	VALRNG3	2.49			0.73	0.00	
	VALRNG4	2.35			0.59	0.00	

CURRICULUM VITAE

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Education

09/2018 – 02/2022	**University of St.Gallen**	St.Gallen (CH)
	Doctor of Philosophy, Management	
04/2015 – 11/2017	**Karlsruhe Institute of Technology (KIT)**	Karlsruhe (DE)
	Master of Science, Industrial Engineering and Management	
08/2015	**Far Eastern Federal University**	Vladivostok (RU)
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09/2013 – 02/2014	**Institut National des Sciences Appliquées Lyon**	Lyon (FR)
	Exchange, Industrial Engineering	
10/2011 – 03/2015	**Karlsruhe Institute of Technology (KIT)**	Karlsruhe (DE)
	Bachelor of Science, Industrial Engineering and Management	
07/2011	**Lycée International des Pontonniers**	Strasbourg (FR)
	French and German A-Levels	

Journal Publications

Classen, M., & Friedli, T. (2021). 'It's not like we can charge for everything': revenue models to capture value from smart services in Pacific Asia. *Asia Pacific Business Review*, *27(3)*, 405–430. https://doi.org/10.1080/13602381.2021.1894770

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Professional Experience

Since 09/2021	**Deloitte Consulting AG**	Zurich (CH)
	Strategy Consultant, Monitor Deloitte	
01/2018 – 07/2021	**Institute of Technology Management, HSG**	St.Gallen (CH)
	Research Associate, Production Management	
04/2017 – 09/2017	**AUDI AG**	Ingolstadt (DE)
	Master Thesis, Controlling Product Planning	
09/2016 – 02/2017	**MTU Asia Pte. Ltd. (Rolls-Royce PS)**	Singapore (SG)
	Intern, Network and Distribution	
02/2015 – 07/2016	**Porsche AG**	Weissach (DE)
	Working Student, Procurement	
	Intern, Project Management 911	
10/2014 – 03/2015	**Institute of Stochastics, KIT**	Karlsruhe (DE)
	Tutor, Mathematics 1 for Business Students	
03/2014 – 04/2014	**ALSTOM Renewable Poland Sp. z o.o.**	Elblag (PL)
	Intern, Industrial Steam Turbines	
02/2013 – 11/2016	**Institute of Economics, KIT**	Karlsruhe (DE)
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