

## Exploring Data Monetization in Established Organizations: a Dynamic Capability Approach

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### Abstract

*The exponential growth of data, together with the increasing importance of analytics in a wide range of contexts, has given rise to data monetization, a phenomenon in which data and data-based offerings are traded for monetary value. Data monetization is relevant for established organizations since they often generate significant amounts of data which provides them with many opportunities for added revenue streams. Previous research shows that incumbents are falling short in harnessing this potential either because of the lack of knowledge of data-based business models or insufficient resources and capabilities. There is a paucity of research on how incumbents could develop such capabilities to successfully sell data and data-based offerings. To fill this gap, we conducted a multiple case study to explore what kind of capabilities are required by established organizations to successfully sell data. The paper contributes to the evolving discourse on data monetization by providing a new understanding of the required capabilities for selling data from the dynamic capability perspective.*

**Keywords:** Data monetization, selling data, selling data-based services, analytics, dynamic capability

### 1. Introduction

In response to the emerging data-driven economy, in which data is seen as a tradable asset, companies have started to directly sell data and data-based insights (Alfaro et al., 2019; Beath, 2020). Trading data between organizations is an emergent and hidden part of the data market but is expected to grow rapidly with a growth rate of close to 12 percent from 2020 to 2030 (Glennon et al., 2022). This is important for established organizations since they generate large amounts of valuable data during their business operations and transactions (Brown et al., 2011) which positions them on the supply side of the data market. However, while it might be relatively easy for startups to get the right tools in place to sell data, established firms are constrained by their existing business models and legacy systems (Hartmann et al.,

2016). Thus, despite investments in data initiatives, established organizations often fail to earn the expected revenue (Gebauer et al., 2020).

Recent research argues that the lack of knowledge and novel ideas of data and data-based business models and insufficient capabilities and resources could be potential causes of the problem (Lange et al., 2021). Organizations need to develop data offerings built on stable premises: they should develop the required resources and capabilities to build the company's capacity for monetizing its data (Parvinen et al., 2020) which requires not only exploiting current resources but also exploring those beyond mainstream competences (Gebauer et al., 2020). Yet, searching for novel resources is far from easy (Kaario, 2016). Dynamic capabilities (DC) theory has been extensively adopted to study how organizations employ their capabilities to create new business models, especially in uncertain, volatile, and complex situations, such as emerging data markets (Santa-Maria et al., 2021). Organizations will be able to purposefully create, extend, and modify their current capabilities into data-related capabilities through dynamic capabilities (Kaario, 2016). However, little is known about how incumbents could develop such capabilities necessary for selling data.

To gain such an understanding, this paper explores various skills, processes, and organizational activities known as micro-foundations of dynamic capabilities (Teece, 2007) that facilitate designing and selling novel data-based offerings. We particularly focus on established organizations since they usually possess a wealth of data collected from their existing business operations over time, but they are stuck in traditional business environments and lack the agility of startups to realize value from their data assets (Mirbagherimarvili et al., 2022). We also differentiate between operational and dynamic capabilities. Operational capabilities are geared toward enabling firms to conduct their daily business and, for traditionally established companies, those are typically product-related capabilities. In contrast,

dynamic capabilities are needed to adopt new routines and processes in response to market changes (Helfat & Winter, 2011). Thus, the research question guiding this study is: *What are the micro-foundations of dynamic capabilities that help incumbents monetize their data?*

We conducted a multiple case study in five international organizations to answer this question. Using DC as an analytical lens we analyzed the collected data and identified a set of micro-foundations that enable established organizations to sell their data.

The rest of the paper is organized as follows. Section 2 presents the theoretical background. Section 3 describes the research methodology. Section 4 includes the results and section 5 discusses the implications and limitations.

