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THE EFFECT OF DIGITALIZATION ON SERVICE PRODUCTION IN FINNISH MUNICIPALITIES

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ABSTRACT

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Digitalization is a current phenomenon both in Finland and globally. It modifies existing practices and creates entirely new ones in both private and public sector. The development of digital technologies provides new opportunities for organizations to enhance their operations and business models. At the same time, the share of services in the employment and production structure of societies has increased and the shift from product-oriented society to the service economy has been inevitable. As a result of this societal transformation, the customer experience and shared value creation have become key strategic factors for organizations. The emphasis on customer experience has brought Service Design methods into service development. Service Design is user-centered and participatory development and design of services using traditional design methods. Comprehensiveness, visuality and interdisciplinary are characteristic for Service Design. Additionally, it is often experimental, iterative, and agile design of services. The primary purpose of Service Design is to create a service which meets both the needs of the users and the business objectives of the service provider. Using Service Design methods organizations can identify the essential services for business. These can be existing services that require development or quite new services. Master's thesis literature review explored digital transformation as a social phenomenon and digitalization from the perspective of organizations. In addition, the literature review examined the service-dominant logic and Service Design process and principles. Since in the scientific research digitalization has been studied mostly from the business perspective, the master's thesis focuses on examining digitalization from the perspective of the public sector, especially Finnish municipalities. In the empirical part of the master's thesis, both the effects of digitalization on municipal operation and the application of Service Design methods in the development of digital services were investigated by interviewing persons responsible for digital services. The results of the study indicate the changes in the operating environment force the municipalities to provide digital services, but on the other hand, digitalization creates opportunities to improve operational efficiency, save costs and above all, serve the residents better.

Keywords: digital transformation, digitalization, Service Design, customer-experience, public services, municipality

TIIVISTELMÄ

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Digitalisaatio on ajankohtainen ilmiö sekä Suomessa että globaalisti. Se muokkaa olemassa olevia toimintatapoja ja luo kokonaan uusia sekä yksityisellä että julkisella sektorilla. Digitaalisten teknologioiden kehittyminen tarjoaa organisaatioille uusia mahdollisuuksia toiminnan kehittämiseksi ja tehostamiseksi. Samanaikaisesti palvelujen osuus yhteiskuntien työllisyys- ja tuotantorakenteessa on kasvanut ja on siirrytty teollisesta tavaratuotantoon painottuvasta yhteiskunnasta kohti palveluyhteiskuntaa. Tämän yhteiskunnallisen murroksen seurauksena organisaatiot ovat siirtyneet tuotekeskeisyydestä palvelu- ja asiakaslähtöiseen ajattelutapaan, jossa asiakaskokemus ja yhteinen arvon luonti ovat keskeisiä strategisia tekijöitä. Asiakaskokemuksen merkitys on korostunut ja se on tuonut palvelumuotoilun menetelmät palvelukehitykseen. Palvelumuotoilu on käyttäjäkeskeistä ja osallistavaa palvelujen suunnittelua. Palvelumuotoilulle ominaista on kokonaisvaltaisuus, visuaalisuus ja monialaisuus. Se on usein myös kokeilevaa, iteratiivista ja ketterää suunnittelua tavoitteenaan palvelu, joka vastaa sekä käyttäjien tarpeisiin että tukee palvelun tarjoajan liiketoimintaa ja tavoitteita. Palvelumuotoilu auttaa organisaatioita tunnistamaan liiketoimintaa hyödyntävät palvelut, jotka voivat olla aivan uusia tai jo olemassa olevia kehittämistä vaativia palveluja. Pro gradu -tutkielman kirjallisuuskatsauksessa tarkasteltiin digitalisaatiota sekä yhteiskunnallisena ilmiönä (digitaalinen transformaatio) että organisaatioiden näkökulmasta. Kirjallisuuskatsauksessa perehdyttiin lisäksi palvelulähtöiseen ajattelutapaan ja palvelumuotoilun periaatteisiin palvelujen kehittämisprosessissa. Koska digitalisaatiosta löytyy tieteellistä tutkimusta enimmäkseen yksityisen sektorin ja liiketoiminnan kannalta, tämä tutkimus keskittyy tarkastelemaan digitalisaatiota julkisen sektorin, erityisesti Suomen kuntien näkökulmasta. Pro gradu -tutkielman empiirisessä osuudessa tutkittiin sekä digitalisaation vaikutuksia kuntien toimintaympäristöön että palvelumuotoilun menetelmien soveltamista kuntien digitaalisten palvelujen kehitystyössä. Tutkimus toteutettiin haastattelemalla kuntien digitaalisten palvelujen kehittämisestä vastaavia henkilöitä. Tutkimuksen tulokset osoittavat, että toimintaympäristön muutokset pakottavat kunnat digitalisoimaan palvelujaan, mutta toisaalta digitalisaatio luo mahdollisuuksia parantaa toiminnan tehokkuutta, säästää kustannuksia ja ennen kaikkea palvella asukkaita paremmin.

Asiasanat: digitaalinen transformaatio, digitalisaatio, palvelumuotoilu, asiakaskokemus, julkiset palvelut, kunta

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1 INTRODUCTION

The development of digital technologies is significantly changing our society as digitalization creates new opportunities to increase competitiveness and generate new digital business (Auvinen & Jaakkola, 2018). At the same time, the market evolution from goods-based economy to the service-centered service economy (Vargo & Lusch, 2004) and the increasing share of services in the employment and production structure (Tuulaniemi, 2011) have increased interest in the user-centered thinking and service design. Digital technologies and Internet have integrated across all sectors of society, resulting the digital services provide new and increasingly advanced alternatives to the customers (Vehmas, Ervasti, Tihinen & Mensonen, 2015). The growing provision of digital services by companies has also forced the public sector to develop services for use through digital channels (Auvinen & Jaakkola, 2018). Additionally, one of the main strategic objectives of Finnish government is to increase the technological and digital capabilities in the public sector as well as to develop co-operation between public and private sectors. To achieve this objective, a digitalization promotion program (Digiohjelma) was launched to make public services digitally available for citizens and organizations by 2023. (Ministry of Finance, 2021a.) Companies provide services to the customers who use and pay for services. In turn, residents and the companies operating in the municipality area are municipalities' customers. Auvinen and Jaakkola (2018) remind that due to the diversity of residents' digital skills, services should be easy to embrace and use (Auvinen & Jaakkola, 2018). Sydänmaanlakka (2015) continues by pointing out that public sector services are mainly developed and maintained by tax revenues, so they should be accessible to all citizens (Sydänmaanlakka, 2015). The user-centered thinking and service design provide solutions to this challenge (Auvinen & Jaakkola, 2018) as service design is a co-creative and user-centered approach for service development (Stickdorn & Schneider, 2017).

The academic literature provides numerous articles dealing with digital transformation and digitalization. Service design has also been studied extensively, but according to Hofeman, Raatikainen, Myllärniemi & Norja (2014), there is little research on the application of service design to the development of digital

services (Hofeman et al., 2014). In Finland and globally, the commercial sector has been the first to develop digital services. Naturally, the academic interest has also focused on digitalization primarily from a business perspective. To diversify the research area, it is justified that this thesis examines digitalization, digital services, and service design in the public sector, more precisely in Finnish municipalities.

Several definitions and explanations of digitization, digitalization and digital transformation are presented in scientific publications. This thesis adopts the concepts defined by Kiron and Unruh (2017). First, digitization is the conversion of products and services into a digital format. Second, digitalization refers to the innovation of new business models and business processes utilizing digitized services. Third, digital transformation is a structural transition of society and organizations resulting from digitalization. (Kiron & Unruh, 2017.) Furthermore, in this thesis, the term digital service is, in accordance the definition by Williams, Chatterjee and Rossi (2008), a service provided and consumed through digital channels.

Since the share of services in the economic structure continues growing and digital services are a key component of modern service-oriented organizations both in the private sector and increasingly also in the public sector, it was easy to get motivated for this interesting research topic. The aim of thesis is to study digitalization at a conceptual level and clarify the definitions related to the digitalization. Furthermore, the purpose is to explore the digital transformation as a phenomenon and increase understanding of its effects on societies, organizations, and people. New and emerging digital technologies have enabled the provision of digital services and currently the increasingly number of services are designed to be used via digital channels. Furthermore, according to Tuulaniemi (2011), the concept of design has expanded from industrial design to the design of services. The purpose of the thesis is to explore Service Design process and principles and the application of service design in the digital service development. The theoretical foundation is the previous scientific research of digital transformation, digitalization, digital services, service economy, and service design. The thesis is qualitative in nature and the empirical part was conducted through semi-structured interviews which included predefined questions and discussion on research themes. The target group of the thesis is limited to the Finnish municipalities. Consequently, the intention is to explore both the practical impacts of digitalization on Finnish municipalities and the application of Service Design methods in the municipal digital services development. The following research questions are posed:

1. How does digitalization affect the operation of municipalities?
2. How is Service Design applied to the municipal digital service development?

