Contemporary perspectives on the strategic role of information in internet of things-driven industrial services

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Abstract

Purpose – This paper aims to analyze the debate related to the strategic role of information in the industrial service business, that is, whether information is a resource that could and should be protected. The connection between manufacturers’ servitization and management strategy literature is used in the analysis.

Design/methodology/approach – A qualitative case study on five new entrants to the industrial service market.

Findings – The results of the study provide new insights on both the characteristics and boundary conditions of new entrants’ approaches to strategically benefitting from information resources. Instead of aiming to possess and control data, the case companies prefer the access to large data volumes over exclusive access, render the question of data ownership to be largely irrelevant and perceive that the strategic relevance of information lies in novel data combinations.

Practical implications – The study provides a contemporary perspective on the prevailing information resource protection doctrine in the context of industrial services. Most importantly, the results challenge the hitherto unquestionable strategic relevance of customer relationships in Internet of Things (IoT)-driven service businesses. Furthermore, the results identify the need for flexible organizational structures that aim to leverage the complexity of the market environment.

Originality/value – Through providing a theoretically grounded and empirically backed contemporary perspective on the role of information in IoT-driven service businesses, the study expands the strategic understanding of industrial service providers.

Keywords Servitization, Strategy, Resource-based view, Industrial services, IoT, Service infusion

Paper type Research paper

Introduction

The role of information in the industrial service business is increasing rapidly (Porter and Heppelmann, 2015). This is largely driven by the developments in the field of the Internet of Things (IoT) (Atzori et al., 2010; Miorandi et al., 2012). The progress in the IoT domain has significantly lowered the remote sensing costs of physical machinery (Porter and Heppelmann, 2014). In addition, the costs of setting up remote monitoring infrastructures have decreased. The result is a major increase in the availability of product-related data for industrial service providers, enabling the design and provision of more advanced information-intensive service offerings (Opresnik and Taisch, 2015).

The growth in information intensity has important implications to the “servitizing” manufacturers and other industrial service providers (Baines et al., 2009; Lightfoot et al., 2013; Vandermerwe and Rada, 1988). The role of information is seen as pivotal for the future of service providers (Opresnik and Taisch, 2015; Porter and Heppelmann, 2015). The accumulated product usage data retrieved from the service providers’ technological asset bases is perceived to be the key enabler in successful service business (Kim et al., 2010; Neely, 2008; Oliva and Kallenberg, 2003; Ulaga and Reinartz, 2011). The trend seems to be that the party that collects the data, and it is the one that is able to reap the benefits (Arica and Powell, 2014; Opresnik and Taisch, 2015). Furthermore, regarding the
The strategic role of information resources in industrial services, the research results almost unanimously advocate either the approach of controlling a competitive position or of possessing valuable and rare resources (Eloranta and Turunen, 2015; McAfee and Brynjolfsson, 2012; Porter and Heppelmann, 2015; Ulaga and Reinartz, 2011). Thus, the extant literature predominantly explains the effective strategic actions (Lengnick-Hall and Wolff, 1999) through the market forces approach (Porter, 1980) or the resource-based view of the firm (Barney, 1991).

The advancements of the IoT seem to further increase the complexity in industrial service networks (Cenamor et al., 2017; Monostori et al., 2016; Opresnik and Taisch, 2015). This is due to the possibilities of vertical and horizontal integration enabled by the developing digital infrastructures: the number of potential service network participants increases (Kagermann et al., 2013). The increasing amount of information also enables the development of new business models, which can blur industry boundaries and redefine the traditional service provider–client relationships (Allmendinger and Lombreglia, 2005; Dijkmans et al., 2015; Porter and Heppelmann, 2014). Thus, the competitive environment changes. In these kinds of dynamic and rapidly changing settings, according to the strategy literature, protecting information resources and sustaining static competitive equilibriums is not successful. Instead, the most important should be placed on leveraging the reciprocities of inter-firm networks (Dyer and Singh, 1998; Lavie, 2006) as well as pursuing continuous streams of various strategic opportunities (Brown and Eisenhardt, 1998; Eisenhardt and Sull, 2001; Sambamurthy et al., 2003). Thus, our literature analysis suggests a theoretical contradiction: the dominant strategic approach used in the majority of industrial service research may be at least partly incompatible with the market changes that the IoT potentially induces.

