UNIVERSITY OF GOTHENBURG

Automation and Digital Transformation

The ways that automation solutions can support digital transformation within ICT companies

Tanja Balic
Hossein Ebrahimi

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Abstract

Digital transformation is a big deal for every company. On the one hand, to survive in a severe competitive market and the emergence of new technologies, companies are forced to adapt themselves to changes rapidly. On the other hand, changing processes, especially in the big companies, is not easy. Furthermore, any mistake about decisions and value proposition assumptions for digital transformation and strategies to implement required structural changes can cause the digital transformation to fail and the company perhaps losses its share in the market. Thus, applying changes needs to have an effective strategic plan to employ innovation processes which can lead companies through digital transformations. The objective of this paper is to identify the ways that automation solutions can support digital transformation within ICT companies. The paper investigates supportive characteristics of automation from both “dimensions of digital transformation” and “procedural aspects of digital transformation” perspectives.

Considering the automation definition, an automation does not change roles and missions. Thus, the automation doesn’t mean transformation, the automation tries to make processes that are known, easer by employing management skills and technological solutions. Most studies in the digital transformation area focused on transforming from traditional workflows to technologies that can employ to digitalize Information. This case study research focuses on understanding concepts of the digital transformation and the ways that automation solutions can support digital transformation to reduce mistakes about decisions and value proposition assumptions. This study tries to connect findings from theories by looking at characteristics of the automation and the ways that automation solutions facilitates transformation in different domains of digital transformation in ICT companies.

As a part of this report we have analyzed relevant theory from automation and digital transformation domain but also one automation project from service delivery department in Ericsson.

Abstrakt

Digital transformation är ett stort steg för alla företag. För att överleva i en hård konkurrensutsatt marknad där ny teknologi dyker upp hela tiden, tvingas företagen att anpassa sig snabbt till förändringar. Åt andra sidan är det inte lätt att byta processer, särskilt i de stora företagen. Vidare kan eventuella misstag om beslut och antaganden som rör värdesättning för digital transformation och strategier för att genomföra nödvändiga strukturella förändringar göra att den digitala transformationen misslyckas och företaget kan förlorar sin andel på marknaden. Tillämpning av ändringar måste ha en effektiv strategisk plan för att använda innovationsprocesser som kan leda företag genom digital transformering. Syftet med detta dokument är att identifiera på vilket sätt automatiseringslösningar kan stödja digital transformation inom ICT-företag. Arbetet undersöker stödjande aspekter av automatisering från både "dimensioner av digital transformation" och "procedurella aspekter av digital transformation" perspektiv.

Med tanke på definition för automatisering, roller och uppdrag ändras inte av en automatisering. Automationen betyder således inte transformation, automatiseringen försöker göra processer som är kända, lättare genom att använda ledarskap och tekniska lösningar. De flesta studier inom digital transformation, fokuserar på att omvandla från traditionella arbetsflöden till teknik som kan användas för att digitalisera information.

Denna fallstudieforskning fokuserar på att förstå koncept av digital transformation och hur automatiseringslösningar kan stödja digital transformation för att minska misstag om beslut och antaganden som rör värdesättning. Denna studie försöker koppla samman fynd från teorier som tittar på automatiseringens egenskaper och sätt som underlättar omvandling på olika områden av digital transformation i ICT-företag.

Som en del av denna rapport har vi analyserat relevant teori från automations- och digital transformation domän, men också ett automationsprojekt från en serviceavdelning i Ericsson.

Acknowledgements

We would like to express our deep appreciation to people in Ericsson for providing us with information that we needed, sharing their experience with us and replying to our many questions.
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Contents

1 Introduction

Today, Internet and innovative solutions based on Internet have totally changed the meaning of the digitalization. Usually, the digitalization refers to a transformation from one level to a higher level. Abazi (2016) explains Digital Transformation as a movement to a level that businesses can collect data through Internet. In other words, Internet is seen as an important source that opens a new era of information for businesses.
Moreover, Internet presents an opportunity to expand the business to a location-independent level. According to this opportunity, Digital transformation is also seen as way of employing digital technologies to deliver information systems through internet based solutions such as cloud computing. In recent years, some researchers have started to talk about strategy instead technology to drive digital transformation. As Kane et. al (2015) stated, the digitalization is not about technology anymore. The strategy is the key in the digital arena.

1.1 Problem discussion

As pointed out above, the digitalization of business activities and processes, and its subsequent the digital transformation are not limited to Integration of digital technologies into business activities. Digital technologies have been expanded to software solutions. However, characteristics of a digital transformation and factors that are affecting digital transformation are not the same as before.
Digital transformation is very important for every company. On the one hand, to survive in a severe competitive market and the emergence of new technologies, companies are forced to adapt themselves to changes very fast. On the other hand, changing processes, especially in the big companies, is not easy. Applying changes needs to have an effective strategic plan to employ innovation processes. In other words, it needs to have a good understanding about innovation processes and how they can support digital transformation.
Most studies in the digital transformation area focused on transforming from traditional workflows to technologies that can employ digitalization of Information. Many ICT company have started their journey towards digitalization long time ago. First going from hardware to software, but also going from software to next generation of software and services.
There are a few studies that started to investigate about solutions such as automation and the ways that they can support digital transformation in technology companies.
As argued before, the definition of digital transformation can vary depending on the level of required digitalization. Thus, answering to what the digital transformation means today, and how domains of digital transformation are connected to various levels of digital transformation, is important to understand how automations and strategies that are employed to facilitate digital transformation, are connected.

1.2 Research questions

This research aims to explain the ways that automation solutions can support digital transformation within service sector of ICT companies.

Given the problem definition, the main research question for the research proposed in this paper is the following:

> **How can automation solutions support digital transformation in the customer service sector of ICT companies?**

To answer the research question above, we try to understand concepts of the digital transformation. We also try to connect findings from theories that look for characteristics of a digital transformation in ICT companies and domains of digital transformation connected to different levels of digital transformation.
By investigating domains of digital transformation and its connections to different levels of digital transformation, we look for the ways that automation solutions can support digital transformation in ICT companies.

1.3 Thesis outline

This study is comprised of a literature study in chapter 2. Literature study is giving theoretical background that summarizes the literatures that has been reviewed having digital transformation and automation in focus.

In chapter 3, we have described research method used in this thesis.

After the background and the method, in chapter 4, the study focuses on the Ericsson case where a case of automation as a part of digital transformations will be investigated.

Chapter 5 focuses on discussion and conclusion. The chapter contains also discussion about strengths and limitations of our work. Suggestions for future work are described in chapter 6.

2 Theoretical Background

In this chapter we will explain what digital transformation is and how automation is part of it.

2.1 Digitization, digitalization and digital transformation

The concept of digitalization was started while developing the binary numerical system in 1679. It originally refers to a base-2 numerical system to represent physical information. Later it was developed and complemented by other scientists such as Boole (1854), George Stibitz (1940) (Irvine, 2001) and was used on the automatic computing (Tropp, 1993). To understand the concept of digital transformation it is important to understand meaning of the terms digitization and digitalization.

2.1.1 Digitization

Digitizing is a word that is usually used in contrast with Analog. In general, digitization refers to representing the objects such as images, sounds and text by a set of the numbers (Khan 2016). Digitizing information strongly affects change processes in the majority of sectors and industries (Collin et al 2015).