The structure of the thesis consists of eight chapters. In the introduction chapter, the background, objectives, research method, results, and structure are shortly presented. The chapter two provides information on Finnish municipalities

including municipal administration, services, and information management. In the chapter three the concept of digitalization is defined and the digital transformation as a phenomenon is examined. Since this thesis explores digital development from the perspective of public sector - especially Finnish municipalities - the literature revealed certain characteristics and challenges faced by public organizations in the rapidly changing operating environment of digital age. They are presented in the chapter 3.3. In the fourth chapter, the development from goods production-based industrial economy to the service economy and the process and principles of Service Design are described as well as Service Design in the perspective of public sector is presented. Furthermore, the role of service design in the digital service development is explored. At the end of the fourth chapter, the literature review is summarized and the conceptual framework for the research is presented. The chapters three and four thus form the theoretical background of the thesis based on the research literature. The following chapter five presents the implementation of the empirical part of the thesis. In addition, data analysis and the thesis reliability and validity assessment are included in this chapter. The sixth chapter includes the findings produced by data analysis. In the seventh chapter the study findings are discussed. In the last chapter, the summary and research conclusions are drawn, the study limitations are estimated, and further research proposals are presented.

2 FINNISH MUNICIPALITIES

In the following subchapters information about Finnish municipalities, organizational structure and administration are first provided. Then the services offered by municipalities are presented and finally the state of information management is reviewed.

2.1 Statistical Information about Finnish Municipalities

In Finland, public sector consists of central government and local government. State administration, universities, the Social Insurance Institution (Kansaneläkelaitos), state-owned enterprises and social security funds are included in the central government. The municipal administration, the municipal school system, the unincorporated service institutions, and joint municipal authorities, in turn, form the local government. (Statistics Finland, 2021a.) In 2022, there are 309 municipalities in Finland, of which 107 use the name "city" and the remaining 202 the name "municipality". The average size of Finnish municipality measured by population is 17851 residents. (Kuntaliitto, 2022a.) Municipalities provide the following types of statutory services to their residents: education and day care services, cultural, youth, sport and library services, urban planning and land use, water and waste management, and environmental services. Health and social services and fire and rescue services will be transferred to the Wellbeing Services Counties (Hyvinvointialueet) on the first day of January 2023. (Ministry of Finance, 2021b.) Even though municipalities have a lot of legal responsibilities and statutory services provision, they have a strong self-government based on local democracy as well as the right to levy taxes (Association of Finnish Municipalities, 2022).

2.2 Municipal Organizations and Administration

The Ministry of Finance is responsible for developing legislation and administration for municipalities (Valtiovarainministeriö, 2021a). The municipalities are directed by this legislation, and it is the basis of municipal management. The Local Government Act (Kuntalaki) enables a wide range of management and organizational models. In each model, the decision-making power is exercised by the municipal council elected by the residents. The council determines the municipality's strategical objectives and goals. The strategic management requires a holistic consideration of different management aspects and levels. In addition to the organizational management, municipal management also consists of ensuring the well-being of residents and companies and sustainable development of municipality. Due to the wide self-governing nature of Finnish municipalities, the leadership is divided into the management of municipal fiduciary and professional management. (Kuntaliitto, 2022b.) Based on the Information Management Act (Tietohallintolaki), the Ministry of Finance, along with other ministries, directs the public sector information management. The purpose of recommendations, standards and regulations is to enhance the efficiency of public administration and improve the access of public services. (Valtiovarainministeriö, 2022.) The municipal services are presented in the next chapter.

2.3 Municipal Services

As mentioned before the municipalities have a legal obligation to provide the following services to the residents:

- education and early childhood education and care
- cultural, youth, library, and sports services
- urban planning and land use
- water and waste management
- environmental services
- health and social services (until year 2023)
- fire and rescue services (until year 2023).

Based on self-government, the municipalities may also organize other services concerning e.g., the economy, employment, or housing. (Ministry of Finance, 2021b.) The residents and companies also have the right to take initiatives regarding the activities and services of their municipality (Valtiovarainministeriö, 2021b). In recent years, the aim has been to improve the municipal economy by reducing the statutory duties. However, this has proved challenging to implement because of established practices, related structures, and the equality requirement between municipalities. Despite the challenges, the development of

functions is needed to meet the municipal efficiency requirements. (Ministry of Finance, 2021b.)

2.4 Municipal Information Management

Kuntaliitto (Association of Finnish Municipalities) conducted a survey of information technology in the autumn of 2018. The main purpose of the survey was to obtain a holistic view of the state of the information management in Finnish municipalities. The aspects of the survey included the basic information technology (IT), information security, information technology procurement and tendering, IT development, and IT maintenance. In addition, cost development, digitalization and utilization of new technologies were the research subjects. The survey also provided information on the current projects and the potential need for support. (Hyvärinen & Parviainen, 2018.)

According to Hyvärinen and Parviainen (2018), in Finnish municipalities the basic IT is organized in different ways. The most commonly it is organized by own activities or through information technology companies owned by municipal or associations of municipalities. A part of municipalities uses the combination of own activities and outsourcing. The information security and information technology procurement and tendering are also organized mostly by municipalities' own activities or through IT companies owned by municipal or associations of municipalities. In addition to this, the IT development and maintenance are also organized mainly as mentioned above. Based on the survey responses outsourcing is not very common in Finnish municipalities but the most common functions that are outsourced are workstation services, IT support, firewall services, maintenance of networks, information systems and servers. (Hyvärinen & Parviainen, 2018.)

3 DIGITALIZATION AS A PHENOMENON

In this chapter, the concepts of digitization, digitalization, digital service, and digital transformation are clarified, the background of digitalization and the digital transformation as socio-technical and cultural phenomenon is introduced. In addition, the digitalization characteristics in the public sector are examined.

3.1 Digitalization and Digital Transformation

Digitalization has affected the organizations over 60 years. In the 1950s, the first computers were used in accounting and transaction processing. In the next decade, the manufacturing robots were introduced, and real-time transaction processing became possible. The real revolution of the personal computers took place from the 1970s to the 1980s. Data warehouses, local area networks, Internet and cellular phones became available in the1990s. The digital transformation continued in the 2000s and the computing capabilities increased exponentially until the 2010s. This development is continuing in this decade as, among other things, Internet of Things (IoT), Machine Learning and Artificial Intelligence (AI) are offering significant opportunities for organizations to utilize digital technologies. (Heavin & Power, 2018.)

From the technical point of view, defined by Siukonen and Neittaanmäki (2019), digitalization is the coded information of computers, which require digital processors, memory, and transmission technologies (Siukonen & Neittaanmäki, 2019). Gartner's Information Technology Glossary defines digitalization as deployment and utilization of digital technologies in the development of organization's operating methods or the creation of new operating methods. Digitalization is a transition process toward the digital business. (Gartner Glossary, 2021.) According to Alasoini (2015), digitalization is a social process utilizing opportunities offered by digital technologies. These new technologies are integrated into people's lives through digitization which is the conversion of analogue information (images, text, or sound) into the digital form. After digitization, the

information can be processed, stored, and transferred through digital devices and networks. (Alasoini, 2015.) Parviainen, Tihinen, Kääriäinen & Teppola (2017) provide an organizational perspective on the topic when defining "digital transformation as changes in ways of working, roles, and business offering caused by adoption of digital technologies in an organization, or in the operating environment of the organization." (Parviainen et al., 2017, p. 64). It can be deduced from the definition the digital transformation affects the organization both internally (the adoption of digital technologies within the organization) and externally (the adoption of digital technologies in the operating environment outside the organization).

Kiron and Unruh (2017) state the definitions of digitization, digitalization and digital transformation are not unambiguous and are depending on the context they are used in. According to their definitions, digitization is the conversion of products and services into a digital format. Digitalization, in turn, means the innovation of new business models and business processes utilizing these digitized services and products. The structural transition of society and organizations resulting from digitalization is a phenomenon called digital transformation. (Kiron & Unruh, 2017.) Legner et al. (2017) also find there are misunderstandings in the term definitions and the clarifications are necessary. They emphasize that digitization and digitalization are different terms because the digitization is the technical process of converting analogue signals to digital form into the binary digits and digitalization is a sociotechnical phenomenon where new technologies and innovations are adopted and utilized by individuals and organizations. (Legner et al., 2017.)