The aim of this study is to contribute to the servitization literature by further exploring this contradiction and the role of data for service providers. Recently, we have seen anecdotal attempts to challenge the information resource protection doctrine in the servitization literature (Agarwal and Selen, 2009; Eloranta and Turunen, 2015; Hu and Monahan, 2015; Kowalkowski et al., 2012). This line of reasoning is, however, still at a relatively nascent stage, and more research is needed to enhance the explanatory power of this approach, and especially, to discover its boundary conditions.

In our research, we have highlighted the differences of the above-mentioned strategic approaches to the information resources, first at a theoretical and then at an empirical level. The connection between the servitization and management strategy literature has been used in this analysis. To avoid the potential biases related to the existing position and resource leverage in the case of incumbent firms, we have focused on the new entrants to the industrial service sector, i.e. the potential market disruptors (Christensen, 1997). Thus, we have gathered data from new entrants to the industrial service industry (without a long manufacturing history). The research question employed in the empirical research is:

RQ1. How do new entrants in the industrial service industry view the strategic role of information?
The information can also be used during research and development (Allmendinger and Lombreglia, 2005; Porter and Heppelmann, 2015). Customer process data includes process automation data (Arica and Powell, 2014; Kagermann et al., 2013), location data (Holmström et al., 2010) and/or operational environment data (e.g. humidity, temperature). Combined with installed base data, process data allows for the creation of services that are targeted towards certain selected clients (Ulaga and Reinhart, 2011). This highlights the role of supplier–customer relationships in gathering and interpreting process-related information (Antiocone et al., 2008).

In terms of the strategic role of information, the convention of resource protection has been considered to be a logical choice for the service provider (Porter and Heppelmann, 2015; Ulaga and Reinhart, 2011). This is because manufacturers and product owners have historically had more or less exclusive access to product-related information. Data about products and their usage have largely been collected by own field service or sales personnel or through the use of specialized proprietary information systems. Therefore, the strategic approach in the extant servitization discourse has been predominantly built on the foundations of protecting unique and inimitable resources (such as installed base and process information) (Eloranta and Turunen, 2015). In the terminology of strategic management, the approaches have primarily followed the “resource-based view” (RBV) (Barney, 1991). The market forces approach, emphasizing the unique competitive position, has been also been applied, especially in the early studies of servitization (Vandermerwe and Rada, 1988; Wise and Baumgartner, 1999) but also increasingly in the very recent discourse on the subject (Opresnik and Taisch, 2015; Porter and Heppelmann, 2014).

Industrial services in the era of the internet of things

The IoT is a multifaceted concept. It is defined as “a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies” (ITU-T, 2012, p. 7). In concrete terms, the implication of the IoT is that physical objects (e.g. machines, devices and materials) can now interact and cooperate with each other to reach common goals (Atzori et al., 2010). Practical actualization of these IoT solutions into the real world has highlighted the need for the widespread integration of enabling technologies, such as RFID tags or embedded sensors (Atzori et al., 2010; Gubbi et al., 2013; Mashal et al., 2015). As a result of these developments, installed base and process data can now be easily collected, combined and analyzed for multiple purposes (Atzori et al., 2010; Miorandi et al., 2012). Data recording processes have become simpler and more affordable and thus more common (McAfee and Brynjolfsson, 2012).

From the perspective of industrial services, the IoT developments are considered to lead to increased complexity in value networks due to vertical and horizontal integration (Kagermann et al., 2013) and the entrance of new value network participants (such as analytics providers) (McAfee and Brynjolfsson, 2012; Yang et al., 2009). This increased complexity blurs product and industry boundaries and reshapes the traditional service provider–client relationship (Porter and Heppelmann, 2014). Data analysis and machine learning are identified to be the fundamental aggregators in this change, as they can be used to automate complex manufacturing and service provision processes (Arica and Powell, 2014; Cenamor et al., 2017; Gubbi et al., 2013; Monostori et al., 2016). However, it is still unclear how the disruptive technology for the data collection and sharing affects the competitive dynamics and strategic choices of the companies.

