

Responding to a Fast-Changing World: Dynamic Capabilities for Digital Transformation

An explorative case study of a commercial vehicle incumbent company

Abstract

Incumbent companies are facing a fast-changing world characterized by technological developments that are reshaping and even disrupting industries. In times like these, incumbent's core competencies turn into its core rigidities hindering its ability to respond to the rapid developments. In order to continue competing and maintaining their advantageous position in the market, incumbents must build and employ dynamic capabilities for sensing and seizing new opportunities and transforming themselves accordingly. The purpose of this study is to understand how teams in incumbent companies develop and maintain dynamic capabilities for digital transformation, using a world leading provider of transport solutions, Scania, as an empirical case study. The study identifies key micro-foundations that formed the basis of dynamic capabilities that the team developed and employed on their journey and main challenges they faced and how they dealt with them along the way. The study finds that dynamic capabilities can be observed at levels of analysis other than the firm-level, that they are built over time through the employment of micro-foundational activities, processes, routines, and skills, and that they contribute to the renewal of the organizational structure, business model development, and organizational culture in order to enable company's digital transformation. In particular, on their journey towards digital transformation, teams manage incumbency-related and entrepreneurial challenges and employ different dynamic capabilities at different stages of the process to deal with the hindrances and enable change.

Key Words: dynamic capabilities, digital transformation, incumbent companies, service development, cross-functional teams

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Glossary

Distributors - Organizational units in markets around the world with the focus of marketing, selling, and administering vehicles and related services in their respective markets

Markets - Countries or regions around the world where Distributors are present

Customer - A company that purchases vehicles and services for use in organization's operational activities

Driver - A person employed by the Customer that is the end user of the vehicle and certain vehicle- and driver-related services

Digital disruption - The change that occurs when new digital technologies and business models affect the existing companies and industries

Incumbent - A long-standing and established company with a level of dominance or competitive advantage in the market

Connectivity - The capability of communicating with devices through Internet connection

Connected vehicle - A vehicle equipped with Internet access allowing it to share data with devices inside and outside of the vehicle

Connected services - Services enabled by connectivity

Digitalization - The process of converting information, processes, activities etc. into digital form

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1 Introduction

New digital technologies are changing and even disrupting a wide range of industries and companies of all sizes. Up until recently, companies saw this disruption as a “future trend” and could postpone drastic changes to the way they operate and compete. Today digitalization is at the heart of many company’s strategic and research agendas (Geissbauer et al., 2016).

1.1 Digital Technologies as a Source of Disruption

New digital technologies act as a double-edged sword in that they provide both incredible opportunities and disastrous threats to incumbent companies (Sebastian et al., 2017). Since 2000, digital-born companies such as Amazon and Google have grown to become tech unicorns, while over half of the Fortune 500 companies have disappeared off the list (Andersson et al., 2017). Social media, mobile technology, big data, analytics, cloud computing, and embedded devices, developed as a result of great improvements in the processing power, device miniaturization, and network benefits of ubiquitous wireless connectivity, have radically changed the way businesses work and compete (Bonnet and Westerman, 2014; Porter and Heppelman, 2014). They are altering current industries, reshaping their boundaries, developing completely new industries, and creating new sets of complex strategic choices for traditional businesses.

The role that new digital technologies play in transforming companies and whole industries has been of great importance to practitioner and scholar researchers alike over the past two decades. Information systems scholars have researched the role that digital technologies play in firms' strategies (Bharadwaj et al., 2013; Hess et al., 2016; Sambamurthy et al., 2003), innovation (Henfridsson et al., 2014; Yoo et al., 2012), and business models (Al-Debei and Avison, 2010; El Sawy and Pereira, 2013) by explaining their disruptive impact on organizations (Warner and Wäger, 2018). Having reviewed the extant body of digital transformation literature, Vial (2019) highlights three types of disruptions: (1) consumer behavior and expectations, (2) competitive landscape, and (3) the availability of data. Consumers are less bound to one company and have expectations that highly efficient, effective and overall convenient digital solutions will be provided to them regardless of the industry or company. As for the competitive landscape, the disruption comes in the form of new digital offerings (Yoo et al., 2010), servitization (Barrett et al., 2015), lower barriers to entry (Woodard et al., 2012) and hindered sustainability of competitive advantage of incumbent players (Kahre et al., 2017). Lastly, availability of data allows companies to use analytics and exploit it for their benefits by getting deep understanding of their customers and serving their needs better.

Organizations must find ways to remain competitive in the advent of digital disruptions (Sebastian et al., 2017:197, Vial, 2019). Research has found that the way firms respond to digital disruption has been through business model innovation (e.g. altering value propositions, implementing digital channels, servitization etc.), cross-functional collaboration (e.g. companies create a separate unit that maintains a degree of independence from the rest of the organization or that remains within the organization), cultivating a digital culture (e.g. a willingness to take risks and experiment with digital technologies), creating new leadership roles (e.g. the role of Chief Digital Officer), and changing employee roles and skills (Vial, 2019).

1.2 The Incumbent Company as an Empirical Context

While incumbent companies face significant challenges in adapting to digital disruptions, the demise of the incumbent is not inevitable. In some instances, incumbents are able to adapt, survive and maintain and even enhance their competitiveness. This section first lays out the typical incumbency-related challenges standing in the way of company's ability to digitally transform itself. Second, the reason for the choice of dynamic capabilities theory in analyzing this phenomenon has been explained.

1.2.1 The Incumbency Curse

Scholars talk about the incumbent company's struggle to adapt to digital disruption under the name of 'incumbency curse' (Roy and Shakar, 2016, Taylor and Helfat, 2009, Chandy et al., 2000). Incumbents have been portrayed as going into decline, while the new entrants take their dominant position by successfully exploiting new technology (Hill and Rothaermel, 2003). This phenomenon has been widely observed and studied across a variety of industries over the years. A few well know and recent examples are those of Ryanair introducing its no-frills model thus challenging mainstream airlines, Apple and Google introducing new operating systems and applications thus challenging the market leader Nokia, Netflix offering online movie rentals and improved customer experience thus challenging the movie-rentals leader Blockbuster (Leonhardt, 2006, Ansari and Krop, 2012).

The incumbent company's demise in the face of digital disruption has often been considered to be due to their failure to embrace new technologies. Scholars have identified several contributing factors. Hill and Rothaermel (2003) structure the different factors based on their roots in economics, organization theory, and strategy. The economic explanation for incumbent inflexibility is based on the idea that incumbents have economic incentives to protect their existing rent streams, add to their established knowledge base, and maintain entry barriers (Gilbert & Newbery, 1982; Reinganum, 1983). Organization theory emphasizes the role that inertia plays in preventing incumbent's ability to respond to new technological threats. The inertia is born out of incumbent company's predictability and reliability, highly structured organizational routines, lack of absorptive capacity (the ability to assimilate new information), power and politics (Hannan and Freeman, 1984; Miller, 1993; Cohen and Levinthal, 1990). The strategy explanation is based on the fact that incumbents are embedded in value networks with suppliers, customers, partners, investors, and communities to which firms make strategic commitments (Christensen, 1997; Pfeffer & Salancik, 1978; Ghemawat, 1991). These external commitments require incumbents to focus on satisfying established demands and maintaining existing relationships, thus constraining their ability to take advantage of new technologies.

The general premise of all the factors contributing to incumbent's inability to adapt is that their core competencies that were responsible for helping them achieve market power have turned into their core rigidities in the face of new digital technologies (Vial, 2019). As such, incumbents face a major challenge of needing to balance the exploitation of existing capabilities while also building new digital capabilities that are compatible with the path dependencies of the past (Svahn et al., 2017). In doing so, firms need to get past their dominant logic that forces them to seek information that confirms their logic, rather than accept the evidence that renounces it (Prahalad and Bettis 1986).

1.2.2 Dynamic Capabilities

Dynamic capabilities refer to a firm's ability to develop and apply competencies to address rapidly changing environments. Dynamic capabilities framework was born out of a necessity for developing a theoretical lens that would be suitable for explaining how and why some companies are able to maintain their

competitive advantage in the times of rapid change (Teece, 1997). As such, the theoretical framework has become one of the most used approaches to study how firms respond to rapid technological and market change (Eisenhardt and Martin, 2000; Helfat et al., 2007; Teece, 2007; Teece et al., 1997). Dynamic capabilities framework is based on the idea that companies can develop new competences and modify their existing resources, processes, organizational setups and other rigidities allowing them to become more agile and innovative (Helfat et al., 2007). Given the disruptive nature of digitalization, dynamic capabilities framework is a powerful lens for studying the digital transformation of incumbent firms in traditional industries (Warner and Wäger, 2018). Incumbent companies must build strong dynamic capabilities in order to remain relevant in the face of digital disruption.

1.3 Research Gap

Although the concept of dynamic capabilities has been around for a little over 20 years, there is still significant need for empirical research to fill the gaps in theory (Schilke, 2018). First, the phenomenon of digital transformation is still understudied from a perspective of dynamic capabilities. New digital technologies are fundamentally transforming business processes, products, services, and relationships, yet the question of how organizations build dynamic capabilities for digital transformation is still largely unexplored (Warner and Wäger, 2018; Karimi and Walter, 2015). Second, researchers have traditionally placed dynamic capabilities at the firm-level of analysis, however in recent years the idea that these capabilities exist at other levels of analysis has been clearly diffused (Augier & Teece, 2009; Felin & Foss, 2005; Helfat & Martin, 2015). Furthermore, Schilke et al. (2018) calls for more precision in studying dynamic capabilities regarding specific units of analysis, considering a highly context-dependent nature of dynamic capabilities. Third, there has been a clear trend towards micro-foundational research in strategy research as a whole (Felin et al., 2012). The dynamic capabilities literature has also been heading towards that trend, but there is still call for further research on a micro-level (Schilke et al., 2018). In particular, literature is calling for further study of micro processes as well as the nature of the work performed by actors to support dynamic capabilities. The idea is that doing so would also help study the link between high level dynamic capabilities and the actual practices performed by organizational actors (Schilke et al., 2018; Teece, 2007). Finally, regarding the method of study, scholars are also calling for rich in-depth accounts of how dynamic capability-related processes and activities work on the ground (Harris et al., 2009; Karimi and Walter, 2015).

1.4 Research Purpose & Research Questions

The purpose of this study is to understand how teams in incumbent companies develop and maintain dynamic capabilities for digital transformation, using a world leading provider of transport solutions, Scania, as an empirical case study. Using dynamic capabilities literature as a theoretical lens, this study will investigate the phenomenon of digital transformation in the context of a cross-functional project team. The study is therefore intended to fill the three research gaps by (1) identifying dynamic capabilities for digital transformation, (2) conducting research at a team level, (3) identifying micro-foundations of dynamic capabilities. Therefore, this paper will explore the following research question:

How do teams in incumbent companies develop and maintain dynamic capabilities for digital transformation?

In order to do that, the following two sub-questions will be answered:

Sub-question 1: How are team-level dynamic capabilities built from micro-foundations?

Sub-question 2: What hindrances do teams experience and how do they deal with them along the way?

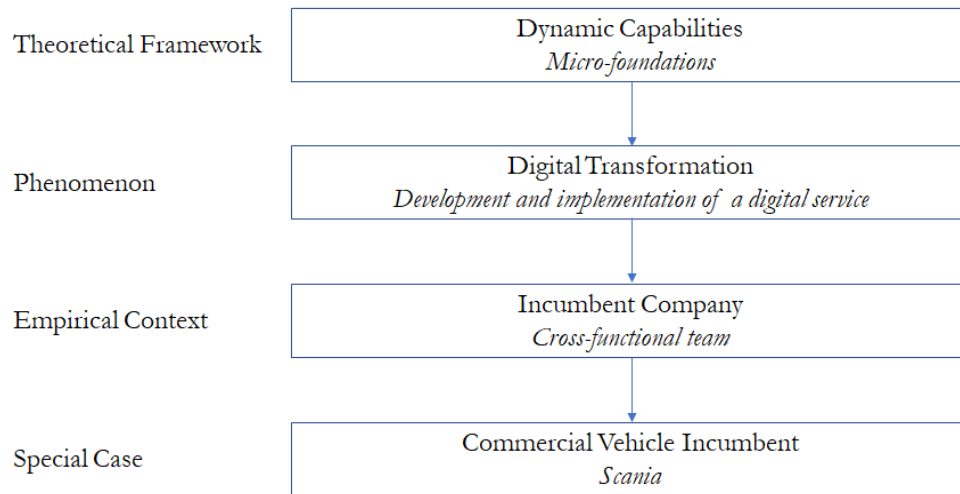


Figure 1: Overview of the study

1.4.1 Delimitations

This study focuses on one digital transformation project within an organization rather than studying all digital transformation-related activity at the entire organization. This was done in order to address the research gap, but also in order to narrow the scope of the study as studying organization-wide processes and activities at a large global company would require a lot more time. The choice was also made to focus on a single case study, as the research gap required an in-depth understanding.

2 Literature Review & Analytical Framework

To understand how incumbent companies develop and apply dynamic capabilities for the purpose of digital transformation, this section will review the relevant literature for the framework and the context of the study.

2.1 Dynamic Capabilities

Originated by Teece et al. (1997), the concept of dynamic capabilities has become an increasingly used theoretical perspective in management research over the past 20 years and has established itself as one of the most influential theoretical lenses in contemporary management scholarship. Yet, it still lacks empirical knowledge and detailed construct specification (Schilke et al., 2018). Teece et al. (1997) introduced the dynamic capabilities framework because they recognized that, while the available theories explain firm-level strategies for sustaining and safeguarding competitive advantage, they are not good at explaining how and why certain firms build competitive advantage in the context of rapid change. Teece especially differentiated the dynamic capabilities perspective from the more static resource-based view (RBV) of the firm, however, some scholars today still see dynamic capabilities as an extension of RBV (Helfat & Peteraf, 2003).

The dynamic capabilities approach draws upon research in a multitude of areas including the “*management of R&D, product and process development, technology transfer, intellectual property, manufacturing, human resources, and organizational learning*” (Schilke et al., 2018) highlighting the complexity of the concept as well as its relevance for the organizational performance. Dynamic capabilities are, therefore, a widely applicable framework relevant to domains such as innovation, market entry, acquisitions, alliances, diversification and more (Helfat et al., 2007). This wide range of applications, combined with the high importance and relevance of the topic of strategic change, has made dynamic capabilities framework of interest to a wide range of scholars.

2.1.1 Current State of the Literature on Dynamic Capabilities

The extant research on dynamic capabilities can be organized into following themes: (1) definition of the construct; (2) theoretical assumptions underlying dynamic capabilities; (3) theoretical integration of dynamic capabilities and other theoretical lenses; (4) dimensions according to which dynamic capabilities are characterized; (5) antecedents to the creation and use of dynamic capabilities; (6) consequences (outcomes) of the utilization of dynamic capabilities; (7) mechanisms (mediators) through which dynamic capabilities affect outcomes; (8) moderators of the relationship between dynamic capabilities and outcomes; (9) dynamics with respect to the impact of dynamic capabilities on outcomes and the development of these capabilities over time; (10) and methods (Schilke et al., 2018). Below is a more in-depth view on a couple of relevant themes including the definition of the dynamic capabilities construct and the dimensions according to which dynamic capabilities are characterized.

2.1.2 Defining Dynamic Capabilities

The most commonly used definition of dynamic capabilities according to Schilke et al. (2018) is the following one: Dynamic capabilities are “*the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization’s ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions*” (Teece et al., 1997). The second most used is one by Eisenhardt and Martin (2000): “*The firm’s processes that use resources—specifically the*

processes to integrate, reconfigure, gain and release resources—to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die.” The third most used one is one by Helfat et al. (2007) that defines dynamic capabilities as *“the capacity of an organization to purposefully create, extend, or modify its resource base”* in a practiced and patterned manner. Helfat and Winter (2011) revised this definition to include an organization’s capacity to influence its external environment as emphasized by Teece (2007).

