# MANAGING DIGITAL TRANSFORMATION

Per Andersson, Staffan Movin,
Magnus Mähring, Robin Teigland,
and Karl Wennberg (eds.)

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Karyn McGettigan, Language Editor


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STIFTELSEN MARKNADSTEKNISKT CENTRUM

In his central role at the Wallenberg Foundations,
Peter Wallenberg Jr has furthered a broad range of important research and research-led education initiatives at the Stockholm School of Economics (SSE) and its Institute for Research (SIR). This indispensable work has also helped create a fertile ground for research on digital innovation and transformation: a phenomenon currently experienced, shaped, and managed in and between organisations and throughout society.

This is the topic of this book, which we dedicate to him.

# Contents

# Acknowledgements

Every year since 1992, the Stockholm School of Economics Institute for Research (SIR) has published an Annual Research Anthology, and this year SIR is publishing the book in cooperation with MTC (Stiftelsen Marknadstekniskt Centrum). The purpose of the SIR Annual Research publication is to enable managers and practitioners better understand and address strategically important challenges by showcasing SSE research on a selected topic of importance for both business and society.

This year's book, *Managing Digital Transformation,* features authors from academic areas across SSE together with representatives outside the institution. The book's eighteen chapters show the strength and breadth of SSE's research within the area of digitalization and reflect the importance that SSE places upon closely linking research to practice and on investigating the leadership challenges and their implications in order to support value creation in society.

Participating in the many ongoing research projects at SSE and the multitude of aspects of digital transformation addressed in the various chapters has been very rewarding for the editors. We would like to thank all the authors for their hard work and cooperation throughout the project. In finalising this book, we have relied upon the expert work of Karyn McGettigan for language editing, Petra Lundin for layout and graphic design, and Marie Wahlström for digital access to the book. We are, indeed, most grateful for their excellent and diligent work.

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Stockholm, January 2018
*Per Andersson, Staffan Movin, Magnus Mähring, Robin Teigland, Karl Wennberg*

# Introduction

One of the hottest research topics lately is digitalization. Many research projects are focusing upon different perspectives. Gone are the days when digitalization or business implications of ICT were just about increasing efficiency. Instead, the ripple effect of digital development can now be felt wider and deeper than ever before. The way in which business is conducted and how it creates value, as well as how corporations can become more efficient and sustainable, are all implications of digitalization. Adapting to new demands and taking advantage of the plethora of possibilities, however, is not always easy.

Managing digitalization and the transformation of business always involves new challenges. The novelty and complexity of the digital age has led to an increased academic interest in the area of digital transformation and a call from companies that seek support in this process.

We take a look at digitalization from the perspective of business research. This creates a better understanding of the challenges that today's businesses are facing. We believe this anthology will serve as a tool to help businesses better understand the force that is digitalization and support these corporations in their digital transformation.

The idea behind this anthology grew as Marknadstekniskt Centrum was taking part in several interesting research projects. Companies were asking MTC to facilitate contact with scholars and supply them with academic insight. Vinnova came on board, by supporting the project *Progressiv digital utveckling förutsättningar för framgång (Progressive Digital Development: Pre-Requisites for Success)* of which this book is a part: its aim to stimulate business to become more progressive in digital change. At last, this book and the website www.digitalchange.com have become a reality.

This joint venture between Marknadstekniskt Centrum and The Stockholm School of Economics Institute for Research follows the SIR tradition of publishing an annual yearbook to showcase its vital research contributions. The book begins with an overview of digitalization, then moves to understanding the new digital customer, and ends by exploring re-organisational effects, business models, and ecosystems. We hope this year's anthology will be useful for managers by facilitating their digitalization processes.

### PART 1: DIGITALIZATION – DIFFERENT PERSPECTIVES

The role of digital technology in business and society is rapidly shifting from being a driver of marginal efficiency to an enabler of fundamental innovation and disruption in many industrial sectors, such as media, information and communication industries, and many more. The economic, societal, and business implications of digitalization are contested and raise serious questions about the wider impact of digital transformation. Digitalization affects all private and public operations, as well as the internal and external workings of any operation. Digitalization is the major driving force behind sweeping large-scale transformations in a multitude of industries. Part 1 includes various perspectives on digitalization and digital transformation.

### PART 2: THE NEW DIGITAL CUSTOMER

Digitalization has resulted in more user-centric business and user-centric systems. The changing behaviour of the digital consumer/customer is discussed here as it connects to new forms of customer involvement and engagement, as well as analysis models of what creates customer value in this digital context.

### PART 3: THE RE-ORGANISATION IN ORDER TO CONNECT WITH THE DIGITAL CUSTOMER

How can companies connect with digitalized consumers and non-digitalized customers? This is a central issue in managing digital transformation, as it draws attention to the emerging intra-organisational, marketing, and customer interaction challenges associated with digitalization: for both the consumer and the supplier. Another aspect of this is the internal handling of new forms of organizational ambidexterity; that is to say, companies and organizations engaged in digitalization processes often require an internal re-organisation in order to handle the demands that digitalization brings, and to explore new digital opportunities while promoting their existing business and operations.

### PART 4: BUSINESS MODELS AND ECOSYSTEMS

How do companies change, adapt, and innovate their business models? Given that digitalization leads to a convergence of previously unconnected or loosely connected markets, the digitalizing company and organisation is analysed in its systemic and dynamic context. This part draws attention to business models

and business model innovation. Incumbent firms need to adapt and change business models while competing with digital start-ups based upon new scalable business models, accessible ventures, and rapid processes of intermediating. These chapters discuss completely new co-operative business models: processes that need to be developed as companies shift from products to digitally based services.

The Ecosystem places digitalizing organisations and companies into their broader and systemic context. This includes discussions on digital disruption, industrial convergence processes, and shifting patterns of competition and cooperation. Digital technologies cause markets to converge in many new and sometimes unexpected ways. The result is the emergence of new roles and market positions of technical platforms.