In terms of strategy, the IoT developments in the industrial service domain imply that the dominance of logics that solely build on protection of own resources and competitive position seems to be in question. The competitive environment changes rapidly, which means that firms must pursue constant streams of strategic opportunities and not only hold to static positions and rigid activity systems (Eisenhardt and Sull, 2001). Furthermore, the strategic benefits must be acquired not only from companies’ own asset bases but also from their inter-firm networks (Dyer and Singh, 1998; Lavie, 2006).

However, as seen in the previous sections, most servitization research does not appear to recognize the possibility of the essential market changes that the IoT causes in servitizing industries, although these changes may lead to significant changes in the competitive environment. Most servitization research still views services and related information from a resource and position protection perspective (Eloranta and Turunen, 2015). Conversely, strategy research that considers the context of dynamically competitive environments does not support the approach of position and resource protection (Brown and Eisenhardt, 1997; D’Aveni et al., 2010; Eisenhardt and Sull, 2001). These contrasting views and the gap in the industrial service knowledge motivate our empirical research.

Method

To investigate the emerging question of the strategic role of information, we conducted a qualitative multiple-case study (Eisenhardt, 1989). This approach is especially effective for under-researched problems, as it allows researchers to discover and theorize about phenomena that are conceptually vague (Yin, 2009). The limitation of the approach is that the aim of this research can only be explorative, and the study provides views that can be regarded as exclusive to the particular context. Therefore, we examined a relatively large number of cases to improve the external validity of the results (Eisenhardt, 1989). We also used several independent data sources (interviews and archival data) to enhance the triangulation of the findings.

Sampling

We selected our cases based on their suitability to our theoretical setting. To date, the focus of industrial service research has been on the large companies within the
manufacturing industry (Eloranta and Turunen, 2015; Opresnik and Taisch, 2015). However, these companies are the prime candidates to display incumbent inertia (Lieberman and Montgomery, 1988) and often choose to exercise conservative strategies. It remains debatable whether their chosen strategies are optimal since the transition is still ongoing, meaning that “there is no playbook” yet (Porter and Heppelmann, 2015, p. 115). We chose to conduct an empirical study within the context of new entrants to the industrial service market. We did this to avoid any potential path dependencies, caused by sunk costs and investments in existing resources, that the incumbent companies might present. The studied new entrants to the field may potentially use strategies that the incumbent manufacturers have not recognized.

Thus, in line with the systematic approach (Eisenhardt, 1989), we searched for companies that would:

- provide ICT-driven, information-intensive industrial services;
- not have a long history in goods manufacturing (to avoid path dependency biases); and
- represent a variety of service offerings and business models (to enable comparisons of different situations and hence gain rich data about contextual factors).

This theoretical sampling (Glaser and Strauss, 1967) led us to select five cases for analysis.

Data collection and analysis

The data were gathered in two stages. First, archival data, including marketing materials, reports and white papers, were collected. Then, the CEOs of the case companies were interviewed. All interviews were recorded and transcribed. We used semi-structured interviews (Patton, 1990), as our aim was to create exploratory insights on theory, not merely to test theoretical assumptions. The interview structure included questions about:

- the role of information in the company’s business;
- which types of information are collected and processed;
- the role of information in gaining and sustaining a competitive advantage;
- other sources of competitive advantage; and
- the ways in which information-related resources are protected.

We analyzed and interpreted the data as recommended by Miles and Huberman (1984). First, we conducted a within-case analysis, which we performed by “drawing and verifying conclusions about a single site” (Miles and Huberman, 1984, p. 79). Hence, each company was investigated in detail to distinguish its specific characteristics as a stand-alone entity (Eisenhardt, 1989). Second, we performed a cross-case analysis, meaning that the findings of each embedded case were interpreted in conjunction with each other. This step helped increase the generalizability of the study and helped us to identify patterns. We conducted both stages of the analysis after data collection since analysis is most useful for a complete database (Miles and Huberman, 1984). Follow-up discussions were held with the case companies to verify the findings.