2.1.2 Digitalization

There is no clear definition of the digitalization particularly when the phenomena and required infrastructures have been already developed (Chew 2013). In general, the digitalization refers to the actual 'process' that leads to change in a technologically-way, within an industry or an organization. Considering this definition, the digitalization is not only about the usage of the IT (Khan 2016). It's linked to all aspects of the business consisted of all needed changes. These changes includes not only IT, but also: social change, infrastructure upgrades, business developments. As Janowski (2015) pointed out, the digitalization is a continuous change focused on finding innovative digital solutions to implement to business processes. Today, in most papers digitalization refers to change existing value chains in public sectors (Collin et al., 2015, p. 29).

2.1.3 Digital transformation

The process required through digitalization within industries and organizations is known as 'digital transformation'. In other words, the 'digital transformation' is the process of digitalization or information conversion (Berman, 2012; Bounfour, 2016; Chew, 2015; Coyle, 2006; Housewright & Schonfeld, 2006). The result of this process can open an opportunity to change and improve existing economic structures and business models (16). Moreover, it can facilitate the availability of information for both individuals and companies (Sganzerla et. al, 2015). One way of describing digital transformation is by digital transformation domains.

2.2 Digital transformation domains

As Rogers (2016) stated, there are five domains of digital transformation: customers, competition, data, innovation and value (Figure 1).

Figure 1. Five domains of digital transformation (The Digital Transformation Playbook: Rethink Your Business for the Digital Age, Rogers 2016)

2.2.1 Customers

The customer is the first domain of digital transformation. It focuses on moving from mass markets to customer networks. In a traditional view, customers have a dynamic connection to the business. But in a digital age view, that is changed to the constant connection. Thus, digital transformation forces the business to rethink its market and its customers' role. As digital age prospective, customers are the first group to focus and the best partner that business can find. According to Rogers (2016), movements on the customer domain can be summarized in six areas.

1. Movement to dynamic networks - In the digital age customers are not just the target to sell products or services (the mass market), they are a dynamic network to expand the market.
2. Movement to two-way communications - The communication is not a one-way broadcasting to customers. It's a two-way communication.
3. Movement to customers as key influencer - The firm is not the key influencer anymore, it's the customers that are the key influencer.
4. Movement to inspirational marketing - Marketing does not persuade customers to purchase. In the digital age, marketing inspires customers to purchase, being loyal, and advocating.
5. Movement to reciprocal value - Gaining value is not a one-way flow. It's a reciprocal flow.
6. Movement to customer-value-centric economies - It refers to the movement to an economy based on customer-value instead economies based on firm-scale.

2.2.2 Competition

This domain refers to the ways that a firm can compete and cooperate with other businesses. In a traditional view, a business competes with other businesses that work

within the same area but in a digital age view, the competition is expanded to all businesses who can potentially become their competitors. In addition, it also refers to the movement from dependent-location boundaries to an independent-location, worldwide market. As Rogers (2016) mentioned, there are six movements for this domain.

1. Movement from a within industry competition to an across competition
2. Movement from the strategy to define relations between the firm and partners/rivals clearly to blurly
3. Movement from competing with all competitors to cooperate with competitors in key areas.
4. Movement from focusing on key assets inside the firm to focusing on outside networks for key assets.
5. Movement from focusing on unique products to focusing on platforms and exchanging value with partners.
6. Movement from focusing on dominant competitors to all actors who can potentially influence on the network.

2.2.3 Data

Data domain refers to the ways that information is produced, collected and managed. In a traditional view, information is produced in planned ways such as surveys but in digital age view all business's processes have their own sub-process to gather information. In other words, it refers to the movement from planning to produce data to planning to use and analysing data. According to Rogers (2016), there are five major area for this movement.

1. A continuous data gathering from everywhere instead looking data gathering as expensive process.
2. Focusing on challenges of using data instead challenges of managing and storing.
3. Looking unstructured data as usable and valuable instead focusing only on structured data.
4. Gaining value from across data silos instead focusing only on operational silos.
5. Looking data as a key for value creation instead a tool for processes' optimizations.

2.2.4 Innovation

Innovation domain refers to ideas that leads processes to develop a product. Traditionally, businesses focus on innovations to test the market for a single product. This way, failures are very costly even though managers are focused on analysing these innovations to avoid failures. Today, thanks to digital technologies, testing ideas is not as difficult and costly as before. Digital technologies have opened the way to enable different approaches. New innovations are based on a continuous process to learn from market feedbacks. Due to these new approaches, the product development is not a linear process, it's an iterative process for experiment-base learnings. According to Rogers (2016), there are to six movements for the innovation domain.

1. Movement from planned decision-making to decision-making based on testing and assessing.
2. Movement from considering that testing ideas is difficult and expensive to testing ideas is fast and cheap.
3. Movement from infrequently experiments by experts to continuous experiments by everyone.
4. Movement from focusing on challenges of finding right solutions to challenges of solving right problems.
5. Movement from the mindset that failure is costly to failure is a cheap way to learn
6. Movement from focusing on the finished product to an iterative product launching to improve the product.

2.2.5 Value

This domain refers to the value proposition that the business offers to its customers. In a traditional view, the value proposition is constant and defined by the firm. Meaning that product updates and improvements don't affect on the value. As a traditional view of the value proposition, defining a clear value proposition is necessary to succeed in business. Thus, the value proposition is not changed over time. Considering to the digital age and its challenges, keeping the value proposition unchanged is quite a challenge. New technologies and new competitors always invite the firm to new challenges and disruptive changes. In fact, every new technology demands their own way to extend the value proposition to customers. Thus, transformations forced by new technologies perhaps changes the value proposition that the firms can offer to their customers. That becomes the path that businesses should care about for constant evolution. Rogers (2016) summarized movements for the value domain in five areas.

1. Changing the value proposition in order to fulfil customer's needs instead defining it within the industry.
2. Uncovering customer value due to opportunities instead running defined value proposition.
3. Evaluating the business model frequently to stay ahead instead optimizing the business model as long as possible.
4. Assessing changes by future potential opportunities instead impacts on the current business.
5. Keeping the focusing on survive the business instead achieving marketing success.

2.3 Digital transformation and business model

In the new digital age, mobile devices, interactive tools and internet are an integral part of daily life. In the same way, businesses look at digital transformations as a way to take advantage and surviving in the competitive market. Even though, digital transformation connects to changes of consumers daily life through Internet, mobile, social networks and etc. It has its own challenges and opportunities. On the one hand, this kind of transformations open an opportunity to create more value by looking consumers as key

partners and on the other hand, it forces business to re-design their business model (Berman 2012).
As a business perspective, this kind of digital transformations can be achieved through three basic approaches (Ibid), either focusing on customer value propositions or transforming operating models and of course combining these two.
As said above, the digital transformations that focus on taking advantage of customers' daily digital life to develop the business, reshape the customer value proposition which can contribute to enhance products and services (Rueter, 2012).
As Berman (2012) said, employing the potential of disruptive technologies such as Internet, social networks and mobile can force the businesses to change their business model in three ways, again changing customer value propositions, adapting business operations to fulfil new customer value propositions and combining both.