While slightly different, the three most used definitions are complementary and build on one another. All three definitions agree on the following things: (1) that dynamic capabilities reflect a company’s ability to change (2) and modify its competences and resources (3) in response to rapidly changing environments (4) in a repeatable way. However, the different definitions vary in their views on the extent to which dynamic capabilities are sources of competitive advantage as well as on the emphasis (or deemphasis) on the external resources.

Dynamic capabilities stand in opposition to ordinary (operational) capabilities. *“Ordinary capabilities involve the performance of administrative, operational, and governance-related functions that are (technically) necessary to accomplish tasks.”* (Teece, 2014) Ordinary capabilities are therefore directed towards maintaining and leveraging the status quo of the organizations (Helfat & Winter, 2011; Winter, 2003; Zahra et al., 2006). As such, ordinary capabilities do not help incumbents achieve a change and reconfiguration necessary for digital transformation. Dynamic capabilities, on the contrary, are directed towards strategic change (Schilke et al., 2018).

Dynamic capabilities are context specific and embedded within organizations, which is why they must be developed over time and cannot be bought or otherwise acquired (Helfat & Martin, 2015). As such organizations must dedicate a substantial amount of effort, time and funds to develop and apply dynamic capabilities for strategic change.

2.1.3 Dimensions of Dynamic Capabilities

Dynamic capabilities are a highly complex phenomena, and they manifest themselves in various distinct forms (Schilke et al., 2018; Eisenhardt & Martin, 2000; Helfat et al., 2007; Helfat & Winter, 2011). To dimensionalize the dynamic capabilities construct, different scholars have developed different approaches. First, scholars differentiate between the types of processes in which dynamic capabilities are engaged. Teece et al. (1997) talks about the processes of coordinating, learning, and reconfiguring, while Teece (2007) brings out, now widely used, dimensionalization of sensing, seizing, and transforming which builds on the former one. Scholars call for more research on the process dimensions regarding both the specifics of how they work in practice as well as challenging the existing dimensionalization instead of taking it for granted (Schilke et al., 2018).

Second, scholars emphasize the degree of routinization of dynamic capabilities from ad-hoc problem solving to highly routinized processes and procedures (Winter, 2003). Recent research has started to look more at the interplay between the two types of dynamic capabilities (Wohlgemuth and Wenzel, 2016) and further research is needed to shed light on how the two work in practice (Heimeriks et al., 2012; Peteraf et al., 2013).

Third, dynamic capabilities differ based on the functional domain, such as new product development or alliancing, in which they are applied (Eisenhardt & Martin, 2000). Scholars call for more research regarding different functional domains such a business model adaptation capabilities, considering a highly context-dependent nature of dynamic capabilities (Mezger, 2014; Wirtz et al., 2010).

Fourth, dynamic capabilities can have different levels of hierarchy (zero-, first-, second-, and higher-order capabilities) where each level of capabilities can be modified by higher level capabilities (Collis, 1994, Winter 2003). The relationship between the different levels of hierarchy is something that scholars are looking to explore more (Schilke et al., 2018).

Finally, scholars also recognize that dynamic capabilities can exist at different units of analysis such as individual, team, organizational, and extra-organizational (Adner & Helfat, 2003; Felin et al., 2012). Traditionally, the dynamic capabilities research has been located at the organizational level of analysis, but since early 2000s other levels of analysis, such as individual level, begun to be explored (Adner & Helfat, 2003; Augier & Teece, 2009; Felin & Foss, 2005; Helfat & Martin, 2015). Scholars call for more research to consider additional units of analysis (Schilke et al., 2018). These different approaches have helped provide richness and nuance to the otherwise generic dynamic capabilities construct making it easier to understand what constitutes concrete and observable dynamic capabilities.

Therefore, there appears to be no single list of dynamic capabilities that is generalizable across all types of organizations and contexts. Having reviewed the extant body of literature and developed a dimensionalization map of dynamic capabilities, Schilke et al. (2018) call for further research to use fine-grained and concrete approaches to investigating dynamic capabilities as opposed to generic ones. They stress that future dynamic capabilities research should require “*precision in defining and measuring specific instances of dynamic capabilities*” (Schilke et al., 2018).

2.1.4 Micro-foundations of Dynamic Capabilities

There is a recent movement towards studying micro-foundations in strategy research with the basic motivation of decomposing macro-level constructs in terms of the activities that happen at lower levels of the organization in order to understand how firm-level performance emerges from these micro actions and interactions.

According to Foss and Pedersen (2014) “*micro-foundations are about locating (theoretically and empirically) the proximate causes of a phenomenon at levels of analysis lower than the phenomenon itself.*” Micro-foundations is not a theoretical or empirical approach, rather, it is a broad set of research heuristics focused on the micro-level mechanisms and their interaction. As such, micro-foundations refer to the micro level of analysis which can, but does not have to, be on the level of an individual (Felin et al., 2015).

The issue that ‘micro scholars’ have with ‘macro scholars’ is that the latter talk about direct causal relationships between macro-level variables (e.g. capabilities and performance) while the real causal relation happens rather at the micro level, which they leave unexplained (Foss and Pedersen, 2014). Additionally, macro-level view masks the variation of micro-level phenomena that underpin it. Therefore, excluding the micro-level view can lead to assumptions that micro-level phenomena either have a uniform or no effect on the variation in the macro-level phenomena which, as suggested by research evidence, proves to be unsustainable and inaccurate (Felin et al., 2012). From a practitioner point of view, leaving the underlying mechanisms of macro concepts, such as dynamic capabilities, ‘black-boxed’ makes it difficult to provide proper advice to managers on how to promote their development (Foss and Pedersen, 2014).

Felin et al. (2012) highlight the importance of focusing further research on micro-foundations for two reasons: (1) “*micro-foundations can enhance our understanding of primary components underlying routines and capabilities*” and (2) “*exploring how components interact, within or across categories, will shed light on how differences in routines and*

capabilities arise.” This, he posits, would allow to identify sources of heterogeneity across firms, as well as aid in understanding how capabilities are built, maintained, extended, leveraged, adapted, and phased out.

The micro-foundational work within strategy research only started to take off from 2010, despite the fact that scholars have been calling for it for more than a decade before (Grant, 1996; Lippman & Rumelt, 2003; Felin & Foss, 2005; Gavetti, 2005; Teece, 2007). Among a variety of topics that were studied from a micro-foundational perspective (e.g. ambidexterity, innovation, routines), dynamic capabilities research has also focused on anchoring the higher-level concept of dynamic capabilities on lower levels (Foss and Pedersen, 2014). According to Teece et al. (2007) the micro-foundations of dynamic capabilities are *“the distinct skills, processes, procedures, organizational structures, decision rules, and disciplines which undergird enterprise-level sensing, seizing, and reconfiguring capacities.”* As such, each of the three enterprise-level dynamic capabilities identified earlier (sensing, seizing and transforming) has a set of micro-foundations in the form of identifiable activities that enable and promote them. The existence of these micro-foundations is crucial in order to be able to study how organizations are able to sense, seize, and transform. Teece (2007) identified some of those micro-foundations while clearly stating that the list must necessarily be *“incomplete, inchoate and somewhat opaque”* in order to be difficult to imitate, but also because micro-foundations are rather context specific (Appendix 1).

Following the Teece’s introduction of dynamic capabilities’ micro-foundations, scholars have moved beyond the organizational level dynamic capabilities research in recent years by focusing on the micro-foundations (Abell et al., 2008; Felin et al., 2015). Research includes the individual-level factors and their role in shaping dynamic capabilities such as human capital (Hsu & Wang, 2012; Kale, 2010), leadership (Kor & Mesko, 2013; Rindova & Kotha, 2001), and managerial cognition (Dunning & Lundan, 2010; Leiblein, 2011). An example of one such study is one done by Salvato (2009) who studied 90 new product development processes at an Italian design firm and got an insight into how “micro-activities” done by individuals shaped the organization’s product development. The following section links the dynamic capabilities with digital transformation and outlines research done to uncover micro-foundations in that context.

2.1.5 Digital Transformation and Dynamic Capabilities

Vial (2019) defines digital transformation as *“a process where digital technologies create disruptions triggering strategic responses from organizations that seek to alter their value creation paths while managing the structural changes and organizational barriers that affect the positive and negative outcomes of this process.”* As such, organizations must develop strategies surrounding the innovation with these technologies that consider their implications for organization’s digital transformation (Hess et al., 2016). In order for firm’s to respond to digital disruptions, they must have the ability to sense disruptions, seize them, and transform themselves accordingly (Vial, 2019). As such, dynamic capabilities framework can provide a valuable insight into the study of how firms engage with digital transformation.

When it comes to sensing, incumbents affected by digital transformation need to scan the environment for technological trends that could be disruptive for the organization (Birkinshaw et al., 2016; Day and Schoemaker, 2016; Helfat and Raubitschek, 2018). Teece and Linden (2017) claim that sensing for technological trends should happen at all levels of the organization. However, incumbents face important challenges when it comes to building sensing capabilities to scan and predict disruptive digitalization trends (El Sawy et al., 2016; Matt et al., 2015). For example, incumbents found it difficult to predict the convergence of unconnected industries through platforms of “smart products” (Sebastian et al., 2017). Some scholars argue that firms need to use different technologies to gather information on unexpected trends, the activity which they refer to as ‘digital evolution scanning’ (Nylén and Holmström, 2015).

Seizing business opportunities that new technologies bring requires incumbents to be more experimental and use techniques such as rapid prototyping to balance risk and reward (Day and Schoemaker, 2016). However, incumbents find it hard to seize these opportunities, even if they manage to sense them, due to their path dependencies which force them to focus on incrementally improving their existing technologies rather than incorporating completely new ones (Teece, 2007). To overcome this, scholars have found that incumbents are trying to use agility methods, originating from software development, but are still experiencing challenges (Birkinshaw, 2018; Rigby et al., 2016; Weber and Tarba, 2014). Rigby et al. (2016) point out that the reason incumbents fail when trying to use agile methods is because they do not understand the conditions under which agile does or does not work. In order to be successful at agile, incumbents need to go through a deeper and broader digital transformation (Birkinshaw, 2018; Hess et al., 2016; Sebastian et al., 2017; Svahn et al., 2017).

To realize the full potential of digital transformation, incumbents need to have strong transforming capabilities. According to Day and Schoemaker (2016), an organization with strong *“transforming capabilities is one where agile, entrepreneurial mindset is actively cultivated within, with a broad expansive approach to external network-building as well.”* However, incumbents experience significant challenges when it comes to transforming despite having a strong willingness to embrace digital innovation (Svahn et al., 2017). This is because incumbents need to balance tensions related to flexibility and control of governance structures, process and product innovations, new innovation capabilities and existing product innovation practices, and collaborative tensions between employees and external partners (Svahn et al., 2017).

While the question of how companies build dynamic capabilities for digital transformation is still largely unexplored, Warner and Wäger (2018) have made two contributions to the literature based on their study of senior executives experiences at multinational incumbent firms in traditional industries in Germany. First, they defined the scope of the digital transformation process in order to provide rich context to the study of strategic change. As such, they identified three aspects of an organization that are transformed by digital transformation: (1) business model, (2) collaborative approach, and (3) organizational culture. Second, they provided empirical insight into what types of digital capabilities do incumbents undergoing digital transformation need to develop. As such, they identified six microfoundations to Sensing, Seizing, and Transforming capabilities as well as three contextual factors that could trigger, enable or hinder the digital transformation (Appendix 2).

2.2 Synthesis and Analytical Framework

This section aims to synthesize the literature reviewed in the form of theoretical gaps that this study will address and present the analytical framework used to address those gaps and answer the research question: *‘How do teams in incumbent companies develop and maintain dynamic capabilities for digital transformation?’*

2.2.1 Theoretical gaps

Theoretical gap 1:

There has been a clear trend towards micro-foundational research in strategy research as a whole (Felin et al., 2012). The dynamic capabilities literature has also been heading towards that trend, but there is still call for further research on a micro-level (Schilke et al., 2018). In particular, literature is calling for further study

of micro processes as well as the nature of the work performed by actors to support dynamic capabilities. The idea is that doing so would also help study the link between high level dynamic capabilities and the actual practices performed by organizational actors (Vial, 2019; Schilke et al., 2018; Teece, 2007). Therefore, this study aims to address this gap by specifically exploring the actual work performed by employees at Scania and categorizing it into team-level dynamic capabilities.

Theoretical gap 2:

Digital transformation presents both significant opportunities and significant challenges for incumbents. New digital technologies are fundamentally transforming business processes, products, services, and relationships, yet the question of how organizations build dynamic capabilities for digital transformation is still largely unexplored (Vial, 2019; Warner and Wäger, 2018; Karimi and Walter, 2015). Teece's (2007) framework clusters micro-foundations of dynamic capabilities according to his Sensing, Seizing, and Transforming framework. His framework does take into consideration the fact that new technologies could be a source of company's strategic change, and processes for detecting and selecting new technologies are therefore included in the micro-foundations related to Sensing. However, Warner and Wäger's (2018) framework fully embraces the fact that new technologies require companies to digitally transform themselves. As such, companies have to be fully permeated by a variety of effects that the new technology brings to an organization including even digitizing their processes of sensing, seizing and transforming. In that sense digital transformation, according to Warner and Wäger (2018), makes incumbents employ entrepreneurial techniques (e.g. rapid prototyping, digital mindset crafting) in order to emulate digitally-born companies. Additionally, Warner and Wäger (2018) recognize another set of factors they call Internal Enablers and Internal Barriers hindering digital transformation in incumbent companies which go outside of Teece's Sensing, Seizing and Transforming framework. However, Warner and Wäger (2018) do not discuss how companies overcome the barriers that they experience as a result of their incumbency status. Therefore, this study aims to address this gap by identifying team-level dynamic capabilities that help incumbents capture opportunities that new technologies bring and overcome incumbency-related hindrances that come with that.

Theoretical gap 3:

Both Teece's (2007) and Warner and Wäger's (2018) frameworks are based on the idea that dynamic capabilities are something that happens on the high level of the organizations. However, as recent research suggests, dynamic capabilities happen at all levels of the organization (Augier & Teece, 2009; Felin & Foss, 2005; Helfat & Martin, 2015). Furthermore, Schilke (2018) calls for more precision in studying dynamic capabilities regarding specific units of analysis, considering a highly context-dependent nature of dynamic capabilities. Therefore, this study aims to address this gap by studying dynamic capabilities at a level of a cross-functional team.

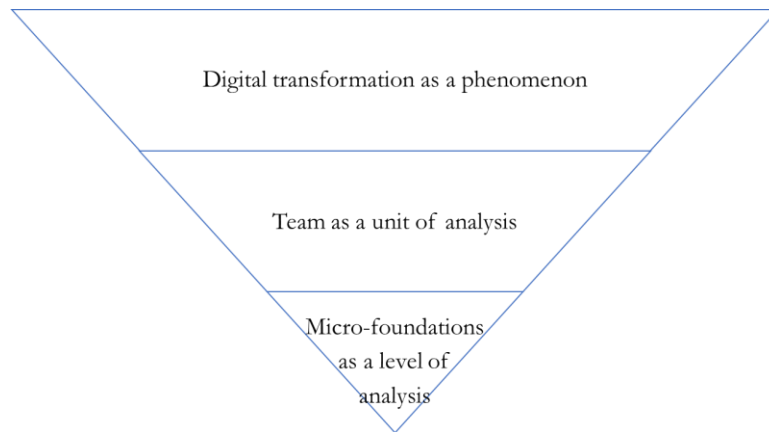


Figure 2: Visualization of the theoretical gaps

2.2.2 Analytical Framework

Given the theoretical gaps that need to be addressed, the analytical framework is intended to analyze:

- (1) The link between micro-foundations of dynamic capabilities and team-level dynamic capabilities
- (2) The incumbency-related hindrances and how teams overcome them

Teece's Sensing, Seizing and Transforming dynamic capabilities framework will be used as the main theoretical framework for both aforementioned relationships. Considering the context of digital transformation at an incumbent company, a layer of internal hindrances will be added beneath similarly to Warner and Wäger's (2018) framework, in order to see how those are overcome by different dynamic capabilities. As such, the analysis will help to answer the research question: *'How do teams in incumbent companies develop and maintain dynamic capabilities for digital transformation?'* by first providing answers to following two sub-questions:

Sub-question 1: How are team-level dynamic capabilities built from micro-foundations?

