



Servitization for consumer products

an empirical exploration of challenges and benefits for supply chain partners

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**Servitization for consumer products: An empirical
exploration of challenges and benefits for supply chain
partners**

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Servitization for consumer products: An empirical exploration of challenges and benefits for supply chain partners

Abstract

Purpose: To increase sustainability of their products and enable new business opportunities, manufacturers explore servitization in consumer markets. Yet, the literature has not addressed this development. This study is one of the first to investigate the challenges and benefits for manufacturers and their supply chains when engaging in Business-to-Consumer (B2C) servitization.

Methodology: The study explores two unique cases of manufacturers of complex consumer products that aim to extend their service offerings to the end-users. Data were collected via semi-structured interviews, observations and secondary data.

Findings: First, we identify two factors as prerequisites for a servitized set-up: internal collaboration within the manufacturer and product characteristics (e.g. product complexity). Second, we identify the network as an important factor for B2C servitization, which includes the triadic set-up between manufacturer, installer and consumer. Third, we identify moderating institutional settings, such as regulations and consumer needs.

Originality: This research elaborates existing B2B servitization theory into an empirically informed theoretical framework for B2C contexts. It expands the view on servitization by introducing the network perspective to service a large number of geographically dispersed customers.

Keywords: Servitization; case study; consumer products; business to consumer, triads, circular economy, sustainability

1. Introduction

Manufacturers of complex consumer products, such as user electronics or air conditioners, face novel challenges due to consumer demands for additional service, extended product warranty, and changing sustainability legislation. A recent study by the European Commission (EC) highlights indeed an increasing need and wish of consumers to extend product life cycles through repairing and service provision (EC, 2018; Montalvo et al., 2016). Pressure on companies further increases through related, already implemented European directives, such as the Waste Electrical and Electronic Equipment (WEEE) Directive (EC, 2012). Taken together these drive manufacturers to investigate the potential for servitization in a Business-to-Consumer (B2C) context in order to be able to repair, exchange and take back manufactured products from customers with important implications for the delivery chain and the nature of their products. The present study aims to investigate these managerial challenges, suggested solutions and consequences.

The servitization literature has remained silent regarding the above challenges, with a predominant emphasis on Business-to-Business (B2B) settings (Baines et al., 2017; Kastalli and Van Looy, 2013; Vandermerwe and Rada, 1988). The limited studies on B2C servitization (Kook et al., 2020; Mahut et al., 2017; Opresnik and Taisch, 2015) have ignored specific characteristics such as the need for geographically dispersed service facilities (Chase and Apte, 2007), the complexity of consumer interactions (Halldórsson et al., 2019), or the involvement of multiple partners in a service network (Ayala et al., 2017; Zhou et al., 2020). Consequently, research has also not addressed, for example, triadic set-ups involving intermediaries that sell, install and serve customers, with limited contact between manufacturer and customers. Taken together, despite an increasing societal need, the effects of these considerable differences between B2C and B2B contexts are not well

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3 understood nor investigated. This is the gap the present study aims to fill. Our main
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5
6 research question is:

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8 *What are the challenges and benefits for manufacturers and their supply chains*
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10 *when engaging in servitization for their consumer products?*
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13 Through this work, we provide preliminary insights into B2C servitization, its
14
15 managerial challenges and solutions as well as supply chain consequences. Based on an
16
17 initial conceptual framework rooted in the existing B2B servitization and service operations
18
19 literature, we empirically build our paper on two cases in two large companies, who are first
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21 movers into this new area of servitization and aim at extending their services for consumers.
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23 The cases provide insights into a number of different products based on dissimilar
24
25 technologies. The findings show the multitude of managerial concerns in B2C settings,
26
27 including the need to create, manage and govern a servitization network between
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29 manufacturers, installers and consumers. Blended with our theoretical base, we use these
30
31 to develop implications and suggestions to extend the field of B2C servitization.
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37 This research extends the servitization literature to the B2C context, showing the
38
39 distinct supply chain implications. Here, the identification and linking of four emerging
40
41 constructs - internal collaboration, product characteristics, network and institutional
42
43 settings - enables substantial elaboration of existing understanding. As most existing studies
44
45 on servitization have focused on B2B contexts, this research establishes an empirically
46
47 informed theoretical framework (Kivunja, 2018) as a first step to towards theory on B2C
48
49 servitization. This research expands our view on servitization, going beyond the original idea
50
51 of close service dyads with few customers (Vandermerwe and Rada, 1988; Wise and
52
53 Baumgartner, 1999) by adding the network perspective to service large numbers of
54
55 geographically dispersed customers.
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3 This research has important implications for managerial practice and public policy as
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5 their decisions can enable or restrict B2C servitization. Managers need to take a broad
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7 perspective by more systemic evaluations of their actions, related to both cross-disciplinary
8
9 collaboration within the manufacturer (to enable service-focused product design and
10
11 internal operations) as well as the supply chain around them. While this consideration is
12
13 emerging in the B2B servitization literature (e.g. Raddats et al., 2019), our research shows
14
15 that these considerations are even more important determinants for B2C servitization. In
16
17 addition, our findings show that policy makers shape part of the institutional context that
18
19 either enables or hinders the potential for B2C servitization and the associated sustainability
20
21 of consumer products. Our findings show that existing and future policies form strong
22
23 incentives for the decisions made by manufacturers, installers and (to a lesser degree)
24
25 consumers. Policy makers can use our insights to draft a thoughtful combination of
26
27 regulations that not only enable and encourage servicing and recycling of consumer
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29 products but also regulate the wider legal implications in terms of product life cycle,
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31 including product warranty and legal liability for failures.
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41 **2. Literature review**

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43 We base this study on existing literature on servitization, which has focused on Business-to-
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45 Business (B2B) settings (Section 2.1). We discuss how these may apply to the Business-to-
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47 Consumer (B2C) setting (Section 2.2) and develop a conceptual framework for our empirical
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49 analysis (Section 2.3).
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54 **2.1 Servitization**

55
56 Servitization describes the strategy of manufacturing firms to “offer fuller market packages
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3 or bundles of customer-focused combinations of goods, services, support, self-service, and
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5
6 knowledge" (Vandermerwe and Rada, 1988, p. 314), which support the product's life cycle
7
8 (Kastalli and Van Looy, 2013). Servitization has predominantly focused on manufacturing
9
10 companies' change of offerings towards the application of technology-based expertise, skills
11
12 and competencies to solve buyer problems (Schmenner, 2009; Zhang et al., 2016).
13
14 Servitization requires integrated Business-to-Business (B2B) relationships, usually in a dyadic
15
16 set-up (Kreye, 2017; Raddats et al., 2017) with **benefits and costs** for both provider and
17
18 buyer. Providers stand to receive higher profit margins with more stable and long-term
19
20 predictable cash flows (Wise and Baumgartner, 1999), and increasing competitiveness
21
22 through buyer lock-in (Schmenner, 2009). Buyers stand to reduce the operational costs of
23
24 equipment by outsourcing maintenance activities and focusing on core activities
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26 (Akkermans et al., 2019; Wise and Baumgartner, 1999), along with optimised buyer
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28 operations through providers' technical expertise (Kastalli and Van Looy, 2013).
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35 The servitization literature (Baines et al., 2017; Raddats et al., 2019; Sousa and da
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37 Silveira, 2017) stresses a need to **change operations** of the providers from traditional
38
39 product-based processes to processes able to deal with customer inputs for service
40
41 provision (Kreye, 2017; Raddats et al., 2017). As a result, servitized manufacturers need to
42
43 manage an increased information flow, ensuring that relevant information, such as the
44
45 equipment's condition, is available at the right time. This makes internal communications
46
47 and information management one of the additional tasks for servitized manufacturers.
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52 Finally, the changed business **relationships** between provider and customer need
53
54 **governance**: i.e. appropriate coordination and control mechanisms (Bastl et al., 2019). To
55
56 coordinate B2B service relationships, providers often rely on relational coordination
57
58 mechanisms (Selviaridis and Norrman, 2014) due to the long-term and close relationships
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1
2
3 with the customer (Raddats et al., 2017; Vargo and Lusch, 2008). These relationships include
4
5 a series of exchanges and planned and administered transactions (Tax et al., 2013),
6
7 increasing predictability and reducing uncertainty for both partners (Kreye, 2017). Such
8
9 relational governance is further strengthened by multiple contact points between partners
10
11 (Grönroos, 2011; Sampson and Spring, 2012): both personal (service engineers repairing or
12
13 maintaining the product, (Kreye et al., 2015) and impersonal interaction (e.g. digital
14
15 monitoring technology or remote operation, (Larivière et al., 2017).
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21 ***2.2 Applying servitization to B2C***