## 2. Theoretical Background

### 2.1. Data as a tradable asset

The rapid increase of data generated by humans and machines and the rising importance of data-based insights in today's business environments have enabled the emergence of data as a new type of asset that companies can productize and sell (Opher et al., 2016). The range of data offerings includes raw and prepared data, data-driven insights, and data-based services (Buff et al., 2015). Companies could sell raw data if they possess data that is of great value to some market (such as retail point of sale (POS) data). Selling data-driven insight involves selling data-based reports and/or analytics but restricting access to the original data (Thomas & Leiponen, 2016). Finally, some companies create platforms and generate new value-added services such as retail payments, selling advertising space, and provision of customer insights. Any "data commercialization" (Thomas & Leiponen, 2016) endeavor must address data's unique properties as a non-rivalrous credence good (Parvinen et al., 2020). Data has the characteristics of a non-rivalrous good meaning that its usage by one person doesn't prevent others from using it at the same time and that its value doesn't decrease with consumption (Faulkner & Runde, 2019). Value of data can even increase upon multiple uses (Thomas & Leiponen, 2016), especially when combined with complementary data from other sources. Furthermore, data tends to be an experience or even credence good which makes it quite challenging to verify its quality and value before consumption (Koutroumpis et al., 2020). Thus, it is difficult to communicate the real value of data to potential buyers (Spiekermann, 2019), or even put a price tag on it. Data's value depends on several factors

including its situation, context, and time. Indeed, the value of a single dataset could vary based on how one employs it (Lange et al., 2021), the data's availability at the proper time and place (Parvinen et al., 2020), and the availability of complementary data and relevant technologies (Koutroumpis et al., 2020). Compared to physical products, data-based offerings are complex and interactive (Hanafizadeh & Harati Nik, 2020) and therefore, trading them requires a different set of skills and strategies.

New actors, such as data suppliers, data managers, data custodians, application developers, service providers, and data aggregators, have recently emerged within data ecosystems (Thomas & Leiponen, 2016). These roles are not mutually exclusive and one single organization could employ multiple approaches simultaneously. Data suppliers, for instance, can sell raw data, or process and analyze the data to deliver insights or services. Most established organizations have the potential to act as data suppliers since they typically possess a wealth of data accumulated over time (Brown et al., 2011).

### 2.2. Dynamic capabilities

The concept of dynamic capabilities has its roots in the resource-based view (RBV) of the firm. The RBV of the firm, first introduced in strategic management literature, provides a theoretical framework to study the relation between a firm's resources and the firm's success (Wernerfelt, 1984). According to this framework, valuable (V), rare (R), inimitable (I), and non-substitutable (N) resources can be important sources of sustainable competitive advantage and a firm's success (Barney, 2000). However, in contemporary rapidly changing business environments, the mere existence of such resources is not sufficient (Opresnik & Taisch, 2015). Instead, there is a need to continuously reconfigure current resources and gain new ones, to respond to changes in business environments (Eisenhardt & Martin, 2000). Owing to its high relevance in today's turbulent and dynamic environment, the dynamic capability theory has also attracted large attention in the IS field (e.g. Daniel & Wilson, 2003; Iden & Bygstad, 2021; Karimi & Walter, 2015).

The theoretical lens of 'dynamic capability' seems to be relevant for commercializing data in the context of incumbents. To integrate the new data business with the existing one, organizations must develop an approach for managing possible conflicts. Due to the opposing effects between the current and the new data-based business, organizations often find themselves unable to reconfigure their current resources to support the new business (Gebauer et al.,

2020). To overcome this obstacle, companies need to take advantage of dynamic capabilities. Dynamic capabilities are enablers of change allowing organizations to achieve new resource configuration in response to emerging markets (Daniel & Wilson, 2003). These capabilities include *sensing* to identify new opportunities and threats, *seizing* to capture these opportunities through new processes, products, or services, and finally, *reconfiguration* to continuously align specific assets and organizational structures (Teece, 2007). Respectively, the micro-foundations of dynamic capability refer to “the distinct skills, processes, procedures, organizational structures, decision rules, and disciplines which undergird enterprise-level sensing, seizing, and reconfiguring capacities” (Teece, 2007, p. 1319).

### 3. Methodology

#### 3.1. Research design

To identify the micro-foundations of dynamic capabilities for the design and development of data offerings in established organizations, we followed an interpretive qualitative approach. Case studies are well-suited to gaining such interpretive knowledge since the researcher studies a phenomenon within its real-life context (Yin, 2003). Case study methodology is particularly appropriate upon investigating new areas of research and when the phenomenon is complex and involves multiple actors. Case studies can involve either single or multiple cases. Multiple case study allows for cross-case analysis and theory extension (Benbasat et al., 1987) and is thus particularly appropriate for this paper.