Sub-question 2: What hindrances do teams experience and how do they deal with them along the way?

2.2.2.1 Dynamic capabilities and their micro-foundations

Dynamic capabilities operate through three overarching mechanisms of sensing, seizing and transforming which in turn have the micro-foundations (processes, routines, activities) that are more context specific (Teece, 2007; Teece et al., 2016; Warner and Wäger, 2018):

- sensing, i.e., the "identification, development, co-development, and assessment of technological opportunities in relationship to customer needs";
- seizing, i.e., the "mobilization of resources to address needs and opportunities, and to capture value from doing so"; and
- transforming, that is, the "continued renewal" of the firm as its resources are reconfigured to strategically seize opportunities and respond to threats.

Sensing (and shaping) opportunities and threats

Sensing is about scanning the environment for information about customer needs, technological possibilities, competitor and supplier responses, latent customer demands, structural evolution of industries and markets, followed by the processes for filtering, interpreting and analyzing the discovered information. Conducting sensing activities continuously is crucial for companies operating in fast-paced, globally competitive environments characterized by rapid technological change.

Seizing opportunities

Seizing is about addressing the sensed opportunities by developing new products, processes, or services. This is done by deciding when, where and how much to invest. For incumbent companies, seizing often comes with the necessity to develop corrective mechanisms to override certain features of established decision-making rules and resource-allocation protocols that hinder the company's ability to seize the opportunities in a timely fashion.

Transforming and reconfiguration

Transforming and reconfiguration is about enhancing, combining, protecting and reconfiguring company's intangible and tangible assets for the sake of maintaining organization's evolutionary fitness and escaping unfavorable path dependencies. To transform itself, an organization must have an entrepreneurial mindset and an ability to reconfigure internal and external resources to adjust to, as well as create, the changes in its environment.

Micro-foundations

Dynamic capabilities are highly context-dependent, especially when it comes to the micro-foundation that constitute them (Teece, 2007, Schilke et al., 2018). In order to leave room to uncover activities, routines and processes that have not been found in previous studies, the analysis of the micro-foundations layer will be empirically-driven, and the findings will be cross-checked and confirmed with existing research findings through an abductive research approach (Ketokivi and Choi, 2014).

2.2.2.2 Incumbent company undergoing digital transformation

The context of the study is expected to play an important role in the findings regarding dynamic capabilities and their micro-foundations. As such, the context of digital transformation at an incumbent company is also incorporated in the analytical framework. Therefore, the opportunities and challenges that digital transformation presents for incumbent companies will be captured with a special emphasis on the internal hindrances that incumbents experience and overcome through that process. Considering that research has not focused on this so far, the discovery of hindrances will be highly empirics-driven (Gioia et al., 2012).

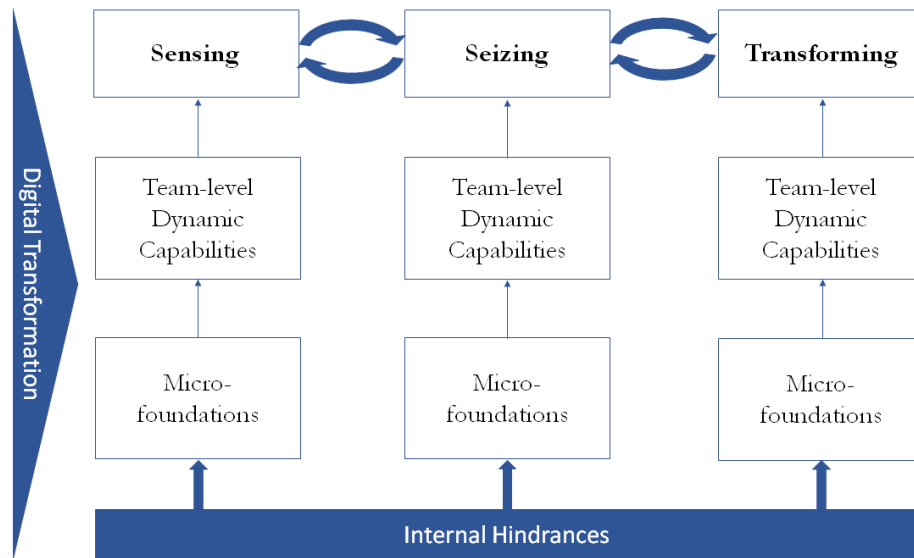


Figure 3: Visualization of the analytical framework

3 Methodology

This section outlines the methodological approach used to answer the research question and ensure a rigorous qualitative study. First, the research design is substantiated, second the research process is described, and third the quality of the study is evaluated.

3.1 Research Design

Research design is based on the ‘Research Onion’, developed by Saunders et al., 2007 which covers all the necessary stages of developing a research design (Appendix 3). Starting from the outside of the onion, each layer of the onion corresponds to a more detailed stage of the research processes.

3.1.1 Research Philosophy

The study is grounded in interpretivism as a research philosophy which was used to guide the author’s research strategy and data interpretation and analysis. Following this philosophical approach, the author believes in the view that *“management can only be understood from the point of view of the people who are directly involved in it”* (Bell and Thorpe, 2013) and is therefore deemed appropriate considering the choice of a qualitative case study research method.

This philosophy is chosen for two specific reasons: (1) The study focuses on exploring the perspectives and lived experiences as shared by multiple stakeholders on the same issue of interest, namely the dynamic capabilities of incumbent companies going through digital transformation (Flick, 2014). (2) The aim of the study is to provide an in-depth description of insiders’ direct lived experiences instead of abstract generalizations (Mathison, 2005).

3.1.2 Research Approach

Abductive reasoning approach was followed in order to allow the researcher to elaborate on the still nascent dynamic capabilities theory rather than generate new theory or test the existing theory (Ketokivi and Choi, 2014).

The theory and the empirical context were simultaneously explored allowing the researcher to use dynamic capabilities framework as a guide for conducting qualitative research while at the same time adapting the theory to the specific empirical context of a transport industry incumbent undergoing digital transformation. This approach was deemed appropriate because the empirical context has not been studied extensively using the dynamic capabilities framework, and therefore the elaboration considering the context was needed. Additionally, the researcher wanted to challenge the generic dynamic capabilities framework which is typically used to analyze firm-level capabilities and study the highest levels of organization by applying the framework within a smaller business unit in a lower level of the organization (Ketokivi and Choi, 2014). Therefore, the aim is to reconcile the general theory with the particular case (Ketokivi and Choi, 2014).

Abductive approach also allowed to go back and find theories to elaborate the new empirical findings, which was then used to adjust the interview guide and modify the analytical framework.

3.1.3 Research Choice

Multimethod qualitative research was selected in order to answer the research question by combining multiple data collection techniques. A combination of primary and secondary data was used to provide thickness and depth to the study and allow for methodological triangulation (Yin, 2014). Primary data was gathered through in-depth semi-structured interviews with the company employees. Secondary data was obtained from annual reports, company website, online news articles, and company documents.

3.1.4 Research Strategy and Time Horizon

Research strategy is intended to explain how the author plans to conduct the research in order to systematically reach an answer to the research question (Saunders et al., 2007). This qualitative study was based on a single case study method. It allowed the author to conduct an in-depth investigation of the development and implementation of a connectivity-based service and to ask how and why questions to get an invaluable understanding of the micro-level aspects of dynamic capabilities (Yin, 2014).

Scania was chosen for a couple of reasons. First, the author was able to get easy access to the company through the company's partnership with author's university, Stockholm School of Economics (SSE). Scania partnered with SSE in order to conduct research in technology-driven business model innovation in transport industry, so the thesis topic was a great fit with the company's research interest (Yin, 2014). Second, Scania is a leader in digital transformation in an industry that is facing big changes and challenges in that regard, and, as such, is a prime example of the phenomenon under investigation (Flick, 2014). Therefore, gaining an understanding of how Scania internally deals with these changes was particularly interesting. Additionally, the particular project, called Driver Services, within Scania's Connectivity Services department that was chosen for investigation was seen as a good depiction of the benefits and challenges of the digital transformation journey. Conducting in-depth semi-structured interviews with employees across different functions allowed to get a good view of the micro-level dynamic capabilities involved in managing these challenges, while the review of the secondary data provided an understanding of firm-level dynamic capabilities as well as helped to supplement and triangulate the interview data.

The time horizon is the time framework within which the project is intended for completion (Saunders et al., 2007). This study was conducted under a cross-sectional time horizon, meaning that the data was collected at one point in time rather than over a long period of time (Flick 2014).

3.1.5 Data Collection & Data Analysis

Data collection and analysis approach used contributes significantly to the validity and reliability of the study (Saunders et al., 2007). Therefore, both primary and secondary data was collected. Primary data was collected in the form of semi-structured interviews with Scania employees, and secondary data was collected from annual reports, news, company website, and company documents.

3.1.5.1 Interview Sample

The interview sample consisted of 11 interviews, 10 original interviews and 1 follow-up interview (Appendix 4). 10 of the interviews were conducted face-to-face and 1 was conducted over Skype due to the fact the participant was outside of the country. Each interview lasted 60 to 90 minutes. The sampling method employed was "purposive sampling" with the aim of obtaining a heterogenous group of participants to explore a variety of experiences and perspectives regarding the same issue (Yin, 2011). Because the focus of the study was on a particular service that Scania has developed, the employees interviewed have all worked on developing and/or implementing that service. The sample involved people

from several fields including marketing, sales, R&D, IT and the distributors in the markets in order to get a comprehensive picture of what went into developing and implementing the service.

The number of participants was deemed sufficient because of few reasons: (1) the unit of analysis was a small cross-functional team, and the participants covered all functions within the team (Yin, 2011), (2) the number of participants was sufficient to identify various micro-foundations of dynamic capabilities in question and to achieve saturation in data (Brinkmann, 2013), (3) smaller number of interviews allowed a more manageable and detailed analysis of the data collected (Brinkmann, 2013).

3.1.5.2 Interview Design

Consistent with a more explorative approach, the interview method used was semi-structured interviews. The questions asked were predominantly *how* and *why* questions in order to develop an in-depth understanding of the phenomenon of dynamic capabilities in a practical context (Flick, 2014). The semi-structured interview method allowed for flexibility so that interviewees were able to focus more on the topics closely related to their expertise as it relates to the phenomenon under investigation (Merriam, 2009; Yin, 2011).

Flexibility is a key requirement of qualitative interviewing (King et al., 2018). The interview guide was based on the dynamic capabilities framework, which was used as a theoretical lens to guide questions asked (Appendix 5). However, the interviewer was flexible with phrasing and order in which questions were asked allowing the participant to lead the interaction in the direction they wanted (King et al., 2018). In accordance with the abductive approach, the interview guide was adjusted after each interview based on the understanding already developed, the questions and probes that worked or did not work well in previous interviews, and to accommodate the different interviewees' areas of expertise (King et al., 2018).

The coordination of the interviews happened with the help of Scania employee and SSE PhD student Mathias Larsson Carlander. All participants received a description of the study beforehand and agreed to participate through an email exchange. The author signed a contract and a confidentiality agreement prior to the start of the study to ensure protection of sensitive data. All interviews were conducted at Scania CV within the Connected Services offices to make it easiest and most comfortable for the participants (King et al., 2018). Small one-on-one meeting rooms were chosen to ensure best sound quality for interview recordings and no distractions.

Before starting the recording of the interview, participants were reminded that the interviews will be recorded to ensure no information was missed and that interviewer can focus on actively listening to the participant, rather than taking extensive notes. After starting the recording, in order to establish rapport, the participants were then briefly reminded of the study purpose and expectations and asked if they have any questions before starting the interview (King et al., 2018). Each interview started by first asking participants to introduce themselves, their history as a Scania employee and their role in the development and implementation of Driver Services. The participants were then asked to tell a story of Driver Services from their point of view from the earliest things they can remember until today in a narrative interview style (King et al., 2018). The interviewer actively listened and took notes in order to ensure they can ask follow-up and probing questions especially relating to the questions outlined in the interview guide related to dynamic capabilities framework.

At the end of the interview, all participants were asked three questions to finalize the interview: (1) If you were to change or improve something, what would that be? (2) Is there anything else that you would like to share? (3) Do you have any questions for me? (King et al., 2018). The participants were then debriefed

on the rest of the research process and expectations regarding the finalized thesis and presentation of the findings at Scania.

3.1.5.3 Data Processing

All interviews were audio-recorded and transcribed in full maximum 24 hours after they were conducted (Flick, 2014). The transcription software used was 'oTranscribe' which allowed the author to easily slow down, pause, and rewind the tape and keep notes of timestamps for different topics within the interview. Secondary sources were read, and relevant quotes were highlighted and copied in a word document for later referencing and use in the text.

Coding and categorizing of unstructured data were conducted with the aid of cloud-based qualitative data analysis software 'Atlas.ti' (Yin, 2014). Interview transcripts as well as notes from secondary sources were read and re-read to generate themes. First-order themes using informant-centric wording were generated using Atlas.ti and then extracted into a data-analysis tool Excel for easy overview. Second-order themes using researcher-centric concepts were then generated by grouping similar first-order themes together (Brinkmann, 2013). This allowed the author to use the terminology that is more consistent with the existing dynamic capabilities theory.

3.2 Quality of Study

Special care was taken to ensure quality in the way that the data was collected, analyzed and interpreted to ensure the trustworthiness of the results (Yin, 2011). This section evaluates the quality of the study using the qualitative research specific criteria of consistency, credibility, and transferability (Lincoln and Guba, 1985; Merriam, 2009).

3.2.1 Consistency

Consistency of a study refers to whether the findings of the study are consistent with the data collected (Merriam, 2009). Akin to 'reliability' in quantitative research, 'consistency' is used for qualitative research because the concern is not whether the findings can be replicated, but whether they are consistent with the data collected (Lincoln and Guba, 1985; Merriam, 2009).

To ensure consistency of the study, three strategies were taken. First, triangulation of data sources was achieved by using both primary and secondary data (Merriam, 2009). Second, interview transcripts were cross-checked with audio files to ensure they were transcribed correctly (Gibbs, 2007). Third, the codes were cross-checked with the quotes from interviews to ensure that they accurately represented the original information given (Gibbs, 2007).

3.2.2 Credibility

Credibility of a study refers to the extent to which the study findings match the reality of data collected (Merriam, 2009). To ensure the credibility of the study, the following strategies were used. First, triangulation of data sources by comparing and cross-checking data from different sources was conducted to improve the validity of the findings (Merriam, 2009). Second, the empirics of the interview were shared with and edited by Scania employees to avoid any mistakes in facts and interpretation of the data (Merriam,

2009). Third, adequate engagement in data was reached through saturation in data, as the researcher started hearing the same themes over and over again (Merriam, 2009).

3.2.3 Transferability

Transferability of a study refers to whether the findings of a study can be transferred to another context (Merriam, 2009). To achieve transferability, the following strategies were used. First, a rich description of the context of the study was provided to ensure that other researchers and practitioners can easily evaluate whether the findings of the study are transferable to their context of interest (Lincoln and Guba, 1985). Second, purposive sampling method was used to present a comprehensive depiction of all the relevant stakeholders in the project of interest, chosen from a multinational organization, both working in Sweden and abroad allowing for greater range of transferability (Merriam, 2009).