22
23 There are differences between B2B and B2C services (Kreye et al., 2018; Tax et al., 2013),
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25 which likely prohibit simply transplanting the above discussed insights from B2B to the B2C
26
27 context. B2C services can be characterised through (1) a large number of geographically
28
29 dispersed service facilities (Chase and Apte, 2007); (2) consumer interactions span both
30
31 transaction-based (one-off) and relationship-based (planned and administered) service
32
33 encounters (Tax et al., 2013); and (3) less complex interactions between provider and
34
35 consumer based on singular channels of contact (Halldórsson et al., 2019). These
36
37 characteristics of consumer services result potentially in changes to servitization in this
38
39 setting. For example, the large, geographically dispersed customer base requires a large
40
41 number of front-line employees (Zhang et al., 2015) and prevents the manufacturer to act
42
43 and service customers directly, implying the need for a triadic network for B2C servitization,
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45 where an intermediate, the installer, provides the front-line service (Finne and Holmström,
46
47 2013). Below, we further assess and contextualize the three main areas of attention:
48
49 distribution of benefits and costs, distribution of operational tasks, and relational
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51 governance based on these differences to B2B servitization.
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3 The ***distribution of benefits and costs*** needs to be considered in B2C. While provider
4
5 benefits may be similar in a B2C setting as in B2B, the benefits to consumers will differ.
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7 Instead of the economic benefits predominantly described for buyers in B2B servitization,
8
9 consumer motivation may stem from increased life expectancy of engineered products and
10
11 hence reduced environmental impact, as evidenced by a recent study by the European
12
13 Commission (EC, 2018). In addition, adding intermediaries required to service a large
14
15 number of consumers adds a third partner, creating a service triad. Service triads are
16
17 defined as a collaboration, where a buyer contracts a supplier to deliver – part of – a service
18
19 directly to a buyer (Wynstra et al., 2015). The distribution of benefits and costs in the triad
20
21 will likely be different from B2B, typically dyadic settings.
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28 Similarly and related, the ***distribution of operational tasks*** requires reconsideration
29
30 in B2C settings, stemming particularly from the likely more complex set-up of operations in
31
32 a service triad. Many of the customer-contact activities are usually handled by an installer,
33
34 who effectively acts as the direct service provider in the triad (Wynstra et al., 2015). The
35
36 service triad literature has also predominantly focused on business settings and specifically
37
38 on the manufacturer's role in managing the relationships (Karatzas et al., 2016; Wynstra et
39
40 al., 2015). While in these business settings, manufacturers have an important integrator role
41
42 (Ramirez Hernandez and Kreye, 2021), this role will differ in B2C settings because installers
43
44 are the predominant customer contact point. Therefore, the distribution of operational
45
46 tasks among manufacturer, installer and consumer in B2C servitization needs to be
47
48 considered.
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54 The B2C servitization context also affects ***relationship governance***. In most B2C
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56 services, front-line employees such as restaurant waiters (Schaarschmidt and Höber, 2017)
57
58 or hotel receptionists (Zhang et al., 2015) often are a predominant contact point for service
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1
2
3 sales and delivery (Kreye et al., 2015; Sampson and Spring, 2012). B2C relationships can
4
5 have a transactional character, which is focused on the individual service engagement, or a
6
7 relational character, which is based on long-term relationships (Tax et al., 2013). In other
8
9 words, consumer services vary in terms of the relationship characteristics. This and the
10
11 effects of actions by a potential third party in case of a triadic setting (Hartmann and Herb,
12
13 2015; Modi et al., 2015) might affect relationships and their governance in B2C servitization,
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15 which may require a mix of relational and formal coordination and control approaches.
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22 ***2.3 Conceptual basis for B2C servitization***

23
24 Based on the discussions above, three concepts emerge as the conceptual basis for
25
26 investigating our research question. First, division of ***benefits and costs*** have been described
27
28 as central prerequisite for servitization (Vandermerwe and Rada, 1988; Wise and
29
30 Baumgartner, 1999). For B2C settings, this would include not only the benefits and costs of
31
32 the manufacturer and customer (Vandermerwe and Rada, 1988; Wise and Baumgartner,
33
34 1999), but also of potential additional actors in the supply chain, such as the installer (Finne
35
36 and Holmström, 2013). Second, in a B2B setting the core is to decide on which division of
37
38 ***operational tasks*** the manufacturer will perform (Bustinza et al., 2019; Rabetino et al.,
39
40 2018; Zhang and Banerji, 2017). It seems that given the geographical dispersion of
41
42 customers and the triadic setting, the division of additional tasks is of interest in the B2C
43
44 setting, as more options emerge. Third, our discussion also pointed at ***relationship***
45
46 ***governance*** (Sampson and Spring, 2012) through coordination and control (Bastl et al.,
47
48 2019). The wide variation of relationships in consumer settings and the need for a triadic
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50 set-up with installers as the service providers create a particularly wide range of potential
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52 relationship governance arrangements in B2C servitization. In addition to these three
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3 concepts, we explore the effects of – or changes in - **context** in our analysis as a fourth
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5 concept. The reason for this is partly motivated because regulations play a role, as indicated
6
7 in our introduction and partly because contingencies and context affect in many supply
8
9 chain management related efforts (e.g. Giménez et al., 2012) often at different levels (Flynn
10
11 et al., 2016). This includes factors, such as higher regulation in case of consumer products
12
13 and their functioning, including warranty periods and liability (Karatzas et al., 2016;
14
15 Valtakoski and Witell, 2018). We acknowledge that these contextual factors can influence
16
17 the ability or need to servitize and its configuration (Reim et al., 2019). Table I presents an
18
19 overview of these identified concepts that are the foundation for our empirical
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21 investigation.
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28 <Please insert Table I about here>
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31 **3. Methodology**

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33 This study aims to build the theoretical foundations for the field of B2C servitization. As we
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35 base much of our insights on existing theory in B2B servitization (Section 2), which we aim
36
37 to extend to a novel context of B2C, we position this research as theory elaborating (Fisher
38
39 and Aguinis, 2017). Theory elaboration is understood as *“the process of conceptualizing and*
40
41 *executing empirical research using pre-existing conceptual ideas or a preliminary model as a*
42
43 *basis for developing new theoretical insights by contrasting, specifying, or structuring*
44
45 *theoretical constructs and relations to account for and explain empirical observations”*
46
47 (Fisher and Aguinis, 2017, p. 441). A qualitative approach via case studies is a suitable
48
49 method for theory elaboration (Ketokivi and Choi, 2014). Case studies offer rich data that
50
51 enable an in-depth analysis of the studied phenomenon as well as identifying contextual
52
53 influences (Voss et al., 2002; Yin, 2018), fitting our research aims.
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3.1 Case selection