Even though the phenomenon of digital transformation has been studied at both the academic and practical levels, Morakanyane et al. (2017) note the comprehensive understanding of digital transformation is lacking. As a conclusion of their literature review the digital transformation is defined as "an evolutionary process that leverages digital capabilities and technologies to enable business models, operational processes and customer experiences to create value." (Morakanyane et al., 2017, p. 437.)

Although the digital transformation is often characterized by the words radical, disruptive, evolutionary, continuous, and complex, Morakanyane et al. (2017) suggest the digital transformation is nonetheless an evolutionary process. Based on the literature explored by Morakanyane et al. (2017) the drivers for digital transformation are digital capabilities and maturity, digital technologies, strategies, company culture, and business models. Of these drivers they consider digital technologies, culture-related factors, strategy, and human capabilities to be the most significant. Furthermore, they emphasize the impacts of digital transformation, which target both the customers and organization and can be both positive and negative. The most significant reason to leverage digitalization is the value creation for both customers and organization. (Morakanyane et al., 2017.)

The conclusions of Morakanyane et al. (2017) are reinforced by the extensive literature review conducted by Vial (2019), which proves the digital transformation has been a vital phenomenon in IS (Information System) research in

recent years and the research has increased the understanding of both the benefits and challenges of the digital transformation. The research indicates that to maintain the value creation and competitiveness, the changes not only in technology and strategy but also in the organizational structure, processes, and culture are required. Even though the understanding about digital transformation with its specific features is at an adequate level, the holistic understanding of its nature and impacts on organizations as well as on society is lacking. (Vial, 2019.) The above presented definitions of digitalization and digital transformation are condensed below in table 1.

TABLE 1 Definitions of digitalization and digital transformation

Authors	Digitalization	Digital Transformation
Siukonen & Neittaanmäki (2019)	The coded information of computers, which requires digital processors, memory, and transmission technologies.	
Gartner Glossary (2021)	Deployment and utilization of digital technologies.	
Alasoini (2015)	Social process utilizing opportunities offered by digital technologies.	
Kiron & Unruh (2017)	Innovation of new business models and business processes utilizing digitized services and products.	Structural transition of society and organizations resulting from digitalization.
Legner et al. (2017)	Sociotechnical phenomenon where new technologies and innovations are adopted and utilized.	
Morakanyane et al. (2017, p. 437)		"Evolutionary process leveraging digital capabilities and technologies to enable business models, operational processes and customer experiences to create value."
Parviainen et al. (2017, p. 64)		"Digital transformation is defined as changes in ways of working, roles, and business offering caused by adoption of digital technologies in an organization, or in the operation environment of the organization."

In summary, there is a consensus among researchers on the definition of digitization, but the terms digitalization and digital transformation have proven challenging to define unambiguously. In the literature, the digitalization is often synonymous with the digital transformation. Since this thesis focuses on digital service development from an organizational perspective, the term digitalization is

used as defined by Kiron and Unruh (2017). According to the definition, digitalization is the innovation of new business models and business processes utilizing digitized services and products (Kiron & Unruh, 2017). The definition may also be considered appropriate for the public sector, as according to Pablo, Reay, Dewald & Casebeer (2007) the public organizations are increasingly expected to improve their performance while financial resources are reduced (Pablo et al., 2007).

The emergence of digital technologies, however, has enabled the development and provision of digital services. Williams et al. (2008) define the digital services as services provided and consumed through Internet Protocol (IP) (Williams et al., 2008). Pakkala and Spohrer (2019), meanwhile, assess digital service as a service entirely based on a technical system to achieve the outcome desired by the user (Pakkala & Spohrer 2019). Gartner's Information Technology Glossary expands the perception of digital services to the digital commerce, which means acquiring goods and services through an interactive self-service experience. Digital commerce consists of service provider, customer, and digital technology, including customer acquisition, analytics, promotion, pricing, and customer experience at all stages of the purchase event. (Gartner Glossary, 2021.) Operational efficiency, cost savings and interaction independent of time and place are the benefits of digital services. The public administration's client relationship strategy emphasizes the user-oriented design, renewal of processes, interoperability of services, information security and data protection. (Ministry of Finance, 2021c.) These are key factors in digital service development in the private sector as well.

3.2 Digital Transformation – a Societal Change Factor

As the digitalization affects all areas of life: entertainment industry, politics, economy, business, public sector, companies, healthcare and people's social life (Ilmarinen & Koskela, 2015) it can be seen at least as a cultural evolution (Pardo & Etayo, 2014; Rogers & Sparviero, 2011), social phenomenon (Stolterman & Fors, 2004), and opportunity to develop or create a business model (Berman, 2012; Øiestad & Bugge, 2014; Pyyhtiä, 2019; Rothmann & Koch, 2014). From an individual company perspective digital transformation is defined as a transition to big data, data analytics, cloud services and mobile and social media platforms (Nwankpa & Roumani, 2016). Matt, Hess and Benlian (2015) explore digital transformation from the organizational strategy perspective and present a framework that describes four transformational dimensions. Figure 1 illustrates the dimensions and the relationships between them. The financial aspects are the foundation for the transformation as the organization's economy can either promote or restrict the change process. If organization has ability and interest to invest in the new digital technologies as well as utilize them, it often has implications for value creation. The deployment of new technologies and changes in value creation will inevitably also lead to the structural changes in the organization. Each

organization has to evaluate the effects of structural changes on products, services and processes. By taking these four dimensions of digital transformation into account, the organization can assess its abilities and create an appropriate digital transformation strategy. (Matt et al., 2015.)

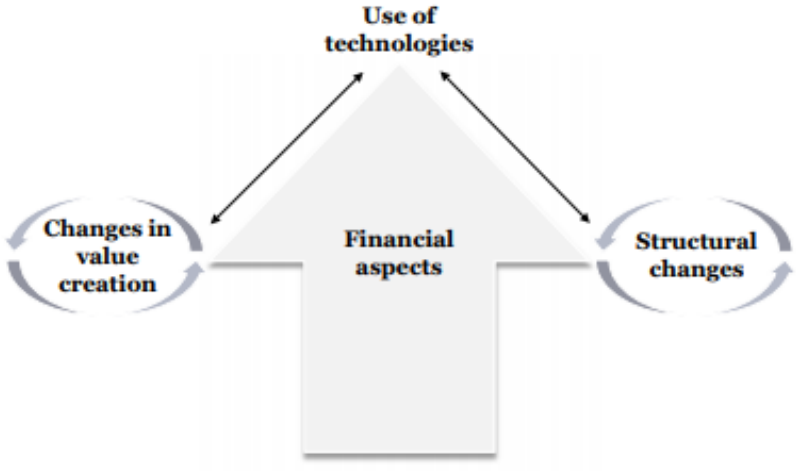

FIGURE 1 Digital transformation framework: balancing four transformational dimensions (Matt, Hess & Benlian, 2015, p. 341)

Ilmarinen and Koskela (2015), meanwhile, observe digitalization broader and find it can be viewed at the level of the company, market, and industry and at the level of society. All levels interact each other because digital services provided by companies change the market and society can for example regulate or deregulate the market. At the company level a company can just try to adapt to a changing operating environment or actively change the business operation and utilize digital technologies. By offering completely new digital services or solutions an individual company can change the market. At the society level the digital transformation changes society, economic structure, market dynamics and customer behavior. Figure 2 illustrates these three levels and their relationships. (Ilmarinen & Koskela, 2015.)