4 Empirical Findings

The Empirical Findings section is structured such that first, Scania's digital transformation journey is briefly described on a high level to set the scene for the empirical context. The data for this is collected from company's annual reports, news, website and other company materials. Second, Scania's journey of developing and implementing Driver Services is laid out in four phases based on the data collected from interviewees.

4.1. Scania's Digital Transformation Journey

"The digitalization of Scania is delivering results and is now on the way to becoming one of our main processes and will be a success factor in our efforts to make continuous improvements in all areas of our business."

Mikael Cato, Chief Digital Officer (Scania, 2017)

Scania's digital transformation journey is enabling and expediting the company's move towards a 'solution provider' rather than a 'truck manufacturer' identity. As such, the company is focusing its innovation around 'jobs to be done' for the customer instead of focusing solely on trying to improve its existing products. On an organizational level, Scania is taking initiatives in three pillars: energy efficiency, alternative fuels and electrification, and smart and safe transport to support their mission of providing "sustainable transport solutions". In order to do that, the organization is developing crucial capabilities enabling it to stay at the forefront of innovation in the transport industry and maintain its competitive advantage in the times of dynamic change.

Scania introduced the first connected truck in 2002. Since 2011, the connected trucks have become a standard for Scania and the data they generated begun to be systematically leveraged. Early investment in connectivity meant that Scania has by now amassed a substantial amount of data critical for shaping their customer offering. Today, Scania has over 360,000 connected vehicles and the number is steadily increasing, enabling further optimization of product and service offering. As such, Scania is simultaneously balancing its core business with the new business to address the rapidly changing environment. They are focusing on new technologies and business models that will become their new core and give rise to even newer technologies. As a part of that journey, the organization is working on becoming more agile by changing their organizational design and employing entrepreneurial ways of working.

4.2. Scania Driver Services

Scania Driver Services (DS) is a connectivity-based solution that allows Scania's customers to optimize driving by reducing the fuel consumption, carbon emissions, and wear and tear, and increase road safety and uptime. The solution consists of data-based tools, training, and coaching for the drivers. Scania Driver Training provides immediately improved results for both experienced and new drivers while Scania Driver Coaching ensures that those results are maintained by helping create excellent driving habits through regular one-on-one coaching sessions based on driver's data-based performance evaluation reports. The smart-analysis tools, including Scania Driver Support and Scania Smart Watch, collect the driving data from connected vehicles and provide useful feedback to the driver helping them to keep enjoying the benefits of driver training and coaching.

This section lays out the narrative about DS through the eyes of the cross-functional team that worked on it from inception until today. The story is divided into four phases: Concept Development, Implementation, Current Situation, and Into the Future. Each phase is divided into three sub-sections according to the three general themes of Organization, Business model development, and Culture. The three themes correspond to the Warner and Wäger's (2018) framework in which they recognized that organization's digital transformation is contingent on the strategic renewal of collaborative approach, business model, and eventually, culture.

4.2.1 Phase 1: Concept Development

As one of the earliest attempts at connectivity-enabled service development that Scania had, DS development started at the time the organization still had a very strong truck-manufacturer identity. Born out of a perceived customer-need and in alignment with Scania's pursuit of connected vehicle technology, it was an important project within the organization.

4.2.1.1 Organization

Product-oriented organization

"At the time we were divided into two organizations. I was in R&D and the people implementing it were on the market side. So we didn't have as much contact with each other as we do now. I was building the tool and they were responsible for the processes of working with it."

Participant F - Development

Scania Driver Service was launched in 2014, three years prior to the reorganization of the Connected Services department at Scania's head office. The organization at the time emulated that of a traditional industrial organization. There was a clear division between the commercial (marketing and sales) and the development side (R&D and IT) of the organization stemming from the product-centric organizational orientation. Commercial, R&D, and IT were different departments working in different buildings, while some IT employees worked within R&D since some of the software developed was connected to the vehicles. The commercial side was close to the customer, developing business concepts and business cases based on customer needs. They were responsible for conducting a long pre-study to figure out if the concept can be developed, if the customers want to buy it, and what requirements it needs to fulfill. As the organization employed the waterfall project management methodology, where different stages of the development followed in a sequential and linear way, nothing was done in terms of development until the pre-study was completed and the concept and business case were fully developed. Because of the long-pre study period, many concepts did not move past that phase as the timing was not right and the resources were not available at the end of pre-study. If business concepts moved past the pre-study phase, commercial side then had to go to the development side and order the work to be done, while development side was the one executing on it. Even within the IT department, the software developers and testers worked in separate line organizations with separate managers. The developers would develop a product, send it off to testers who would test it and send it back to developers and so on until the product was finalized. As such, even when the projects moved past the pre-study phase, it took 1-2 years for the development side to bring out a finalized product.

Transition towards a service-oriented organization

Prior to the development of DS, Scania had developed their first connected services solution called Scania Fleet Management, which was the foundation to DS and all the other connected services that Scania offers

today. Scania Fleet Management was developed by IT employees working within R&D organization and in order to bring it to the market, the Connected Services commercial department (CS) was formed. CS consisted of about 30 sales and marketing employees when they developed a concept for DS. Since they did not have any IT or R&D employees within CS, they had to go to those departments and request that they help them develop the functionality, and they needed help from Scania Academy, to train the trainers working for distributors. Finally, they needed to get the distributors on board who were to be responsible for delivering the coaching and training parts of the service. All of these parties needed to be convinced that investing resources in DS would be a good business case for them.

4.2.1.2 Business model development

Customer-centric concept development

Scania Fleet Management, helped customers take control of their fleet and get most out of the business by collecting the data from the trucks. While one of the benefits of having access to Scania Fleet Management was the ability to track fuel consumption, CS recognized that customers did not have the knowledge or the resources necessary to train drivers to help lower their vehicle's fuel consumption. There was a possibility for Scania to offer that service, and since they saw that other external parties offering driver training and coaching existed, they saw this as a real market opportunity both in terms of a business case as well as Scania's brand image. The solution was very customer-oriented, as the idea was confirmed by interviewing customers. The Scania Coaching Tool software was then built based on Scania Fleet Management data providing a performance evaluation reporting functionality to both the coaches and the drivers that was then used for personalized coaching sessions. The project was approved at a newly introduced quarterly cross-functional decision meeting including the senior managers for respective business and commercial functions. The decision was made to launch this, which gave the project internal prestige.

Conflicting expectations and business requirements

"Things were discussed on a very high strategic level regarding customer purchase process and what is important to them, leaving a lot of space when it comes to what our colleagues on a business unit level were expected to actually do with this."

Participant J - Commercial

The two-day DS launch event was a big show at Scania CV, with all the distributors present. As Scania was pursuing and highlighting the connectivity of their vehicles, the event was important from a strategic and branding point of view. However, the conflicting business expectations and requirements between the internal DS team and distributors surfaced during the event. Distributors expected to have all the practical details regarding the implementation of service finalized at the event, while DS team focused mainly on the strategic and customer-oriented aspects of the service, expecting that distributors will take care of the rest. Even some technical aspects of the service were not fully developed, so Excel was used to demonstrate a mockup of some software functionalities.

Furthermore, it was not clear to the DS team where DS would fit in within distributor organizations. Despite being considered as a connected service, DS was not only a software tool, it was a service that included human trainers and coaches thereby requiring new organizational capabilities to be developed. Sales area managers responsible for helping distributors implement this service thought that Fleet Management departments should also be responsible for DS. But DS required a completely different set up with different kinds of people involved in the service delivery. Additionally, the service implementation required the involvement of managers outside of the CS departments at distributor organizations, so it did

not have a landing ground in CS either. It was clear then that implementing this service in the markets would prove to be difficult.

4.2.1.3 Culture

Transition from a siloed to a collaborative culture

As described in the 'Organization' section above, the organization emulated that of a traditional industrial company at the time of the DS launch which was also evident in the organization's culture. While different departments were trying to come together to work closer on service development, the predominant mindset was still that every function operates in its own silo. In order to bridge those, managers from different functions had to deal with a lot of politics to gather the resources necessary to work on developing DS. The communication and collaboration between different functions involved in the development of DS was at a very minimal level. There was still a customer-supplier relationship between the commercial and the development sides. Furthermore, development side had no direct contact with the customers, and any customer-related insight was coming from the commercial organization. Because of the division between the two, there was still largely a culture of blaming the other side for any problems and complaining about the lack of understanding that each side has for the other. The most common frustration was about the different timelines that the two sides have where the commercial side wants things to be delivered "here and now" and the development side needs to take the time to do it.

4.2.2 Phase 2: Implementation

Implementing DS in markets around the world came with many challenges. Nevertheless, the perseverance to make DS a success remained present throughout the journey as the belief in the customer value it brings was strong throughout.

4.2.2.1 Organization

Bridging the silos

The movement towards more cross-functional and agile organization started to take place and managers within CS started looking into ways to organize CS in a more efficient and effective way for where the organization was heading.

Gradually, the steps were being taken to collocate people for easier collaboration. Within IT, the testers who previously worked in a separate department under a separate manager were now placed within development teams, causing a long struggle among management. Next began a movement towards a more agile way of working where previously year-long projects were broken down into smaller work packages lasting about two months. These shorter projects were still managed using waterfall methodology but at least the developers had the opportunity to change their direction after two months, rather than a whole year.

To help bridge some of the silos when it came to service development and create a more collaborative approach the Service Roadmap was created in 2015 through a series of cross-functional workshops involving, among others, the DS team. Service Roadmap is a plan for the future development in each service area (e.g. driver services is one service area). Each service area has a service area forum, a cross-functional meeting with relevant people from different parts of Scania who meet on a regular basis to evaluate the

content of the roadmap and address any gaps. Service Roadmap was created because of the frustration that there was no overview of the different services that were being developed at Scania. The idea was also that creating it would provide transparency for what everyone is working on so that any overlaps between activities can be leveraged.

4.2.2.2 Business model development

Conflicting business requirements

“The big bulk of people in distributor organizations are there in order to drive results for the company. They are not employed for having wild ideas and failing fast.”

Participant J - Commercial

Convincing distributors to implement the new service was challenging as the conflicting expectations and business requirements between the Scania CV and the distributor organizations continued during the implementation phase. First, not all distributors were willing and able to implement DS due to the financial risk and the market conditions that they were facing. Distributors were responsible for recruiting trainers and coaches as well as ensuring that their administrators and salesmen can support the sales and delivery of the service. As recruiting personnel was a high investment for distributors that also came in times of savings, DS team and distributors went in different directions. Those distributors that decided to implement DS believed more in the customer value than the financial value of it and were willing to take the short-term financial risk in order to maintain a long-term relationship with the customers. Second, distributors and dealers relied more on Scania's traditional business of vehicle sales - something that they did successfully and profitably for years. Convincing them to invest time and resources in a connected service unrelated to vehicle sales was challenging. Third, DS team and distributors had conflicting ways of working and management requirements. The former were expected to be more innovative and risk-taking while latter had to drive results and maintain long and stable relationships with their customers. Thus, implementing a completely new and not fully refined service, did not meet their requirements. Fourth, the DS team and distributors had conflicting ideas about the business model aspects. For example, a lot of time was spent in discussions about whether a coach should have technical skills or be more of a classical coach focused on behavior change. DS team was pushing for the latter while distributors generally believed a coach should be the driving expert. In some markets, distributors were very open to hiring coaches that did not have a driver's licence or specific vehicle knowledge, while in others, they stuck with more technical coaches believing that worked better for their market situation.

Developing a revenue model

The revenue model has gone through a few pivots during the implementation phase and is still not finalized today. Distributors were free to develop their revenue model for DS. Initially, there were attempts to alleviate some of the riskiness of signing up for the service for the customers by developing profit-sharing revenue models. However, this proved to be difficult to execute in practice as fuel consumption was affected by many things such as weather conditions and type of loads carried other than just proper driving behavior. This made it hard to demonstrate exactly how much of the fuel savings DS was responsible for. Eventually, the distributors gave up on this model and settled for a fixed-price one. Distributors generally charged a monthly subscription to the service for each driver which included one coaching session per month. However, the issue that they were facing was that it meant they had to perform coaching every month regardless of the driver's performance that month. This resulted in coaches spending more time on

preparing to coach good drivers than those who really need coaching as they needed to nitpick and dig through their driving reports to find a way to provide them with value. As this was not the best use of their time, the idea has been to figure out a way to move away from this type of a model.

Locally-developed processes

“I would say Driver Services is one of the service areas we have to put the highest amount of our own initiatives, ideas and content on to make it happen and to make it sell.”

Participant H - Commercial

Scania distributors in different markets around the world typically have to adapt processes, strategies, services to the specific market demands and requirements. When it comes to DS, the general process for how training and coaching should work as well as the content comes from Scania CV, and distributors' CS departments, responsible for sales and administration of connected services, have to adapt and implement it. Distributors are also responsible to ensure that the services they sell are profitable. As such, they invest resources in their marketing and sales efforts and developing an offering suitable for the market.

Legislation for driver training also differs across different countries. For example, in Germany-Austria market, the recent legislation was passed allowing for driver training to be done online. As such, the local distributor took the initiative to develop an e-learning solution. Initiatives like this that are taken at different markets are then often shared with other markets and the CV allowing the best-case practices to spread easily on a global scale. For example, in the Netherlands, an improved version of DS software was developed in order to automate analyzing driver data and reporting, which was then adapted by Scania CV and implemented on all markets. Gaining global distributor acceptance for new roll-outs was challenging as the iterations of the service were typically done in collaboration with only a few reference markets¹, so not everyone's input and requirements were taken into consideration. However, supporting all of the different markets from Scania CV would be very tricky as demonstrated by the statement below.

“Driver Services supports a way of working, and if you have a different way of working in 30 markets then it gets almost impossible to create a good tool for all of them. If you were to adapt everything to each and every market, then you would create a system which would be very complicated for the user and hard to maintain.”

Participant F - Development

Nevertheless, efforts were made in order to meet the markets somewhere in the middle with solutions that would work for them as well as for Scania CV. When it comes to DS, one such effort was to map out all of the processes that all the different markets use when working with it. After doing that, the DS team was able to evaluate what are the most common and best processes and derive a flexible process that works globally and is supported by the DS tools.

4.2.2.3 Culture

Transitioning to agile

As the DS team was working on bridging silos and developing a software-based service, they were also working towards becoming more agile and embracing the minimum viable product mindset. However, the history of truck-manufacturer identity and traditional waterfall project management was hard to shed. The

¹ Reference markets - Scania distributors in certain markets chosen as reference points to all Scania distributors

team found themselves balancing the tensions that this transition brought in many ways. Internally, they started working in shorter iterative cycles, closely collaborating with few reference markets and customers. At the same time, they had to deal with organizational processes and procedures that required them to work in a waterfall way. Dealing with distributors, who were still far away from the agile and innovative mindset, posed a big challenge as the cultural conflict between their different identities became prominent.

The beliefs in ‘how things should be done’ differed across different groups involved, some of whom were highly influenced by the organization’s history and others by where it is heading in the future. This was evident in the perception of success and failure at the organization. Considering that DS was not fully ready by its launch date, and that it took a lot of time and several iterations as it struggled to gain acceptance in the markets, some saw DS as a failure. Others, on the other hand saw this opportunity to leverage internal resources to continuously rework the service despite the lack of immediate success as a strength. Those claim that DS offers a significant value to the customers and as such should definitely be a part of Scania’s service offering. But showcasing that value and convincing customers to pay for it is something that has been difficult to get right, the culprit being Scania’s tradition as an organization that sells trucks, not training and education services.

4.2.3 Phase 3: Current situation

While DS was a very good idea, it showed to be too difficult to carry out and it did not meet the expectations. Today, DS is far away from the visions and targets that it was intended to fulfill.

4.2.3.1 Organization

Self-sufficient cross-functional teams

“The journey we have done is, instead of a traditional organization where you take on a supplier relationship where someone is ordering the service and someone is supplying it internally, which you normally have in a company where you have purchasing, and R&D departments, we wanted to try to have all the resources in the same organization to see if we could be more agile.”