We present insights from two empirical case studies to enable contrasting observations “across different contexts” (Fisher and Aguinis, 2017, p. 445). In fact, novelty is such that currently only few organizations extend servitization strategies to consumer products as of market trends and regulatory pressures in this area are relatively recent (EC, 2018; Montalvo et al., 2016). Therefore our case selection is mainly based on unique or atypical cases (Voss et al., 2002), being organisations that consider or started efforts into B2C servitization. Given the strategic nature of such efforts, case selection was based on existing and established contacts with organizations and as such opportunistic because we found it impossible to sample the potential population systematically for this emerging field of practical concern. In contrast to conventions in complex consumer product industries, the two case companies explored new strategic choices in the form of B2C servitization, providing unique possibilities for theory elaboration. Case A fitted our purpose as it offered different types of heating equipment in consumer homes and apartments blocks. Case B fitted as being a manufacturing company operating in the water supply sector, providing products and appliances for water treatment. Many of these products and appliances are part of an installed base in private homes and blocks of flats. Both cases fitted our theoretical setting and conceptualisation as both produce consumer products where existing and developing regulations point towards a more service-oriented set-up, such as the WEEE framework for consumer electronics or warranty demands (EC, 2012). Additionally, to facilitate comparison, the cases have similar products, as they require relatively little direct consumer interaction during normal operations. Finally, both cases were at the initial stage of considering and investigating implementation of a B2C servitization strategy. At the same time, the cases offer differences in some potentially

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2
3 important factors, such as the technologies, delivery strategy and institutional environment
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5
6 at large. Together these support the theory-elaborating nature of this research, mitigating
7
8 the possible detrimental effects of our case study selection.
9

10 11 12 **3.2 Data collection** 13

14 The data were collected from multiple sources of evidence (Yin, 2018). The researchers had
15
16 ongoing, long-term collaborations with both case companies focusing on their existing
17
18 business strategy and operations in servitization. Initially, senior managers were interviewed
19
20 before later directly involved senior managers and operational respondents were included
21
22 in our data collection. The core of our data were 29 semi-structured interviews with
23
24 employees and senior managers in different functional fields, as well as installers, and
25
26 consumers across the two cases (Table II). Interviewees were selected as being
27
28 knowledgeable as is clear from their senior positions and/or performed and monitored tasks
29
30 directly related to technical and service tasks for the chosen product and its context
31
32 (Gibbert and Ruigrok, 2010). Others were also referred to as relevant and knowledgeable
33
34 informants (snowballing). An interview guide was developed iteratively with respondents as
35
36 case-specific understanding emerged. Initially, open questions explored the interviewees'
37
38 view on opportunities and challenges for B2C servitization, as well as existing management
39
40 capabilities in the case organisation. These discussions enabled an initial understanding of
41
42 the potential for B2C servitization in the case companies and initially offered a more open
43
44 approach to data collection. This initially inductive approach was deliberately chosen
45
46 despite the theory-elaborating nature of this research to ensure suitability of the selected
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48 cases and enable the researchers to capture potentially new issues beyond the conceptual
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50 framework. Eventually, a more structured approach based on the conceptual framework
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3 (Table I) ensured that theoretically identified concepts were included in the interviews
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5 through probing. This offered comparability between interviewees and cases (Yin, 2018).
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7
8 The Appendix shows the final list of questions and topics discussed in the interviews.
9
10 Interviews varied between 30 and 90 minutes in length. In addition, observations at the
11
12 company sites and collected secondary data (including company meetings, regulation
13
14 documents, and company memos and reports) complemented the in-depth insights by
15
16 providing important background information and sources for confirming insights from the
17
18 interviews.
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23 <Please insert Table II about here>
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26 **3.3 Data analysis**

27
28 Data were analysed using qualitative coding through thematic analysis to provide rigorous
29
30 and consistent insights across the empirical data, enabling connection between theoretically
31
32 and empirically derived concepts (Miles et al., 2014; Yin, 2018). Specifically, we used a two-
33
34 step process. First, within-case analysis focused on each individual case to understand its
35
36 specific dynamics and challenges. We combined deductive and inductive elements fitting
37
38 our theory elaboration aim. We started data reduction to identify first-order themes firmly
39
40 rooted within the case evidence. Subsequently, these themes were clustered deductively
41
42 based on the conceptual framework (Table I). In doing so, we detected that some first-order
43
44 themes could not be interpreted or associated with any of the existing theoretical, a priori
45
46 categories. Hence, we clusterd these into newly emerging aggregate themes, such as
47
48 product complexity and internal collaboration. At the same time, our data did not show any
49
50 evidence for the relevance of the division of operational tasks, which therefore was
51
52 excluded from further analysis. Due to the specific triadic set-up of B2C servitization, our
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3 findings suggest that the division of tasks does not change substantially as front-line services
4
5 are still provided by intermediaries. Based on this process, we identified four aggregate
6
7 themes – product characteristics, internal collaboration, network, and institutional settings.
8
9
10 In order to further validate our findings we obtained feedback in presenting initial
11
12 conclusions to the individual case companies, which further enhanced our understanding.
13
14 Table III provides insights into our coding structure, including example quotes, first-order
15
16 and aggregate themes.
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20 <Please insert Table III about here>
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23
24 Second, the cross-case comparison enabled contrasting of insights between both cases.
25
26 Here, the case-specific insights regarding the four aggregate themes were compared,
27
28 showing similarities and differences between them. This provided insights regarding the
29
30 nuances of the four aggregate themes identified in the within-case analysis for further
31
32 conceptual development and theory development (Welch et al., 2011). Figure 1 shows how
33
34 first-order themes were combined into aggregate themes based on our abductive approach,
35
36 making explicit where existing theoretical constructs from our initial conceptualization
37
38 (Table I) were employed.
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43 <Please insert Figure 1 about here>
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46 47 **4. Findings** 48

49
50 This section presents the within-case analysis of both cases. Comparison between these
51
52 insights is included in the discussion.
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54

55 56 **4.1 Case A** 57

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59 **Case context:** Case A was part of a large multi-national company operating in a diversity of
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2
3 markets in terms of geography, products and technologies. Case Company A's products
4
5 were sold through and installed by independent installers, who also sold and installed
6
7 similar competitor products. These installers provided advice and often maintenance and
8
9 repair services throughout the product's lifecycle. Case Company A provided technical
10
11 support and advice to these installers, as well as service parts if needed. On average,
12
13 products needed replacement after 15-20 years. Setting up a service network themselves
14
15 would not only be a major investment given the size of the consumer base, but building
16
17 such a network would potentially destroy the existing relationship with installers, that
18
19 played an important role in consumers' buying decisions. Still, warranty and reputation and
20
21 the difficulty to quickly detect systematic failures in delivered and installed products, and
22
23 the wish to have in-depth insights into the product use, made Case Company A decide to
24
25 explore options for servitization in a triadic setting. Finally, there is also a believe that
26
27 customers would like to have more direct contact with the manufacturer and that markets
28
29 change, as *'Customers like to be able to get objective advice, but this is not available enough*
30
31 *via installers. That is when customers start to search online and contact the producers of the*
32
33 *heating devices themselves'* (Director Sales Operations).
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42 **Product characteristics:** Standard products had been produced for 30 years with
43
44 little further (fundamental) innovation possible. A new line of products, which were more
45
46 complex and technologically advanced, was developed driven by changes in energy usage
47
48 and was now gaining market share. The new products had some fundamental different
49
50 properties, requiring specific knowledge and capabilities: *'When products become more*
51
52 *complex, knowledge about it becomes increasingly valuable'* (Sales Manager) as well as
53
54 *'These [Innovative products] and the installation thereof create a need for knowhow'*
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59 (Director Installer). These new products offered increased options for monitoring products
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3 in use at the consumer's site. These new products would help the installer to provide a
4
5 better service to the consumer, get access to a new promising market and at the same time
6
7 extend the service offering to the consumer by providing maintenance and additional
8
9 services. Servitization would be easier for the newer and more complex products where an
10
11 extended service offering is more valued. In other words, product characteristics
12
13 determined whether B2C servitization was possible in Case A, as also the Director Installer
14
15 realized: *'parties ought to think differently'*.
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20
21 **Internal collaboration:** Interestingly, there was also a major issue internally for the
22
23 manufacturer to be able to manage and control or even realize servitization. As the Sales
24
25 Manager Commercial Heating noticed, *'There has to be a culture change for the services*
26
27 *that are added and adjusted to fully integrate'*. Similarly, the Director of Sales Operations
28
29 pointed out that *'We need to change our culture, since we are familiar with selling products,*
30
31 *and we need to start focusing on service and selling a promise'*. This would also enable Case
32
33 Company A to control service quality in the product usage. *'We want to control the first use*
34
35 *of [these products], to make sure that it is installed well'* (Sales Manager Commercial
36
37 Heating). This would additionally enable Case company A to control the extended legal
38
39 liability to some extent.
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45
46 **Network:** A servitized network would require collaboration with installers, who
47
48 would continue to be responsible for installing and maintenance/repair. As the Director
49
50 Product Management voiced: *'We have to be careful in not messing up our collaboration*
51
52 *with installers, when we choose to servitize'*. The required involvement of and cooperation
53
54 with the installers was seen as one of the main challenges for the (current) mature products
55
56 and markets, as the Director Product Management said *'When tasks and relationships*
57
58 *change due to servitization, I think it is important to inform and involve the installers that*
59
60