2.4 Digital Transformation Strategies

In the beginning of this paper we have mentioned that there is an opinion that strategy should be leading digital transformation. So, what is strategy? According to McKiernan (McKiernan, 1997) strategy as term has its roots from two different areas. One is from Darwin's scientific theory about natural selection and the other one is from military. Strategy was used as military term describing high-level plan that military leaders had, to reach a goal in uncertain conditions. Ancient Greek and Chinese warriors were using strategy planning in their military planning. Same terminology around strategy is used even today, many centuries after, but not only in military, its meaning has been adapted to many other areas. Term strategy can be seen almost everywhere where there is a goal. It describes a way to reach that goal.

There are many views on strategy. Porters was representative of industrial school of strategy theories, believing in positioning. For Porters (Porters 1996), strategy is the creation of a unique and valuable position, involving a different set of activities connected to value chains and competitive forces such as rivalry among existing competitors, bargaining power of buyers/suppliers, threat of new entrants, threat of substitute products or services.
Other view on strategy had G.Hamel and C.K Prahalad (Hamel & Prahalad, 1994) as representatives of resource learning. They believed in importance of core competences, operational excellence, customer intimacy and product leadership. Seeing a future as a static point was according to them wrong as future and surrounding has constantly changing. So, having the organization with competent resource with ability to adapt is more important than planning all the details. Henry Mintzberg (Mintzberg, 1994) is also criticizing the concept of formalized planning as there are many obstacles for that like challenges in predicting the future, not having enough relevant information and other factors.

Business strategy of any company should be connected to company's vision and show a way to fulfill this vision. Usually companies have a clear goal of what they want to achieve but resources to achieve these goals are limited, and surrounding could be very dynamic, so importance of having a good strategy is huge. Strategy goals could be very different depending on company's business: becoming a leader, taking a new market share, making a better profit, adapting a new technology, surviving and etc.

Today's business environment is very dynamic, on many levels. Market is changing, technologies are developed with extreme speed, companies are getting global, working cultures are mixing, politic situation is instabil and all that causes challenges when deciding a strategy. There are many examples in the business world where the lack of the good strategy was devastating for the companies. One of the examples was described by Evans and Wurster article (1997), Encyklopedia Britannica was overruned by Microsoft Encarta due to lack of strategy that was adapting the business to new technologies. According to them all business is information business but what differentiates the companies is how they transform this information into value for the company.

Strategy at the company level can be divided into several layers. But it is important that all underlying strategies point to the same overall strategy, that all underlying strategies are aligned. Not so long-ago IT and IS were seen just as helping functions in the company, but thanks to technology changes in almost all kind of business, they have been lifted up to higher level. Some theories about IS strategies and planning, during the 90-ties, helped in this process too. Lederer and Salmela (Lederer and Salmela,1996) have been writing about SISP (Strategic IS Planning), processes that help company identify applications that are crucial in realizing the business plans and goals. As this was linear process, stable environment was needed. Even though SISP theory was considering many factors it was criticized in late nineties as it was not adaptive for dynamic changes. Neil McBride (McBride, 1998) was proposing dynamic version of SISP. McBrides statement was that effective IS strategy is a result of incremental steps and that most result from IS strategy can be expected if it was grounded on instability. He also pointed out importance of the resources within the organisation that have most power when it comes to creating strategic patterns.
Because of technology evolution, access to information and dynamic business surrounding, companies need to find new ways, innovative ways in using existing assets or creating a new asset when creating and implementing their strategy. Innovation is seen as factor that makes a difference, especially in technology companies.

The strategies through digital transformations can be considered from two perspectives, “dimensions of digital transformation” and “procedural aspects of digital transformation” (Matt et al. 2015).
As a dimensional perspective, the firm based on its own strategy to decide about which aspect of the needs is required to become a leader, chooses one of “use of technologies”, “changes in value creation”, “structural changes”, and “financial aspects” as the main digital transformation strategy. Moreover, the strategy that a firm chooses for marketing such as becoming leader or grabbing their share of the market, affects on the strategy of digital transformation. Regardless of which aspect the firm chooses to become a leader, all dimensions also aim to support “use of technologies” (Figure 2).

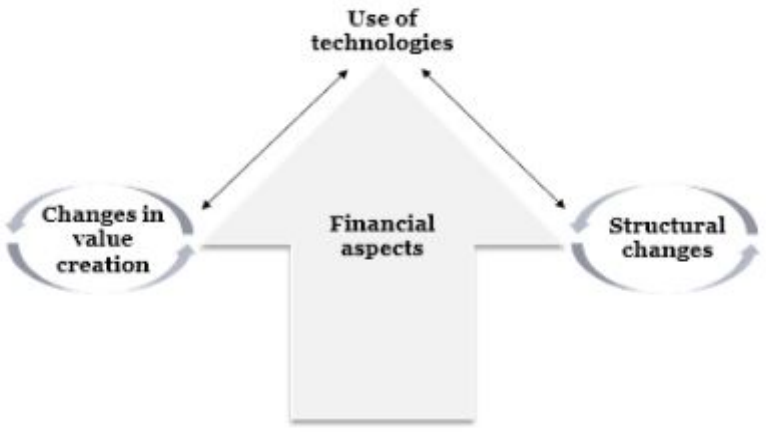

Figure 2 - Digital transformation framework (Matt et al. 2015)

As a procedural perspective, digital transformation is a continuous change project and can affect all operation within a company. In other words, defining a clear strategy to implement changes through digital transformations become as the first strategy of the firm.
Regardless of which strategy the firm choose for its digital transformation, integrating digital transformation strategies into the firm and its strategies is very important. Strategies of a digital transformation need to align with operational strategies. This alignment is not limited to IT alignments. It also covers other functional and operational strategies (Ibid).

2.5 Automation as Digital transformation

As definition, the automation refers to “a mechanical figure or contrivance constructed to act as if by its own motive power; robot” or “a person or animal that acts in a monotonous, routine manner, without active intelligence”[1]. In other words, acting automatically without an external motive force is called the automation. An automation does not change roles and missions. The automation tries to make processes that are known, easier but not necessarily more comfortable by employing management skills and technological solutions. Lynch (2000) identified three ages of the automation by studying the library systems. As Lynch (2000) mentioned, those three ages lead the library systems to a revolutionary transformation. In other words, the automation for the libraries worked as a pre-step of the transformation to the digital worlds. Moreover, it points out that computerizing an operation, does not mean the transformation.
One of the significant reasons for the automation is to improve routines through product or service customization or personalization. The customization/personalization is not new. It is a remarkable key aspect to integrate the customer into the production process (Offler 1984). The personalization strategies in service companies or the service department of the companies determines the level of market share through the customer (Gilmore and Pine 1999, 2007). According to Kumar (2010), the personalization is a limited case of the customization and moving from mass customization to mass personalization is a strategic transformation which is lead by automation strategies.

[1] Dictionary.com, accessed 18 May 2017, <http://www.dictionary.com/browse/automaton>

3 Research Method

There are two approaches for research studies, quantitative and qualitative. Each approach is based on its own measurement factors. Approaches based on qualitative methods focus on the respondent's viewpoint and typically are more flexible in process (Given, 2008). Approaches based on quantitative methods focus on testing and verifying by using use mathematics and statistics (Backman 2008) and based on a great amount of individuals and limited number of variables (Olsson and Sörensen 2011).

3.1 Qualitative Study

This study is primarily a qualitative study based on open-ended, semi-structured interviews. As Backman (2008) mentioned, semi-structured interviews which are typically associated to qualitative studies allows researcher to ask freely. In other words, interviewees speech freely about topics that are planned for the interviews and the interviewees are asked only if needed to back to right ways (Björklund & Paulsson, 2012). Study's primary resources have been direct contributors to an automation within Ericsson company. There were 4 interviewees involved in innovation and automation project. On average, each interview tooks around one hour.