Findings

Our study produced three main findings. First, it appears that the case companies do not perceive data possession or exclusive access to data as a competitive advantage. Instead, the companies focus on using data to create and develop markets. The targets for these new entrants are high data volumes, ease of data collection and effective data utilization. The companies’ customers also allow this strategy to take place without restrictions—leading to our second finding. Even though the data are unanimously viewed as the customer’s property, it appears that customers are willing to widely share their data with the case companies to obtain valuable insights. Therefore, there is no rationale for the service providers to challenge the data ownership. Third, the case companies focus on forming novel combinations of diverse data sources. This is beneficial for both the service providers and customers: the customers’ data are analyzed in light of wider industry references, and the service providers can further develop their capabilities based on the constantly accumulating data. A synthesis of the findings is presented in Table I. Next, we will review the findings in detail.

Large data volumes are preferred over exclusive access

The case companies were not interested in controlling the possession of data or having exclusive access to data that are collected in the industry. The detailed reasoning for this decision varied but the underlying logic was the same in all cases (see Table I). As stated by the representatives from Companies A and E, the raw information is seen as a necessity rather than as a source of strategic benefits. Thus, it seemed that for the case companies, the data only enabled the service market, and in terms of differentiation, exclusive data access was insignificant:

- The data, or the sensor values, they are just raw data, of which one cannot get anything out of. – CEO, E
- I would not say [data] provides it [a competitive advantage] […] It’s is more like a necessary thing. – CEO, A

Furthermore, while our informants were uninterested in gaining control over the data, in some cases such goals were regarded as unrealistic to achieve. Regarding the data governance, the representative of Company B specifically pointed out that it is demanding to exclusively control the data due to the diversity of different technological systems in the market. In addition, our informant suggested the possibility that customers might consider proprietary access interfaces to be an unfavorable option, due to the fear that some party could leverage a data monopoly. Therefore, our informant believed that open interfaces are the key enabler to the ability to create successful service offerings. In turn, the representative of Company C stressed that the company wants to keep data utilization as un-opportunistic as possible, emphasizing the customer’s free will to share:

- If one could control the data [it would provide a competitive advantage] […] but, due to the diversity of different technological systems, the only way to control [the company network], is to have open interfaces [to data]. – CEO, B
- We are not forcing anyone to work with us […] It has to originate from free will. – CEO, C
Instead of exclusive access, our informants emphasized the volume of accessible data. The informant from Company A specifically stressed that it is the amount of data the company has access to that defines the size of its market. We noticed differing approaches among the case companies to increasing the volume. For Company C, the privacy restrictions on the data limited the scale of collection. However, the company was able to expand its data volume by focusing on non-private information distribution potential of the digital infrastructure. Nevertheless, the companies were more competent in data analysis. The informants agreed that the need for the guidance and advice that the suppliers provide is the major reason they obtain access to the customers’ information resources:

The data which is there is more or less customer’s property […] We try to provide insights that matter [to the customer] but it [the data] is not our property. – CEO, C

We provide novel insights in novel ways to the customer, but this means that the customer must share us something. – CEO, A

As shown in Table I, the companies provided various types of insights to their customers. The insights could be rather