*Staffan Movin, Stiftelsen Marknadstekniskt Centrum*

# Digitalization: Different Perspectives

# Strategic Challenges of Digital Innovation and Transformation

PER ANDERSSON AND CHRISTOPHER ROSENQVIST

## Introduction

Digitalization has reached all industries and all sectors of society. Companies and industries are currently facing challenging transition processes; the future appears to be less predictable for many, which threatens existing competitive position. Meanwhile, digitalization opens up for many new options, thus, shifting companies' and organisations' opportunities to re-position their business and operations. Digitalizing incumbents and new digital start-ups both face a number of strategic challenges associated with digital transformation and digital innovation processes. Our focus in this chapter is on these strategic challenges. We will extract, present, and discuss a set of common strategic challenges that are associated with digital transformation and innovation processes, while drawing upon insights from cases in fifteen different sectors and digitalizing arenas. Larger incumbents are under pressure to transform their business while acting in a short-sighted quarter-to-quarter perspective. The rapid pace with which new start-ups are creating strong market positions sometimes leaves the incumbents with no choice but to collaborate – or be left behind. One major strategic challenge stemming from digitalization is the development of business models based upon new forms of cooperation and partnerships. One report expresses this new competition and the resulting strategic challenges:

> "The current generation of entrepreneurs is unlike any other. Empowered by digital technologies and unencumbered by legacy structures, they are unleashing fundamentally new business practices at a pace that was almost unthinkable just a couple of decades ago... inventing new business models and monetization strategies all along the way." (Source: *Ericsson Digital Disruption Report*)

Digitalization poses strategic challenges for both incumbents and for the new digital disruptors. Major challenges concern business development, including business model changes. Building upon a broad set of case studies in a variety of industries, the purpose of this chapter is to provide an empirical overview and a discussion of the recurrent strategic challenges that are associated with digital transformation. To set the scene for this discussion, we introduce three short introductory illustrations from three completely different sectors.

Our first example comes from the automotive industry. The increased demand on behalf of car users for "car access as a service" requires new business models and a strategic shift from product to service orientation in the automotive industry. Meanwhile, the digitalization associated with the launching of connected vehicle strategies enacts another strategic challenge, which appears to be part of the digitalization process: the creation of new cooperative business models across previously weakly connected business networks. When launching various types of "connected vehicle" concepts, companies in the automotive and the ICT industries report similar experiences. When Ericsson presented its connectivity platform for connecting the car, thus, directing attention to business model challenges, the ITC company argued that business modelling and new forms of partnerships could be an area for innovation: "It… enables new profitable innovative business models for the industry where new actors – government and third party players – are able to share revenues. Several stakeholders share the growing interest in being connected on the road: Governments want to enhance road safety and collect road tolls and congestion charges. Insurance companies want to be able to offer insurance based on how you drive; media and content companies want to be present in the vehicle." (Ericsson: Connected Vehicle Cloud). This leads to challenges in establishing completely new business models across industries. One of the anticipated obstacles relates to the vast differences between the automotive industry and the mobile communication industry, as expressed by one mobile operator: "The automotive and mobile industries have been drawn together by the unstoppable rise of the Connected Car. As with any partnership, there will inevitably be teething problems, but both sides are aware of the importance of making the relationship work as the demand for connectivity in cars grows." (Telefonica: *Connected Car Industry Report 2013*, p.9)

Our second example is from the medical technology industry. A business unit manager in a global medical technology company was interviewed about his and the company's main challenges with regard to directing attention and resources to digitalization:

> "The biggest challenge is to grasp the complexity of the strategic challenges that we are facing when taking the next steps into digitalization. We had an idea of what to start with, but soon we experienced that there were many strategic issues that required our attention. And they seemed to be strongly connected. We experienced some difficult delimitation problems quite early when starting to work with this…"

The company thought it could do something about the masses of machine and patient data that was being generated from the company's machines when used globally in intensive care rooms. Thus, big data issues captured the company's early attention. A first mover advantage was expected in relation to competing global medical technology suppliers that had (connected and complementary) intensive care machines placed in the same rooms in different parts of the world. However, creating a new business around the analyses of big data aimed for intensive care professionals and their hospitals would require a shift in business orientation: from selling products, associated hardware, and services to also becoming a service and consultancy provider. Intensive care staff would have limited use of data analyses from only one supplier; much more value would be created if analysed data from complementary medical technology suppliers were included in the service package. This would require some radical re-thinking on behalf of the medical technology suppliers of their present, competition-based business models, as well as technical integration. New cooperative business models would be required with patients as the focus of value creation. The initial and delimited big data was difficult to separate from other main strategic issues: moving from products to services, shifting toward more user-centric business operation, and handling completely new cooperative business models.

Our third example is from the education sector and the emerging education technology industry. Sensavis is a Swedish company that offers high quality 3D visualisation software for the K12 education sector. Sensavis' vision is to improve learning outcomes by making it easier to understand complex and abstract phenomena, particularly within STEM: science,

technology, engineering, and mathematics. The small company's mission is to provide educators all over the world with tools that enable them to reach and include all students in the learning process. Headquartered in Sweden, the company operates in 36 countries and serves over 550 schools, thus, reaching more than 220,000 students. Sensavis and the education technology industry face a unique challenge: the public education sector is characterised by fairly high levels of bureaucracy, risk-aversion, and slow technology adoption (2014 OECD Conference: *Innovating the Public Sector: From Ideas to Impact*). This often stands in stark contrast to the innovation-driven education technology industry, which presents multiple barriers to entry for education technology companies. In addition, investor impatience to show returns puts more pressure on education technology companies, such as Sensavis. Although education technology companies have the opportunity to transform learning, the potential impact of their digitalized services often depends upon their ability to develop a viable business model. In the case of Sensavis, as the small education technology start-up successively learned more about the customers, the users and the other stakeholders in the local networks, it altered and adapted its business model four times during its first years of existence: "We had the ability to spark interest and got the traction of people who were early adopters and visionaries, but we lacked the understanding of what people really needed..." And considering this was a situation where digitalization was difficult due to existing structures and institutions, "we are trying to change 100 years of tradition in schools and that is the biggest challenge."