3.2 Research design and approach

This study has been split into three phases. The first phase is to read theories connected to digital transformation and automation and also strategies that leads companies. Considering that concepts of Digital Transformation have rapidly grown in recent years and difficulty to find updated studies, researches in relevant theories such as 'Strategy theories' are reviewed as well. The second phases is case study of one automation project on one ICT company (Ericsson). This case study consists of 4 interviews with the personnels who were involved in the automation project in Ericsson. In the last phase, firstly, findings are analysed to confirm the preliminary hypothesis that automation solutions can support digital transformation and secondly, the study analyses findings to connect them to reviewed theory. Figure 3 presents an overview of the research design.

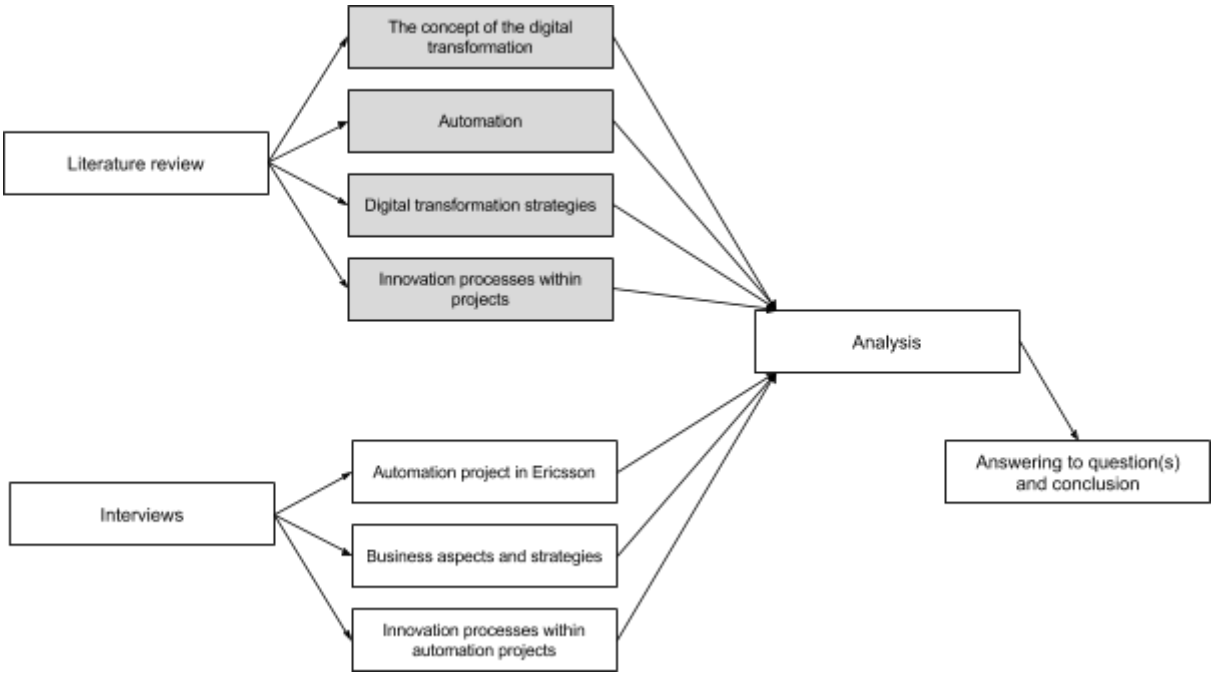

Figure 3. An overview of the research design

3.3 Theoretical Data

This study employs a Systematic Literature Review to review the existing literature that has already researched digital transformation and automation. The literature that is reviewed by this study was found by searching keywords such as ‘Digital Transformation’, ‘Digitalization’, ‘Innovation’, ‘Strategy’, ‘Process’, ‘Success’, ‘Factors’, ‘Automation’, ‘Change’, ‘ICT’, ‘Telecom’ in titles and abstracts of research papers and focused on the papers that were about ‘Digital Transformation’ and ‘Automation’. The theoretical concepts of the digital transformation and automation were used as a comparison material when creating interview questions, and reviewing the primary data.

3.4 Primary & Secondary Data

This study uses two sources as data, qualitative interviews with the 4 Ericsson associates (the primary data) and reports and documentation papers provided by the interviewees (the secondary data). Secondary resources consist of open-access documents and completion reports about Ericsson Fulfillment solutions and related automation projects in the customer's service sector. However, official documents from the automation project used as a case in this study, Google scholar, ScienceDirect and Diva are sources of most documents and researches that have been reviewed. The topics that are focused by this study for gathering primary data, are based on theoretical findings. Those topics are used to design interviews’ questions. In addition, the questions conducted to ask in the interviews, are very open, and are asked only if needed to keep the interviews connected to predetermined topics. However, the questions asked during the interviews are connected to the particular innovation initiative and are covering the causes, processes, motivation and results. There are some examples of the questions asked in the interviews:

- What was your motivation to be involved in this innovation?

- What processes have you followed?
- What can be done better?
- Who gained from this?
- What is the main or top aim of the automation?
- Has it been successful? What do Customers say and what do you think?
- Is this kind of solution being a continuous strategy or is a temporary solution to solve a problem?
- What about economy aspects,has the company saved money, time, whatever through this automation?
- Learning, or collecting data
- Create value
- Is there any process or any department in the company to decide about this kind of solutions?
- About employees, are they ready for this kind of automatons?

Empirical part of this study consists of 4 separate interviews with people who were involved in automations for the Fulfillment solutions within Ericsson customer service domain. Each of the interviews an average is around one hour. The interviews are conducted as face to face interview, phone interview and skype interview. All interviews are recorded for subsequent transcribing. Table 1 presents an overview of the individuals interviewed.

Informant nr	**Name**	**Title**
1	Kenneth Andersson	Solution integrator 1
2	Christian Holm	Solution integrator 2
3	Fredrik Flyrin	Innovation driver/resource manager
4	David Möllersten	System Manager, Product Development Unit (PDU) contact

Table 1. An overview of the individuals interviewed.

As said before, the interviews are conducted as open-ended, semi-structured interviews with four subjects about the project connected to EMA (Ericsson Multi Activation) automation in Ericsson:

1. Aims and general strategies
2. Connected domains
3. Business aspects
4. Strategies (automation)

Transcribed texts from the interviews were analysed in order to present findings in a meaningful manner. In addition, aims, innovation strategies and business aspects within automation projects for the customer service through one of Ericsson's products named "Ericsson Multi Activation" and connected domains to the project extracted from the transcribed text.

3.5 Discussion and Conclusion

In the analysis, in order to see how reality corresponds to the literature and the case, the theoretical background with the primary/secondary data are analysed to find connections between automation solutions and digital transformation and followed by results. Considering to the results, this study attempted to answer the research question in a qualitative way.

3.6 Limitations of study

As a part of empirical study, we were gathering empirical data by interviewing people who are involved in innovation processes in Ericsson. In other words, gathered data is limited to only one ICT company, Ericsson and only one innovation activity connected to one product. Accordingly, findings might not be reliable to be generalized to the broader community based on this study alone.