1
2
3 *you want to work with*'. The Director Installer mirrored this view as follows: *'You cannot*
4
5 *circumvent some installers to feel like their tasks have been stolen*'. Redistributing tasks
6
7
8 would be challenging, there would be a need to either by-pass existing relationships
9
10 between consumer and installer or shape cooperation in a mutual beneficial way. Given the
11
12 novelty and some new tasks, this would be easier for the new products, where installers
13
14 would receive support from the manufacturer as the manufacturer could take care of
15
16 regulations ensuring safety and help installers *'... in being certified to sell [these products]*
17
18 *and perform trainings that teach installers how to install them*' (Sales Manager).
19
20
21

22
23 In a product-based set-up, the installers had a pure transactional relationship with
24
25 the manufacturer, while they generally had a more service-related, long-term relationship
26
27 with the consumers. Still, frequency of interaction was limited. However, moving into
28
29 servitization offered installers direct association with the manufacturer. Consumers
30
31 acknowledged that they would like the installer to be more connected to the brand and
32
33 reputation of the manufacturer. The Director of Sales Operations explained: *'Our name*
34
35 *makes that a lot of installers are possibly willing to collaborate with us, as it is a trusted*
36
37 *brand which the customers like*'. The installer might also benefit from the back-up and
38
39 technical support of the manufacturer, which would give better access to consumers and
40
41 enable to offer a better product and service, while the consumer might have more trust and
42
43 certainties in a triadic service arrangement and installed product: *'When [Company A] uses*
44
45 *pre-selected installers, I would trust the installers more*' (Customer). All in all, in terms of
46
47 costs and benefits, the aim to *'create a relationship where we and the installers are both*
48
49 *feeling like we will benefit from a new servitized situation.*' (Director Sales Operations) was
50
51 possible. In addition, the manufacturer aimed to influence the installers to recommend their
52
53 products to the consumer and support them with technical advice. This means that the
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1
2
3 relationship between manufacturer and installer would become tighter in a servitized set-up
4
5 for the novel and complex products, i.e. become *'partners that are willing to work on behalf*
6
7 *of [Company A]'* (Director Installer). Here, the installers' motivations in terms of the
8
9 expected advantages of an association with the manufacturer's brand would create a strong
10
11 driver towards the creation of the closer relationships. This type of relationship would
12
13 create dependencies for the installer, but also options as it provided better market access
14
15 and builds up knowledge.
16
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19

20
21 The more intense contacts between the parties and specifically between the installer
22
23 and the manufacturer required additional mutual investment between the manufacturer
24
25 and the installer in terms of training: *'Installers can only install our [new products] if they*
26
27 *followed a training at [Company A]'* (Director Product Management). Additionally, the
28
29 manufacturer could assume the legal responsibility and responsibility for required
30
31 certification for the installation of the product, providing a source of income: *'The regulation*
32
33 *... is a typical example of a service that can be capitalized'* (Sales Manager). Even without a
34
35 formal contract, such involvement of the manufacturer might feel for the consumer as a
36
37 direct relationship with the manufacturer: *'Licenses and a guarantee of installer's*
38
39 *knowledge gives trust'* (Customer). In addition, some installers would acquire a different
40
41 status as being a selected installer, which could improve their competitive advantage on the
42
43 market.
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49
50 **Institutional settings:** Interestingly, the company strongly assumed consumers
51
52 would welcome additional services from the manufacturer (or others) as *'We move towards*
53
54 *selling less of a product; it is more and more about the services that are attached to the*
55
56 *product'* (Director Sales Operations). In other words, consumers' changing requirements for
57
58 more services created a strong driver for servitization in Case A. In addition, also the
59
60

1
2
3 certification of the product was of importance *'we are certified to handle any aspect of it,*
4 *which is a service for our customer'* (Director Sales Operations) and would limit liability
5
6 issues or claims. Finally, closer involvement of the manufacturer would also help to prevent
7
8 failures to happen that would be seen as dangerous, leading to reputational losses.
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13 14 **4.2 Case B**

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16
17 **Case context:** Case Company B's main motivation for servitization was increased
18
19 sustainability and competitiveness. The Senior Director of Technology Product manufacturer
20
21 explained, *'we can differentiate ourselves from our competitors with [having] the least*
22 *impact on the environment. And this is all about takeback systems, reuse and repairability.'*
23
24 While their existing approach was to outsource the disposal of old units and materials,
25
26 which was required by existing regulations (WEEE guideline), they now aimed at actively
27
28 driving sustainability through a servitized set-up. Here, they had already improved material
29
30 use for their products with their supply chain. Servitization would offer the opportunity to
31
32 work with partners downstream to increase environmental sustainability.
33
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39 **Product characteristics:** B2C servitization required change of the product designs to
40
41 enable service. Case company B needed to integrate the installer's wishes into their
42
43 products and servitization promises. The Senior Product Line manager summarised this as
44
45 follows: *'What is it that really gives him benefit? It can be that it is easy to store, easy to*
46 *order or to have components cover many applications so he does not have much in stock.'*
47
48 Case company B put the starting point at the product design as the Head of Technical
49
50 Innovation manufacturer explained: *'if you need repair on site, it [the service] takes too long*
51 *in relation to the downtime and the number of hours an installer is going to do. Then there*
52 *are also some considerations about how to scrap it.'* As a result, installers currently just
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3 replaced the whole product. For a more sustainable service-based set-up, the installer
4
5 needed to be able to service the product quickly and repair or replace individual
6
7 components. Current products saw limited serviceability due to the importance of reliability
8
9 as the Senior Marketing Manager explained: *'All electronics are completely molded into*
10
11 *plastic, which makes it completely impossible to disassemble afterwards. It is hard to get a*
12
13 *clean plastic part and a clean core or electronics part.'* Additionally, increasing serviceability
14
15 *'... means that you have a platform for some solutions that you use across the products. So a*
16
17 *little more modular'* (Director of Product Compliance). By enabling the exchange of
18
19 components rather than whole systems and standardising the components, services could
20
21 be provided quickly and cost effectively and replaced components (and products at their
22
23 end-of life) could be returned to Case Company B for disassembly and remanufacturing. The
24
25 assumption was that if enabled through appropriate product designs, installers would be
26
27 able to repair products more frequently and collaborate with the remainder of the network
28
29 for servitization and increasing environmental sustainability.
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36
37 **Internal collaboration:** A servitized set-up required a different management
38
39 approach and internal changes from Case Company B as the Director Product Compliance
40
41 explained: *'I very much see this circular economy theme as super interdisciplinary, i.e. really*
42
43 *across the whole company. It requires something to involve the right places at the right*
44
45 *times, we really need to be good at working on this.'* In other words, B2C servitization
46
47 required Case company A's different departments to share information and integrate their
48
49 processes much more seamlessly.
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53