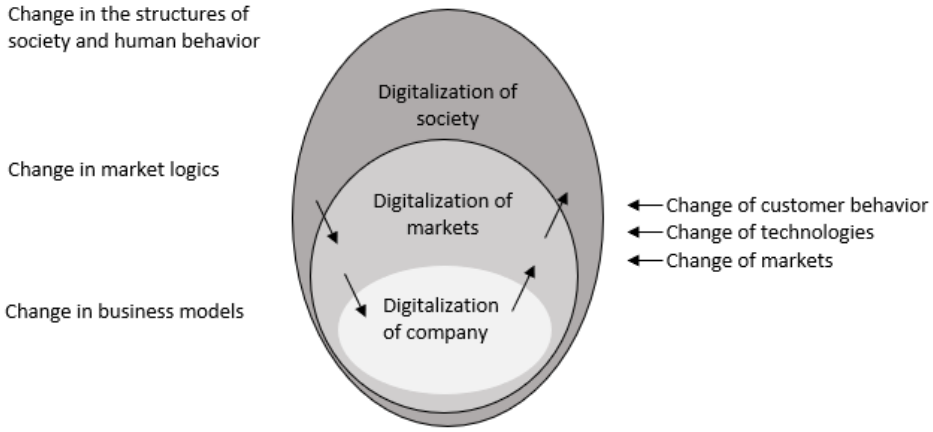

FIGURE 2 Digitalization levels (adapted from Ilmarinen & Koskela, 2015, p. 23)

Sydänmaanlakka (2015) has observed when exploring the development of society that the industrial society has transformed into an information society, which has further transformed into a network society. In this transformation both the digitalization and the globalization have been the main factors. Simultaneously, the society has become more complex and unpredictable as well as the pace of change has increased. The invention of the microprocessor and the exponential growth of computing capacity can be seen as the beginning of the information society. According to Moore's Law, the computing capacity is forecast to double every two years. The introduction of the Internet in the 1990s and early 2000s marked the beginning of the network society as the Internet enabled the global distribution and use of information. The digitalization is the most significant factor in this development. It is predicted that the network society will be followed by the bio-society and the use of the biotechnology which simulates biological processes. Figure 3 illustrates these transition periods. (Sydänmaanlakka, 2015.)

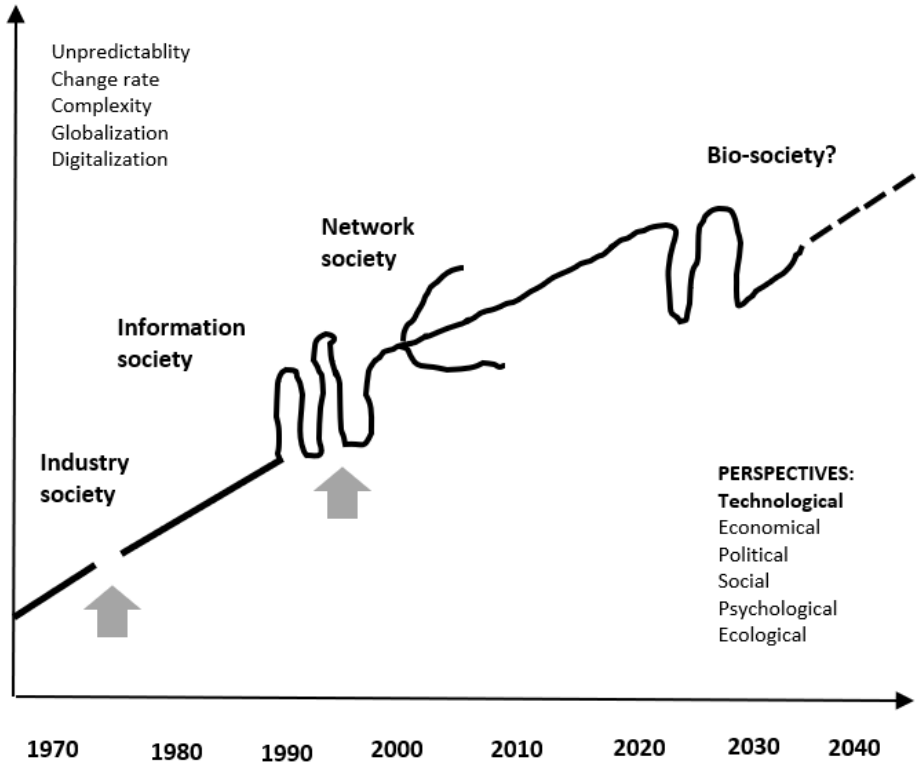

FIGURE 3 Changes in societies during periods of stability and transition (adapted from Sydänmaanlakka, 2015, p. 30)

Ilmarinen and Koskela (2015) also agree the digital change is inevitable and the pace of change is rapid. The change can be linear, or it can be disruptive, in which case the business model or operating method is completely different from previous. The digitalization dimensions emerge from concurrent changes of customer behavior, market, and technology. Together, these are shaping the business environment more than any other change since the industrial revolution (figure 4). Furthermore, Ilmarinen and Koskela (2015) remark the basis of digitalization is basically the development of technology. The new digital technologies have enabled the development of new applications and innovations. In addition, the

development of hardware, software and telecommunication has contributed to digitalization positively. New digital applications and innovations are inevitably shaping the market. (Ilmarinen & Koskela, 2015.)

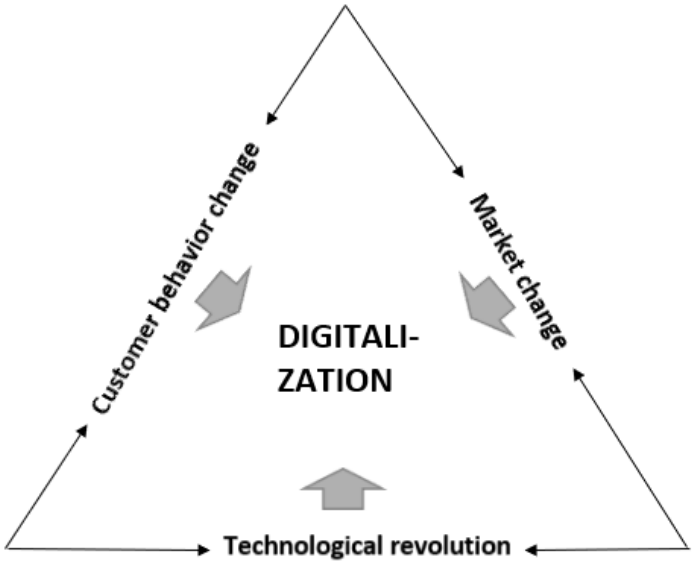

FIGURE 4 Digital revolutions (adapted from Ilmarinen & Koskela, 2015, p. 52)

Vial (2019) also emphasizes, based on his research, that the companies' operating environment is becoming more complex due to digitalization (Vial, 2019). In fact, according to Hämäläinen, Maula and Suominen (2016), digitalization is a revolution for whole operating environment, and it will change the way of doing business fundamentally (Hämäläinen et al., 2016). However, Parviainen et al. (2017) state that despite of the multidimensional change in the organization's operating environment, the digitalization can also be a path to a successful business (Parviainen et al., 2017).

Ilmarinen and Koskela (2015) state the business environment is no longer local but rather global as digitalization offers new opportunities to grow and reach customers from all over the world. To succeed in this rapidly changing era, the adoption of new service and business models, agility to innovate business, and sensitivity to meet customer expectations are essential for companies. As in the global digital world there are countless options for customers to acquire information, buy products and consume services, the companies are required to be transparent and reliable. By responding to the changed customer expectations, companies can generate new ways to produce value for customers. (Ilmarinen & Koskela, 2015.)

Hämäläinen et al. (2016) also note that the digital transformation has already affected many industries and this development cannot be stopped. Although the change is inevitable and difficult to predict, it can be prepared for with agility and adaptability. (Hämäläinen et al., 2016.) The digital technologies allow for rapid experimentation, monitoring, and analysis of results. If the developed solution or service is not appropriate, it can be replaced with a new one. (Gerdt

& Eskelinen, 2018.) Thus, a curious and pragmatic approach encourages the successful utilization of digital transformation (Hämäläinen et al., 2016).

On the other hand, Nwankpa and Roumani (2016) state the digitalization has been driven mostly by the technology. The development of digital technologies has enabled the global networking among companies. As a result, companies have created new business models and innovated their business. (Nwankpa & Roumani, 2016.) Pyyhtiä (2019) states despite of digital technology being the foundation of new business and technological opportunities, must be understood, the technology is still only a tool for developing a business. Digital technologies shape the operating environments of companies strongly and for this reason, it is essential to have a holistic understanding of the changes. He emphasizes the customer-centric approach and the recognition of business environment. The new possibilities of business need to be understood by the companies and the technology is a part of strategic planning, but the development of business cannot be technology driven. (Pyyhtiä, 2019.) Gerdt and Eskelinen (2018) share this view, stating the role of technology is considerable but digitalization is not a technology project (Gerdt & Eskelinen, 2018). Ilmarinen and Koskela (2015) have also discovered that digitalization is based on technologies and thus it is enabled by technology, but technology alone is not enough because only the new ways of operation lead to digitalization. (Ilmarinen & Koskela, 2015.)

How have these opportunities and challenges of the digital transformation been adopted by organizations? The ability to respond to development and changes in society depends on the organization's dynamic capabilities, which are ability to evaluate and acquire the required competence and resources and create competitive advantage (Teece, Pisano & Shuen, 1997; Teece, 2018). Although creating competitiveness is central when evaluating organization's dynamic capabilities in the private sector, they can also be assessed in the public sector. The dynamic capabilities in the public sector are mainly the strategic abilities to adapt service provision in the rapidly changing operating environment. (Pablo et al., 2007.) As the operating environments in the public and private sector are rather different, the challenges and opportunities for digitalization may also be different. In the next chapter the digitalization in the public sector is examined specifically.