4 Finding and analysis

As said before, this research uses Ericsson Fulfillment suite as case. The study does not cover all part of the case. It focuses on one automation projects, having EMA in focus, to investigate how automation solutions can support digital transformation in the customer service domain.

As Ericsson official explained, Fulfillment is an Ericsson service that provides a hands-off based system for operators to give them satisfying customer experience. Ericsson claims that Fulfillment expands technologies in a way that can decreases risk for the operators by increasing opportunities to offer personalized services to their customers. The personalization as an important way to keep customers satisfied, is the main offering of the fulfillment solution. According to Ericsson website[2], "fulfillment solutions are designed to streamline and simplify offer creation and automate fulfillment processes". Fulfillment targets processes to improve them to generate the products that customers want quickly. To achieve this goal, Fulfillment focuses on an information-driven method based on agility to help the operators to drive their companies in a flexible and efficient approach so that customers are leaped forward at every step of the product lifecycle.
The Fulfillment suite consists of several sub-products where "Ericsson Multi Activation"[3] is one of them. In newer releases EMA has changed as a product and also a name has changed to "Ericsson Dynamic Activation" or EDA. EMA focuses on managing all networks by automating service activation and provisioning activities (4.1).

4.1 Ericsson and Ericsson Multi Activation/ EMA case

We have chosen to write about one case from Ericsson as Ericsson is a very interesting company that not only is one of the first companies that applies new technology but also a company that creates a new technology. Ericsson has over 42000 granted patents.
Ericsson has been grounded for more than 140 years ago in Stockholm, Sweden and has been succesfully led by Lars Magnus Ericsson and his wife Hilda for many years.Company has been growing rapidly thru history. Main focus for Ericsson from the beginning until today has been communication and enabling the communication for everyone. Company is seen as one of the global leaders in delivering of ICT solutions, approximately 40% of the world's mobile traffic is carried over Ericsson networks. Strong R&D (Research and Development) is leading the company towards its vision for a "Networked Society" -"*where every person and every industry is empowered to reach their full potential.*"[4]

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[2] Ericsson Digital Support Systems, Ericsson, accessed 5 April 2017, < https://www.ericsson.com/ourportfolio/it-and-cloud-products/digital-support-systems?nav=productcategory005 >

[3] Ericsson Multi Activation, Ericsson, accessed 5 April 2017, < https://www.ericsson.com/ourportfolio/products/multi-activation?nav=productcategory005%7Cfgb_101_0162%7Cfgb_101_0138 >

[4] Vision, Ericsson, accessed 30 September 2017, < https://www.ericsson.com/en/about-us/our-vision

"5G, Cloud and IoT are hot topics in the area of digital transformation. Creating new connections between people and objects, while revolutionizing industries with unprecedented agility and efficiency."[5]

One of Ericsson's products that is a part of the company's Product Catalog is EMA.
EMA is a single platform offered by Ericsson's to automate processes required to activate services through the networks. It's also known as "Speed service activation". EMA is a signal platform to manage all activations required by the operators that supports all kind of mobile services in both classic and layered core networks included 2G/3G, LTE, VoLTE and VoWiFi. The aim to integrate service activations as a platform is to decrease costs and increasing the speed of the adaptation to handle newer technologies.

"Activation is the cornerstone of provisioning solutions, and has been successfully deployed in networks, regardless of size. The activation solutions give service providers one interface in a multivendor environment by integrating all type of nodes and hence supporting the operator with distributing and updating data in the nodes
Activation systems automate the explicit commands to turn on a new service. They communicate with service layer databases, network management systems, element management systems or directly with network elements." Informant
"Fulfillment solutions are a solution to ensure operators performance in areas like ordering, provisioning and activation, right at the center of mission critical processes like Order to Service and instrumental to improve operational efficiency, shorten time to market and increase automation and flow-through."

EMA undergoes the initial phase of a transformation into a cloud based product. This initial phase was started a few years ago. According to 'System Manager', it was realized very soon that due to the nature of EMA, it is too difficult to deploy this cloud based version. Thus, developing a tool to help out the deployment of EMA solution became as an agenda. The output of this effort is a tool called Deployment Manager.

EMA is a Linux- and Java-based package involved with many hardware specifics such as MAC addresses. The package is updated frequently in order to support new hardwares, fixing problems, improving existing features and adding new features. Accordingly, every time that a new version is released, a re-installation is needed as well. The product re-installation is a very complicated process.

"Today we have a lot of configuration files to manually fill in for a new installation. This sometimes lead to a lot of troubleshooting when trying to find the one parameter you have entered wrong. Finding about 28 MAC-addresses and then updating configuration files based on them, is a time-consuming process which any human error can make it more complicated." Informant

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[5] In Focus, Ericsson, accessed 30 September 2017, < (https://www.ericsson.com/en/in-focus)

The installation process usually took about 120 man-hours before using the automation solution. As ‘Solution Integrator’ mentioned, it has decreased to two man-hours now. In fact, EMA automation solution is a java tool to create configuration files for EMA installations by generating right values.

> *“There is a java- based tool today called EMA Deployment Manager which creates configuration and installation files for virtual installations of EMA. With that tool as a base we feel it would be possible to modify it to create the correct configuration files needed for a successful installation in much lesser time than is needed today. A cool feature would be if the customer questionnaire could be mapped to it.” Informant*

4.2 Aims and strategies

According to ‘System Manager’, the main aim of producing a tool to deploy EMA is to simplify the deployment of EMA, the life cycle operations of it: installing it, expanding cluster and so on. It makes the process a lot easier, not only for customers and Ericsson’s personnel but also for internal development efforts. However, the solution has improved the process in two direct ways, saving time and decreasing human errors (with hard evidences) and two indirect ways, the required level of training and saving money (with softer evidences).

> *“The time saved is hard to measure, but from my experience the installation would gain time. One - four days would be saved in trouble shooting. Also, it will save about one day of creating the configuration files as well.” Informant*

> *“PDU discuss with SI-engineers and design a tool all can benefit of. 80-120 hours of work.” Informant*

> *“If we can calculate with two and a half days saved lead time, times two installation engineers. It is one week of work saved for every project. For an experienced engineer the hourly cost is 786 SEK times 40 hours give us a save of approx 30,000 SEK / project” Informant*

As “Solution Integrators” mentioned, this automation and similar solutions aim to solve and fulfill essential needs. In case, the solutions can be updated to fix probable problems or adding missing parts but there is no plan to upgrade them with new features. At the same time, the interviewees point out the code used by this automation is based on a code that was developed for other type of EMA deployment. According to Ericsson documentation policy, all products are documented for future usage. Thus, somehow the product life cycle is continued, perhaps outside of the department where the product is developed.

As said before, EMA’s installer is a script-based program. As ‘System Manager’ mentioned, developing the automation based on a script language instead a native installer was because of the miss in communication in the beginning about what was the intent of it. He points out, perhaps someone thought that it was competing with the deployment tools that

are out there. It's clear that this tool has saved a lot of the hours but a tool for the native environment, hardware oriented deployment could be more beneficial. This tool is obviously not usable in cloud based deployments but anyways there was no tool to install EMA before this, the process to install EMA was completely manually. This is still a continuous development but not in a way that a product is improved. First of all, the concept of the installation tool will be ported to the new cloud-based generation of EMA. Moreover, the experiences gained by this kind of tools will be reused on future products in the same way that this installation has reused previous documents and codes.