54
55 **Network:** In a product-based set-up, Case company B was part of a supply chain that
56
57 included wholesalers or system manufacturer s, who then sold the product (or physical
58
59 system) to installers. The installers distributed them along with competitor products to
60

1
2
3 consumers, which involved installing the chosen product into private homes and servicing it
4
5 when needed. In other words, installers were the front-line service providers. In a servitized
6
7 set-up, installers were still required as the Senior Service Manager explained: *'[Case B] still*
8
9 *wants service partners; we cannot have operational employees service the whole world. We*
10
11 *will have a combination of our own people, who have a lot of expert knowledge, and then*
12
13 *have a good network of partners.'* Wholesalers would not drive the servitized set-up as the
14
15 Programme Manager explained *'The wholesaler I see more as a stocking facility. They take*
16
17 *what is hot in the market at the time, so they make sure to have it on the shelf, as the*
18
19 *customer would like. And it is our job to make sure to put something on their shelf the*
20
21 *customer would like.'* Thus, Case company B focused their attention for servitization on the
22
23 network with installers and consumers.
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30 Relationships in the distribution chains were predominantly transaction-based with a
31
32 focus on product price due to the many competitors on the market. To enable a servitized
33
34 set-up, a relational approach needed to be built with installers based on mutual trust and
35
36 commitment. This could be achieved through, for example, shared marketing between
37
38 manufacturer and installers as the Lead Project Manager explained: *'We can share the story.*
39
40 *(...) it is not a singular transaction [anymore].'* For example, the manufacturer and installer
41
42 could jointly market the environmental sustainability of their remanufactured products by
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44 highlighting the recycled nature of used material more.
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50 The relationship between manufacturer and installer was already changing based on
51
52 the use of digital technology and support apps for product installation and operation. The
53
54 Senior Service Manager explained: *'[We are] trying to create more value add to the installer*
55
56 *at the moment, which they can also use towards the customer.'* To increase relational
57
58 closeness between manufacturer and installer, the manufacturer had identified different
59
60

possibilities as the Senior Service Manager explained: *'We have some different programs. [There is] a marketing program around end-sized [products]. How can we help them [installers] sell more of some products we see being sold elsewhere. How can we have some annual development programs together that ensure that we both move in the right direction? And through that they also share the right information [with consumers] and ensure the growth, so that is followed up.'* While this reflects the already realised potential for closer installer engagement, it is also clear that it needed to be expanded to the service business to enable more collaborative relational engagement between manufacturer and installers.

These changes required a different approach to relationship management and control from manufacturer as the Senior Service Manager explained: *'[We need] to have a more professional approach to our service partners. How can we ensure they inspect properly? How can we ensure that they appear as [our] extended arm? How can we ensure that we also enable them, and also that way win more business and expand their business in a more professional way.'* This mirrors that along with the above mentioned need for closer relationships and engagement in training activities also closer control over installers' activities was required.

Institutional settings: The main drivers and main benefactors of a servitized network would be the product- manufacturer (higher market share) and the consumer (more sustainable products). The Programme Manager explained: *"... sustainability plays a large part of the awareness of the customers. They start to worry about where the materials come from, how it is produced and what is the footprint for this product. And can it be maintained while still maintaining quality.'* To achieve this as a competitive advantage, Case company A lobbied for national regulation to define *'the methods in this document include design*

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3 related criteria of the product and support-related criteria when the product is placed on the
4
5 market, taking into account knowledge of parts that are likely to fail, need replacing, or have
6
7 reuse potential.' (Regulation draft document TC10-WG3_N102). This was aimed at
8
9
10 furthering the institutional drive towards B2C servitization.
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14 **5. Cross-case analysis and discussion**

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17 Below we discuss and elaborate the four identified constructs (aggregate themes from our
18
19 data analysis) for B2C servitization and then their connections that emerged from the cross-
20
21 case analysis. Finally, we present the limitations of our study.
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26 **5.1 Cross-case analysis: Characterizing B2C servitization**

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28 This study identified four constructs that can be associated with B2C servitization. First, we
29
30 find that **internal collaboration** within the manufacturer needs to be improved to increase
31
32 the level of cross-functional cooperation. While internal collaboration has been indicated in
33
34 the B2B literature (Bastl et al., 2019; Kreye, 2017; Raddats et al., 2017; Sampson and Spring,
35
36 2012), it is specifically recommended for highly complex offerings, such as performance-
37
38 based agreements (Akkermans et al., 2019). In contrast, our research suggests, that for B2C
39
40 servitization, this is an important consideration irrespective of the nature of offering.
41
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43

44
45 Additionally, increased internal collaboration might oppose earlier suggestions in the B2B
46
47 servitization literature, which have focused on establishing separate service departments
48
49 (Baines et al., 2017; Reinartz and Ulaga, 2008). Our study hence extends the literature by
50
51 showing the need for increased internal information sharing between all related service-
52
53 based and product-based functions. In line with related research streams, such as Industry
54
55 4.0, some of these could be overcome or enabled by digital technologies for knowledge
56
57 sharing and collaboration to overcome existing barriers in an organisation (Larivière et al.,
58
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1
2
3 2017). The role of internal collaboration might be similarly important beyond B2C
4
5 servitization, such as outsourcing of transportation and service triads in general
6
7 (Halldórsson et al., 2019), and even for B2B servitization. Here, we suggest these as areas
8
9 for future research.
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12
13 A second important finding is the relevance of **product characteristics**, specifically
14
15 product complexity and its management through modular product designs. Interestingly,
16
17 product characteristics are rarely discussed explicitly in the B2B servitization literature.
18
19 Although empirical studies typically focus around complex products (Baines et al., 2017;
20
21 Bustinza et al., 2019), the actual servitization seems not affected by it. Our findings show
22
23 the central role of product complexity as an enabler of B2C servitization, but might be
24
25 extended to B2B contexts. More modular product designs might open up options to provide
26
27 quick and efficient servitization on-site by separating or replacing a module and repairing it
28
29 at another location. Moreover, it suggests that related concepts in a wider range of OM and
30
31 SC literature, such as sustainability (Wilhelm et al., 2016) or circular economy (Selviaridis
32
33 and Norrman, 2014) might benefit by considering potential relations between product
34
35 complexity and product design and integration in the supply network.
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43 The third construct for B2C servitization is **network**. We find that network choices
44
45 regarding partner selection, training, relationship governance and joint marketing to
46
47 consumers enable shaping B2C servitization. Similar issues have been explored in the
48
49 literature. For example, the importance of partner selection applies to service triads in
50
51 general (Hartmann and Herb, 2015; Modi et al., 2015). Similarly, relationship governance
52
53 has received much attention in the B2B servitization literature (Kreye et al., 2015; Raddats
54
55 et al., 2017) as well as in the service operations literature in general (Bastl et al., 2019;
56
57 Selviaridis and Norrman, 2014). Our research shows the importance of relationship
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1
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3 governance for B2C servitization, as manufacturer s need to build relational capabilities
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5
6 when engaging in this strategy.
7