The three examples indicate that digitalization processes often enact radical new forms of business and industry change. The same complexity emerges regardless of the digitalizing industry or sector. During these digitalization processes, previously unconnected or weakly connected industry networks become connected (for example, automotive and telecom industries). As with these first two examples, many incumbents in different industries have begun their digitalization journeys; one over-arching experience is that digital transformation processes often embrace big strategic challenges. And, one strategic challenge does not come alone; it is often connected to other bigger issues. Hence, the guiding question is the following:

*What are the general, strategic, and managerial challenges associated with digitalization?*

Companies report on a set of major strategic challenges when engaging in digital transformation. This seems to be general in the sense that they appear in many different business (and public) contexts. When starting the process of digital transformation, these strategic challenges do not come alone. For example, business model challenges can often become intertwined with technical challenges associated with the introduction of a new technical platform. Companies show different behavioural patterns in terms of how they deal with this inter-connectedness of digitalization challenges. We will describe and elaborate upon these general strategic challenges. First, let us say a few words about how they have been extracted.

## About the Underlying Research

The digital transformation challenges are collected from a longitudinal comparative research project focusing upon in-depth studies of companies in 15 different contexts engaged in digital transformation processes (see Table 1.1). The discussion here builds upon a broad set of ongoing case studies, and secondary sources on digitalization. The strategic managerial challenges were extracted from ongoing cases of digitalization processes listed in the table. The cases all share the fact that the effects of digitalization are apparent/considerable (a transformation) and are of central strategic importance for the organisations involved; this includes the role of various technical platforms. In many of the represented sectors, digitalization is associated with an overlapping between sectors and networks, which sometimes includes tension between different "industrial logics". Thus, the processes in most cases open up for considerable changes and re-positioning of companies: where business development and business model innovation become part of the digitalization changes. The strategic challenges discussed in this chapter provide a snapshot of ongoing digitalization processes that have been extracted from both secondary sources (digitalization reports from different industries, government reports, companies' annual reports, and business press) and from a set of ongoing case studies that occurred between 2015–2017 (see Table 1.1.) The main case studies (from areas 2, 5, 7, 8, 11, and 15 in the table) are based upon interviews in the case organisations and workshop sessions. These focus upon internal and external organisational challenges associated with ongoing and future steps in the case companies' digitalization processes. In broad terms, the digitalization challenges were initially discussed along a set of different

themes, which included the following issues: technical, customer exchange and value, external partnership and business ecosystem, economic and financial, and other business models. With these as guidelines, a set of ten general strategic issues was finally extracted from the cases and the secondary sources from the fifteen digitalization areas. (The research is ongoing as of 2017; therefore, no claim is made that the list is exhaustive or that all issues are equally relevant for companies in all fifteen areas.)

**Table 1.1: Cases of Digital Transformation Processes: Studied in 15 Different Areas**

| Digitalization Area | Start of Empirical Studies | Focal Sector (and Business and Societal Issues) | Main Ongoing Case Studies and/or Empirical Collection During 2016–2017 |
|---|---|---|---|
| 1 "The Smart Home" | 2016 | Building construction and digital homes | Mainly ongoing data collection from secondary sources |
| 2. "The Connected Vehicle" | 2014 | Automotive industry | Volvo-Ericsson: The connected vehicle case (reported In: Andersson & Mattsson 2015) |
| 3. "The Big Media Event" | 2014 | Media and entertainment industries | Mainly ongoing data collection from secondary sources, including case of a major sporting event |
| 4. "The Mobile Enterprise" | 2010 | Administration and office operations | Mainly ongoing data collection from secondary sources |
| 5. "The Remotely Monitored Patient" | 2014 | Healthcare sectors | Getinge: ongoing case study of integrated patient care and big data challenges |
| 6. "The Beyond-the-Pill Solution" | 2016 | Pharmaceuticals and healthcare | Mainly ongoing data collection from secondary sources, including reports on pharmaceutical companies buying health care digital support companies |
| 7. "The Connected Farm" | 2015 | Farming and food industries | Vertical Farming: ongoing case studies of the digitalizing of supervision in farming, including vertical farming |
| 8. "The Networked University" | 2016 | Public and private sector education | Sensavis: ongoing case study of a new start-up company in the education technology sector |
| 9. "The Smart City" | 2015 | City planning and sustainability issues | Mainly ongoing data collection from secondary sources, including reports from Stockholm and Dubai |
| 10. "The Monitored Environment" | 2015 | Sustainability and issues of environmental monitoring | Mainly ongoing data collection from secondary sources |

| | | | |
|---|---|---|---|
| 11. "The 'Mobility -as-a- Service' System" | 2015 | Transportation and logistics | Nobina: ongoing case study of public transportation supplier ("Public transportation as 'mobility-as-a service") |
| 12. "The Automated Production System" | 2016 | Manufacturing, industry automation and production | Mainly ongoing data collection from secondary sources |
| 13. "Digitalizing Finance" | 2017 | Banking, finance institutions and new FinTech start-ups | Mainly ongoing data collection from secondary sources |
| 14. "The Networked Public Society" | 2017 | Public safety, social welfare organisations, and elderly care | Mainly ongoing data collection from secondary sources |
| 15. "E-com 3.0: Consumer Centric Retailing" | 2015 | Retail sectors: music, food, and fashion | Universal Music Sweden: ongoing case study of management of big data in music consumption |

## Ten Digitalization Challenges

What are the major managerial challenges experienced by managers in different sectors? We have extracted ten general strategic challenges taken from discussions and meetings with both global suppliers of digital technology solutions for transforming sectors and with companies engaged in digital transformation. We can still say that while the composition of problems under each of the ten strategic issues can differ, it appears as though several issues are common, based upon a first exploratory step of analysis and the given empirical limitations. In addition, the centrality and importance of certain challenges can differ between industries and sectors, partly depending upon the stage of digitalization in which a company or sector finds itself. For example, the issues facing media companies is often at the forefront of digitalization – such as, in the music industry – yet they do not fully mirror those of companies in other more traditional types of manufacturing and construction industries. We will now summarise these companies by giving short descriptions of them. We begin by addressing the challenges associated with the technologies, explore the challenges of increased user-centrism, and then move toward business model issues; , lastly, we will end with more systemic challenges. We focus upon the broader strategic issues, and end the list with linking these to important internal organisational challenges.