While there is no clear direction on the number of ideal cases, a number between 4 and 10 cases seems to be an appropriate choice with regard to both

theoretical saturation as well as practical considerations (Eisenhardt, 1989). In this study, through desk search and authors’ network, we initially targeted 11 companies from various industries that had already started developing innovative data products and services. We received positive responses from five companies. Table 1 shows the description of the cases.

In contrast to traditional random sampling, we selected these diverse cases for theoretical reasons to fill theoretical categories and provide examples of polar types (Eisenhardt, 1989). This enabled us to identify capabilities needed for selling data regardless of industry. All the case companies have their headquarters either in Finland or Sweden and operate in the other Nordic countries and the Baltic region. Thus, all the case companies operate under the European Union (EU) law and need to comply with the EU General Data Protection Regulation (GDPR). Approved in 2016 and implemented in 2018, GDPR increases citizens’ control over their data and gives them the “right to be forgotten” (Art.17 GDPR), and thus, sets several constraints on data monetization.

#### 3.2. Data collection and analysis

We collected data from several sources to get a clearer understanding of the phenomenon under study (Benbasat et al., 1987). First, we started with collecting publicly available information about the case companies’ data initiatives ranging from internet pages to company reports. Next, we collected data through 10 semi-structured interviews. Participants were sampled using "expert sampling", which helps investigate new areas of research (Etikan, 2016). Accordingly, we targeted experts from the case company with knowledge or experience about their company’s data strategy and new data business ventures. The interviews were guided by a protocol

**Table 1: Case companies’ description**

Companies	Industry	Number of employees	HQ	Market coverage	Number of Interviews	Interviewees’ position
Company A	Retail	> 40,000	Finland	Finland, Estonia	2	- Head of eCommerce Data and Analytics - Division Manager
Company B	Retail	17,650	Finland	Nordic and Baltic countries	2	- Director, Loyalty Concept and Communications (2 interviews)
Company C	Telecommunication	20,000	Sweden	Nordic and Baltic countries	2	-Head of Data & AI Business (2 interviews) - Head of Data & Digital Marketing
Company D	Postal Service	> 20,000	Finland	Nordic and Baltic countries, Poland	3	- Product owner - Product Manager
Company E	Information Service	420	Finland	Finland	1	- Manager, Product and Services

including a set of questions about the current situation of data business at the company, and questions in three general themes: 1) the most important activities to sense data opportunities, 2) the actions taken by the firms to seize newly sensed data opportunities, 3) the resources that are reconfigured by the firms to address newly sensed data opportunities. We collected all data between September 2022 and February 2023. The 10 in-depth interviews lasted from 45 to 90 minutes, were conducted online, and were recorded and transcribed.

To analyze the collected data, we followed an abductive approach. The power of the abductive approach lies in the fact that it combines both inductive and deductive analysis to “provide new theoretical insights which reframe empirical data in

(Strauss & Corbin, 1994) for abductive data analysis (Timmermans & Tavory, 2012). So, we engaged in an iterative process of open and axial coding (Corbin & Strauss, 2014), to group the raw data inductively into emergent microfoundations. The line-by-line open coding process resulted in 28 distinct first-order constructs. Then, we searched for similarities and relationships between them and started to aggregate them into 12 initial second-order themes. Until this step, we did not consider previous research on microfoundations of dynamic capability to avoid confirmation bias. In the third step, we engaged in an iterative process of matching the analysis with the extant literature. Consequently, Teece's (2007) framework of dynamic capabilities was used as a