Table I A Synthesis of the findings

<table>
<thead>
<tr>
<th>Theme</th>
<th>Approach taken by Company A</th>
<th>Company B Building maintenance and service systems</th>
<th>Company C Security solutions</th>
<th>Company D Energy-efficiency optimization</th>
<th>Company E Data acquisition from sensing devices</th>
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<tr>
<td>Large data volumes are preferred over exclusive access</td>
<td>The data are not a source of competitive advantage, rather a necessity. Company A uses a business model that is built on the information distribution infrastructure.</td>
<td>If companies cannot control the data flows, they should look for open data interfaces. Company B encourages customers toward openness, focusing on expertise and operational excellence.</td>
<td>The collected data are sensitive and cannot be utilized out of context. Company C integrates multiple technological systems to achieve an effortless customer experience. A higher number of integrated systems leads to a better experience.</td>
<td>Company D receives a wide range of different data from each customer from different contexts and segments. Company D designs the data collection infrastructure so that it receives the correct data effortlessly.</td>
<td>The data are considered just raw material that needs to be refined. Company E shares its data to help the markets grow, since it perceives gaining volume to be at least equally important as uniqueness or exclusiveness.</td>
</tr>
<tr>
<td>The question of data ownership seems to be largely irrelevant</td>
<td>The customer uploads data to a cloud server and provides access to Company A. Company A designs data collection systems from multiple components. They provide unique insights as-a-service and help the customers to improve their processes.</td>
<td>Company B has gained access to all the biggest building automation systems in the world. Customers share information to Company B and receive guidance in return. Company B focuses on data visualizations and on providing simple metrics.</td>
<td>The data ownership belongs to the customers, but they – based on their free will – grant access to Company C. Company C can analyze the data more profoundly than the customer and provides insights on how to optimize the customer experience in the future.</td>
<td>Company D only provides the infrastructure for the customer’s own data collection and enables sharing of information resources among different actors. Company D can utilize its wide customer base to identify the best practices and provide business intelligence to the customers.</td>
<td>Company E installs its sensing hardware in customers’ buildings and receives a direct communication link to monitor the machines. Company E emphasizes real-time data and designs its devices to transmit specific, detailed datasets on demand.</td>
</tr>
<tr>
<td>The strategic relevance of information lies in novel data combinations</td>
<td>Company A utilizes innovative tools to analyze steel industry processes; industrial internet applications, newest laser technology, and high-speed cameras. Company A gathers a unique combination of data. These accumulating data are actively used in its future product development.</td>
<td>Company B uses various IT solutions and simulations to optimize customers’ systems in the long run. The company utilizes historical data to see how the situation evolves. It helps owners to bring energy-efficiency tracking up to date and consult with them constantly, rather than as projects.</td>
<td>Company C embraces the method of learning-by-doing. It receives sensitive customer data, which cannot be disclosed, from multiple locations. However, the company can analyze all this material and shares the general insights that are derived.</td>
<td>Company D provides business intelligence based on multiple sources for data, which are collected automatically. For most of the data, individual data points are publicly available. However, Company D forms a unique combination from these data and can leverage this compilation.</td>
<td>Company E focuses on the efficiency of data collection and designs systems to transmit information on request. The company analyzes various process parameters for data, which can be used to predict and prevent failures.</td>
</tr>
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simplistic, such as intuitive data visualization (Company B) or more complex business intelligence leading to process improvements (Companies A and D). In some cases, just the sheer amount of data could compel the customers to share data, as indicated by the representative of Company E:

We have squeezed [the data] into one simple figure. The closer to 100 the better. – CEO, B

We can see from many firms that they have extreme amounts of data in the databases, but no one remembers what data it is, why it has been gathered and how it could be utilized. – CEO, E

This attitude toward data ownership remained the same even though the approach toward data collection varied. For instance, Company D was looking to leave the task of data collection to other parties and simply to design the supporting infrastructure. In turn, the representatives of Companies C and E emphasized that although they could and would perform data gathering, they are only interested in providing insights based on the data. The informants perceived that their companies’ value as a service provider was based on providing the infrastructure, or platform, through which many diverse actors could share data and connect to each other:

[Instead of collecting the data] we provide the infrastructure [to connect many different and diverse actors]. – CEO, D

The strategic relevance of information lies in novel data combinations

We found that all the case companies were looking to establish mutually profitable connections with other firms. It appeared that combining diverse data sources in novel ways was one of the key activities in the cases (see Table I). These combinations have the potential to benefit the companies by enhancing their capability building.