## 1. MANAGING THE IMPORTANT ROLES AND MARKET POSITIONS OF TECHNICAL PLATFORMS

Platform management research in general – and more specifically, information management – tends to draw attention to the growing importance of technical platforms, as well as their organisational and technical complexity. The emergence of industry-wide technical platforms sparks profound changes – and challenges – in industrial structures. This blurs industry boundaries, reshapes markets, and impacts firms' strategies, structures, and management processes (Yoo et al. 2010). This transformative impact of digitalization is often connected to the growing importance of technical platforms. As Gawer & Cusamano (2014) argue, the concept "platform" has become almost ubiquitous; their definition of "external platforms", however, draws attention to the external strategic dimensions: "We define external (industry) platforms as products, services, or technologies that are similar in some ways to the former, but provide the foundation upon which outside firms (organized as a "business ecosystem") can develop their own complementary products, technologies, or services…" (ibid, p.418)

A technical platform's eco-system can refer to one or several platform owners and a more or less explicit platform leader. The way in which technical platforms emerge and how their ecosystems evolve is of great importance in management. Platforms are "manageable objects" (Gawer & Cusumano 2014), purposefully managed to bring multiple parties together: primarily users and 'complementors'. Platform leaders and their competitors, as well as suppliers, complementors, and users are involved in both competitive and cooperative interaction: that is to say, in co-opetition. This creates new managerial challenges. In digitalization processes, a complementor might become a platform leader that is in competition with the incumbent leader. Moreover, from the perspective of layered modular technology, there appears to be many loosely coupled layers of devices, networks, services, and contents when it comes to technical platforms that are central in many digitalization processes. Yoo et al (2010) describe the strategic challenges of this: "Because of the dynamic nature of the layered modular architecture, the same firms can compete on one layer and peacefully coexist on other layers" (p.729). Many of the identified management implications come back to the fact that digitalization and the new technical platforms upset old industry structures and require new types of "frameworks" for analysing and understanding competition. Digital

technologies and platforms require actors to create new "meanings" to products, competition, customers, etc. (Yoo et al 2010, p.729).

Part of the managerial issue concerns the important role of technical platforms as new *intermediaries* in service innovation. That is, the technical platforms take on and/or are given a central role between a set of complementary suppliers (complementors) and a set of customers. The intermediating role seems to be associated with new complex patterns of cooperation and competition, thus, creating important strategic challenges for involved companies, including platform leaders. Intermediation in the digitalization processes seems to be associated with dynamic network processes and changes in network connections.[1]

## 2. MANAGING BIG DATA: CREATING NEW VALUE BASED SERVICES FROM DIGITALIZATION

Quotes from three managers interviewed in 2016 in an ongoing research project[2] on digitalization processes in different sectors of the networked society, illustrate the problem area. This is the focus of our second strategic challenge connected to digital transformation:

"We are working hard right now to try to figure out a strategy for big data – one important question is if we should build our own internal big data analytical capabilities, like some leading companies that have created specific units and business focused on this, or if we should outsource parts of big data operations to partners." (Interview with product manager at engineering company engaged in IT and industry automation, Jan 2016.)

"One of the strategic issues that we are struggling with in our ongoing digitalization concerns our future approach to big data. There is a business opportunity in this, but one of the tricky issues concerns the fact that our products are strongly connected to a number of competing companies' products. Big data analyses for the end user of these systems is of less value if the analyses do not involve data from all products. This is a new situation of competition and cooperation emerging…." (Interview with marketing manager at high-tech medical device company, Dec 2015.)

1 In an article published within our ongoing research, Andersson & Mattsson (2015), argue: "We find it useful to introduce elements from methodology, specifically including material objects as actors and to acknowledge the performative role of technology for overlapping and intermediating in industrial networks." (p.92)

2 A three-year research project on digitalization processes ending in 2017: *Renewal of the Service Society* ("Det mogna tjänstesamhällets förnyelse", Wallanderstiftelserna)

"The first issue is of course to understand if and how our big data analyses can be actually turned into value creating services for our customers and other partners. The second issue concerns our own role in this and what our business model should be when creating new business value for ourselves." (Interview with marketing manager at a media company, Feb 2016.)

Recurrent questions in the contacts with managers concern the experienced challenges associated with big data (BD), now and in the future. As the above quotes indicate, these challenges concern both strategic and practical operational issues around BD: What role should the company and other organisations have in BD, including specialised BD analytic companies? What value can actually be developed from BD, and for whom in these stakeholder networks? And what are the various practical challenges when taking a step into BD operations: translating accessed, structured, and analysed data into value creating services? A number of emerging question marks concerning data sharing, privacy, and ethics around BD are also added to this. Practitioners' concerns regarding BD, thus, circle around three broad issues: 1) strategic, which includes the (external) distribution of work and control over various BD related activities; 2) value and business models, regarding the actual output value from BD analytics and associated business models; 3) operations and practices, including the processes of translating BD analyses into value creating services, and how to internally re-organise in order to manage BD-related operations. Edelmann & Singer (2015) are in line with the last point; they describe how companies draw upon large amounts of customer data in order to analyse and build effective "customer journeys" that, in turn, require new internal organisational structures and innovative types of management.

## 3. COPING WITH USER-CENTRIC SYSTEMS: MEETING THE POWER OF CONSUMER NETWORKS

One common observation in digitalization reports is that the 4th Industrial Revolution leads to increased user-centric orientation in companies (World Economic Forum). A consequence of this shift, for example, is that marketing and its bridging role are placed right at the centre of this development. Consumers buy and use products and services in new ways, sometimes sharing products and services as part of what collectively has been labelled "the sharing economy" (Frenken & Schor, 2017). Companies' existing product and product sales-based business models become challenged when large networks

of consumers or organisational customers start sharing products and begin demanding "access to product use", rather than ownership, which is often based upon digital support systems.