The automation targets both customers and Product Development Unit (PDU) contacts. As explained before, saving time and decreasing human errors are two main goals of the project. Those goals directly improve the workflow of the customer service department and indirectly involved customers' workflows. Saving time and money in Ericsson means saving time and money for customers as well.

4.3 Domains

Data gathering - According to the interviewees, EMA's installer is a script-based automation GUI. There is no predicted routine to collect data. As "Solution Integrator 2" said, EMA's installer has not been designed to be used by the customers so there is no possibility to gather data from the customers directly even if EMA's installation could. Despite all those limitations, limited data is collected through PDU's discussions and customers' explanations. 'System Manager' points out that the timesaving contributes to both sides, customers' and company. A faster installation process means saving time for the customers as well. Consequently, reducing installation costs also decreases customers' costs. The timesaving and costs are two new issues that the customers more or less discuss with the customer service department after starting using EMA's installer. Considering documentation disciplines in Ericsson, those discussions can be looked as collected data. However, both "Solution Integrator" and 'System Manager' emphasized that the documentation is a part of any process in Ericsson so all products, where automation solutions are included, contribute to collect data in an organizational view.

Value creation - In most cases, there is a trade-off between accuracy and speed needed to achieve the best result. In the case of EMA's installer, both accuracy and speed have been improved. As "System Manager" said, the troubleshooting was the most difficult and time-consuming part of EMA installations.

> *"The tool reduces possibilities for errors, which earlier led that we had to troubleshoot on installations that were not done correctly because there were too many details and if we missed one of these things, it was very complicated to find out misconfigurations. So, the tool has streamlined the deployment and lifecycle operations while making them faster." "System Manager"*

"Innovation driver" also refers to a time saved by automating things. It brings specific value when it comes to save the time but it also brings a lot of value to the customer since it prevents Ericsson personnel from the human factors here, as it prevents doing mistakes.

Overall the installation has increased the quality of the product by reducing human errors. But in the same time, he mentions it needs to identify that indeed time-consuming is an actual value for Ericsson, it was only implemented, no one measure it.

Considering to those improvements, Ericsson gains value from both customer satisfaction through reducing errors and faster installations, and customer service process improvements through reducing costs and increasing quality. “System Manager” believes a native installer can increase value, decreasing the issues when collecting data. Moreover, as an organizational view, the documentation creates value within Ericsson by supporting learning loops. In contrast with “System Manager”.

Customers - In an ideal case when a system is deployed the system should be always tested, failures solved and made sure that the system will work correctly. As “Solution Integrator 2” said, in a real case when the system is deployed manually, it is very common that installators do something wrong but the system seems fine and the customer gets error later when the installator has left. In a customer view, the risk of having misconfiguration that the system only warns that something is not working correctly and it needs a failover, is reduced by the installation tool. In addition, the timesaving from EMA’s installer (from four days to a few hours) gives a great opportunity to the customer to see possible misconfiguration errors faster and consequently, asking the customer service department to solve the errors.

Competition - In fact, EMA’s installer is a tool to create and updating configuration files used by EMA. EMA has been designed to work with Ericsson common rack architecture so the tools can’t be used for the operators who have not already been Ericsson customers. Thus, the competition is not the case for this version of EMA, “Solution Integrator” says. At the same time, he emphasises that the new cloud-based EMA will be not limited to Ericsson hardwares. These kind of automation solutions can indirectly support the competition domain by learning loops and customer satisfaction.

Innovation process - “Innovation driver” believes that innovation should be normal “ways of working” for each employee and department, everyone needs to do it basicly. It’s a way to find new opportunities which Ericsson considers to be able to survive. There is no specific department to lead innovations in Ericsson but there is a mechanism that tries to keep together and working over the organisation with the people, helping them, coaching them and working together with the coaches in the different teams. The aim is to coach and drive innovation to work within the organisation. There are two common processes to gather ideas during projects. Basically, it starts with IdeaBox that is the company-wide tool to gather ideas and to get people to enter ideas in that tool. It’s also gathered by logging and measuring and keeping track of the processes within the organization.

> *“We have a strategy to categorize ideas regard to different types of innovation, incremental or disruptive. We use different kind of methods depending on what kind of innovation it is. And we also have a reward and recognition system, to help or to get it more, what you say, likeable to do it, so that there is incentive for you to actually do it. It is little bit special here in our organisation since we measure all the*

innovation, try to put estimated value on them. So that is a little bit different of what I heard in other organizations within the company." "Innovation driver"

Furthermore, there is a group that works on regulation boards so they have regularly checked the ideas coming in and if they find a good idea they are actually coach the people and support them with the contacts within Ericsson, "Solution Integrator 2" points out.
People have different perception of what is innovation. For some, all improvements in processes or products can be seen as innovation. But for some, it has to be major breakthrough to be seen as innovation. In case of the automation, it does not mean innovation. It is only an improvement to a process that could be done without the automation deployment. Producing a tool for EMA can be seen as an improvement. "Solution Integrator 1" and "Solution Integrator 2" blive continuous improvement does not mean innovation.

"EMA's installer was just a workflow that needed to be updated. The tool did not bring any benefit or whatever, we could have done it without it. Innovation for me is like E=mc2 that Albert Einstein found, or something profound more. Perhaps the innovation could be seen from the customer service side where installation progresses has been changed or in general, Ericsson post-production progresses has been fixed." "Solution Integrator"

One aspect that interviewees were complaining about, is the time that they spent from moment they come up with the idea until they realized solution.

"It took a long time since coming up with the idea until developing the tool, about one and half years." "Solution Integrator 2"

However, all the interviewees believe that there are clear innovation processes in Ericsson, that lead innovations on the organizational level but the problem is that they have not been adapted to support innovation processes in lower levels, for instance, innovations within the customer service department.

Furthermore, any innovation should bring some values and it needs to identify the value at the end.

"We should put the estimated monetary value on each innovation and asses the result to measure innovation. It's the most difficult part that we need to do. It is so hard to measure innovation." "Innovation driver"

However, two of the interviewees believe that EMA installer has speeded up installation processes and maintenances. The idea to create installation is not something new but it's new for EMA.

"Installation was manually and then they discovered that that this is too hard to actually do and you cannot really get it right from the beginning. They identified a big problem and then they solved it with an installation wizard. So, in that sense, yes, they reused framework for the product and they reused implementation method and

everything they reused. But idea is new for the product. It's a specific innovation, we have discussed this before, this is about installation and configuration of upgrades of the specific product, and since this is done so many times even the small improvement of the installation process is a big value. Since it will be done over, maybe, I don't know exactly 300-400 times this year." "Innovation driver"

4.4 Business aspects

As "Solution Integrator" mentioned, EMA's installer does not have any effect on the business model, neither the sub-models in the customer service department. Furthermore, the customers probably don't know about the change but they can see somehow re-installations are faster than before.

> *"We figured out that we lost about twenty hours on doing the re-installations and configurations, and using two persons, it is about 40 hours, one working week for each installation so customer does not notice anything except that it is cheaper." "Solution Integrator"*

In other words, the automation has made installation processes faster and cheaper. It's also reduced human errors. Thus, from customers' point of view, they pay less to get a faster and better service and in the other side, from Ericsson's point of view, this is more for a reason to have better installation rate. According to "Solution Integrator", nobody lost its job through this installation process improvement. Now personnels who work in the customer side to install EMA have more time to troubleshoot and give the customers a faster and better service.