3.3 Public Sector Digitalization

Kiron and Unruh (2017) state the digitalization is not only a trend in the commercial sector, but it will inevitably affect the interaction between governments and citizens in the public sector as well (Kiron & Unruh, 2017). Sabbagh et al. (2012) argue the digitalization increases transparency and efficiency in society. Moreover, the societies benefit from digitalization, for example through the growth of employment and better public service accessibility. The digitalization enhances the public service delivery while higher quality e-services increase digitalization. (Sabbagh et al., 2012.)

In Finland, one of the main strategic objectives of government is to increase the technological and digital capabilities in the public sector as well as to develop co-operation between public and private sectors. To achieve this objective, a digitalization promotion program (Digiohjelma) has been set to make public services digitally available to citizens and organizations by the year 2023. (Ministry of Finance, 2021a.) The objective of Digiohjelma is by developing the legislation to ensure the uniform development and provision of digital services in different administration sectors. Other priorities of Digiohjelma include the development of digital support to improve the citizens' digital capabilities and development of digital services for companies. (Ministry of Finance, 2021d.)

The final effects of Digiohjelma will be seen in the future, but it can already be shown that Finnish municipalities are pioneers in digitalization globally. According to Mattila, Pajarinen, Seppälä, Mäkäräinen & Neuvonen (2021), Digibarometer is a study published since 2014 that evaluates the utilization of digitalization in 22 different countries. The framework consists of three levels and three sectors. The levels are *implications*, *utilization* and *capabilities* and the sectors are *company, civic and public*. Each sector is examined on each level and the result is a scoring matrix of nine cells. For each cell is selected four variables, which describe the dimensions of the cell's theme. Figure 5 shows Finland's total, level, sector, and cell specific rankings. The change in the ranking compared to the last year is illustrated with the italic font. In 2020, Finland is ranked in the second place in the total index of Digibarometer. The Nordic countries take the top positions as Denmark takes the first place, Sweden is in the third and Norway in the fourth place. It should be noted, that in previous years, the company sector has been Finland's leading digital sector. In 2020, however, the Finnish companies rank the fourth in the company sector while the Finnish public sector takes the first place in the international comparison. (Mattila et al., 2021.)

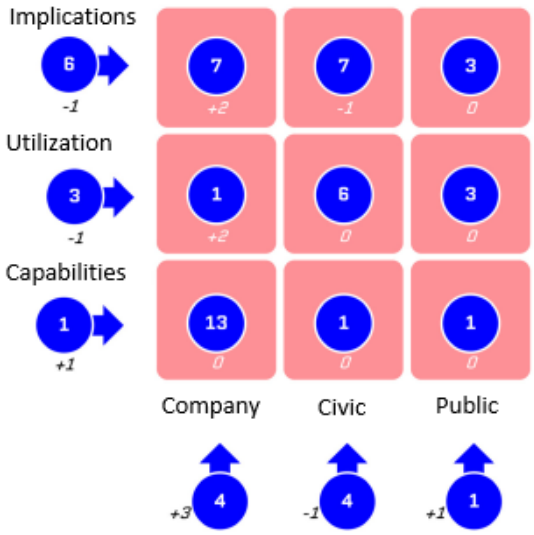

FIGURE 5 Digibarometer framework and Finland's ranking (Mattila, Pajarinen, Seppälä, Mäkäräinen, Neuvonen, 2021, p. 76)

The leading rank in Digibarometer proves the Finnish municipalities have invested in the development of the digital services in recent years. This view is also supported by an interview study conducted by Sofigate (2021). The digitalization has been considered in the planning of operations and almost all municipalities have made a digital strategy (Sofigate, 2021). The key objective is to provide services digitally, but it has been noted that the whole process must be digitalized to achieve the operational efficiency. The competence development and the reform of operation policies are also considered essential objectives in Finnish municipalities. (Sofigate, 2019; Sofigate, 2021.)

As noted in chapter 3.2, digital transformation is a complex and rapidly changing phenomenon shaping the structure of society as well as organizations. According to Pablo et al. (2007), in order to be successful in the changing environmental conditions, organizations are required to have sufficient dynamic capabilities. The dynamic capabilities are often seen as the creators of competitiveness only in business, but they can also be explored from the public sector perspective although the creation of a competitive advantage is not a public sector intention. In the public sector, dynamic capabilities are mainly strategic capabilities to adapt the service provision in the rapidly changing operating environment. (Pablo et al., 2007.) Digital maturity models describing the progress of digitalization prove the strategy and culture are the key components of organization's digital success. Digitally mature organizations have created clear, holistic, and coherent digital strategy for ensuring the digitalization is a part of organization's processes, practices, and business model. (Kane, Palmer, Phillips, Kiron & Buckley, 2015; Kane, Palmer, Phillips, Kiron & Buckley, 2017.)

Due to the complexity and rapid pace of the digital age, the long-term planning based on a stable operating environment is no longer productive. The traditional bureaucratic and slow-reacting organizations face difficulties undoubtedly. The organizations with the capability for an inclusive and experimental strategy where risk-taking and failure are acceptable can be successful. (Kane et al., 2015; Hämäläinen et al., 2016.) Furthermore, the commitment of the company leaders is essential when implementing the strategy change. As the leaders create a participatory and open organizational culture, the dynamic capabilities increase, and organization becomes agile and responsive. (Pablo et al., 2007; Kane et al., 2015.) Although the above-mentioned characteristics; flexibility, agility, and responsiveness are also emphasized in the public sector, Virtanen and Stenvall (2019) argue the public administration management culture is still traditional, bureaucratic, and controlling (Virtanen & Stenvall, 2019). In addition, public administration is strongly governed by legislation which aim is to respond both the societal objectives and the needs of public service users (Virtanen & Stenvall, 2014). The public administration is also characterized by politics, which often lead to the lack of continuity from the perspective of digitalization (Virtanen & Stenvall, 2019). Furthermore, Sydänmaanlakka (2015) recalls a characteristic feature of public sector, namely silos, which means that each administrative sectors develops services from its own perspective and forgets the holistic point of view (Sydänmaanlakka, 2015). According to Gartner's research report, both the

legislation and the political aspect of the public administration pose challenges to the continuity of digitalization in the public sector. The legislation is not fast enough to support co-operation between authorities to create common digital knowledge, and especially the change of the government after the election period creates uncertainty to the long-term digital development. (Gartner, 2017.) Furthermore, the incompatible information systems and inability to utilize technology may complicate the development of digital services in the public sector (Virtanen & Stenvall, 2014).

The survey results by Hyvärinen and Parviainen (2018) prove the strategic importance of digitalization is well understood although the shortage of resources, the level of competence and the slow decision-making processes were perceived as a problem. The silo effect and lack of integrated and holistic development and design, the lack of experimentation culture as well as the economic difficulties were seen as slowing the digitalization. To some extent the non-commitment of managers was also mentioned as an obstacle to the digital development. Concerns were also caused by incompatibility of information systems and the rapid pace of digitalization. The research also examined which services are digitalized the most and least of all. It was noted that human resources and financial management services, library and education services are offered digitally most in Finnish municipalities. The least number of services have been digitalized in housing, democracy an interaction, economy services and social services. (Hyvärinen & Parviainen, 2018.)

4 SERVICE DESIGN

This chapter is about Service Design. Firstly, the development from goods production-based industrial economy to the service economy is described, then the importance of customer experience is discussed, after which the process and principles of Service Design are presented. Then the Service Design in the public sector is explored and finally, the application of service design to development of digital services is examined. In the last subchapter the literature review is summarized.

Apparently, the term "service design" was mentioned in the literature for the first time in 1982. Shostack (1982) stated that notwithstanding the difference between product and service, they have a connection to each other and can form an entity. As the products and services are marketed increasingly together, the system for visualizing the process is first step to the service design. (Shostack, 1982.) The concept of design has expanded from industrial design to service design where it is understood as a holistic, user-centered, and co-creative methodology (Tuulaniemi, 2011) that accelerates the development of novel services (Työ- ja elinkeinoministeriö, 2011). Tuulaniemi (2011) continues, Service Design is a concrete activity that combines both the needs of service users and the objectives of service providers for a functioning service. Service Design helps organizations identify business opportunities for services, create new ones, and develop existing services. (Tuulaniemi, 2011.) Rae, Fishman, Chew, Doyle & Nelson (2019) define Service Design as a holistic approach to the service experience, considering both the customer and the organizational perspectives (Rae et al., 2019). Stickdorn and Schneider (2017), in turn, state there is still no common definition of Service Design, but it can be considered as an interdisciplinary approach combining different kinds of methods and tools from various disciplines (Stickdorn & Schneider, 2017). However, servitization, service-dominant logic and customer-experience are concepts strongly linked to the Service Design. In the following subchapters these concepts are examined in the service development context.