Participant E - Development

A lot has changed in the organizational structure since DS was introduced. Over the course of the last three years, there were a lot of discussions on how to develop an organizational infrastructure that would bring the development closer to the business. In 2017, R&D and IT employees were added to the marketing and sales organization at CS and the organization more than doubled in size within a year. With that move, the different functions including marketing, sales, R&D and IT were joined into ‘tribes’ (or business areas) sitting together within CS. Tribes are akin to project teams, but they are permanent organizational structures. Each tribe is headed by a business manager who has a role akin to that of CEO for the particular offering that the tribe is working on. As such, the business manager is responsible for setting the strategy for the tribe and managing its profit and loss statements. In that sense, tribes operate as small start-ups. The inspiration for this way of organizing came from ‘lean startup’ and Spotify’s organizational structure (Appendix 6). The tribe organization was intended to create a close connection between the business manager and product owner functions and the development teams.

Creating tribes allowed the friction between the different functions to dissipate and improved the way they collaborate as well as avoid the politics in the organization. The new organization allowed the teams to be

more agile. By having tribes focus on one business area, employees within the tribe built a lot of knowledge on it allowing them to focus on and prioritize projects they deemed most important. Having the same development team throughout, rather than switching them out from project to project, makes a big difference. They get to know the customers, and participate a lot more in discussions. This gives them freedom to pause or postpone a particular project they are working on to focus on an issue that is of utmost importance for the customer at a given time.

4.2.3.2 Business model development

Refining and demonstrating customer value proposition

“Driver services is one of these services that has proven difficult to charge the full value of because we have not been able to convince the customer of the full value, but still in the back of the head the customer knows that this is a good service.”

Participant I - Commercial

Distributors and customers are not yet fully convinced of the value that connectivity-enabled services can bring as they still have the traditional transport industry mindset. DS team is still struggling with figuring out how to showcase the service's value as it takes time in most cases to see the long-term effects and results of the service. Additionally, the sales force selling the service is used to selling trucks and feels less comfortable selling a service not directly connected to trucks. In order for them to be more successful at selling, they need all the help they can get which is why DS team believes that developing a tool that would easily showcase the value for each customer would immensely support the sales. Nevertheless, the customers that do use the service have reported great results for their organization. Their testimonials are typically used in order to showcase customer value today.

Furthermore, in order to make the coaching more efficient today and provide customer value where it is needed most, the DS team is working on implementing flexible coaching. Flexible coaching would allow coaches to focus only on those drivers that need help and coaching them on a more regular basis. What they are doing today is the basis of a more data-based personalized offering that they intend to offer in the future.

Moving to the cloud

The DS software is being rebuilt today as it is being moved to the cloud². This is an important step in improving the DS offering as it will create improved scalability, stability and compliance. This in turn, requires some of the code to be rewritten, putting the development of new functionalities for the customer at a standstill.

Moving to the cloud seems to be a frustrating journey for both developers and sales and marketing employees. Developers are frustrated because they know that transfer to the cloud will take much longer than the business managers think. There is a misunderstanding between the technical and business side of the team, and developers blame that on the fact that those working on the business side do not have the technical knowledge background.

² Cloud - a vast network of remote servers around the globe operating as an ecosystem designed to store and manage data, run applications or deliver content accessible through any Internet-capable device

4.2.3.3 Culture

The journey towards a new culture

“Setting the culture is really the key to success and I don't think that we have succeeded so far. It is not enough to just create a new organization, you also need to set the agenda and the culture for the organization and that is much trickier.”

Participant E - Development

While the tribe organization has a lot of benefits, it also comes with its challenges. One of the challenges is managing a variety of people with different mindsets and values and creating a common culture. CS was traditionally a sales and marketing organization, and the head of the department is still a commercial manager. Becoming a manager over a variety of different people has proven to be challenging. While CS is now a home department for a lot of R&D and IT employees, it does not necessarily share their same core values and the values they had in their previous organization. CS is still a marketing and sales organization at heart and the organization has not managed yet to find its unique culture. CS employees understand that creating a culture is a journey and needs dedicated and aligned management to drive it. However, at the moment, all the resources are used for moving to the cloud and organization and culture improvements seem to be put on the backburner.

“I can't pinpoint why we are not there yet with the culture, but I think this cloud journey is choking us. These big technology shifts when you are stressed with resources and time and cost and you need to deliver and until you are ready with that you cannot take in so many other demands.”

Participant E - Development

The development side of the organization also feels like they are not fully understood and supported by the management team due to the fact that there is no one on the higher level who has a technical background. As such, there is not as much focus on technical aspects such as stability, performance and quality of the software. However, they recognize the great benefits that having a mix of both commercial and development managers has brought to their way of working.

Journey towards higher integration

“I think it was too big of a change to go from the old organization. I don't think we were ready. You have the number of managers and if you transform the organization, you still have the same number of managers so you have to fit them somewhere.”

Participant E - Development

The contrast between the old and new organization and way of working is apparent to everyone. However, there is still a lack of integration between the commercial and development sides. Tribes still have two different managers, one responsible for managing software developers and the other for managing commercial people, and those managers have their own managers. So while it looks like a cohesive unit on the outside, it is still not fully integrated. The developers are still often seen as delivering something to the stakeholders on the sales side. While there is opportunity for developers to go out and meet customers occasionally, on a regular basis, they do not go out and sit with customers to discuss their needs. The development is still largely based on the input from the commercial stakeholders.

4.2.4 Phase 4: Into the future

The Driver Services journey will continue on into the future as the team works on figuring out how to overcome some of the challenges they had so far and as the market becomes more mature in terms of acceptance towards connectivity-based solutions.

4.2.4.1 Organization

Refining the tribe model

“We talk a lot about freedom but I don't think it's really true because there are a lot of requirements coming from the management team and from other parts of Scania as well. So you really don't have that much freedom.”

Participant F - Development

Organizing CS department into cross-functional tribes was both a big step forward and a big challenge for the organization. Moving into the future, the idea is to focus further on refining the way of working and organizing in order to improve the integration and collaboration within the team even further. How exactly that would look like is not yet clear. While freedom is an important aspect of the tribe, some participants highlighted the need for even more freedom to make its own decisions and gain easier access to resources for good ideas.

4.2.4.3 Business model development

Further digitalization

“Going from knowing what you should do to actually changing your behavior, that's where you normally need someone to push you. I think the human contact is where you start to change your behavior because you need someone looking over your shoulder and reminding you.”

Participant E - Development

For CS department, digitalization is in their DNA. As a combination of a digital and human service, DS has experienced some challenges, but having both is also seen as a competitive advantage. Nevertheless, further digitalization of this service is already happening and more things are likely to come. The views between employees interviewed vary in the extent to which DS should be digitalized further. Since DS coaches are intended to change the behavior of the driver, they are seen as an integral part of the offering. The Game is one solution developed to help incentivize drivers to driver better, having them compete against each other. However, The Game alone does not teach drivers how to drive better which is where trainers and coaches are still necessary. Having a fully digitalized service would solve a lot of resource-related issues, but as a premium brand, Scania DS team feels the need to retain the human touch.

DS team is also working on selling their services online. Today, almost nothing is sold online at Scania despite an ongoing project to set up online sales for the past four years. Having online sales would make it easier and more user-friendly for the customers to sign up and change their subscription according to their needs at a given time and help demonstrate the DS value proposition in a better way, making it more convincing for the customers to sign up.

The whole value proposition of DS of improving driver behavior to increase driving efficiency is contingent on the fact that drivers exist in the first place. However, Scania is leading the way in developing autonomous vehicles and platooning technology³ that would significantly reduce and potentially eliminate the need for drivers all together in the future. As such, Scania employees recognize that DS is bound to eventually either evolve into an offering focused on improving the way a vehicle is driven with or without a driver, or to completely disappear in the long run.

Data-based personalization

“To sell a service, we need to be able to handle value-based selling. With the data scientist and analyst team, we are starting to use the data from customers and see which customer has the best potential of using these services.”

Participant C - Commercial

The power of data is evident within the CS department. DS offering is fully contingent on the data that the connected vehicle is able to collect. However, the many possibilities that advanced data analytics provide are yet to be explored and captured. The DS team needs to learn what to measure and utilize the data scientist team to improve their capabilities of using data for commercial needs. Using customer data to provide highly personalized offers to customers is something many interviewed employees agreed on. Having the possibility to see which driver has what needs and to propose a mix of different products and services to a customer based on that is considered to be of great value to Scania DS team. Doing so would not only provide greater value to the customer, but it would allow DS teams not to waste their resources on coaching every driver, despite them not needing or wanting to be coached.

The team is currently looking into an evolved data model improving the feedback individual drivers get from the tools. A tool like this would make it easier for the sales people to demonstrate to the customer the level of fuel savings they can achieve by using DS. The belief is that doing this would significantly increase their service sales because it clearly demonstrates the customer value.

4.2.4.3 Culture

Developing a unique culture

“We for sure need change management. We need to have management that is more aligned that would put the culture in place to make people feel they are working towards the same targets.”

Participant E - Development

As described in the section on ‘Phase 3: Current Situation’, the CS department has still a long way to go in order to develop a culture that fits everyone involved its cross-functional tribes. However, doing this is seen as one of the main priorities by participants interviewed going into the future. Making sure that the highest level managers within CS are focused on change management and aligning everyone’s motivations towards the same goal is seen as a way forward.

³ Platooning - Automated driving technology using inter-vehicle communication that allows heavy vehicles to travel in close formation on the road following the lead vehicle without the need for drivers in the following vehicles

5 Analysis

This thesis aims to explore how one incumbent company, Scania, develops and applies dynamic capabilities for digital transformation from a micro-foundational level of analysis and at a team-level unit of analysis. For this purpose, the empirical data presented the previous chapter will be systematically analyzed through the analytical framework presented at the end of chapter II. This section is divided according to the research questions:

Section 5.1 will address the Sub-question 1: How are team-level dynamic capabilities built from micro-foundations?

Section 5.2 will address Sub-question 2: What hindrances do teams experience and how do they deal with them along the way?

Section 5.3 will aggregate all pieces of the analytical framework to answer the main research question: How do teams in incumbent companies develop and maintain dynamic capabilities for digital transformation?

5.1 Team-level dynamic capabilities and their micro-foundations

This section aims to provide an answer to the first research sub-question: ‘*How are team-level dynamic capabilities built from micro-foundations?*’ Through the Scania Driver Services case, the author aims to identify the specific processes, routines, activities that the cross-functional team used while developing and implementing the connectivity-based service and categorize them into team-level dynamic capabilities that allowed the team to sense the opportunities, seize them and reconfigure and transform their resources along the way. The section will be divided into the same stages as the ‘Empirical Findings’ section in order to follow the team through their journey.

5.1.1 Phase 1: Concept Development

Scania Driver Services team recognized the opportunity to develop an additional connectivity-enabled service by *recognizing the unmet needs* of their Fleet Management customers (sensing). Additionally, they *conducted competitor research* to see if there are any other companies in the market offering a similar service and *interviewed customers* to see if they would be interested in purchasing the service (sensing). As such, they were able to validate the fact that their business idea was viable.

In order to transform the idea into a service, marketing and sales people from Connected Services department had to *pitch the idea* to R&D and IT employees as well as Scania Academy to get their help in developing the service (seizing). In doing so, they managed to *form a cross-functional* team that would work on developing the service (transforming). Rather than starting from scratch, the team was able to *use already-existing service*, the Fleet Management System, and build DS on top of that (transforming). Finally, in order to get firm-wide acceptance to launch the service, they *presented the concept* at the cross-functional decision meeting including senior managers from respective departments and got an approval to go to market with it (seizing).

The big launch event was organized to *create an internal hype* surrounding the new services and get the business units as well as Scania CV employees excited to launch it (transforming). However, DS was not fully

finalized before it was launched - DS team *left a lot of flexibility* for the distributors to develop their own processes (seizing), and tools such as Excel were used as *mock-ups of software functionalities* that were yet to be developed (seizing).

Figure 4 demonstrates how team's different activities, processes, and routines, identified as micro-foundations, in the Concept Development phase allowed the team to build team-level dynamic capabilities.

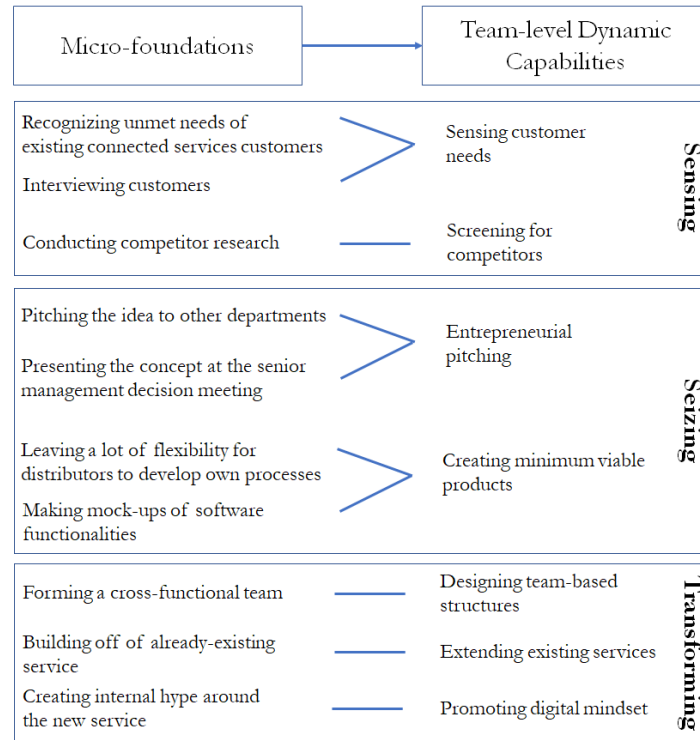


Figure 4: Phase 1 Data Structure

5.1.2 Phase 2: Implementation

Over the years that the DS was being implemented, the changes started happening in the organization. Attempts were made to bridge silos by *collocating testers and developers* and *long and rigid project plans were broken into short work packages* (transforming). The service development became a more prominent issue within Scania CV, so the *service roadmap was created* through a series of *cross-functional workshops* that DS team participated in to increase collaboration and transparency (transforming). *Cross-functional service area forums* were created to discuss and enhance the service development in the organization (transforming).

DS team spent significant effort on *convincing the distributors* to invest their time and resources in this service (seizing) as the they had conflicting business requirements and needs and were therefore not ready to fully embrace the new service from the beginning. While implementing DS was not easy, the team managed to *continue leveraging internal resources* in order to continuously rework the service and support the business units until they can get the service design and the sales process right (seizing). This allowed them to *continue offering to the customers a valuable service* despite the lack of initial success (seizing). As they were iterating the service, they *learned from reference markets* what changes needed to be made to DS tool as well as the process of working with it (sensing). For example, one market automated the analysis of driver data to save time for the coaches who previously did it themselves, and Scania DS team then *adopted the functionality* within the main coaching tool and *scaled it up to all markets* (seizing). While the markets were adapting to using the new tool, DS team had to continue *maintaining both tools in parallel* (seizing). Considering they were dealing with a completely new kind of service, the DS team had to *adjust the revenue model* several times in order to appropriately capture

the value the service created (seizing). They also had to *be flexible with distributors' service delivery and revenue models* since different distributors and markets had different requirements (seizing). To ensure that DS tool supports the different processes that different distributors employed, the team *mapped out all of the processes used in different markets* and used it to derive a process that they can support (seizing).

Figure 5 demonstrates how team's different activities, processes, and routines, identified as micro-foundations, in the Implementation phase allowed the team to build team-level dynamic capabilities.