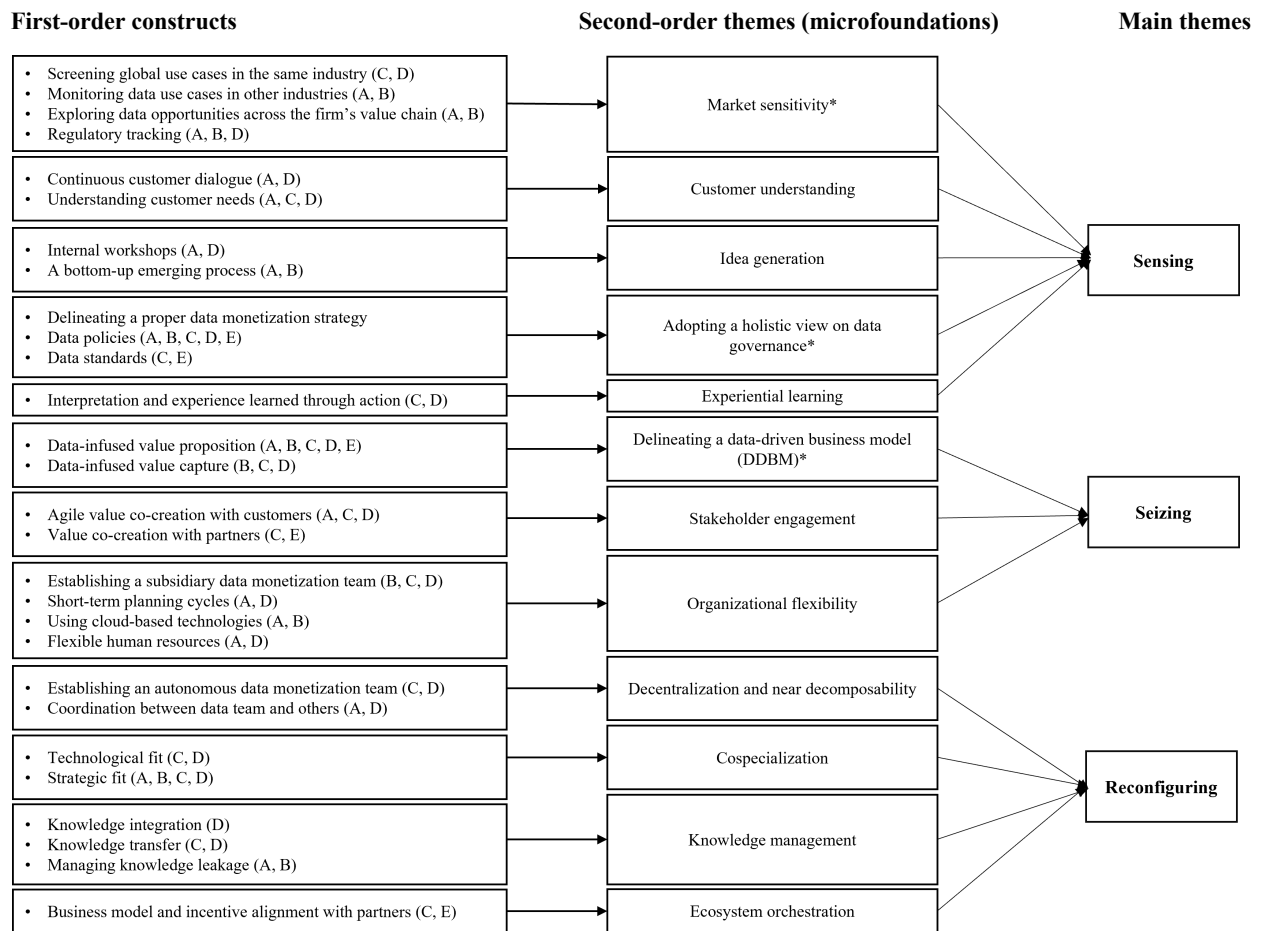


Figure 1: Data Structure (\*emergent micro-foundations)

contrast to extant theories” (Timmermans & Tavory, 2012, p. 12). The data analysis was conducted in 3 steps. First, building on Teece’s dynamic capability theory (2007), we structured the raw data according to the three general themes of sensing, seizing, and reconfiguring. Next, the structured empirical data were analyzed followed by an inductive approach

theoretical lens, and we started to map our initial second-order themes to the microfoundations proposed by Teece (2007). Four out of the 12 initial second-order themes were fitted into Teece’s proposed microfoundations namely, customer understanding, decentralization & near decomposability, cospecialization, and knowledge management. Then

we searched for other relevant microfoundations in the literature on dynamic capabilities for digitalization and business model innovation. As a result of this step, we assigned other four initial second-order themes to the respective microfoundations: idea generation, experiential learning (proposed by Khan et al., 2020), stakeholder engagement, and ecosystem orchestration (proposed by Santa-Maria et al., 2021). Consequently, the other three emergent second-order themes were found to be exclusive microfoundations for selling data in incumbents: market sensitivity, adopting a holistic view of data governance, and delineating a data-driven business model (DDBM). In the last stage of data analysis process, guided by Teece's (2007) framework, the 12 micro-foundations were aggregated into the three dimensions of sensing, seizing, and reconfiguring. It must be noted that, while previous studies propose organizational flexibility as a microfoundation of reconfiguring (Santa-Maria et al., 2021), we decided to consider it as a microfoundation of seizing based on our empirical data. Figure 1 shows the data structure.