8 Finally, this research showed as we suspected the role of **institutional settings**.
9
10 Specifically, consumer wishes and regulatory frameworks affect the potential requirements
11
12 for product functioning and serviceability. The importance of regulatory influences is
13
14 perhaps unsurprising given the high level of regulations in consumer products (e.g. EC,
15
16 2012), however, the servitization literature so far ignored institutional dependence of
17
18 servitization strategies. Our research shows at least the relevance for consumer products,
19
20 but given an increased focus on sustainable supply, this might be put more prominent on
21
22 the research agenda. Even more, as servitization indirectly links to institutional settings in
23
24 the context of public buyers, such as hospitals, or in offering servitization in different
25
26 national set-ups (Pereira et al., 2019), our research may also point towards further
27
28 investigation in B2B servitization.
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36 ***5.2 Cross case analysis: Conceptualizing B2C servitization***

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39 Our findings not only suggest the relevance of known and new constructs for B2C
40
41 servitization, but also connections between them. The cross-case analysis strongly suggests
42
43 that there are two prerequisites for B2C servitization: internal collaboration and product
44
45 characteristics.
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49 Internal collaboration is stressed in both cases as an enabler for product-related
50
51 changes. This connection aligns with suggestions from the servitization literature, which has
52
53 highlighted the need for increased internal communication for successful service provision
54
55 (Lightfoot et al., 2013; Sousa and da Silveira, 2017). The connection between internal
56
57 collaboration and network adds to the discussion on the (joint) effects of internal and
58
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3 external integration (starting with Frohlich and Westbrook (2001), for recent debate see
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5
6 Barratt and Barratt (2011) and Roscoe et al. (2020)). In that debate, our insights point
7
8 towards an ordered connection with internal collaboration being a prerequisite for B2C
9
10 servitization (external collaboration).
11

12
13 Product characteristics are also seen as a prerequisite for B2C servitization, but in
14
15 different ways. On the one hand, products that are more complex enabled B2C servitization
16
17 through the need for more technical knowledge for servicing, as Case A showed. On the
18
19 other hand, reducing complexity through modular redesign made B2C servitization possible
20
21 in Case B. This could suggest an inverted u-shape relationship between product complexity
22
23 and B2C servitization, with potentially an optimal level of product complexity in terms of
24
25 highest business value. However, these insights could also suggest that different levels of
26
27 product complexity go along with different service needs and associated network set-ups
28
29 for B2C servitization. Our findings extend the contemporary focus in product and service
30
31 modularity on meeting customers' needs (Rajala et al., 2019), to its central role during the
32
33 usage and servicing part of a product and the network needed to deliver B2C servitization.
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40 Finally, and probably less surprising, our findings suggest that all of the above
41
42 discussed linkages are affected by institutional settings. These can act as potential
43
44 accelerators for B2C servitization through new regulations and societal drive towards
45
46 environmentally sustainable products. So far, existing supply-chain research has focused on
47
48 institutional settings as a contextual factor (e.g. Wiengarten et al., 2014; Xiao et al., 2018)
49
50 mostly to distinguish between different countries. In our study, we find a more active role
51
52 for changes in institutional settings. Somewhat differently, also the potential threats of
53
54 product warranty and liability of the manufacturer motivates companies to strive for more
55
56 direct insight into usage and condition of installed products through B2C servitization.
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3 Figure 2 depicts a summarised framework of the concepts and connections between
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5 them.
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8 <Please insert Figure 2 about here>
9

10 11 12 **5.3 Limitations and future research** 13

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15 The limitations of this research offer important opportunities for future research on this
16
17 topic. First, given the low level of development of and implementation of B2C servitization
18
19 in industry, it was hard to detect more than two unique cases. While these cases were
20
21 chosen as relevant (Yin, 2018) based on the specific character of the studied manufacturers
22
23 (Baines et al., 2017), they limit the provided insights in terms of industry contexts, national
24
25 contingencies, and industry networks. Each of these can be part of future research that
26
27 might use our theoretical framework as a starting point. A particularly interesting area for
28
29 further investigations is the possibility to offer B2C services globally, i.e. to target different
30
31 customers around the globe. Issues, such as a diversified global service portfolio to enable
32
33 B2C servitization in different institutional settings, including consumer mind-sets and drive
34
35 towards sustainability, regulatory frameworks that support or hinder B2C servitization, and
36
37 the ability of global manufacturers to drive adoption of new regulations, which can benefit
38
39 their expansion into specific local markets offer interesting routes for further research.
40
41 Much more work is needed in this area to explore the effect of the institutional setting on
42
43 B2C servitization and specifically the nature of servitization in this context. It would be
44
45 interesting to see if insights from International Business or other work on comparative
46
47 institutional settings could be integrated here as well.
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56 Second, our cases focused on plans for and exploration of B2C servitization, rather
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58 than realized B2C servitization. This is again because of the emergent nature of B2C
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2
3 servitization. As a result, some of the identified themes of B2C servitization may focus
4
5 particularly on the initial stages of implementing such a strategy. Follow-up work needs to
6
7 explore B2C servitization in operation to widen our understanding. As was already evident
8
9 from our study, a clear value creation and fair appropriation needs to be set for
10
11 implemented networks. Each of these may create unique relationship dynamics in the triad
12
13 and create specific performance effects of the service. Suitable lenses could be based on the
14
15 double agency role of suppliers for achieving sustainability goals (Wilhelm et al., 2016) to
16
17 study opportunistic behaviour, for example by the installer, and strategies for preventative
18
19 actions through, e.g. vetting, and long-term contractual and relational tools to management
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21 the relationship with installers.
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28 Third, another limitation might be our data gathering within the studied industry
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30 network focusing particularly on the role of the manufacturer. However, as demonstrated,
31
32 other network actors, e.g. installers, wholesalers, and consumers, may affect B2C
33
34 servitization and form important subjects for future research in this area. Consequently,
35
36 future research is encouraged to take a network perspective on B2C servitization, following
37
38 suggestions by Kim et al (2011), in cases with different stages of implementation across a
39
40 variety of technologies, industries and consumer products.
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46 A final point for future research relates to our starting point. We departed from
47
48 existing insights in the B2B context and demonstrated distinctive characteristics for the B2C
49
50 context. We encourage future research to further investigate these differences, while also
51
52 considering potential overlap in concepts and relationships between them. For example, our
53
54 research suggests B2C servitization seems to deviate from B2B contexts by the
55
56 geographically spread of its customers. Such geographical spread is also of interest for B2B
57
58 servitization where more locations are served. Of interest for both contexts is then to
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3 investigate how many service providers can be managed and where the turning points in
4
5 the number of geographical dispersion are to be able to directly serve consumers. In line,
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7 such future research across a wider range of relevant constructs could potentially arrive at a
8
9 continuum of both servitization types rather than a strict dichotomy.
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14 **6. Conclusions**

16
17 This research aimed to investigate the implications from manufacturers' engagement in
18
19 Business-to-Consumer (B2C) servitization. As most existing studies on servitization have
20
21 focused on B2B contexts (Baines et al., 2017; Kreye, 2017; Rabetino et al., 2018; Raddats et
22
23 al., 2017; Vandermerwe and Rada, 1988; Zhang and Banerji, 2017), this research forms one
24
25 of the first to explicitly investigate servitization in B2C contexts. This research expands our
26
27 view on servitization, going beyond the original idea of creating close service dyads with few
28
29 customers (Vandermerwe and Rada, 1988; Wise and Baumgartner, 1999) by adding the
30
31 network perspective to service large numbers of geographically dispersed customers. Our
32
33 cross-case analysis and discussion elaborate existing servitization theory to servitization in
34
35 consumer settings (B2C servitization), in which configurations of product, internal and
36
37 external network are the central theoretical constructs. The resulting theoretical framework
38
39 provides a foundation for further theorizing and research in this area (Kivunja, 2018). This
40
41 extension clarifies and stresses the relation of servitization with the supply-chain literature
42
43 in general (Giménez et al., 2012; Roscoe et al., 2020; Wilhelm et al., 2016) and service triad
44
45 literature in particular (Halldórsson et al., 2019; Karatzas et al., 2016; Wynstra et al., 2015)
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47 and enables discussions around sustainability and circular economy.
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6.1 Theoretical implications

This research forms a conceptual basis for exploring the field of B2C servitization as it extends and adapts existing B2B-focused investigations into the emerging B2C context. Our conceptual and empirical work shows that B2C servitization requires specific theory (Kivunja, 2018) and research attention. This research offers a starting point for theorizing through its theoretical framework that identified four important theoretical constructs (internal collaboration, product characteristics, network and institutional settings) and their interrelationships (Figure 2). Following these, important avenues for future research are identified that provide stepping-stones for further theory building. Our work has important theoretical implications for the servitization literature, as it provides the conceptual basis for B2C servitization, which has thus far been largely neglected in that literature.