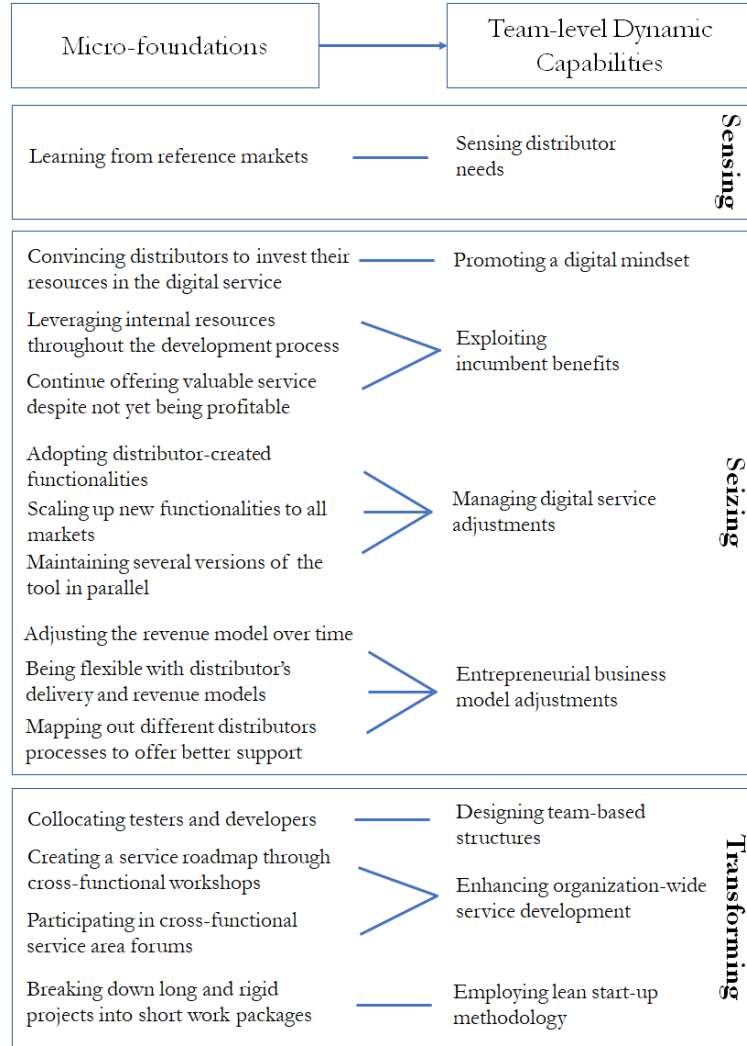


Figure 5: Phase 2 Data Structure

5.1.3 Phase 3: Current situation

CS is today organized in *self-sufficient cross-functional teams* called 'tribes' that include everyone and everything needed to develop a service (transforming). Tribe's business manager has the same responsibilities as the CEO *running the tribe as a start-up* allowing the teams a level of autonomy and agility (transforming). The *inspiration* for organizing like this *came from a digitally-born startup* Spotify (sensing). To collaborate better, the team *increased the communication between the commercial and development sides and brought the development team closer to the customer* (transforming). *Keeping the same developers on all projects related to one specific service* allowed them to build extensive knowledge in the area, giving them more autonomy and flexibility in deciding what to work on (transforming). While working on figuring out how to better showcase the value that DS brings, the team is *using customer testimonials* to convince the traditionally-minded customers of a connected service's value (seizing). The team is now working on *improving the efficiency of the service delivery process* by introducing

flexible coaching and thus forming the base for future data-based personalized offering (seizing) and *moving to the cloud* to develop a more scalable, stable, and compliant code (seizing).

Figure 6 demonstrates how team's different activities, processes, and routines, identified as micro-foundations, in the Current Situation phase allowed the team to build team-level dynamic capabilities.

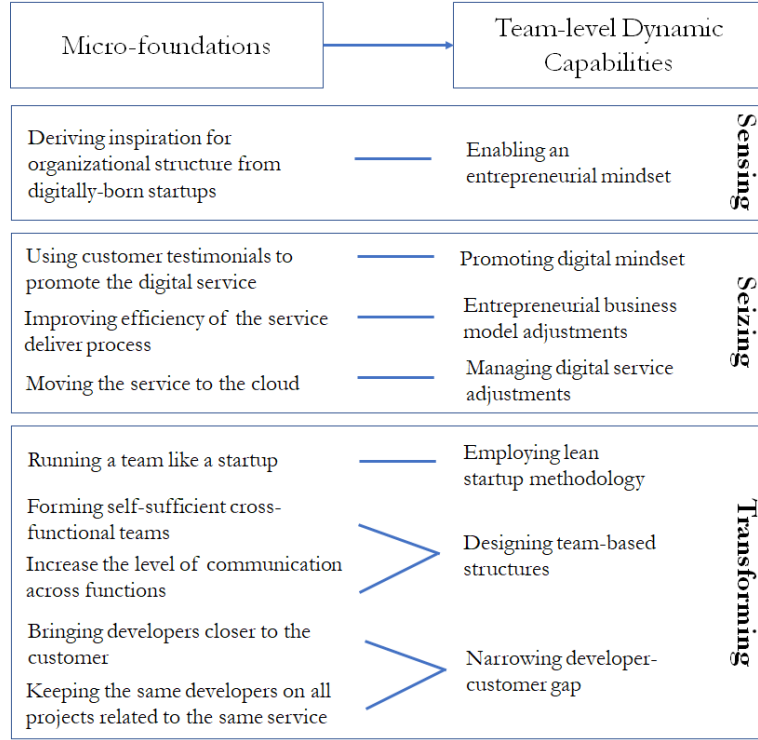


Figure 6: Phase 3 Data Structure

5.1.4 Phase 4: Into the future

Going into the future, the team will work on refining the tribe model to *give the teams more freedom* and *improve the integration and collaboration between commercial and development sides* (transforming). The team is working on *digitizing aspects of the service* (transforming) and *selling services online* (transforming). Team *recognizes that technology* such as autonomous vehicles and platooning *might make the service obsolete* (sensing) so they are keeping that in mind as they develop the service further. The team is looking to *expand its data analysis competencies* (transforming) and *offer data-based personalization of services* in the near future (seizing). *Change management efforts* will also be employed for developing a unique culture that brings together the commercial and development side even more (transforming).

Figure 7 demonstrates how different activities, processes, and routines, identified as micro-foundations, that the team believes are necessary for the future will allow them to build team-level dynamic capabilities.

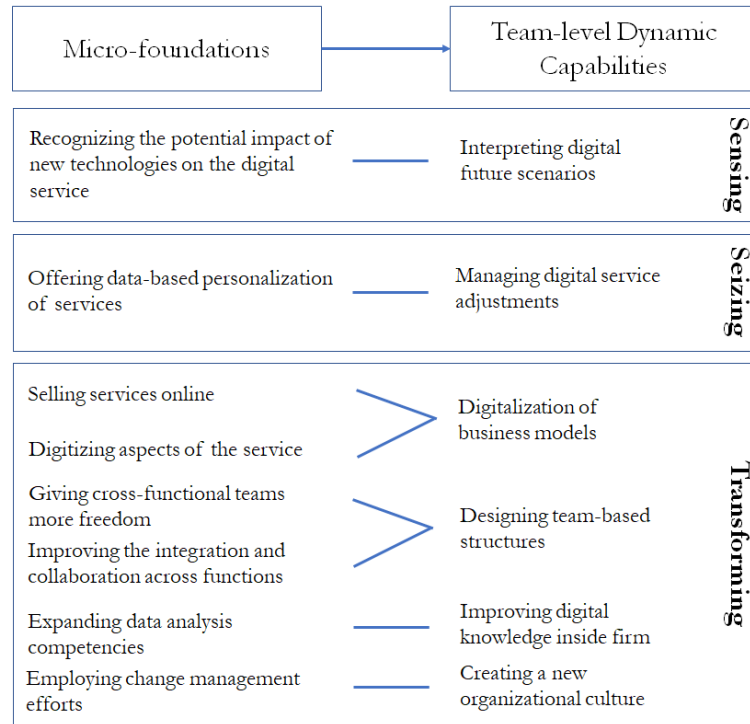


Figure 7: Phase 4 Data Structure

5.1.5 Concluding Remarks

To answer the research sub-question: *‘How are team-level dynamic capabilities built from micro-foundations?’* this part of the Analysis section identified “distinct skills, processes, procedures, organizational structures, decision rules” (Teece, 2007) which form the basis of the team-level dynamic capabilities. Doing so allowed the researcher to drill down to a fine-grained level of detail contributing to deeper insights. This section will be broken down into the dynamic capability categories of Sensing, Seizing and Transforming (Teece, 2007) and will address how team developed their dynamic capabilities throughout their journey to contribute to their Organization, Business model development, and Culture, the themes identified in the ‘Empirical Findings’ section (Warner and Wäger, 2018).

	Concept Development	Implementation	Current Situation	Into the Future
Sensing	Sensing customer needs	Sensing distributor needs	Enabling an entrepreneurial mindset	Interpreting digital future scenarios
	Screening for competitors			
Seizing	Entrepreneurial pitching Creating minimum viable product	Promoting a digital mindset	Promoting digital mindset	Managing digital service adjustments
		Exploiting incumbent benefits		
		Managing digital service adjustments	Entrepreneurial business model adjustments	
		Entrepreneurial business model adjustments	Managing digital service adjustments	
Transforming	Designing team-based structures Extending existing digital services Promoting digital mindset	Designing team-based structures	Employing lean startup methodology	Digitalization of business models
		Enhancing organization-wide service development	Designing team-based structures	Designing team-based structures
		Employing lean startup methodology	Narrowing developer-customer gap	Improving digital knowledge inside firm
				Creating a new organizational culture

Figure 8: Team-level dynamic capabilities across phases

5.1.5.1 Sensing

Team's sensing capabilities needs changed over the course of their journey. In the Concept Development phase, the focus was on discovering customers' unmet needs and validating the business idea by screening for competitors in the market. Doing so contributed to their ability to develop a viable business model for the service. As they moved into the Implementation phase, they had to switch their attention to the distributors as they were the ones selling and delivering the service. The interaction with distributors raised both issues regarding the business model and organizational requirements needed to implement the service as well as highlighted the traditional vehicle manufacturer culture that was still prevalent throughout the organization. In the Current Situation phase, the focus was on learning how to create a more entrepreneurial organization by taking inspiration from digitally-born startups. Going Into the Future, however, requires the team to focus on understanding how new technological shifts might require them to innovate their business model.

The team-level dynamic capabilities in the sensing category correspond largely to those identified by Warner and Wäger (2018) with the exception of *sensing distributor needs*. The abductive research approach however allowed the author to identify complementary research regarding service-innovation capabilities at product-centric firms where *service systems sensing* was identified as a dynamic capability that involves understanding the needs of other actors involved in service delivery, such as distributors (Kindström et al., 2012).

5.1.5.2 Seizing

Team's seizing capabilities across all four phases focused mostly on business model development. In Concept Development, minimum viable product was created to allow for learning and business model adjustments later on. In subsequent phases, the team iterated the business model in an entrepreneurial way and managed adjustments to the digital aspects of the service while exploiting the incumbent benefits that gave them the resources necessary to make these changes. The team promoted the digital mindset within the organization by creating internal hype during the Implementation phase and among their customers in Current Situation phase by demonstrating digital service value through customer testimonials. This contributed to a cultural renewal from the traditional product-centric to digital service-centric mindset. To adjust the organization to the new way of cross-functional collaboration during the Current Situation phase, the team relied on employing lean startup methodology collocating different functions and working in a more agile way. Going Into the Future, the team will continue managing the digital service adjustments according to new customer needs and technological shifts.

The seizing capabilities identified at a team-level differ greatly from those identified by Warner and Wäger (2018). Here is where the difference between focusing on high, strategic levels of the organization to identify dynamic capabilities falls short of understanding the actual dynamic capabilities needed for teams that are actively developing products, services and organizational structures to succeed in digital transformation. The activities related to iteratively adjusting the business model and changing functionalities of the digital tools that teams do on a regular basis are highly customer and technology-centric and crucial for digital transformation, yet invisible from a high strategic point of view. However, Kindström et al. (2012) do identify the *structuring the service development process* and *adopting new revenue mechanism* as important micro-foundations in service delivery similar to those identified here.

5.1.5.3 Transforming

The focus of team's transforming capabilities has been the organizational and cultural renewal across all phases. The team leveled up in each phase when it came to developing team-based structures, starting from

engaging in cross-functional work across different siloed departments in the Concept Development phase, to collocating people and creating a service roadmap for easier cross-functional collaboration in Implementation phase, to engaging in a complete reorganization of service-development teams to break down the silos in the Current Situation phase, and to refining the organizational structure even further in the future. The cultural transformation is also a part of the process as the team promotes the digital mindset internally and enhances the service development processes. Going into the future, the focus of digital transformation will be digitalizing the business model, building digital knowledge inside the firm and creating a new organizational culture for the tribes working on service-development.

Transforming capabilities identified here also differ greatly from those identified by Warner and Wäger (2018) at a high strategic level with the exception of *designing team-based structures* and *digitalization of business models*. On the other hand, Kindström et al.'s (2012) *creating a service-oriented mental model* corresponds to *promoting digital mindset* identified here as both are about creating a culture around being not just a product-but also a service-development organization. Their *balancing product and service-innovation related assets* corresponds to *enhancing organization-wide service development* as both are about ensuring that product-centric firms place special attention to service-development so that new service-oriented capabilities are developed within the organization.

To conclude, the answer to the research sub-question 'How are team-level dynamic capabilities built from micro-foundations?' is that teams employ different activities, processes, routines, and skills related to sensing, seizing, and transforming to renew the organization, business model and culture over time. At different stages of the journey, teams place emphasis on different aspects of renewal and different dynamic capabilities. In earliest stages, focus is on understanding the demands of the customers and distributors (sensing) to form the basis for business model development. This is then followed by the focus on the development of the business model through iterative cycles (seizing). In the next stage, the focus is the transformation of the organization towards a more cross-functional and lean startup model, followed by the transformation of the culture around developing a digital service-oriented mindset throughout the organization (transforming).

5.2 Incumbency-related hindrances and how teams deal with them

This section aims to provide an answer to the second research sub-question: 'What hindrances do teams experience and how do they deal with them along the way?' The analysis uses the following coding:

Italics font is used to highlight the specific challenges that teams themselves identified during interviews.

Bold font is used to highlight the overarching categories that these challenges fall into.

Underlining is used to highlight the actions and strategies that the team employed to deal with the challenges.

5.2.1 Phase 1: Concept Development

During the concept development phase, DS team dealt with several challenges stemming from Scania's history as a successful truck manufacturer. First challenge was the *siloed and product-oriented* organization which was evident in a **clear division between the commercial and development functions**. There was a *customer-supplier relationship* between the commercial and development functions where former was *ordering* the work and latter one was *delivering* it instead of the two working collaboratively throughout. Second, there were **conflicting expectations and business requirements** between Scania CV and distributors as distributors *expected all the details to be finalized at the event* and DS team *expected that distributors would take care of the details*. Additionally, they did not find the *distributor - service fit* as the distributor organizations did not have

the capacity in terms of departments and resources for working on a service that combined both software and human resources. Third, the organization was going through a **transition from a siloed to a collaborative culture**. As DS team was trying to have a closer collaboration across departments, they had to *navigate the organizational politics* in order to engage in cross-functional collaboration. Even when they did that, they still had to deal with the remaining cultural challenges of *lack of communication between different functions* and *customer-supplier relationship mindset* between the commercial and development functions. The *tradition of blaming the other functions for any problems*, *clash between different timelines*, and *differences in the level of customer understanding* were also difficult to get past.