## 4. Results

In the following, we present the results of the study, organized based on the three main dimensions of sensing, seizing, and reconfiguring.

### 4.1. Sensing micro-foundations for data monetization

Sensing new opportunities is a complex process of scanning, creation, learning, and interpretation. We identified five micro-foundations of sensing, including *market sensitivity*, *customer understanding*, *idea generation*, *adopting a holistic approach to data governance*, and *experiential learning*.

**Market sensitivity** refers to the firms' ability to constantly scan, search, and explore local and global markets. While investment in research and development activities is a prerequisite for this capability, our results show that screening global data use cases as well as exchanging ideas through attending different seminars and industry forums help companies leverage others' research efforts. But in fast-paced, globally competitive environments such as data markets in which industrial lines are getting blurred, the search activities must not be limited to just one industry. Indeed, the case companies monitor not only their core business ecosystem but also the periphery of their business ecosystem. The relevant research activities embrace authorities, standard-setting bodies, and educational and research

institutions. Our empirical evidence indicates that offering data-based solutions to a firm's current value chain has been the most common form of data monetization in the case firms. All the case companies, for instance, are providing some form of data offerings to their current customers and stressed the importance of it. Thus, organizations must start exploring data opportunities there. We found that partners might also be able to anticipate the potential for the company's data; as in one case, selling data was triggered by an external technology provider who recognized the value of the firm's data in conjunction with their technology. Finally, we observed that regulatory authorities and standard-setting bodies play a significant role in sensing data opportunities as they shape the "*rules of the game*" (Teece, 2007) in the data marketplace. While legal issues set some constraints on data monetization in some of the sample companies, new regulations such as the GDPR encouraged others to start selling data because they provide clearer and more consistent rules. In this regard, an interviewee from Company D said: "*GDPR gives us a clear playground. So that we know what we can and cannot do with the data. That is why we dare to monetize data*".

**Customer understanding** capability here refers to the firm's capacity to understand the core and latent needs of potential customers. Customer understanding has special significance for data products since customer maturity seemed to be an issue in all cases. Several interviewees highlighted the importance of continuous customer dialogue.

Our results show that sensing new opportunities is not solely concerned with scanning the external environment, but also involves searching for opportunities within the organization. Such **idea generation** could be through a bottom-up emerging process so that anyone can propose and bring up an idea about sharing some data and bringing value out of it or through internal workshops where many employees are involved from within the organization.

**Adopting a holistic approach to data governance** relates to the exercise of authority and control over the management of data throughout the whole organization and incorporates different sets of actions ranging from delineating data strategy to developing data policies, standards, and procedures (Abraham et al., 2019). A proper data strategy would enable and support an exploratory approach to data monetization through which new and innovative use cases will emerge. But since "*attention is a scarce resource*" (Teece, 2007, p. 1326), firms must limit the scope of their data exploration activities. Our results show that the firm's strategy seems to be an appropriate filter so that limited resources are not allocated to every search.

As an informant from Company D said: *“The only guideline that we have from the strategic point of view is that we need to find data solutions that boost our basic business.”*

All interviewees stressed data quality as an issue that hinders them from selling data. Data policies, thus, provide general guidelines for the proper acquisition, storage, and usage of data and help companies avoid these issues on the initiative level. Data standards, on the contrary, ensure that data and data-related activities are consistent throughout the organization. Currently, data is collected and used mainly for original business purposes. And for new data initiatives, if any, data value assessment is rather a reactive (i.e. based on a single data product, initiative, or customer-specific project) instead of a proactive (i.e. based on sensed data opportunity potential) approach. But then, the problem is, that one data solution might conflict with others. One interviewee from Company C, for instance, said: *“There are independent (data) projects in different organizational units, which is not ideal”*.