Additionally our work theoretically enriches the conceptual basis of the service triad literature, as we identify and connect the four important constructs of internal collaboration of the OEM, product characteristics, network and institutional settings.

6.2 Practical implications

This research has important implications for managerial practice and public policy as their decision can enable or restrict B2C servitization and thus affect the aimed for sustainability effects of consumer products. Managers are required to engage in more systemic evaluations of their actions, related to both cross-disciplinary collaboration within the manufacturer (to enable service-focused product design and internal operations) as well as the wider ecosystem around them as our findings show. While many of the large manufacturers, who may currently consider B2C servitization, are structured around functional units, our research showed the need for integrating technical, buyer and

1
2
3 functional expertise in revising product designs to enable front-line servicing and ultimately
4
5 achieve a B2C servitization strategy. This consideration is emerging in the B2B servitization
6
7 literature (e.g. Raddats et al., 2019); however, our research shows that these considerations
8
9 are equally important determinants for B2C servitization. Another important managerial
10
11 implication relates to managing the changing relationship with installers from a
12
13 transactional to a relational approach in order to enhance a B2C servitization strategy.
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18 Furthermore, policy makers have a potentially strong role in enabling or hindering
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20 B2C servitization and the resulting potentials for increased sustainability of consumer
21
22 products. Our findings show that existing and future policies form strong incentives for the
23
24 decisions made by manufacturers, installers and (to a lesser degree) consumers. Current
25
26 policies on product liability and warranty (for manufacturers) may hinder servitization as
27
28 they incentivise product renewal and innovation instead of servicing and
29
30 recycling/refurbishing at times. At the same time, increased regulations along with
31
32 awareness for sustainability and reuse of materials provides a strong institutional driver for
33
34 B2C servitization. Policy makers can use our insights to draft a thoughtful combination of
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36 regulations that not only enable and encourage servicing and recycling of consumer
37
38 products but also regulate the wider legal implications in terms of product life cycle,
39
40 including product warranty and legal liability for failures.
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Appendix

Interview guide

Context:

1. How would you characterise the industry context you operate in, in terms of, for example, product reputation, product failure?
2. Can you describe the wider setting of your wish to servitize – regulations other influences?

Benefits and costs:

3. What benefits and costs do you see from servitizing your consumer business?
4. What benefits and costs arise for your partners?

Operational tasks:

5. Can you explain your product's life cycle to me (within manufacturer)?
6. What efforts are being made to enable technological improvement of your product?

Relationship governance:

7. Explain to me the relationship with your end-user?
8. Explain to me the relationship with your installer?

Tables and Figures

Table I: Identified potential concepts for B2C servitization

Concept	Definition	Sub-dimensions
Division of benefits and costs	Individual actors' potential gains and losses in a servitized set-up (Wise and Baumgartner, 1999)	Financial benefits (Neely, 2008): increased profit margins, predictable cash flow (Vandermerwe and Rada, 1988; Wise and Baumgartner, 1999); Operational benefit: customers focus on their core business with lower expenses for equipment operation (Vandermerwe and Rada, 1988; Wise and Baumgartner, 1999); Increased competitiveness: keep competition out from customer dyads (Vandermerwe and Rada, 1988) through buyer lock-in (Kreye et al., 2015)
Division of operational tasks	Respective responsibility for equipment-related tasks to ensure performance and operability (Vandermerwe and Rada, 1988)	Maintenance: typically with provider, including repair, monitoring, maintenance (Rajala et al., 2019) Equipment use and operation: fully with customer for relatively simple services, such as maintenance or repair (Sousa and da Silveira, 2017), or fully with provider for complex services, such as performance-based arrangements (Kleemann and Essig, 2013); Operational focus: manufacturer and/or service provider need to focus on customer needs (Wuyts et al., 2015) Customer touch points: need to manage customer influence in service production (Pereira et al., 2019), customers are required to provide information (e.g. equipment identification, site access) for service activities (Sampson and Spring, 2012) Network integrator: manufacturers are potentially required to integrate input from different players (Ramirez Hernandez and Kreye, 2021)
Relationship governance	"ability to perform in and benefit from inter-organisational relationships" (Kreye et al., 2015, p. 1235)	Coordination: "alignment and adjustment of activities, processes, and roles" (Bastl et al., 2019, p. 24; based on Gulati et al. 2012) Control: "is exerted through the managing actor's ability to maintain communication and monitor the behavior and performance of the other two actors" (Bastl et al., 2019, p. 24) Relational set-up: Customer relationship that focuses on the individual service engagement rather than long-term development (Tax et al., 2013) Transactional set-up: Customer relationship that develops over long-time periods rather than the individual service engagement (Tax et al., 2013)
Context	"the setting in which organizational practices are established and applied." (Ho et al., 2002, p. 4424)	Industry setting: creating driver for or against servitization activities (Neely, 2008); Regulations: legal ties (Niranjan and Metri, 2008) and contract support (Karatzas et al., 2016) and safeguards (Bastl et al., 2019) can prohibit or support servitization

Table II: Overview of research design and collected data

	Case A	Case B
	Mar 2018 Jun 2019	Sep 2019 Jan 2020
Collected data	<p>Company Background (strategy, existing supply chain, relationships)</p> <p>Interviews</p> <ul style="list-style-type: none"> • Manager after sales* • Director Service Operations* • Service technician* • Manager Helpdesk* • Manager Quality Management* • Sales Manager Commercial • Director Product Management • Director sales operations • Product manager • Director Installer • Consumers 1-10 <p>Secondary data:</p> <ul style="list-style-type: none"> • Site visit for several weeks at different times during research period • Meetings and presentations • Internal reports, e.g. service reports and reports on service desk activities and complaints • Data on sales and product quality 2012-2018 • Company documentation e.g. Bill of Materials • Product warranty reports e.g. top spare parts and failures • Relevant regulations 	<p>Company Background (strategy, existing supply chain, relationships)</p> <p>Interviews:</p> <ul style="list-style-type: none"> • Senior service manager* • Lead Project Manager Environmental Health Safety (EHS) • Head of Technical Innovation manufacturer • Programme Manager • Senior Director Product manufacturer • Senior Sales Manager • Senior Specialist Product Safety • Head of Production* • Director of Product Compliance • Senior Product Line Manager • Product Manager manufacturer • Senior Marketing Manager (Public Affairs) • Senior sustainable product specialist • Production supervisor Recycling <p>Secondary data:</p> <ul style="list-style-type: none"> • Site visit for one week • Meetings and presentations (observations and one presentation document) • Company documentation (7 internal reports) • Relevant regulations (3 documents)