The shared data enabled our case companies to improve themselves. For instance, the representative of Company C stated that the company continuously “learns by doing,” and the derived insights must be channeled to improving the company’s products and services. Similarly, Companies A and E were constantly looking for better ways to collect and integrate all the relevant information into their systems. Furthermore, Company B utilized various data sources and customer feedback, which helped the company to recursively leverage the available data. In general, we found that the case companies strived to utilize the data to which they were granted access to acquire both business intelligence and a sense of the “bigger picture”:

The method of working is like learning by doing. – CEO, C

The information is what we are trying to get, in order to produce something bigger and more interesting [as a result]. – CEO, E

The key action enabling the companies to benefit from data seemed to be the tapping of the firm’s solution or platform to extensive amounts of public and private data flows in the service supply networks. Based on the statements of Companies B and E, the possibility to systematically combine data was at the center of these efforts. In addition, Company D’s case offered an illustration of how many different data sources – outside a conventional context – could be enriched by intelligent integration. The company gathered various types of data, most of which are publicly available, into a single system. The separate data points might not be unique but the overall combination is, which enabled Company D to create novel business intelligence and unique offerings:

In our operation we use various IT, information systems, [and] dynamic energy simulations. […] We try to optimize [the systems] in the long run, […] by utilizing all the [historical] data to see how things evolve. – CEO, B

We can effectively combine all this data from different sources. […] We collect all kinds of [customer’s] process parameters in order to predict when the process fails, but also to learn to manage the process so that it fails less frequently. – CEO, E

Discussion

In this section we identify the implications of our findings on a theoretical level. First, we will view the case companies’ strategic approaches to information resource leverage in light of the extent servitization research and identify the contributions to the servitization literature. Then, we will focus specifically on the strategic role of industrial service providers’ customer relationships and point out some additional contributions. Third, we will consider how the case companies structured their businesses and theorize regarding the relevance of those structures in managing the resource sharing-based operations in industrial service networks.

Providing a contemporary perspective to the resource protection doctrine in servitization literature

In the context of industrial organizations it has traditionally been believed that equilibrium-based strategies, based on the logic of protecting valuable resources or competitive positions, provide a sustainable competitive advantage (Lengnick-Hall and Wolff, 1999; Barney, 1991; Porter, 1980). Resource and competitive position-based strategies have also been prevalent in the discussions regarding manufacturers transitioning to service providers (Eloranta and Turunen, 2015).

Our study presents contradictory evidence that challenges the supremacy of these previous assertions. First, our results indicate that information sharing and collaboration-based strategies are emerging in the field of IoT-driven industrial services. The studied new entrant companies to the industrial service market were open to data sharing and did not see data as a source of competitive advantage. Rather, the data were seen merely as the necessary foundation for their businesses. The data were treated as raw materials, not as a scarce resource. Instead of data ownership, the companies sought to gain access to data flows and the markets that they generate. This view on openness was also shared by their customers, as they enabled access for third parties. Our cases showed that by sharing data, new entrants and their customers seem to be lowering some of their resource-based barriers, in contrast to what the literature suggests (Porter and Heppelmann, 2014). Rather than exclusivity, the case companies they emphasized the access to diverse information flows and the ability to constantly improve based on the gained information. The case companies sought to learn by doing and to adapt when needed.

In light of contemporary strategy research, the identified approach seems to have considerable potential. The developments in the IoT are turning both manufacturing and industrial service industries into environments with low predictability and increasingly permeable market boundaries.
New markets have emerged due to disruptive technologies (Christensen et al., 2015). In fast-changing markets, companies must build several temporal competitive advantages (Brown and Eisenhardt, 1997; D’Aveni et al., 2010; Lengnick-Hall and Wolff, 1999). Thus, our results offer more detail to the previous anecdotal findings in the servitization literature, challenging the resource protection doctrine (Agarwal and Selen, 2009; Eloranta and Turunen, 2015; Hu and Monahan, 2015).

**Challenging the indubitable strategic relevance of customer relationships in industrial service business**

The dominant view in the servitization literature has been that OEMs are ultimately protected by their proprietary access to clients’ process information (Eloranta and Turunen, 2015; Kowalkowski et al., 2015; Opresnik and Taish, 2015; Ulaga and Reinartz, 2011). This is motivated by the argument that installed-base information, without related process information, is not enough to create proper foundations for valuable new service innovations (Kowalkowski et al., 2015; Ulaga and Reinartz, 2011). Thus, process information has high strategic relevance, and consequently, it is only shared with partners that have earned strong trust due to long relationships (Nordin and Kowalkowski, 2010; Tuli et al., 2007). This makes the access to the clients’ process data complicated, as it is mediated by the nature of the relationships.