Therefore, increased transparency, documentation, and communication between different data initiatives through clear data procedures could help to avoid conflicting data practices and redundant investments in disparate data activities. Sensing new opportunities also involves interpretation and experience learned through action. Sensing data opportunities, in most cases, was through improvisation and trial and error cycles, referred to as *experiential learning* (Khan et al., 2020). As an interviewee from Company C put it: *“In the first year, we mostly did these kinds of customer-specific pilot projects... It was through approaching the customers with a solution sales approach, trying to get them interested, and then trying together with them to define what kinds of projects we could make and then deliver the project after the project we discussed was this useful? Should we continue?!”*

#### **4.2. Seizing micro-foundations for data monetization**

This theme includes the micro-foundations that firms must develop to take advantage of the identified opportunities. Our results revealed three specific micro-foundations of seizing including *delineating a data-driven business model (DDBM)*, *stakeholder engagements*, and *organizational flexibility*.

Data-infused value proposition is a central part of any **DDBM** and the case companies took different approaches to it based on the sensed opportunity as well as the customer maturity. It might be through offering an additional value wrapped around the core

products, selling data, or providing data-based insight and services. Most of the companies in our sample used data to offer an additional feature to their current customers or partners either for free or for an additional cost. A representative for Company D highlighted the importance of such additional features in engaging the existing customers and building loyalty: *“By giving these additional services, we try to engage customers more and encourage them to invest in our company more”*. The second approach involves selling raw data directly to business customers and granting its ownership to them and then the customers utilize the data for their purposes. Potential data buyers include firms’ suppliers, marketers, and data aggregators. An interviewee from Company C referred to these opportunities as *“the biggest and most valuable cases”*. But in these cases, the buyer needs to have sufficient business needs, as well as the necessary tools and analysis team to develop the data further. However, since not all businesses are yet ready to benefit from raw data, in most cases companies were providing data-driven insight and reports or delivering data-driven services through interactive dashboards.

Given the distinct nature of data offerings and lack of reference prices, new pricing strategies and revenue mechanisms are needed. The case companies devised different ways (e.g. unit pricing, value-based pricing, flexible pricing) to price data offerings, as one informant from Company C pointed out: *“We considered the needs and even the budget situation of the potential customers ... it was a little bit like a cat-and-mouse type of discussion because we were trying to figure out how much they would be willing to pay, and the customer was asking about the price.”*

Regarding the second micro-foundation, **stakeholder engagement** is critical in seizing as almost all informants, stressed the importance of it. The case companies tried to first validate and test new ideas with potential customers before productizing them. For instance, one interviewee from Company A mentioned: *“We try to get something usable for the customers and then test whether the customers like it or not. Testing is really important”*.

Furthermore, data use cases are vertical specifics meaning that they require understanding the business needs and use cases of different industries. An interviewee from Company C described the situation as follows: *“Already in the beginning, we figured out that our expertise was not the public transportation planning, retail marketing, tourism marketing, or urban planning which are the main, target groups that we utilize.”*

Hence, there is a need for traditional firms to work with new partners on co-creation activities to help them in developing data offerings.

Finally, **organizational flexibility** refers to the firm's ability to adapt successfully to new data initiatives. Establishing an autonomous team led to increased agility in developing new ideas, as the firm's structure and culture did not impede the process. Besides, to cope with the fast pace of change, the case companies have adopted short planning cycles instead of long-term plans. As one interviewee from Company A mentioned: *"We have a two-month planning cycle. Every two months, we plan what work we do and if there's some opportunities, then we'll just gather the people we need and have, to seize the opportunity"*.

As mentioned earlier, rapid prototyping to test and validate new ideas was another practice that helped case companies to learn and adapt quickly and cheaply, before scaling up new data solutions. Finally, using cloud-based technologies enabled companies to easily start working on new ideas.

### 4.3. Reconfiguring micro-foundations for data monetization

This theme includes micro-foundations that allow companies to reconfigure assets, organizational structures, and processes to match the seized data opportunities. We noted four micro-foundations of reconfiguring, namely, *decentralization & near decomposability*, *cospecialization*, *knowledge management*, and *ecosystem orchestration*.