4.1 From Goods Production-Based Industrial Economy to Service Economy

Over the past few decades, the share of services has increased in the structure of employment and production. An increasing share of GDP (Gross Domestic Product) is accounted by service economy. In Finland the share of services in GDP has been growing steadily and in 2011 it was 66%. (Tuulaniemi, 2011.) In 2020 the share of Finnish employees working in service sector was 74% (Statistics Finland, 2021b). As a result of this social change both the traditional service sector and the share of the service business in the manufacturing industry have increased. Especially in manufacturing industry sector the difference between products and services is challenging to identify. (Tuulaniemi, 2011.) The term servitization was introduced by Vandermerwe and Rada in 1988. They defined servitization as a combination of goods, services, support, and knowledge for adding value to the original product (Vandermerwe & Rada, 1988). Baines, Lightfoot, Benedettini and Kay (2009) in turn reviewed 58 research papers related to the servitization and concluded: "Servitization is the innovation of an organizations capabilities and processes to better create mutual value through a shift from selling product to selling Product-Service Systems." (Baines et al., 2009, p. 555). Ilmarinen and Koskela (2015) define servitization as meaning that instead of selling the product, a service built around the product is sold (Ilmarinen & Koskela, 2015). Although different definitions are presented, Cheng and Johansen (2016) find the servitization as a transformation process of creating value by adding services to the products to satisfy customers' needs, achieve competitive advantages, and enhance firm performance. Thus, the servitization can be the provision of extra services included to the product like maintenance, finance, or support services or on the other hand, it can lead to the renewal of entire business model of the company. (Cheng & Johansen, 2016.) Therefore, it can be noted that compared to a manufacturing-based economy, the service economy perhaps requires a more comprehensive understanding about customer needs as the customer is offered a broader solution than just a product.

Vargo and Lusch (2004) examined the marketing evolution from tangible, goods-based economy toward intangible service economy and stated the shift from the traditional goods-centered dominant logic to the service-centered dominant logic is obvious. The focus is oriented to the interactivity and relationships as well as from producer to the consumer. The role of customer is seen as a co-producer of service. In addition, the change from goods-centered thinking to the service-centered thinking has an impact on the value determination. (Vargo & Lusch, 2004.) Based on the goods-centered dominant logic, the value has been added to the products in the production process and is transferred to the customer during purchase transaction (Lusch & Vargo, 2006). Service-dominant logic emphasizes the interaction between customer and company. The customer is a service co-producer and has a central role in value creation and value production. The value is created - or co-created - with the company and the customer

and it is ultimately determined by the customer. The company (or service provider) only offers value propositions for the customer. (Vargo & Lusch, 2004, 2008, 2016.)

Service-dominant logic, originally conceptualized within the field of marketing (Vargo & Lusch, 2008), is applied also in the public sector. Osborne, Radnor & Nasi (2013) challenge the current public administration and suggest for adopting the service-dominant approach within the public management. The presented public service-dominant logic (PSDL), based on the philosophy of service-dominant logic, is justified by the fact that the engagement of citizens for delivering public services produces added value to both citizens and public organizations. (Osborne et al., 2013.) Later, Osborne (2018) proposes replacing the term public service-dominant logic with the term public service logic (PSL) as the link between PSDL and the underlying service-dominant logic has been deteriorated. Additionally, PSDL emphasizes the service-dominant (instead of product-dominant) nature of the public service delivery as well as the role of users as the service co-producer and value co-creator. (Osborne, 2018.) By presenting the public-service logic (PSL), Osborne (2018) argues the focus should be shifted from linear co-production to dynamic value co-creation, continuing that the public sector organizations do not create value for citizens, they merely offer services. The value is based on the user's experience of the public service. The user integrates the service offering to the needs, personal abilities, and experiences in his/her social context. As summarized the focus is on the public service user and public services facilitate the value co-creation of service users. (Osborne, 2018.)

Although the development from the goods-dominant logic to the service-dominant logic is widely accepted in the marketing economy, Heinonen et al. (2010) argue the service-dominant logic focuses still on the service provider's internal processes and interaction instead of the customer perspective. They find the role of service provider is still too dominant and customer's needs and objectives are not sufficiently considered. Additionally, the role of service provider in the customer's life should be better noticed. To turn the approach more to the customer than the service provider, they present a customer-dominant logic of service. In their research, they propose the customer-dominant logic starts the development towards better understanding of customer experience. The essential is not the service but the customer's objectives reached by using the service. (Heinonen et al., 2010.) In the next chapter the customer experience is discussed in more detail.

4.2 Toward Better Customer Experience through Service Design

According to Heinonen et al. (2010), the shift from the goods-dominant logic to the service dominant logic has changed the focus from the company's internal processes to the interaction between company and customer. By focusing solely on the interaction between customer and company, it is unable to realize the company's role in the customer's life. Therefore, the customer-dominant logic would

be the key to understand the customer experience. The focus is on the customer experience and the value reached by using the service. (Heinonen et al., 2010.) In 2009 Verhoef et al. (2009) submitted the customer experience is a holistic event between customer and retailer, it can take place on several different channels and the retailer can control it only partially. Customer experience includes customer's cognitive, affective, emotional, social, and physical reactions to the retailer from the product search phase to the after-sale phase. (Verhoef et al., 2009.) Later Lemon and Verhoef (2016) defined: "the customer experience is a multidimensional construct focusing on a customer's cognitive, emotional, behavioral, sensorial, and social responses to a firm's offerings during the customer's entire purchase journey." (Lemon & Verhoef, 2016, p. 71). Almost a similar definition has been reached by Klaus and Maklan (2013), as they define customer experience as "the customer's cognitive and affective assessment of all direct and indirect encounters with the firm relating to their purchasing behavior." (Klaus & Maklan, 2013, p. 228).

The importance of customer experience for customer satisfaction and customer loyalty has long been recognized by the organizations (Zomerdijk & Voss, 2010). By providing a decent customer experience the company can achieve competitive advantage and increase revenue not forgetting the main point that is the enhanced satisfaction of the customers and employees (McColl-Kennedy, Zaki, Lemon, Urmetzer & Neely, 2019). When designing and implementing products and services, it is essential to understand how and when the customers encounter the company's offering (Tuulaniemi, 2011). In the literature the encounters are called touchpoints and the customer experience is comprised of multiple touchpoints (Frow & Payne, 2007; Clatworthy, 2017). By mapping out the touchpoints carefully, the customer experience can be improved (Frow & Payne, 2007). In addition to the customer experience, the touchpoints are central in value co-creation as the customer interacts with company, starting from the planning or searching phase to the consumption phase (Frow & Payne, 2007; Clatworthy, 2017). Even though the touchpoint management is essential and has been greatly emphasized, it can lead to the narrow perspective and the perception that customer satisfaction is on the better level than it actually is. Instead of focusing on individual interaction moments the entire customer journey should be examined. (Rawson, Duncan & Jones, 2013.)

From the customer or service user perspective, the service consists of series of activities and events (touchpoints) that form a service event (customer journey) (Zomerdijk & Voss, 2010). Nowadays the customer can interact the service provider through many different channels, from the physical appointments to the virtual interactions via Internet. It is essential that all these alternatives are mapped when constructing the customer journey. The optimal result is achieved when the touchpoints are mapped with the customers as this also provides an opportunity to identify both problems and innovations related to the service. (Stickdorn & Schneider, 2017.) The mapping of touchpoints provides a holistic understanding of customer's behavior, feelings, motivation, and attitudes toward the service, and it can be utilized for both analyzing current services and

designing new ones (Zomerdijk & Voss, 2010). Furthermore, the well-structured and visual customer journey map offers an opportunity to compare the service to the ones of the competitors (Stickdorn & Schneider, 2017).

Even though the views of service users are crucial for designing excellent services, the perspective of service provider and other actors are equally important. Zomerdijk and Voss (2010) present five experiential design areas the service consists of (figure 6). At the frontstage are located the service employees and service delivery process visible to the customers. The supporting actors who are not visible for customers are located at the backstage. The design areas are quite familiar in the theory and practice of Service Design, and they help to outline the service entity. (Zomerdijk & Voss, 2010.)