> *"...One is usability, and nice experience when doing this. You minimize a lot of possibilities for errors, which earlier led that we had to trouble shoot on installations that were not done correctly because there were so many details and if you missed one of these things it was very complicated to really find out what was the problem later on." "System Manager"*

"Innovation Driver" believes these kinds of improvements contribute to get the culture going and to actually identify all the different good things. It also brings the value to Ericsson. The value can be gained from both sides, costumers and personals. In the personals side, it encourages them to start contributing ideas more and more when they hear about it, "Innovation Driver" says. Furthermore, it's a way to learn about how to get people more involved and identifying ideas as innovations. It can also contribute to get personals more ready for these kinds of innovations. Three of the interviewees see that as a way to take an insight from reality and bring the value to Ericsson by implementing something new.

"Innovation Driver" and "Solution Integrator" agree that this kind of automations does not affect on the business model and its sub-models but they believe it contributes to align innovations within the company which is a prerequisite step to find out required changes to improve the business model and its submodels.

"We have a streamline of deployment and lifecycle operations whilst also making them a lot faster. If we go couple of years back then you filled in template files which you edited manually and it was like 30-40 files with hundreds of parameters in each. Which you had to get right and it was very difficult to troubleshoot if you got it wrong and so on and you had to know a lot of stuff in order to do it." "System Manager"

"System Manager" points out to issues such as faster customer service and less personnel which can affect indirectly on at least in the customer service department submodels. However, all of the interviewees agree that the value gained by the automation should be measured to assess the result and its effects.

4.5 Strategies

As explained before, there is no specific department to lead innovations in Ericsson. There are internal mechanisms and processes addressing the documentation and coaching support keeping together and working over the organisation with the people and leading innovative ideas. According to "Solution Integrator", the idea for creating an automation was firstly discussed in a short meeting with the department manager and then the department manager discussed the idea with higher level managers. The main aim to create this automation was to reduce human errors but in the same time, reducing costs and speeding up the installation process have also been considered. "Solution Integrator 1" and "Solution Integrator 2" notice that the process to come up with the automation idea was very slow. In other words, from convincing the department manager to start developing the automation, it took a long while.

"We presented our idea, first in a short meeting. and then we had a longer meeting where we tried to figure out that there is a need …" "Solution Integrator 1"

"We could have done it a bit faster. It took a long time before we thought about this, long time between we come up with the idea and the tool was ready, like 1,5 years or something like that" "Solution Integrator 2"

However, all of the interviewees think that there is a general mechanism to get in innovative ideas but the processes have been not fully adapted for specific innovations such as the automation yet. Furthermore, they notice that the value that perhaps can be gained by this automation was not estimated before developing and not also measured after deploying.
Moreover, documentation disciplines in Ericsson have created a specific learning loop which support innovate automation solutions. So according to the interviewees, there is no particular strategy for automation solutions in Ericson but general strategies to get in innovative ideas and leading innovations support automation solutions as well.

"This was very much an informal process. I had some time last year, when I did not have a good project to work on so I had a chat with my manager so we said: Yeah, ok, if you want I can sponsor this so I got like 200 hours to work on this, and that was what I did." "Solution Integrator 2"

“Solution Integrator 1” and “Solution Integrator 2“ think that there is no future for this installer. The next generation of EMA will be something quite different. But “Innovation Driver” and “System Manager” believe that there is no possibility to return to the past. The next generation of EMA will certainly have an installer as well. In the same way that existing codes and documents were re-used to develop EMA’s installer, the output from this project will be re-used on future products/reversions. There is a general strategy to re-use resources in Ericsson so projects or its outputs are kept accessible for future use. Learning loops are a part of this strategy. Additionally, “Innovation Driver” thinks that the result of this project gets more attention in this kind of innovation (automations) from leadership team in Ericsson.

> *“My feeling is that the focuses are higher every year on this matter. And we get some attention from leadership team in Ericsson and they really think that this is important.” “Innovation Driver”*

> *“The strategy looks like on the higher level but for sure it is mentioned and that is a big change from before. I mean that we now focus a little bit more on this. But we have a strategy on quiet high level so you can say more specifically that here is the strategy for innovation but the innovation is mentioned in the overall strategies.” “System Manager”*

5 Discussion and conclusions

According to the main objective of this study and the findings explained on the previous chapter, this section has been divided into four parts, ‘Business aspects and Strategies’ (5.1), ‘Learning loops’ (5.2), ‘Supported digital transformation domains’ (5.3) and ‘Conclusions’ (5.4).

5.1 Business aspects and Strategies

According to the automation definition considered by this study, automations put no revolutionary change on roles or missions within the organization. The automation is a way to improve known processes by employing management skills and technological solutions.
Both researches reviewed by this study and our findings imply to product or service customization (or personalization) as the most significant reason to deploy automation solution. Outcomes of improvements by an automation deployment can be seen from both company and customer sides. As company side perspective, “time saving” and “money saving” are two significant consequences of deploying automation solutions. In the customer side, money saving and time saving are usually known as faster services and less costs. Furthermore, our findings show that reducing human errors or increasing precision can be seen as a reason to deploy automation solutions as well (Table 2).

Automation consequences / Company side	**Automation consequences / Customer side**
Time saving	Faster service
Money saving	Less cost
Reducing human errors	Better service

Table 2 - Automation consequences / Company side and Customer side

However, saving time and money or reducing human errors don’t mean creating value for the company. Thus, to see business aspects of an automation deployment, it needs to measure the value gained by the automation. Considering that the innovation is measured based on its result assessment, it’s difficult to apply a general strategy to all types of innovation. In other words, looking at a type of innovation such as automation as a way to take advantage needs to have a clear strategy. Regarding to three basic approaches to achieve digital transformations mentioned by Berman (2012) (2.3), an adapted strategy to take advantage from automation solutions to support digital transformations should consider customers value propositions and adapted operating models. In the case that this study focused on, the install automation has opened an opportunity to use interactive tools and Internet for a part of the customer service activities but taking advantage of this opportunity needs to adapt roles and missions. Hence, the strategy on the higher level should lead automation solutions in a way that supports company's visions. Considering that strategy at the company level consists of several layers, leading the strategy on the high level refers to

needs to align underlying strategies such as strategies to employ innovations based on automation solutions with the overall strategy employed by the company to achieve its visions.

Regarding the digital transformation strategies mentioned by Matt et al. (2015) (2.4), a clear strategy to lead particular solutions such as automation is required to take advantage from them. According to dimensional perspective, first at all, the strategy should have a clear decision about which aspect of the needs is required to become a leader through a digital transformation. So, based on the chosen main digital transformation strategy, underlying strategies should be aligned with the overall strategy.

5.2 Learning loops

Considering the digital transformation framework presented by Matt et al. (2015) (Figure 2, 2.4), through a digital transformation, the organization structure and the value creation are influenced by using new technologies. Applying structural changes is a crucial for every company. Changing processes become more risky when the company employees new technologies in the same time. In other words, in a severe competitive market, any mistake about decisions to choose aspect of the needs to become a leader for digital transformation and strategies to implement required structural changes can cause the digital transformation to fail and the company perhaps losses its share in the market. Thus, applying changes needs to predict feedbacks of the changes from both customer-side and inside the company and having plan to deal with them. The key for the feedback prediction is knowledge that is mainly gained by learning through analysing collected data.