This general shift has also been associated with changes in connectivity, advances in analytics and artificial intelligence, and the growing profusion of smart devices and sensors. The experience concept, customer value, and outcomes receive special attention as consumers' set of daily digital activities grows: they search and buy, download, stream, access, connect and create, do peer reviews, and so on. Since the growing digital ecosystems are becoming increasingly digital and more user-centric, companies strive to meet the number of new challenges. One such challenge is how companies should connect in the best way possible to these digitalizing, and sometimes cooperating, consumers: directly, via platforms, in aggregated marketplaces, via connected objects, products, and services, in digital information systems, and so on. A wide range of new digital marketing technologies, systems, and solutions are implemented to support back-office analyses of customers' digital journeys and new digital behaviour, and also to support new digitalized interactions with customers. Together, these new marketing technologies are beginning to shape newly emerging marketing platforms, thus, connecting the digitalizing company with its digitalizing customers. The challenges of this digitalization for companies' marketing operations include the speed and pace of the responses to, and reactions from, customer actions. Interaction processes are becoming more continuous with ongoing customer contacts; deep and ongoing insight into customer journeys, and marketing planning processes are being radically affected. For example, long-term product life cycles and marketing planning is changing, as digitalization enables continuous experimentation and product testing. In turn, this also affects and creates challenges for the strategies as well as the total business of companies.

### 4. GO-TO-MARKET AND SCALABILITY: GOING FROM DIGITAL PILOTS TO THE SHAPING OF NEW MARKET

Digitalization processes include the development, production, implementation, and use of new digital solutions and offerings. A recurrent managerial issue in many business sectors is how digital solutions in pilot tests can be translated into scalable business models to target larger markets. Going from single successful pilot projects to market launch of new targeted digital offer-

ings is often experienced as being challenging due to the uncertainties regarding which parts of the associated business model can support scalability. An example is a global ICT supplier and incumbent in its ICT business, which considered a new business opportunity. The company tested new digital infrastructures with sensors and Internet of Things technology, which also included mobile phone applications aimed for the audience and spectators at a world sport championship. The managerial issue in focus was how to turn a successful digitalization pilot into the next commercial step by creating a viable business model that could support the sales of the system on the global market for "big events" (sports, music festivals, and so on.) Which parts of the business model for this particular "digital solution" could be stabilised, if any, and which parts needed to be kept agile and adaptable? The business model scalability issue turned out to be essential. In order for the company to find a way to go to market and continue providing these types of solutions, it needed to find a scalable way to transform the ideas tested during the pilot project into new revenue streams as part of the business model. One of the first issues to solve became which central partners to target in the (global) stakeholder network as part of the business model, as well as finding out also the value in which different stakeholders were seeking from the large-scale digital solution. A central issue in the digitalization project then became determining how to transform the value created by new digital big event solution into real cash flows based upon a new revenue model. Similar large-scale digital infrastructure projects in other industries indicate similar scalability challenges.

## 5. MANAGING DIGITALIZATION AND SERVICE TRANSFORMATION: SHIFTING FROM PRODUCT TO SERVICE-BASED BUSINESS MODELS

In many sectors, digitalization has become connected to transitions from product to service provision or, in the words of Vargo & Lusch (2004), shifting toward a service dominant logic. This has also become one of the major managerial challenges in digitalization processes: one that often requires new organisational principles, structures, and customer interaction processes. Business models change from transaction to relationship-oriented, which means that new sets of capabilities will have to be developed: such as organisation structures, metrics, marketing and sales incentives, and more. Three possible service innovations can be seen in the following examples: Philips launching its concept of "lighting as a service"; Volvo marketing its "connected

vehicle" based upon new digital infrastructures; and, public transportation company Nobina moving toward "mobility-as-a-service" for city travellers instead of bus operations. These innovations involve many knowledge areas, new digital technologies and platforms, and actors from several industries in new partnerships. Such digital service innovations may be new, in terms of how individual services are connected to each other (bundled or unbundled), the role of different actors (including the users), the organisation and the distribution of services (as well as the price and payment for services). We have seen and reported (Andersson & Mattsson 2015) how cooperative and competitive relationships in business practice change when different knowledge areas and industries are involved in such digital service innovations. Shifting from product to service-based business models when going through a digital transformation means that uncertainty and complexity need to be acknowledged. Moreover, the value of the new digitally-based service for a user may be more or less difficult to perceive and evaluate during the transformation.

### 6. SHAPING NEW CO-OPERATIVE BUSINESS MODELS

Digitalization opens up for network interdependencies that cross industry borders. An individual company in such a context cannot independently develop and implement a sustainable digital transformation, including business model change (Berman 2012; Westerman & Bonnet 2015; Ehret & Wirtz 2017) For example, implementing the ideas of "smart cities" based upon new digital infrastructures, means that different private as well as public actors may prefer other designs of the model. Conflicts between actors with different business models need to be addressed. For a digital service innovation of this magnitude, many uncertainties will emerge, thus, challenging traditional roles and positions. And, these are challenges that both young digitalizing firms and established businesses face when they seek to collaborate with one another in order to engage in digital transformation processes. However, such cross-industry collaborations also enable firms to accelerate innovation and create more competitive market positions. Therefore, there are two kinds of challenges associated with the digitalization and the creation of new cooperative partnerships and new business models: first, as in the case of Volvo and Ericsson around the Connected Vehicle Cloud, there is the challenge of creating new types of bilateral cooperation. Secondly, such as in the case of "smart cities", there are the many challenges of establishing functioning

partnerships associated with broader sets of cooperating organisations. This type of wide form of digitalization challenging innovation connects to Vargo et al (2015): for example, they propose an ecosystem approach for considering different types of technological and market innovations as being driven by new forms of institutionalisation processes.