**Near decomposability** involves maintaining a delicate balance between granting autonomy to local business units to respond quickly to market changes, while ensuring coordination and integration among them as needed (Teece, 2007). The case companies agreed that the revenue generated from selling data was still relatively low, and therefore, it did not receive the attention it deserved. Decentralization along data products with independent profit centers, thus, helped case companies get the required competencies and compensate for issues arising from the lack of data business priority, lack of agility, and traditional culture in the parent organization. Yet, according to one of the informants from Company C, *"the disadvantage of being separate is that you cannot get so much benefit from the mother company such as the brand reputation, customer relationship of the existing company and so on"*. Furthermore, data was an integral part of the firm's core products, with data solutions closely intertwined with the core offerings. Hence, it is a fine balance, and local units and data teams need to be orchestrated.

**Cospecialization** refers to prioritizing data initiatives that fit existing organizational resources and building or acquiring competencies that are value-enhancing (Teece, 2007). The ability to invest in

cospecialized assets was identified as a fundamental micro-foundation, as one informant from Company D emphasized: *"To some extent, we need to play by the technologies that we already have. It is not very smart or efficient to think about big technological changes just based on data monetization plans."*

Our analysis showed how some data projects have the potential to also enhance the main business, as implied in the following quote from one of the Company A representatives: *"Another driver for investing in data monetization would be to encourage us to pay more attention to the data quality and we would benefit from that better quality data ourselves"*.

Although sensing also involves learning about the external environment, **knowledge management** here refers to the ability to share, integrate, and manage knowledge as a strategic asset in response to the identified data opportunities. A representative from Company C, for instance, described how the combination of know-how enabled the sales team to acquire the required knowledge to sell the data offerings: *"We used to have a few special salespeople around these [data] offerings, but as they used to go to the actual meetings with the sales team (including the account manager), after a while the account manager learned how to sell these data solutions."*

Close cooperation with the legal department within most of the case companies is another example that reveals the importance of knowledge sharing within the firm.

Finally, **'ecosystem orchestration'** refers to the capability of identifying, managing, and coordinating the strategic partners within the business ecosystem (Santa-Maria et al., 2021). Ecosystem orchestration capabilities, including the ability to identify business model alignment and incentives with partners, were found to be relevant in certain cases. For instance, one interviewee from Company E described the partnership challenge as follows: *"There are some companies that try to be our partners ... They promised to deliver us data in the future but upon further inspection, we notice that it is not clear what data they can deliver to us and in which year! They expect that we support them, but we are not sure whether we can get anything back from them."*

## 5. Discussion and concluding remarks

In this multiple case study, we gained new insights into selling data in the context of incumbents. All the case companies had an interest in selling data, but some issues hindered this. All interviewees referred to data quality as an initial issue that companies face in developing data offerings. In particular, the interviewees referred to poor quality of

data, siloed and inaccessible data, and lack of a clear data catalog as evident factors that hinder deriving revenue from their data. Customer maturity also seemed to be an issue in all cases regardless of the industry; therefore, companies found it hard to generate decent revenue from their data solutions. Furthermore, analyzing multiple cases allowed us to identify which of the identified practices are more relevant. Concerning sensing capabilities, “adopting a holistic view on data governance” is of the highest importance since it was present in all the cases. In all the cases data is collected and used mainly for original business purposes. New data-based value creation is based on perceived business problems rather than assessed data opportunity potential. Therefore, a holistic view of data governance should be adopted to facilitate interoperability among different data initiatives and allow for an explorative approach to the design and development of new data offerings. “Market sensitivity” capability was found to be of second importance and was present in 80% of cases. Earlier research also stressed the importance of constant scanning of technological development and markets (Teece, 2007). While our empirical results support the significance of market sensitivity, technological opportunities seem to be of lesser importance in this context as there was a consensus among all the interviewees that the ideas must not come solely from technology. Rather, they all come from customer demands and technology is only the tool to address the demand. Regarding seizing, delineating a DDBM emerged as a critical capability in all cases. According to earlier research, selecting product architectures and business models is a fundamental micro-foundation of seizing (Teece, 2007). Our case companies developed separate data-driven business models and continued to operate with dual business models. Lastly, regarding reconfiguring capabilities, the cospecialization of strategy to structure and of assets appeared to be of utmost significance. All cases interviewed emphasized that these new data businesses needed to be on the strategic agenda and that they needed to align and work with technologies and resources that they already had. It must be noted that this does not mean that other capabilities are not relevant; it simply highlights that these capabilities are proposed as essential for selling any form of data within incumbents.