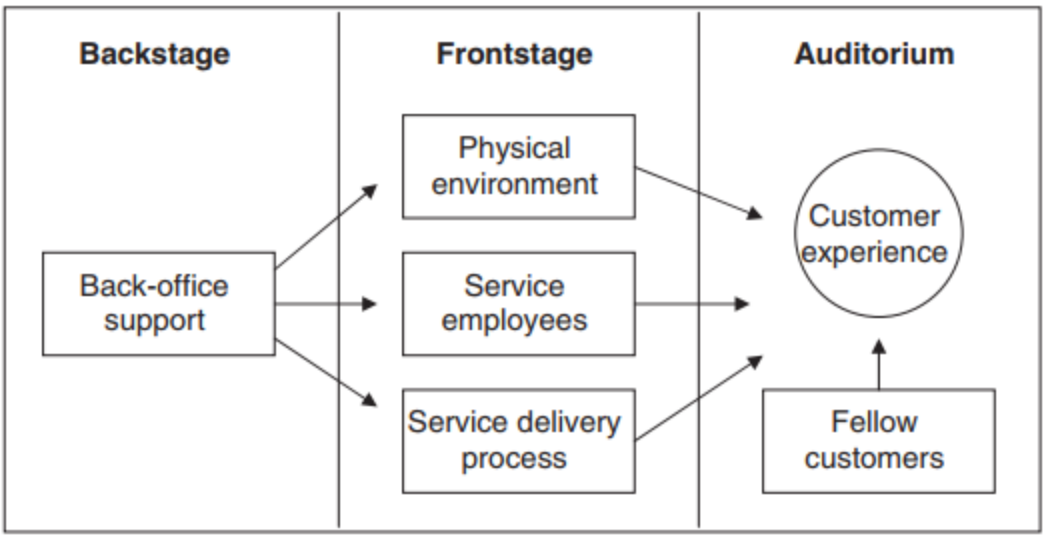

FIGURE 6 Five experiental design areas (Zomerdijk & Voss, 2010, p. 13)

Fundamentally, the design areas resemble another design tool, namely a service blueprint. The service blueprint is a tool for specifying the detailed aspects of the service. It is a visual representation introducing not only the relationship between customer and service provider, but also all stakeholders involved in the service provision. As the service blueprint is created in collaboration between all service actors, it is a significant way to reduce silos between different actors as well as clarify the responsibilities of each actor. (Stickdorn & Schneider, 2017.) The customer journey maps, and service blueprints are central tools for Service Design process as they give a comprehensive understanding of the service and relationships between different service stakeholders. In the next chapter the Service Design process and principles are presented.

4.3 Service Design Process and Principles

The unambiguous definition of service is difficult. Usually, it is considered as a process that is perceived but can't be owned and it solves the problem of its user. It is also characterized by abstractness, intangibility, and interactivity. (Tuulaniemi, 2011.) In some contexts, a service is defined by comparing it with a product. In contrast to the service, Shostack (1982) defines the product as a concrete object with time and place dimension. The service, in turn is an abstract concept that is created, experienced, and participated in. (Shostack (1982.) Osborne et al. (2013) describe the service as an intangible process that is produced and consumed simultaneously. In addition, it is mentioned the role of the service user is different from that of the product user as the service user is not only purchasing and consuming but also co-producing or co-creating the service. (Osborne et al, 2013). Vargo and Lusch (2004) define services as application of knowledge and skills through acts and processes to the benefit of someone (Vargo & Lusch, 2004).

The development of Service Design has been significantly influenced by industrial design which is a process, and the outcome is a design or a product. Service design is also a process, and its outcome is a service. (Tuulaniemi, 2011.) Furthermore, Tuulaniemi (2011) continues, service design is a process aimed at creating a service that solves the problem of the service user. The service provider therefore wants to develop a solution to the service user. This problem-solving process includes divergence and convergence. The divergence means inventing new ideas and solutions creatively while the convergence means analysis and pruning based on the knowledge. (Tuulaniemi, 2011.)

The Double Diamond evolved by Design Council is based on the concepts of divergence and convergence. Figure 7 presents the framework for innovation which core is the design methodology. This four-step process describes the design process from the starting point to the outcome. At the beginning of the process (the step called "Discover") the problem or challenge is identified in co-operation with the people involved. As a result of the interaction, the outputs of Discover phase are analyzed and synthesized (the step called "Define"). Once the problem or challenge is defined, the following step is called "Develop". This phase is characterized by the inspiration and co-design with people. In the last phase (the step called "Deliver") different solutions are tested, inappropriate ones are discarded and those that respond to the objectives are further developed. In the discovering and developing phases the creative divergent thinking is prevailing while the definition and delivery phases are analytic and convergence oriented. As can be seen in figure 7, the process is not linear but iterative by its nature, which means returning to the previous phase if necessary. Actually, the whole framework is iterative but especially in the developing and delivering phases the iteration is often necessary. Furthermore, Double Diamond framework includes the concepts of engagement and leadership. Engagement is required from all stakeholders, as developing connections, and building relationships is just as important as delivering ideas. The positive and encouraging

leadership, in turn, creates a favorable condition for open, innovative, and agile design process. (Design Council, 2019; Design Council, 2020.)

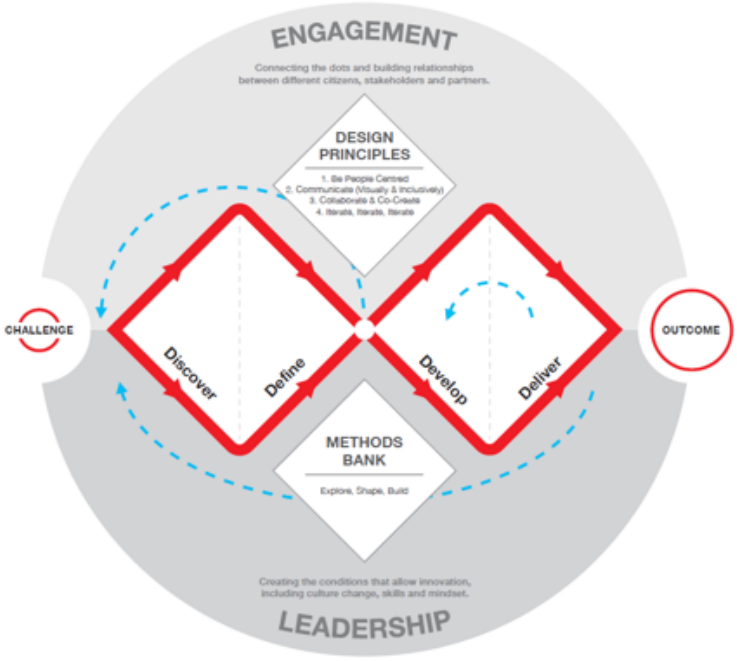

FIGURE 7 Double Diamond (Design Council, 2019)

In addition to Double Diamond there are other models describing Service Design process. Tuulaniemi (2011) presents a five-step model that proceeds from the definition phase to the evaluation phase. Figure 8 illustrates this model.

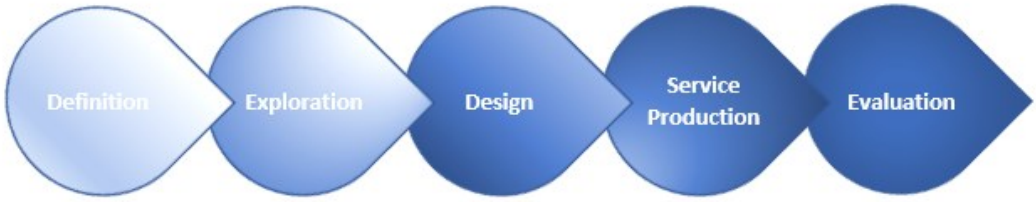

FIGURE 8 Service Design process (adapted from Tuulaniemi, 2011, p. 128)

The purpose of Definition phase is to create a holistic understanding about service, design process and problem to be solved. This understanding is achieved, for example, through interviews and customer surveys. The main objective of the following, Exploration phase is the acquisition of in-depth customer understanding. In the Design phase different service solutions are innovated and tested iteratively. The aim is to develop as much solution proposals as possible. The divergence and convergence are characteristic for the brainstorming. The ideas and solutions are produced unlimitedly and then analyzed and pruned. Furthermore,

the phase is characterized by iterativity; the brainstorming and pruning alternate until the most useful ideas are found. The useful ideas are developed and turned into service concepts, which are visualized solutions allowing complex entities to be presented in a simple and understandable way. The functionality of service concepts is tested through prototyping. The service will be prototyped so it can be developed interactively with the design team. The prototyping is a key part of Service Design, and it is applied in every phase of the process. When the service prototype is accepted, it will be launched for the end users (Service Production). Finally, in the Evaluation phase the development process is assessed, and the effects are measured. (Tuulaniemi, 2011.)