## 7. MANAGING THE NEW DIGITAL ENTREPRENEURS AND THEIR RAPID PROCESSES OF INTERMEDIATING

There is a tendency to draw a great deal of attention to the steps and moves of the so-called Unicorns and successful digital start-ups when discussing and analysing digital transformation. In reality, digital transformation processes in all sectors involve a wide array of different relationships between both young and established incumbent firms being dependent upon each other and being part of the same transformation. Digital transformation is a collaborative innovation process in which small and large companies create joint strategic partnerships. The small digital start-ups may take advantage of the fact that many of them are digital from the start and may also possess a scalable business model from the outset. They are often in need of access to the established incumbents' advantages, however: in terms of financial resources, established cooperation networks, experiences, regulatory knowledge, and so on. In some cases, they can rapidly scale successful digitalization experiments across multiple markets.

An example can be seen in the service sector. New digital actors, such as Booking.com and Tripadvisor, have created new intermediate positions in a short period of time between hotels (including big global hotel chains) and customers: where the former struggles to attract hotel customers back to the hotels' own web/booking sites. As a result of digitalization processes, similar intermediation can be seen in other service industries, thus, challenging the incumbents regarding who is going to have most of the direct contact with the customers. As a previous study stated:"… service innovation processes might require, or stimulate, changes in intermediation – sometimes also the entry of new actors as intermediaries" (Andersson & Mattsson 2015). One company expressed the process as going in both directions: that is to say, embracing both dis-intermediation and re-intermediation processes: "Increased usage of ICT has led to a complex and dynamic process of 'disintermediation,' as producers are able to generate direct sales and creators can directly distribute their work online. Telecom and IT players, meanwhile, create a move toward

're-intermediation,' allowing smaller companies that may not have large marketing budgets to participate in the market."[3] The challenge of managing the new digital entrepreneurs and their rapid processes of intermediating has a mirror effect; the digital start-ups need to embed their business in established network settings by relating to incumbents. No business is an island.

## 8. CREATING NEW BUSINESSES ACROSS INDUSTRY BOUNDARIES AND INDUSTRY LOGICS

Digital technologies cause markets to converge in many new and sometimes unexpected ways. The previous wave of convergence between the sectors for information, communication, media, and household appliances is being replaced by much more radical forms of convergence (Hackling, 2013). And, digital technologies are at the centre of these processes: pulling different and sometimes distant industries and markets toward each another. Previously unrelated sectors become dependent upon one another. Connectivity and interdependence between networks change with digitalization, due to technical and market convergence: for example, between the ICT sectors, the automotive industry, and in various public spheres (road authorities, and so on) when launching more integrated connected vehicle concepts. Following these processes of overlapping between industrial networks, unexpected new patterns of cooperating and competing companies emerge and create new market situations. Such overlapping between digitalizing industrial networks implies the need to consider and address new relationships, changes in old ones, and closer indirect contact. Overlapping confronts actors with uncertainties and tensions, and sometimes threatens established network positions (Andersson & Mattsson 2015). Through digitalization, companies that were not previously considered competitors are pulled closer together; categories of firms that were once distinct begin to converge, and build new cooperative business models. Processes of technical and industrial convergence create new digitalized markets: for example, through the proliferation of technical platforms. In the emerging smart home ecosystem, a good example is Google's acquisition of Nest (thermostat, smoke detector, and alarm system hardware). With these two companies, players as wide-ranging as telecoms, energy corporations,

3 From official presentations made by the ICT company Ericsson under their label The Networked Society. These presentations are listed and are made available at: http://www.slideshare.net/Ericsson/industry-transformation-in-the-networked-society

gaming systems, and home appliance manufacturers form new Smart home constellations of both cooperating and competing firms. This includes Google, thus, positioning itself in relation to operating system or cloud service providers for smart products and digital selves. And, beneath it all is digitalization, which enables new potential contributors to enter these emerging networks. A general implication for management is to develop a preparedness to act upon unexpected new actors entering these networks; this becomes the new normal situation in many industrial areas.

### 9. RE-ORGANISATION OF DIGITALIZING CUSTOMERS: MANAGING ORGANISATIONAL BUYER ALLIANCES

The digitalization of companies and industries also affects the buyer side. Purchasing power moves to executives outside of regular purchasing and IT departments and functions. Digitization brings a more permanent change to the ICT investment and buying processes. In turn, this creates a more complex sales environment for technology providers engaged in their customers' digitalization processes. Furthermore, large-scale digitalization processes – such as investments in "Smart cities" – create new and very complex buying situations. Complex constellations of both public and private organisations need to engage in the creation of functioning buyer constellations in order for large-scale digitalization processes – such as smart city projects – to move from idea to pilot, and then to large-scale implementation. Successful examples, such as the city of Dubai, can be explained by the fact that constellations on the buyers' side have been created and engaged in the process. The growing influence of joint business and public buyer constellations in purchasing decisions when digitalizing also constitutes a major challenge for the supply side. Providers of digital solutions will need to support the creation of functioning buyer constellations, thus, creating new go-to-market models that meet these organisational challenges on the buyers' side.

### 10. MANAGING THE POLITICAL AND INSTITUTIONAL CHALLENGES OF DIGITALIZATION

Digitalization, in general, and the access to and use of big data, in particular, pose a number of challenges for both companies and policy makers. As one manager in health care expressed it: "One of the biggest challenges for us right now is how to relate to policy makers and policy making – often (the) lack of

policy making – when it comes to digitalization, in general, and issues concerning patient data, in particular. Understanding how to handle these new strategic issues and how to influence politicians and policymakers are two of our major concerns…." Addressing privacy and security issues will become paramount as more data increasingly travels across boundaries for various purposes and as a result of increased digitalization.[4] Security issues and intellectual property issues are becoming part of companies' data strategies, yet it is perhaps becoming more importantly a privacy and trust issue when it concerns customers and other stakeholders. Meanwhile, one of the strategic challenges for companies in many digitalizing sectors is how to influence policy makers, so the choices they make also help individual firms in their quest to capture value from using big data. For digitalizing companies, it is a matter of complying with the role that policy makers have of developing policies that balance the interests of companies that want to create value from data and citizens who wish to protect their privacy and security. This new situation for companies is often accentuated by the fact that one of the most important enablers of value creation from big data combines data from multiple sources. This is a new situation in many sectors and digital data policies are still often lacking or need to be adapted. Still, this has become one of the major strategic challenges for many companies: the way in which to relate to – and sometimes influence – new policy-making. The ownership, access, collection, storage, use, and dissemination of information require rules and policies; companies and public organisation tend to become highly involved in these processes.