As pointed out above, structural changes are a part of digital transformation that is not considered by automation solutions. A digital transformation aims to change value creation in order to financial aspects. Meaning that, value proposition assumptions are the reason for a digital transformation. Thus, it's started with some assumptions that there is no guarantee that they are correct even when the digital transformation is quite successful. In this sense, knowledge is the key to assume realistic assumptions for value propositions. For instance, if 'Less cost', 'Faster service' or 'Better service' are seen as value proposition for a digital transformation, outcomes from automations such EMA installer contribute to have a more realistic estimation of the value that can gain after implemented changes by the digital transformation.

Furthermore, feedbacks from customers and from the organisation are valuable data to predict possible resistances to new workflows after changes. For instance, in case of EMA, the possibility to install remotely through Internet makes it possible to get feedback from customers to predict possible resistances when the cloud based version is released, a version that perhaps requires being at physical locations less than the current version.

Moreover, using existing knowledge and documents and producing new knowledge and documenting them through automation improvements, create a learning loop that generally increase knowledge within the organization. Knowledge acquired through this way covers both technical and procedural issues. Considering EMA, the case studied by this paper, the

produced code was based on an existing code and its documents. In other word, the automation was mainly improved the code that have been already developed. It also increased knowledge within the organization, for instance, the knowledge gained through the project can contribute to estimate how human errors are costly.
As mentioned above, automation solutions contribute to acquire knowledge in three ways:

1. Assessing assumptions for value propositions
2. Predicting possible resistances to new workflows
3. Using existing knowledge to produce new knowledge

Taking advantage of the first and second issues needs to have a particular strategy to lead automation solutions in a way that supports company's visions for digital transformation. The third way was also mentioned by Lynch (2000) to explain three ages of the automation which led the library systems to a revolutionary transformation (2.5). This case is mainly led by general documentation strategies.

5.3 Supported digital transformation domains

Any digital transformation domain mentioned by Rogers (2016) consist of several movements (2.2). Those movements refer to changes that are usually achieved through structural changes within the organization. Thus, as automation solution focused mostly on improving known processes, can't be seen as a movement. But this essential difference between automation and movement doesn't necessarily mean that outcomes are also different. Both automation solutions and digital transformation movements can change value propositions. The distinction between value propositions for an automation and a digital transformation is areas of influence. An automation mainly aims the change of the process of a product or service that considered to improve through employing management skills and technological solutions, whereas a digital transformation aims all processes within the organization by structurally changing roles and mission. Hence, value propositions considered by automation and digital transformation are not on the same level. Despite all the distinctions, the measurement of the value of the automation results can give a realistic image of value propositions to assume realistic assumptions for value propositions assigned to the digital transformation. Thus, automation solutions mainly support to assess assumptions before assigning them to the digital transformation. However, this supportive issue is not automatically enabled. It needs to have a particular strategy to evaluate automation results and connecting them to aspects aimed by the digital transformation.

Considering movements for the value domain mentioned by Rogers (2016), the movements are continuous and the assessment for each stage are used to lead to the next stage. Hence, any supportive knowledge for the first stage that there is no stage before, are considerable.
All the movements assigned to the value domain focus on structural changes. Thus, knowledge produced within organization included knowledge acquired through automation solutions can indirectly support them. Additionally, preliminary assumptions for value propositions on two first movements can be supported by assessing outcomes from

automation solutions that were implemented in the areas aimed by the digital transformation (Table 3).

Value domain movement	**Automation supportive issues**
Changing the value proposition in order to fulfil customer's needs instead defining them within industry	- Support to assume preliminary value propositions. - Support to find real customer's needs
Uncovering customer value due to opportunities instead running defined value proposition.	- Support to assume preliminary value propositions.
Evaluating the business model frequently to stay ahead instead optimizing the business model as long as possible.	N/A
Assessing changes by future potential opportunities instead impacts on the current business.	N/A
Keeping the focusing on survive the business instead achieving marketing success.	N/A

Table 3 - Automation supportive issues for Value domain

The data domain is the most considerable area to take advantage from automation solutions. Automation solutions produce not only data but also contribute to assess produced data types. Due to movements mentioned by this domain, data gathering from everywhere and challenges to use them should be considered on the digital transformation. However, the continuous data gathering is important but using enormous collected data is a big challenge. Hence, automation solutions as the way explained on learning loops (5.2) can contribute to evaluate of data types. In other words, the automations can be seen as a tool to support the data domain movements.
In the same way mentioned for movements on the value domain, all movements can be indirectly supported by automation solutions. Furthermore, automations can be employed as a tool for two first movements of the data domain (Table 4).

Data domain movement	Automation supportive issues
A continuous data gathering from everywhere instead looking data gathering as expensive process.	- Tool to gather data
Focusing on challenges of using data instead challenges of managing and storing.	- Tool to evaluate data types
Looking Unstructured data as usable and valuable instead focusing only on structured data.	N/A
Gaining value from across data silos instead focusing only on operational silos.	N/A
Looking data as a key for value creation instead a tool for processes' optimizations.	N/A

Table 4 - Automation supportive issues for data domain

Other domains, 'competition', 'customers' and 'innovation', mentioned by Rogers (2016), mainly focus on fundamentally changing point of view about issues aimed by the movements (2.2.1, 2.2.2, 2.2.4). Thus, solutions such as the automation are not considerable for those domains.

5.4 Conclusions

Regarding to explanations above, answers to the research question can be summarized as below:

> **How can automation solutions support digital transformation in the customer service sector of ICT companies?**

The automation is a way to improve known processes by employing management skills and technological solutions. Thus, it puts no revolutionary change on roles or missions within the organization. The most significant supportive issues are to support learning loops and assessing assumptions for value propositions. In case, the automations can be seen as a tool to support the digital transformation domains.

However, taking advantage of the automations needs to have a particular strategy to lead automation solutions in a way that supports company's visions for digital transformation.

Findings of this study can also be considerable because of movements on domains of digital transformation where they are influenced by automation solutions but perhaps revealing domains where we did not notice enough effect of automation in customer service sector

case is more important. Having a clear automation strategy not only in development units but in service delivery units could gain more value and support digital transformation on deeper level. So anyone working with strategies that are leading towards digital transformation could take advantage of this work.

6 Future work

There is no doubt that automation is needed as a part of digital transformation. And innovation is described as a factor that is very relevant within the digital transformation. Many company understand importance of all these driving factors in company's development but there still is lot of areas to improve. Even though innovation strategy exists and there are well developed processes that support this strategy, it seems that there are different views on who should be leading these processes. Should it be individuals? Or should there be dedicated resources for that? Companies like Ericsson are very good when it comes to creating and updating processes, in this case innovation processes but the question is, "Are people working in the company ready to use them?". How to motivate people to explore innovation possibilities? A possible future work could be seeing other aspects of innovation, more concentrated on human motivation and how that can add value to digital transformation.

Also having a deeper, more quantitative case study with several innovation, digitization and automation projects in same or even in different companies, would give more weight to research results.

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Tables and figures

Keywords

Digital transformation, Digital transformation domains, Automation, Innovation process, Innovation strategy,

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Abbreviations

EDA - Ericsson Dynamic Activation
EMA - Ericsson Multi Activation
ICT - Information and Communication Technology
PDU - Product Development Unit
SISP - Strategic Information System Planning