Another interesting insight is that the three core capabilities of sensing, seizing, and reconfiguring have to be considered together. Earlier research argued that there is a sequential logic to the implementation of sensing, seizing, and reconfiguring (Khan et al., 2020). We caution that the sequential process does not mean that organizations should

implement the three capabilities independently and separately. Customer understanding for instance was found to be vital to both sensing and seizing. Cospecialization and knowledge management are also important for both seizing and reconfiguring.

## 5.1. Theoretical contributions

Our study makes two main contributions to IS research. First, we contribute to the data economy literature, by providing a new understanding of monetizing data through designing and selling novel data-based offerings in the context of established organizations. Earlier research called for more research to further explore how incumbents perform the activities in each step of data monetization (Parvinen et al., 2020). By empirically exploring various skills, processes, and organizational activities that facilitate the sale of data in incumbents, we shed light on the capabilities needed in different stages of direct data monetization.

Second, we contribute to the DC literature by answering the call for research to engage with micro-foundations that support dynamic capabilities (Schilke et al., 2018). We discovered three novel micro-foundations exclusive to our setting (i.e. market sensitivity, adopting a holistic approach to data governance, delineating a DDBM) and identified nine generic micro-foundations that have been proposed in prior literature (e.g. Teece, 2007, Khan et al., 2020; Santa-Maria et al., 2021). Thus, by identifying new micro-foundations and supporting the findings of previous studies through empirical replication, we enrich the literature on DC, which has been criticized for the lack of empirical knowledge and the under-specification of the underlying constructs of dynamic capabilities (Schilke et al., 2018).

## 5.2. Practical implications

Our results provide organizations with insights into the types of skills, processes, and organizational activities that are needed to develop and sell data offerings. Our study shows that customer understanding has special significance for sensing since customers are not yet ready to fully realize the value of data. Thus, to identify and shape data opportunities, companies must not only strive to understand the full array of potential customers but also how they could potentially benefit from a company’s data. In addition, technological advancement does not seem to play a big role in identifying new data opportunities. Thus, companies should primarily focus on how to derive value from available technologies and the data they already



possess. Finally, data solutions should start from a business problem or unmet customer demand.

To seize data opportunities, companies could start by developing a new data-driven business model or integrating data initiatives into their existing business models and strategies. Second, companies should engage customers early in the value-creation process, otherwise, the data offerings may not appeal to the intended customers. Since incumbents from traditional industries generally lack knowledge and experience of data and data-based offerings, they need to search for and involve partners to complement their capability in developing data offerings. Third, we caution that businesses need to be flexible to adapt successfully to new data initiatives.

We have four recommendations for companies to reconfigure their assets, organizational structures, and processes to match the seized data opportunities. First, while establishing an autonomous data team may compensate for the lack of data business priority and lack of agility in incumbents, we caution that local units and data teams need to be orchestrated for the data team to benefit from the company's internal knowledge and resources. Second, data initiatives must always have a place in the business strategy, and organizations need to prioritize initiatives that fit existing organizational resources. Incumbents also need to acquire knowledge management capability to share, integrate, and manage knowledge as a strategic asset in response to the identified data opportunities. Finally, aside from reconfiguring internal resources, firms need to orchestrate data production and management within the whole ecosystem.

### 5.3. Limitations and avenues for future research

As with any study, this study is not without its limitations. One limitation of this research is that the findings might have been subject to sampling bias. Although all the interviewees were senior executives with substantial knowledge and experience in data businesses, future research with further interviews with experts from different divisions such as IT and sales and marketing could provide more insights into the required dynamic capabilities for data monetization more broadly. Besides, the interviews represent interviewees' opinions, which can be influenced by subject error and bias. Indeed, despite ensuring anonymity, the interviewees may have hidden or downplayed their organizations' real plans due to societal skepticism toward data selling. A second limitation is concerned with the generalizability of the results. All the case companies

were from Nordic countries and operated under GDPR. Thus, it would have been insightful to study whether the required dynamic capabilities differ if the companies have their headquarters in non-European countries. Furthermore, we deliberately selected the cases that were deemed relevant to the research objective. This can introduce selection bias. Nevertheless, our sample included cases from diverse industries, with different types of data.

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