However, our findings question the taken-for-granted protection that customer relationships are argued to provide for the incumbent companies. One of the most interesting findings in our study was that the case companies had not experienced problems with interfering in the relationship between the customer and the OEMs, contrary to what has been suggested in the literature (Opresnik and Taish, 2015; Porter and Heppelmann, 2015; Ulaga and Reinartz, 2011). If the customer and the OEMs were able to exercise strict, relationship-based resource protection strategies in practice, they would try to specify some agreements or set certain restrictions for the data resource utilization and access.

In fact, in some cases, the customers were more willing—and also able—to assign the information processing tasks to a third party, which had no part in the physical production process, rather than leaving it to the OEM. A potential explanation for this choice is that the customer perceives these companies as non-reliant on the manufacturing business and therefore more capable of having an objective view of the processes. On the other hand, the customers might not even count these firms as competitors due to the remarkable differences in their sizes and operational fields. Whether or not these assumptions are true, the customer relationship orientation, which has been emphasized in the servitization literature (Nordin and Kowalkowski, 2010; Tuli et al., 2007), has not resulted in the protection of a competitive advantage, contrary to the position argued in the extant literature. Although our results are highly context-specific, these notions must be considered when assessing the sources of strategic advantages in industrial service business in general.

**Organizing the business for information resource sharing**

It also appears that many case companies organize their businesses specifically to manifest the information sharing strategy. Adhering to the contemporary strategy literature, our new entrant cases have very defined niches of operation and smartly organized footprints (Ilinitch et al., 1996). Moreover, they organize their businesses with flexible processes and infrastructures. Based on the case data, this is due to the increased sharing and usage of resources from multiple actors as well as the pivotal role of continuous change and innovation (Sambamurthy et al., 2003).

We interpret that many case companies organize themselves as “platforms,” where the business is run on a continuously adapting digital infrastructure that allows better connectivity and provides a way to orchestrate actors and resources (Cenamor et al., 2017; Gawer, 2014). In recent years, the servitization literature has identified different uses of platforms in industrial service business (Kowalkowski et al., 2013, 2015; Pekkarinen and Ulkuniemi, 2008). However, within our case companies, it appears that the platforms are not simply offerings, ICT environments or multi-sided marketplaces, as the prevailing servitization literature suggests but rather provide a comprehensive way to organize innovation, operations and networking. This finding is in line with the platform discourse in strategy and organization domains, which emphasizes the role of platforms in creating adaptable “meta-organizations” (Gawer, 2014; Gulati et al., 2012). Thus, our results offer more detail to the emerging discussion in the servitization literature with regard to the use of platforms in pursuing organizational adaptability and leveraging environmental complexity (Cenamor et al., 2017; Eloranta et al., 2016; Eloranta and Turunen, 2016; Löfberg and Åkesson, 2017).

**Conclusion**

The growth in information intensity and the advancements of the IoT have rapidly increased the complexity of industrial service networks. Due to these disruptive changes, service providers must evaluate the environmental fit of their current strategies since different approaches work in stable and turbulent settings. The prevailing approaches in the industrial service research have emphasized the strategic logic of maintaining a state of equilibrium, that is, protecting resources and competitive positions. However, according to the strategy literature, in dynamically competitive and disruptive environments, these approaches result in only limited success.

To further elaborate on this contradiction and to elaborate on the anatomy of the alternative strategies that might provide a better fit with the disruptive market developments, we performed an empirical case study of new entrants in the industrial services context. In our empirical case analysis, we found that the new entrants prioritize data volume over exclusivity and build mutual sharing-based relationships with their customers and partners. Furthermore, combining data from many sources and many actors, as well as providing platforms that facilitate the formation of these connections and combinatorial innovations, is at the core of the new entrants’ approaches. In essence, it seems that it is the ability to beneficially redirect the flows of information and to tap into those streams that provides strategic benefits in industrial service networks—not mere data ownership or exclusive access to data.
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