	Clear division between the commercial and development functions	Conflicting expectations and business requirements	Transition from a siloed to a collaborative culture
Challenges	Siloed and product-oriented organization Customer-supplier relationship - commercial side ordering and development side delivering	Distributors expecting all details to be finalized before the launch DS team expecting distributors to take care of the details Not finding a fit between distributor organization and the new service	Navigating organizational politics
			Lack of communication between different functions
			Customer-supplier relationship mindset between commercial and development sides
			Blaming other functions for any problems
			Clash between different timelines
			Differences in the level of customer understanding
Solutions			Engaging in cross-functional collaboration

Figure 9: Summary of challenges and solutions during the Concept Development phase

5.2.2 Phase 2: Implementation

During the implementation phase steps were being taken towards bridging the silos identified in the previous phase through collocating people for easier collaboration and developing a common service roadmap. However, the DS team continued facing some old and new challenges.

First, **conflicting expectations and business requirements** between the DS team and distributors became even more prominent through the following challenges. First, for distributors, implementing a new and not yet finalized service posed a *risk that they were not willing or able to take* due to cost-cutting requirements and different market conditions they were facing while DS team needed to *take risks in order to learn and develop the service further*. Second, distributors were *unwilling to sell a non-core service* as they have built their success on selling trucks and did not have a lot of experience selling connected services. Third, distributors had to *deliver result and maintain long-standing customer relationships* according to management expectations, so they did not have a lot of room for failure. Fourth, distributors had *conflicting requirements regarding the business model aspects* compared to the DS team. All of these challenges required the two parties to engage in long discussions prolonging the whole implementation phase. Second, **getting the revenue model right** was challenging because the *service was unique to the organization* as it involved both software and human service. The challenge of *capturing the value* that DS brought to the customers required iterating the revenue model a few times. While this allowed the team to arrive at a better solution over time, it is still something they are working on improving today. Third, **supporting all distributors** was also challenging as DS supported a distributors way of working and *distributors had many different processes for working with the service*. As such, new roll-outs of the service *did not always gain acceptance of all distributors*. Nevertheless, the team attempted to support all distributors by mapping out all the processes that different distributors used to develop functionalities within the DS tool that supported most common processes. Finally, **transitioning to agile**

required the team to *manage the tensions between the old and new ways of working* and *shedding the truck-manufacturer identity*. The *perception of success and failure* at the organization also started to shift as the ‘failing fast’ mentality started to gain momentum.

	Clear division between the commercial and development functions	Conflicting expectations and business requirements	Getting the revenue model right	Supporting all distributors	Transitioning to agile
Challenges		Distributors not willing or able to take the risk of implementing a new service			
		DS team needing to take risk in order to learn and develop the service further			
		Distributors unwilling to sell a non-core service	Service was unique to the organization	Distributors having many different processes for working with the service	Managing tensions between the old and new ways of working
		Distributors having to deliver results and maintain long-standing customer relationships	Challenge capturing the value the service creates	New roll-outs did not always gain acceptance of all distributors	Shedding the truck-manufacturer identity
		Conflicting requirements regarding business model aspects			Changing perceptions of success and failure
Solutions	Collocating people for easier collaboration				
	Developing a common service roadmap		Iterating the revenue model a few times	Mapping out all the processes different distributors used	

Figure 10: Summary of challenges and solutions during the Implementation phase

5.2.3 Phase 3: Current Situation

Today the organization is one step further than in the previous stage when it comes to bridging the silos. This is done through self-sufficient cross-functional teams, tribes, that bring together all the people needed for developing and maintaining a service. However, DS team is still refining both the service and the ways of working and organizing.

First, **refining and demonstrating customer value proposition** is still a challenge today as *distributors and customers had a lack of understanding of the value of connected services*. The team is working towards developing a tool to easily demonstrate customer's value in relation to the customer's operations as well as improving efficiency of the service delivery process. Second, the journey of **moving to the cloud** represents a challenge because it is *taking away resources from developing new features for the customers* and it is highlighting the *misunderstanding between the technical and business side* as to what it takes to undertake this shift in technology. Third, **the journey towards a new culture** is presenting some challenges within the tribes due to the difficulty of *managing a variety of different people* and *dealing with the remnants of previous organizational structure* when CS department was a commercial organization. Overcoming this challenge, however, is postponed due to *all resources being taken up by the cloud journey*. Finally, **continued journey towards increased integration** between the commercial and development sides still poses a challenge as *separate managers for commercial and development lines are still retained after reorganization*. As such the *customer-supplier relationship* between the commercial and development sides is still a challenge that need to be overcome.

	Clear division between commercial and development functions	Refining and demonstrating customer value proposition	Moving to the cloud	The journey towards a new culture	Continued journey towards increased integration
Challenges		Distributors and customers having a lack of understanding of value of connected services	The process is taking away resources from developing new features for the customers Misunderstanding between the technical and business sides	Managing a variety of different people Dealing with the remnants of previous organizational structure Challenge moving forward as all resources are taken up by the cloud journey	Separate managers for commercial and development lines still retained after the reorganization Customer-supplier relationship remains
Solutions	Self-sufficient cross- functional teams	Developing a tool to easily demonstrate customer value Improving the efficiency of service delivery process			

Figure 11: Summary of challenges and solutions in the Current Situation phase

5.2.4 Phase 4: Into the Future

Going into the future, DS team aims to resolve some of the challenges they have been dealing with so far. First, they want to refine the tribe model to overcome the previously highlighted **continued journey towards increased integration**. Second, there are ideas about **further digitizing the service** to overcome some of the *resource inefficiencies* that come with human involvement in the service. Selling the service online would make subscription management and value proposition demonstration easier, and developing an increased personalized service offering based on data would ensure better returns on investment as the team would be able to invest more on higher-value customers. The *lack of data analysis competencies* and *difficulties getting the online sales right* are still challenges that need to be overcome. In the far future, DS might experience *cannibalization* as autonomous vehicles and platooning technology become more widespread and drivers become less needed. However, this is something they are not concerned with yet. Finally, employing strategic change management will be necessary as the team continues on their **journey towards a new culture** identified earlier.

	Further digitalizing the service	The journey towards a new culture	Continued journey towards increased integration
Challenges	Resource inefficiencies related to human resources needed for the service Lack of data analysis competencies Difficulties getting the online sales right Product-service cannibalization due to new vehicle technologies		
Solutions	Selling the service online Developing personalized service offering based on data	Employing strategic change management	Refine the tribe model

Figure 12: Summary of challenges and solutions in the Future phase

5.2.5 Concluding Remarks

To answer the research sub-question: *What hindrances do teams experience and how do they deal with them along the way?* this part of the Analysis section identified the specific challenges that the team faced on their journey of service development and implementation and solutions that they employed for some of them.

	Concept Development	Implementation	Current Situation	Into the Future
Challenges	Clear division between the commercial and development functions (I)	Conflicting expectations and business requirements (I)	Refining and demonstrating customer value proposition (E)	Further digitalization of the service (E)
	Conflicting expectations and business requirements (I)	Getting the revenue model right (E)	Moving to the cloud (E)	The journey towards a new culture (I)
	Transition from a siloed to a collaborative culture (I)	Supporting all distributors (I)	The journey towards a new culture (I)	Continued journey towards increased integration (I)
		Transitioning to agile (I)	Continued journey towards increased integration (I)	
Solutions		Collocating people for easier collaboration*		Employing strategic change management
		Developing a common service roadmap*	Self-sufficient cross-functional teams*	Selling the service online
	Engaging in cross-functional collaboration	Iterating the revenue model a few times	Developing a tool to easily demonstrate customer value	Developing personalize service offering based on data
		Mapping out all the processes different distributors used	Improving the efficiency of the service delivery process	Refine the tribe model*

*solutions to challenges from previous phases
(I) Incumbency-related challenges
(E) Entrepreneurial challenges

Figure 13: Challenges and solutions across phases

On their journey of digital service development and implementation, the team experienced several challenges related to the company's incumbency status and some entrepreneurial challenges typical for a startup entering a new business area. The incumbency-related challenges had to do with the organizational structure and culture that was hindering team's agility, the typical challenges identified by incumbency curse scholars (Hill and Rothaermel, 2003), and entrepreneurial challenges had to do with continued iterative business model development. Due to the classical siloed organizational structure, team had to over time engage in different ways of overcoming the problems it created for their collaboration. Initially, they had to make-do with the traditional organization, and over time they broke more and more through the silos to eventually completely re-organize into a new department. Along with that journey, they engaged more and more into developing a new collaborative and digital culture within the team. Finally, they learned from customers and distributors along the way in order to improve the business model to deliver and capture most value from the service. Going into the future, the team will continue working on the challenges they have not yet managed to overcome in order to get even closer to the organization, culture and business model renewal needed for digital transformation.

5.3 Team-level dynamic capabilities for digital transformation of incumbent companies

This section will aggregate the previous two sections to answer the overarching research question: *How do teams in incumbent companies develop and maintain dynamic capabilities for digital transformation?*

The author conducted a micro-foundational analysis of a cross-functional team working on developing a new digital service within a large incumbent company to explore how the team built dynamic capabilities needed for digital transformation. By combining Teece's (2007) and Warner and Wäger's (2018) model with this perspective, the author was able to confirm that teams engage in sensing, seizing, and transforming in order to renew the business model, organization, and culture for digital transformation as well as contribute to the theory by identifying specific challenges faced and solutions employed through a process view. Teams in incumbent companies face incumbency-related challenges from the start and manage them by engaging in activities and processes that over time build their dynamic capabilities for change, giving them the ability to find solutions to these challenges, and thus, renewing the organization and culture. Teams also face entrepreneurial challenges and manage them by employing methodologies used by startups, thus renewing the business model and organizational structure. As such, on the journey towards digital transformation, teams must constantly juggle the tension between becoming more entrepreneurial and working within an incumbent organization as they develop their dynamic capabilities.

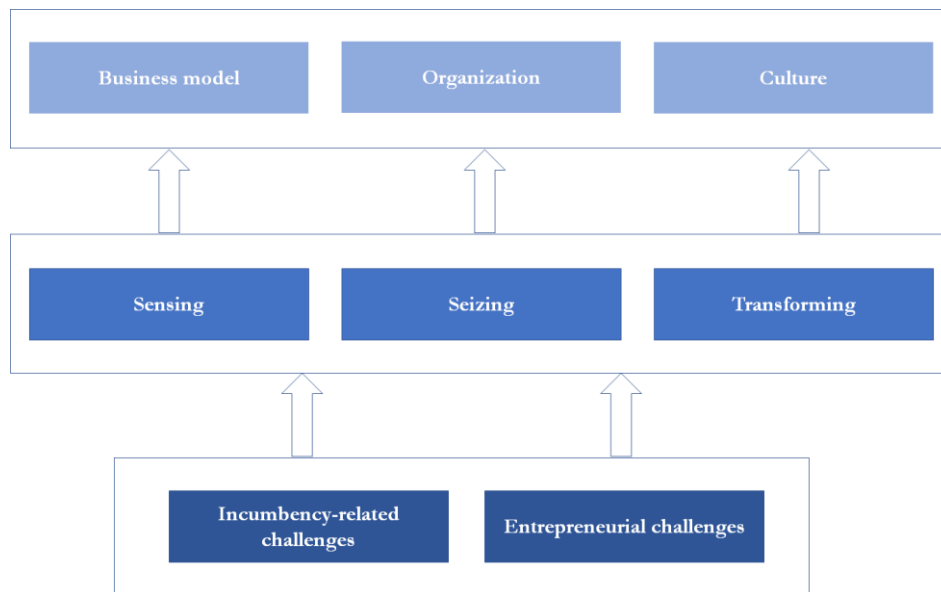


Figure 14: High-level overview of a digital transformation of an incumbent company

6 Discussion

In this study, author embraces aspects of the dynamic capabilities framework that, while recognized by scholars, are not typically highlighted and put at the focus of the study. Those aspects are micro-foundations of dynamic capabilities, the hindrances that incumbents face when trying to build dynamic capabilities, and the rapid changes in the environment in a form of digital transformation. Teece et al. (1997) has identified these aspects of dynamic capabilities since the beginning and continued expanding and putting more emphasis on them in his subsequent papers (Teece, 2007; Teece, 2014; Teece, 2018). Yet the research conducted on dynamic capabilities has remained mostly on a generic level of the framework (Schilke et al., 2018). This perspective helped confirm as well as enrich the existing theory.

In particular, the author found that teams need to balance organizational rigidities and entrepreneurial action to respond to digital changes, consistent with the findings by Svahn et al. (2017). It also highlighted the notion of continuous change over time consistent with the idea of Helfat and Martin (2015) that dynamic capabilities are something that needs to be build and nurtured over time rather than acquired instantaneously. Consistent with incumbency curse research (Hill and Rothaermel, 2003), the study found the incumbency-related hindrances tend to slow down the adoption of new technologies. However, this notion is enriched by this study through an understanding of how teams deal with hindrances on an everyday basis. In that regard, this study found that teams at lower levels of the organization, if given the power, can themselves lead the renewal of the aspects of the organization and handle the hindrances they face. In that sense, the digital transformation of an organization becomes not only something that is considered from a strategic point of view and led by upper echelons of the organization, but something that happens at the smallest units within the organization through everyday activities. As the micro-level scholars suggest, the firm-level differences can and should be explained by the micro-level phenomena because there is where the real source of differentiation comes from (Foss & Pedersen, 2014; Felin et al., 2012).

Furthermore, this study found that the dynamic capabilities identified come from the combination of dynamic capabilities for digital transformation as seen in Warner and Wäger (2018) and dynamic capabilities for service innovation in product-centric firms as seen in Kindström et al. (2012). Considering the fact that digital transformation indeed promotes servitization of industries and enables service innovation in general it is important that these two are considered in conjunction whenever product-centric firms are faced with digital transformation.

7 Conclusion

This study puts the dynamic capabilities framework in a clearly demarcated and described context, thus addressing the research gaps identified through literature review and contributing to the overall stream of literature that focuses on the contextualization and specificity of dynamic capabilities (Schilke et al., 2018).

The findings show that dynamic capabilities can be observed at levels of analysis other than the firm-level, that they are built over time through the employment of micro-foundational activities, processes, routines, and skills, and that they contribute to the renewal of the organizational structure, business model development, and organizational culture in order to enable company's digital transformation. In particular, on their journey towards digital transformation, teams manage incumbency-related and entrepreneurial challenges and employ different dynamic capabilities at different stages of the process to deal with the hindrances and enable change. Early on in their journey, the focus is on developing sensing capabilities to capture unmet customer needs that will form the basis of the future business model developments. In the next phase, the focus turns on development of the business model through iterative cycles (seizing). This is followed by the focus on reshaping of organizational structure to encourage collaboration and agility, and finally the transformation of the culture towards a digital service-oriented one (transforming).

7.1 Theoretical Contribution

This study contributes to theory in three significant ways. First, it gives insight into the nature of the work performed by actors to support development of dynamic capabilities. As such, it highlights how dynamic capabilities are built from micro-foundations therefore addressing the gap in theory (Vial, 2019; Schilke et al., 2018; Teece, 2007). Second, it extends the application of dynamic capabilities framework to the level of a cross-functional team, a unit of analysis that is yet to be extensively studied. As such, it confirms the idea that dynamic capabilities happen at different levels within the organization (Augier & Teece, 2009; Felin & Foss, 2005; Helfat & Martin, 2015). Third, it applies the contextual factor of digital transformation at an incumbent company to give a detailed description of hindrances that teams face, and how they overcome them to enable digital transformation therefore contributing to the gap in that area (Vial, 2019; Warner and Wäger, 2018; Karimi and Walter, 2015).