## Digitalization Challenges are Connected

The focus of the ten challenges of digital transformation is different: some are more closely connected; some are not. Those that are concern technology: for example, platforms and big data management and user orientation – such as big data analyses, user-centric and user-network driven actions. Several managerial challenges are business-model related: creating new cooperate business models and shifting to service-based business models; some of these also connect to broader ecosystem-related challenges for digitalizing companies;

4 For example, both public and private organisations need to interpret and relate to various new principles: for example, OECD's eight Privacy Principles, which concern: Collection Limitation, Data Quality, Purpose Specification, Use Limitation, Security Safeguards, Openness, Individual Participation, and Accountability.

thus, creating new business across industry boundaries and managing new forms of buyer/user constellations.

A digital transformation challenge for an incumbent firm seldom comes alone. The medical technology company to which we referred in the introduction began one part of its digital transformation with a delimited interest in how to manage the big data generated from the use of its intensive care machines. Successively, major business model issues emerged: cooperation or competition with other machine suppliers and users: doctors, hospital administration units, and other related issues. Seeing how firms in various sectors take different initiatives into digital transformation, we can see that digital transformation steps often lead to new digitalization challenges.

Managers need to cope with the fact that digitalization challenges do not come alone. We can assume by building upon our first insights into this issue when going into the fifteen business areas of digital transformation, that companies take different paths in their digital transformation processes. There are differences with regard to initial drivers and managerial problems, as well as when and the way in which these connected challenges are handled. Hence, the emphasis shifts over time. Technical platform issues in this digital transformation might dominate a certain period; more attention could be given to user-centric issues and the processes of business modelling or creating functioning cooperation between involved stakeholders in the emerging ecosystems might dominate the other stages. Incumbents in many industries have begun their digitalization journeys; the starting point creates different digital transformation paths in different industries and in different organisational contexts.

The management of digital transformation should not be seen as purely an intra-organisational or operational issue. Instead, it is a strategic and societal issue, which is often a challenge of highest priority. As seen in Table 1, the studies and cases of digital transformation, however, all reveal that the ten strategic challenges are connected to big internal challenges and tensions within the organisations.

## Implications: Pressures on Internal Organisational Structures, Processes, and Resources

Digitalization is becoming a dominant driver of internal change: both in private and public organisations. For incumbent companies as well as public

organisations, digitalization often requires administrations to explore new opportunities while still operating with mature technologies in mature markets. Many incumbent organisations experience profound changes in organisational structures, daily operations, and in other modes of doing business. Thus, dual forces affect internal operations and organisations in profound ways. Keeping the digitalized business or operations separate or integrating them with current traditional ones is but one of the organisational challenges that needs to be managed.

We conclude this chapter by discussing the demands upon internal organisational structures, processes, and resources when entering a digital transformation. Interviewees have forwarded these issues that were taken from reports, which represent all fifteen digitalization arenas listed in Table 1 and have also been compared with other studies: for example, Soule et al, 2016. Many of the issues described are structural and concern new principles for organising digitalized operations, as well as internal resources and capabilities. Many of the mentioned internal challenges are change related. The focus of internal organisational challenges includes managing and leading digital innovation and transformation processes. Comments from managers centred around seven general areas: 1) leadership challenges; 2) new skills, resources, and internal capabilities; 3) customer orientation and customer oriented work practices; 4) internal organisational structures and responsibilities; 5) internal processes for continuous experimentation and user orientation; 6) internal cultural challenges; and 7) change management challenges.

### A LEADERSHIP CHALLENGE

A common view among managers in all sectors is that digitalization can only be successful if top management support is ensured. The presence of a dedicated CEO and a central team to propel the new digital development is central in achieving successful transformation. This is not a back office or an IT department problem. Some firms and organisations hire a new chief digital officer to spearhead the changes in a digital transformation. Few, however, believe that installing a new chief digital officer or one in a similar position is a guarantee for success. One can argue that digital transformation is a big challenge, and that support for the process needs to be driven from top management, thus, fostering a (new) corporate culture. That is to say, the responsibility of creating a corporate culture that effectively drives digital transformation ultimately

rests with the CEO.[5] There is a strong common belief that top management is responsible for setting the digital vision and strategy of the company or organisation. Some also argue that a new type of leadership is needed, thus, moving away from hierarchical autocratic top-down approaches and looking instead to create more open collaborative environments, powered through digital collaboration tools.[6]

### NEW SKILLS, RESOURCES, AND INTERNAL CAPABILITIES

Many argue that, apart from the many technological resources that are required to ensure a digital transformation, there is also a need for new human skills. Interviewed managers often come back to various workforce-related issues. There is a need for people with skills and experiences with different digital technologies (cf. Soule et al 2016). When digitalizing, desired employment skills will include technological experience with social and mobile technology, artificial intelligence, big data analytics, internet of things, and more. The competition for such skills and capabilities is expected to increase. The ways in which to apply these technology skills operationally, tactically, and strategically will also be part of the skills that will be needed when going digital. Furthermore, the increasing importance of networked and connected resources and capabilities means that platforms and skills for such networking will have an increasingly important role in digitalizing organisations.