* Included in initial open interview round

Table III: Excerpt of coding structure

Aggregate theme	First-order themes	Exemplar quotes
Product characteristics	Product complexity	<i>"we know the application really well and we make sure that everything is properly assembled, so that is why the [product] usually has reasonably optimal operating conditions"</i>
	Material use	<i>"Our competitors are going more and more towards plastic because it is cheaper, and our customers don't give a damn. But we are [Case company], we want to be less plastics, more aluminium more metal so it can be reused and recycled afterwards. But if we are the only ones going for that, and that costs money, then it is really hard to justify the business side of that."</i>
	Modular product design	<i>"we also have to figure out what we value most, or can we find another way to find the same reliability without being melted into plastic."</i>
Internal collaboration	Internal collaboration	<i>"we need to work with product technical responsible and our technology department "okay stop using composite, stop gluing things together"</i>
Network	Transaction-based set-up	<i>"So our relationship with our distributors is very much in this category focused on price, these products are being commodities, so there are a lot of players around the sale of such a simple product"</i>
	Lack of direct access	<i>"we have in fact a fairly limited direct relationship with the end user, and in fact also direct relationship with the installer"</i>
	Relational set-up	<i>"where you see with the partners and the customers where we have a certain amount of trust and we deal with them as a partnership we see that we can work together and we can see as a result the relationship get even stronger, because we are working as a partner on this issue, you can see that there is more goodwill on both sides"</i>
	Training	<i>"Our technicians can provide training on how to set up the [product], why have we made the features that are in the [product]."</i>
	Control	<i>"it is of course super important that we have control over it and in this way we live up to our overall ambitions"</i>
	Immediate wins	<i>"For [these products], people are reluctant to do the repair themselves. They are much more likely to call the installer."</i>
	Indirect benefits	<i>"there is a key selling point for the [installer] who says it can be difficult to set the [product] up right out there [i.e. on consumer sites]. So we have had some [applications] with different functionalities that make them not have to think terribly much about how they set up the [product]."</i>
Institutional settings	Compliance with existing regulations	<i>"we are very much on chemical compliance, so we really have a lot of clean material to stand on, for example, until the last update of reach we have not used materials from the banned anaxis"</i>
	Proactive influence on industry standards	<i>"We have actually requested a statement on long-term sustainability from our suppliers so as not to end up in a situation that it is no longer possible to use them for sustainability reasons"</i>
	Consumer preferences	<i>"some of our customers they are having these green boiler which is using recycled materials which is more efficient"</i>

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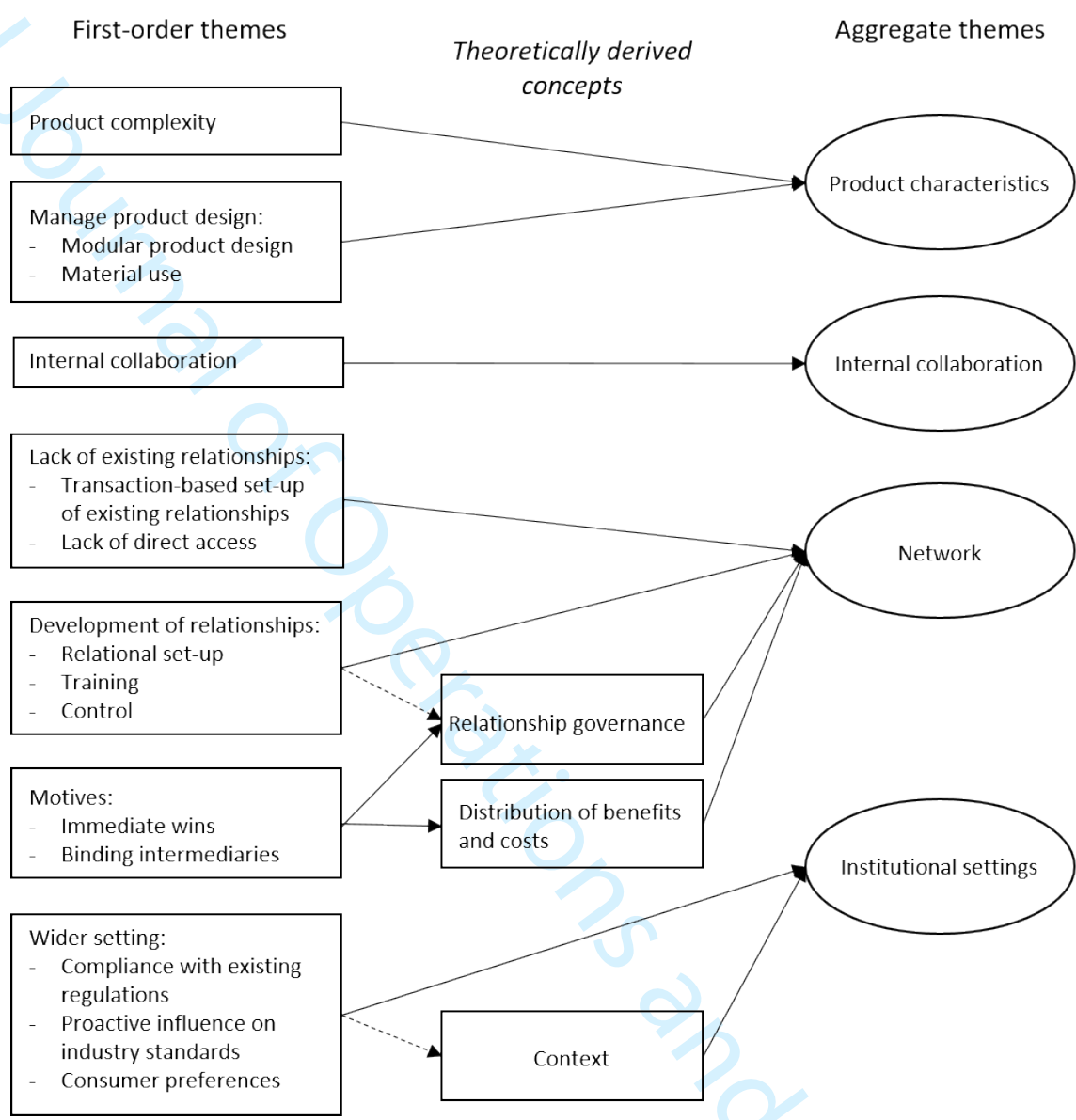


Figure 1: Coding structure

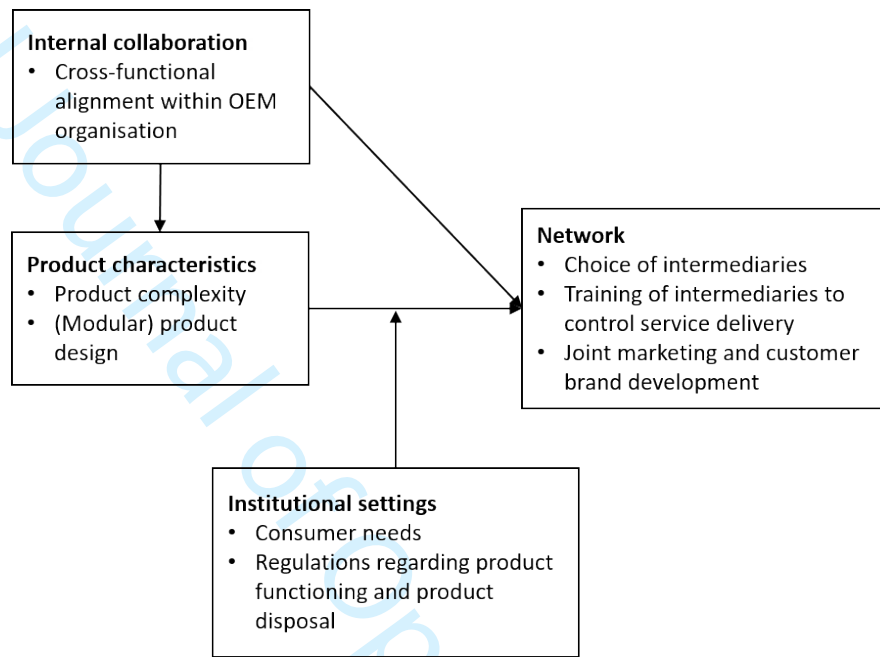


Figure 2: Theoretical framework for B2C servitization