7.2 Managerial Implications

For managers, digital transformation is now one of the main topics on the agenda as it stands to disrupt companies and industries of all shapes and sizes. Understanding what it actually entails in terms of the capabilities they need to develop and nurture within the organization is of immense value. This study contributes to that understanding by unpacking the micro-level mechanisms that are typically left 'black-boxed', allowing them to understand what is it exactly that teams do on an everyday basis to enable digital transformation (Foss & Pedersen, 2014). The following three takeaways are important for managers. First, digital transformation starts with customer needs rather than new technologies, the new technologies merely act as an enabler to deliver the value. Therefore, in the earliest stages teams need to engage in sensing those needs and understanding how they can provide value to the customer. Second, teams will have to constantly manage the tension between incumbency-related and entrepreneurial challenges as they deal with rigid organizational structures and processes while engaging in agile cross-functional collaboration. Teams

need to be granted autonomy in order to reconfigure the organizational resources to their advantage as they go about pursuing new organizational structures and business models. Finally, teams need to be supported in their journey of promoting the digital mindset within the organization and its customers as the change in the culture of the organization is crucial for digital transformation.

7.3 Limitations

Three limitations are identified in this study. First, the study did not investigate how team-level dynamic capabilities contribute to the firm-level dynamic capabilities. Doing so would add another layer to the micro-foundational level of analysis and provide insight on the extent to which the team-level dynamic capabilities enable and promote firm-level dynamic capabilities. Second, the study did not look to evaluate the success of the team or the success of the organization when it comes to their digital service innovation capabilities as measuring success can be difficult (Helfat et al., 2007). Third, due to the highly contextual nature of the study and the dynamic capabilities framework employed, the extent of applicability of the study is likely limited, and could be enhanced by conducting multiple in-depth studies across a variety of industries.

7.4 Future Research

Three topics for potential future research are identified through this study. First, the study identified interesting findings regarding how teams in incumbent companies employ certain entrepreneurial methodologies and derive inspiration from digitally-born startups for organizational structure. The dynamic capabilities literature could benefit from future research that compares startups and incumbents in how they go about building dynamic capabilities and the differences in the challenges they face and their abilities to deal with them. Second, the context of the study was an industrial firm that is expanding its offering from products to digital services, and therefore, it would be interesting to see whether the findings of the study could be applied to other industrial firms regardless of the type of the industry. The findings of the study found confirmation in other studies on traditional (Warner and Wäger, 2018) and product-centric companies (Kindström et al., 2012) and as such the idea that there is a general set of dynamic capabilities applicable across these firms seems viable. Finally, a longitudinal study could provide even more insight into real-time tensions that teams have to deal with as well as a more precise sequence of development of different dynamic capabilities in different phases of their digital service development journey.

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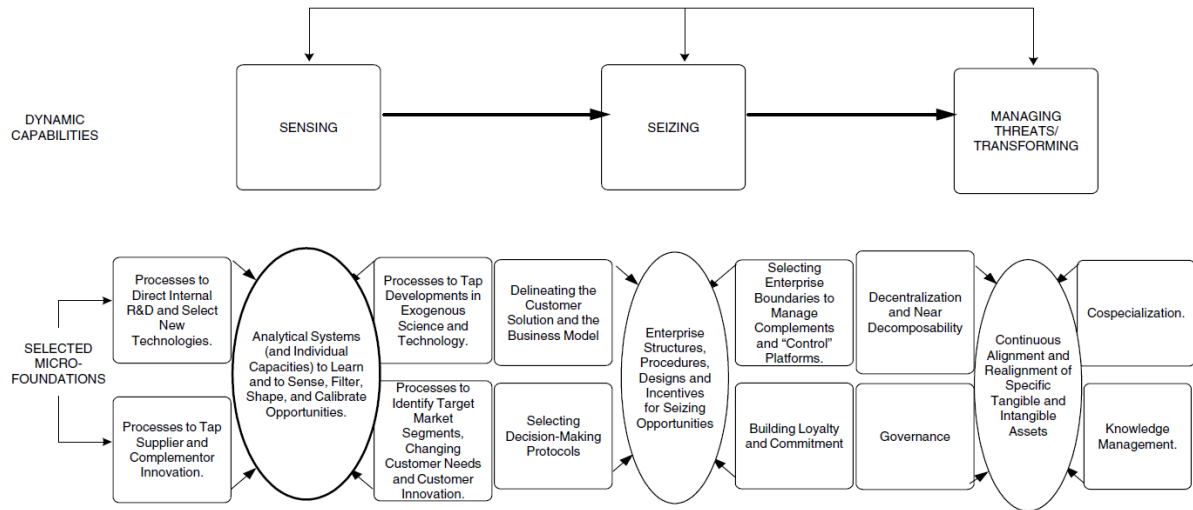
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9 Appendices

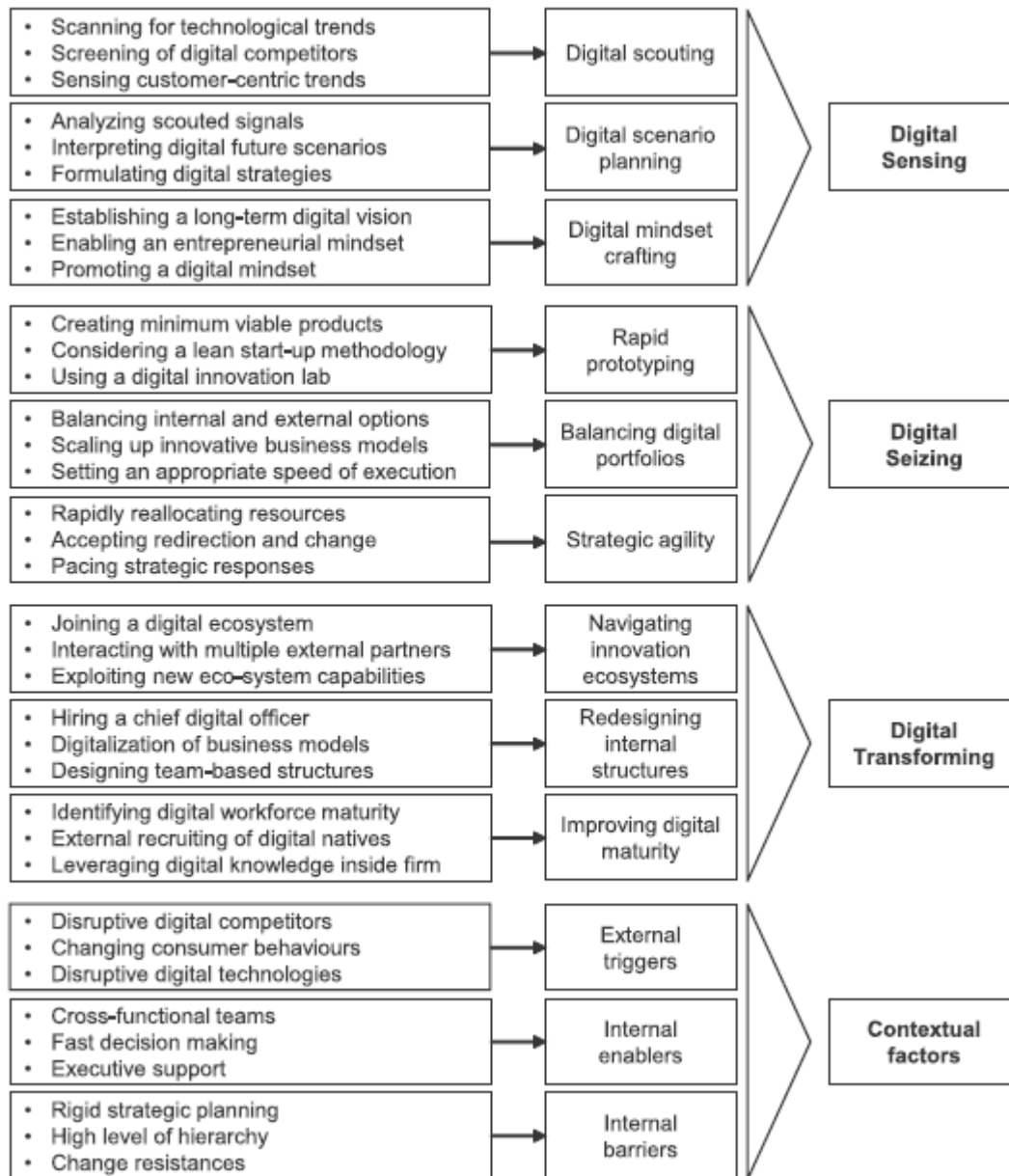
Appendix 1

Dynamic capability micro-foundations (Teece, 2007)



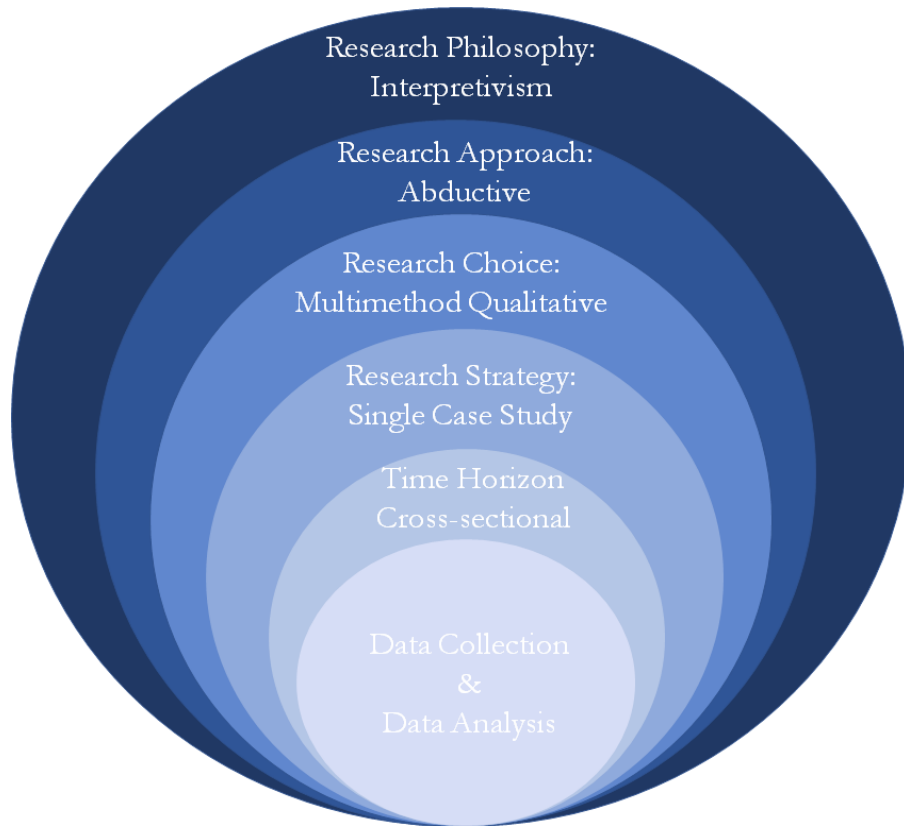
Appendix 2

Dynamic capabilities for digital transformation (Warner and Wäger, 2018)



Appendix 3

Research onion. Adapted from Saunders et al. (2007)



Appendix 4

List of interviewees

	Interviewees	Role	Location	Interview Type	Date
1.	Participant A	Commercial	Sodertälje	Face-to-Face	15/04/2019
2.	Participant B	Commercial	Sodertälje	Face-to-Face	15/04/2019
3.	Participant C	Commercial	Sodertälje	Face-to-Face	15/04/2019
4.	Participant D	Commercial	Sodertälje	Face-to-Face	18/04/2019
5.	Participant E	Development	Sodertälje	Face-to-Face	24/04/2019
6.	Participant F	Development	Sodertälje	Face-to-Face	24/04/2019
7.	Participant G	Development	Sodertälje	Face-to-Face	25/04/2019
8.	Participant H	Commercial	Germany	Skype	25/04/2019
9.	Participant I	Commercial	Sodertälje	Face-to-Face	25/04/2019
10.	Participant J	Commercial	Sodertälje	Face-to-Face	29/04/2019
11.	Participant D	Commercial	Sodertälje	Follow-up, Face-to-Face	29/04/2019

Appendix 5

Interview guide

- Can you give me a description of the service: what it is, what it does and how it does it?
- Tell me about your project of developing this service from the inception of an idea towards completion. Can you divide it up into different phases? (Think about critical moments throughout the project such as tensions, problems, big events etc)
 - Why was the project initiated and by whom? Where did the idea come from? What internal or external factors played a role in the decision to start this project? (when did this happen and how long did the process take?)
 - Who was involved in the project? What was your role in it? What roles did other team-members take?
 - What internal hindrances and external challenges did you face?
 - What stage is the project at now?
 - What kinds of assets that Scania possesses made it possible to do this project?
 - How did Scania's previous actions and its history enable or hinder the development and implementation of this project?
 - In your opinion, what made your project successful?

Probing questions regarding sensing, seizing and transforming capabilities

- Sensing
 - How did your team go about the identification, development, codevelopment, and assessment of technological opportunities?
 - What role did customers/ technologies/ resources/ organization/ managers/market trends/external partners play in the development and implementation of the project?
 - What are your competitors doing with regards to this? How did you go about learning what they are doing?
 - How does this project fit into a more long term vision of innovation and digital transformation at Scania? (aka what digital strategies do you have, how do you plan for the uncertain future, how do you analyze the signals you sense in the market)
- Seizing
 - How did your team go about mobilization of resources to address customer needs and opportunities, and to capture value from doing so?
 - What challenges do you face in seizing the opportunities that new digital technologies bring?

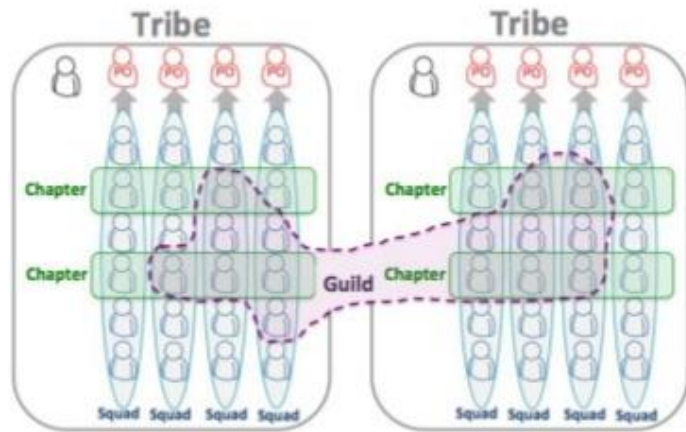
- How do you get resources needed throughout your project?
- How did you go about making complex decisions regarding the design of this product/service?
- How did you go about getting the firm-level support for the project?
- How did you decide when, where and how much to invest?
- How did you go about overriding certain dysfunctional features of established decision-making rules and resource allocation processes?
- What organizational characteristics do you think made it possible to develop and implement this project? (aka incentive design, openness to experimentation and innovation, agility, forward thinking, entrepreneurial thinking)
- Transforming
 - What changes and reconfigurations of internal and external (tangible e.g. technology and intangible e.g. knowledge) assets and resources needed to be made in order to implement this process? How did you go about making those reconfigurations? What challenges did you face and how did you overcome them?
 - How do you go about the challenge of transforming and developing a new business model vs retaining and maintaining an old business model?
 - Who is involved in the transformation process both internally and externally?
 - What challenges did you experience in the transformation process and how did you deal with them?
 - How did the decision-making process go? To what extent was the decision-making process centralized/decentralized?
 - To what extent did you use internal vs external resources (open innovation)? How do you utilize your ecosystem? How do you involve external partners? How do you balance internal and external collaboration?
 - To what extent does this project operate independently and as a decentralized unit?
 - How do you ensure that people involved in the project are up to date with digital and technological opportunities?

Appendix 6

Scaling Agile @ Spotify (Kniberg & Ivarsson, 2012).

Spotify

- Squad
 - Equivalent to a Scrum team
 - Autonomous as possible
- Tribes
 - Same office < 100 people
 - Common area of the system
 - Organised for minimum interdependency
- Chapter
 - Skills community
 - Chapter Lead is line manager
- Guilds
 - Community of interest
 - Cross Tribe group
 - Guild Unconferences



Source: Henrik Kniberg & Anders Ivarsson Oct 2012