### CUSTOMER ORIENTATION AND CUSTOMER-ORIENTED WORK PRACTICES

A central recurrent idea among interviewed managers about the new internal requirements for digitalizing organisations is the fact that organisations with digitalization are coming closer to end users: that is to say, customers, patients, clients, and so on. Digitalizing organisations are becoming more and more user centric. Actively participating and closer connected users require internal skills and capabilities – as well as processes and organisational structures – that support new user empowerment. The challenge for existing marketing and customer operations includes understanding, following, analysing, and trying to influence customers' "digital and analogue journeys"

5 WEF Report: *World Economic Forum White Paper: Digital Transformation of Industries: Digital Enterprise*, January 2016

6 WEF Report: *World Economic Forum White Paper: Digital Transformation of Industries: Digital Enterprise*, January 2016

(Edelman & Singer 2015) across various channels, platforms, and physical settings.

### INTERNAL ORGANISATIONAL STRUCTURES AND RESPONSIBILITIES

During the transition, organising the new digitalized operations in relation to the old established operations sometimes create "ambidexterity problems" for incumbents (O'Reilly & Tushman 2004; Birkinshaw et al 2016). That is to say, the new digitalized operations need to be organised and handled in relation to existing traditional business operations. How this should be managed in practice is often challenging and requires organisational skills. In addition, new organisational processes based upon changed internal and external connectivity often require new digital platforms in order to enable new forms of cooperation. Some argue that digitalization and platforms for cooperation might lead to a shift toward flatter hierarchies. One of the new internal challenges is creating structures that enable organisations to draw upon networks both within and beyond traditional organisational boundaries.

### INTERNAL PROCESSES FOR CONTINUOUS EXPERIMENTATION AND USER ORIENTATION

Leadership and organisations in general need to adapt to two central shifts in operations; the first concerns the need for less focus on long-term planning, thus, moving toward more continuous development. Traditional internal roles and responsibilities need to be adapted, including leadership and CEO roles. Some reports[7] argue that, as a consequence of internal digitalization, leadership needs to embrace the role of moving to shorter data-driven predictive analytical planning cycles with greater focus on experimenting. Digitalization leaders need to embrace the role as drivers of new forms of development, thus, becoming promoters of continuous innovation processes. The second challenge concerns the new role of end users; internal organisational processes and operations need to be changed and coordinated in new ways to adapt to this new orientation. Understanding and organising in relation to end users' digitalization processes is a challenge that requires new leadership orientation, new internal processes, structures, interactions, and capabilities.

7 WEF Report: *World Economic Forum White Paper: Digital Transformation of Industries: Digital Enterprise*, January 2016

### INTERNAL CULTURAL CHALLENGES

Creating an effective digital strategy is critical, as is fostering a corporate culture that is open to innovation and will be supportive of the new strategy. Digital transformation processes equate cultural challenges, which are often a part of the new demands facing CEOs and leaders of the transformation.

### CHANGE MANAGEMENT CHALLENGES

Many incumbent organisations are not prepared for digital transformation. A big challenge is the actual change process. One report[8] describes three ways in which organisations seem to approach the change management challenge when digitalizing. The first is a direct approach: that is to say, transforming existing business processes. Initiatives can come from, and within, various parts of an organisation: marketing, supply chain, production, and operations. They can also be connected to a number of partnerships of the organisation. One of the many challenges with the direct approach is how to coordinate different initiatives and how to engage the entire organisation. The second approach starts by creating an autonomous "digital unit" free from corporate legacy and standardised business processes. When it works, the separate unit ("skunk works" unit) functions as a start-up with no learning barriers or aversions to risk. The second approach has a niche focus upon building new digital models. The third change approach builds a parallel digital business, which is a parallel business aimed at repositioning the existing enterprise as a start-up geared towards digitalization. This becomes a sort of incubator aimed at delivering new business models and insights that can be leveraged by the traditional organisation. Overall, there are multiple ways to begin removing barriers to digitalization and to learn from the change processes within organisations. Irrespective of the change management principle, one of the major challenges is how to digitally transform the entire organisation and how to coordinate different change initiatives. Traditional mindsets, practices, and resources can be difficult to adapt. Developing new (digital) mindsets, practices, and resources on every level, and within every function, is often perceived as being a difficult and long-term change management issue.

8 From official presentations made by the ICT company Ericsson under its label *The Networked Society*. These presentations are listed and are made available at: http://www.slideshare.net/Ericsson/industry-transformation-in-the-networked-society

### WHAT CHARACTERISES A DIGITAL ORGANISATION?

Our interview findings can be compared to those of Soule et al (2015), who investigated organisations' modes of becoming digital and state that the characteristics of a digital organisation could be summed up in four critical areas concerning mindset, practices, workforce, and resources. First, Soule et al state a distinguishing feature of a digital organisation is a (digital) mindset: an attitude that reflects a broad tendency to initially seek digital solutions, use technology as a tool for advantage, and approach enterprise data in a systematic fashion. Secondly, as concerns practices, they argue that four fundamental behavioural norms are present in a digitalized organisation: first) digitized operations based upon extensive use of data and information exchange; second) a readiness for boundary-crossing collaborative learning, problem solving, and the discovery of new insight, and data-driven decisions; third, digital organisations view their workforce in broad terms, thus, acknowledging the contributions of all when it comes to technology experience, digital skills, and high engagement in digitalization issues; and fourth, digital tools and data are critical inputs to the functioning of the digital organisation, and the main resources are often real-time customer data, accessibility to integrated data about internal operations, and digital collaborative tools to support communication, collaboration, and rapid feedback within the organisation.

## Conclusion: Connecting External Strategic and Internal Operational and Organisational Challenges

As aforementioned, digitalization challenges do not come alone. In this chapter, we have elaborated on one broad question: What are the general, strategic, and managerial challenges associated with digitalization? We described different general paths of digital transformation building upon our insight from the fifteen areas of digital transformation, arguing that there are strong overlaps between them: in terms of the accompanying managerial issues that are involved and managed. For example, big data problems and issues appear in many of the studied business contexts. There are also differences with regard to initial drivers and managerial problems, as well as when and the way in which external strategic challenges and internal operational challenges are handled. In these terms, the digital transformation paths are always unique, while the overall external and internal digital transformation challenges are very similar across industries and organisations.

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