As its simplest, the design process can be described in three steps (figure 9), starting with the research of user needs, continuing with visualization, and ending with improving the solution by iterative prototyping (SEE Platform Report, 2013). Actually, this simple model includes the same elements as the models introduced above by Design Council (2019), Design Council (2020) and Tuulaniemi (2011). The design model presented by SEE Platform Report (2013) describes the co-creation process from the determination through problem solving to the implementation. By defining customer journey, the intangible is made tangible and unnecessary elements can be eliminated. At the same time the relevant participants can be found. Prototyping is a cheap and effective tool for ensuring the functionality of the solution. Furthermore, by improving the prototypes iteratively, the risk of failure reduces. (SEE Platform Report, 2013.)

FIGURE 9 Design as a three-step process (SEE Platform Report, 2013, p. 7)

The models presented above embody main principles related to the Service Design: user-centered, co-creative, tangible, divergence, convergence, iterative, holistic, and interdisciplinary. The principles are summarized and briefly described in table 2.

TABLE 2 Service Design principles

Principle	**Description**	**Authors**
User-centered	Human perspective Empathy Interaction between actors	Tuulaniemi (2011) Stickdorn & Schneider (2017) Design Council (2019)
Co-creative	All stakeholders included Reduction in silos Increased commitment and loyalty	Tuulaniemi (2011) Stickdorn & Schneider (2017) Design Council (2019)
Tangible	Visualization Prototypes From intangible to tangible	Tuulaniemi (2011) Stickdorn & Schneider (2017) Design Council (2019)

(to be continued)

(table 2 continues) Divergence	Creativity Ideas Brainstorming	Tuulaniemi (2011) Design Council (2019)
Convergence	Analytical nature Pruning	Tuulaniemi (2011) Design Council (2019)
Iterative	Prototypes Testing Learning by experimenting	Tuulaniemi (2011) Design Council (2019)
Holistic	Consideration of entire service environment Broad perspective From parts to the whole Perceiving the whole	Tuulaniemi (2011) Stickdorn & Schneider (2017)
Interdisciplinary	Combination of different methods from various disciplines, e.g., psychology, sociology, cognition science, information technology, engineering	Stickdorn & Schneider (2017)

4.4 Service Design in Public Sector

According to SEE Platform Report (2013), the requirements of a high standard of living and the sustainability of economic growth are increasingly challenging the societies (SEE Platform Report, 2013). Moreover, the publication "Muotoile Suomi" by Työ- ja elinkeinoministeriö (2011) claims the major social changes such as urbanization, aging of the population, digitalization and the growth of service sector require a change in the public sector too. In the future, public services are becoming increasingly significant, and they have to meet the needs of users. The citizens expect quality and user-centricity from the public services, on the other hand the public service resources have declined. (Työ- ja elinkeinoministeriö, 2011.) Tuulaniemi (2011) agrees and notes the major challenge for the public sector is to develop services meeting the people's need with increasingly limited resources. Just as companies are required to create value for the owners, the public sector organizations have to create value for the citizens and companies. The value arises from high-quality services promoting the well-being of citizens. (Tuulaniemi, 2011.) According to Virtanen and Stenvall (2014), over the past twenty years the role of citizens has changed from the passive resident to the service user and public service provision has become customer-oriented, enabling citizens' participation in the design and development of services (Virtanen & Stenvall, 2014). Sydänmaanlakka (2015) also states the role of municipality has increasingly changed from a public authority to a service provider and emphasizes the customer-oriented approach in the service development (Sydänmaanlakka, 2015). The efficient public services also strengthen national competitiveness in the global economy. The change into a service society as well as digitalization create business opportunities, and the design competence can play a significant role in implementation of novel business. By utilizing service design, the needs of residents can be assessed, and the desired services can be developed.

(Työ- ja elinkeinoministeriö, 2011.) However, Tuulaniemi (2011) considers the extensive utilization of design is challenging because there are neither design traditions nor service design skills in the public sector (Tuulaniemi, 2011).

Björklund, Hannukainen & Manninen (2018) state the level of service design utilization describes the organization's design maturity. There are organizations where design is not applied systematically, while in some organizations the design is a key strategic element in business model. (Björklund et al., 2018.) Junginger (2009) illustrates the organization's design maturity level with a visual tool that locates organization's design thinking and design methods in different places (figure 10). The white circle represents the place of design in the organization. When design is an external resource, it is located on the edge and the design thinking is nor essential neither constantly present in the organization. In this case, the organization does not have own design capability. The second place for design is when it is a part of some organizational functions or specific products or services. Often instead of design consultants, the organization employs an in-house designer or design team. The third maturity level or place is achieved when design is on the central position in the organization. The leaders are committed to the design thinking and furthermore design is strongly linked to the organization's strategy. After reaching the full maturity level the role of design is to solve all kinds of organizational problems and design is fully integrated into the organization. (Junginger, 2009.)

FIGURE 10 Four places of design thinking in the organization (Junginger, 2009, p. 26)

The design thinking maturity level can also be applied in the public sector. SEE Platform Report (2013) presents the three-step model demonstrating the public sector design levels (figure 11). At the lowest step the design thinking is not at the core of the organization and design projects are solving only separate problems. At this level the design is one way to increase technology utilization and usability. At the second step the public sector employees have design skills and they have recognized the perspective of citizens they serve. The designer teams are hired only if necessary, since employees have skills to solve problems themselves as well. At the third level the design is a mindset adopted by the policy-makers with the aim of reducing risks by prototyping, getting a holistic view of system, removing inter-departmental silos, and engaging stakeholders. (SEE Platform Report, 2013.)

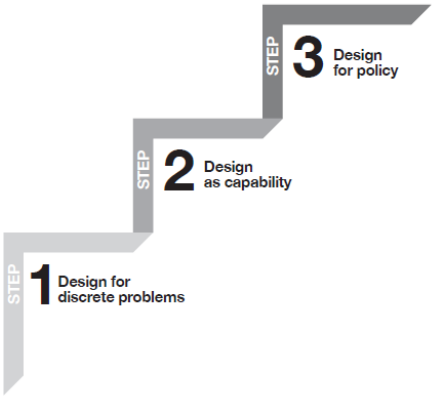

FIGURE 11 Public Sector Design Ladder (SEE Platform Report, 2013, p. 8)

According to SEE Platform Report (2013), most public sector service design projects are at the lowest step. However, the Public Sector Design Ladder model is proposed as a diagnostic tool for finding out the current design level and defining the future plans. One advantage of design methodology is the organization can start in a controlled way with a small project and expand design thinking methods to the demanding projects as skills develop. (SEE Platform Report, 2013.) In the next chapter the Service Design methods in digital service development are examined.

4.5 Applying Service Design to Digital Service Development

As stated in the chapter 3.1, one driver for digitalization is the evolution of digital technologies. Both the public and private sectors in Finland and globally exploit the opportunities offered by new technologies. By developing digital solutions, like online and mobile services, organizations aim for efficiency and competitiveness. The previous chapters of the thesis state the shift from product-oriented society to the service economy has been inevitable. In the context of digitalization, this means developing and providing new digital services. According to Heinonen et al. (2010), the service society requires the companies to have an in-depth understanding of customer's needs. They emphasize the importance of customer experience as an outcome of marketing and service delivery, as well as the resulting value-in-use in the context of customers' lives. (Heinonen et al., 2010.) Actually, Rytilahti et al. (2016) state the digital business consists of several stakeholders with their own values and furthermore digital development has created a complex socio-cultural network of human values (Rytilahti et al. (2016). Also, Saunila, Rantala and Ukko (2017) mention the ideal digital service provides value for both users and service provider (Saunila et al., 2017). Gerdt and Eskelinen (2018), on the other hand, state the automated processes and tools enabled by the digital technologies provide an unprecedented opportunity for companies to develop the business into customer centered (Gerdt & Eskelinen, 2018).

How do these above considerations - utilization of digital technologies and understanding the customer - can be combined when developing services? As defined by Williams et al. (2008), the digital services are provided over Internet Protocol (IP). From a service development perspective, this means the physical services are transferred to digital platforms and are provided through digital channels such as websites, mobile applications, or chat. It should be noted that during the customer journey all or only some of the transactions (or touchpoints) may be digital. Williams et al. (2008) give an example where the order is made digitally, but the purchased product is delivered physically. Whether the service is either fully or partially digital, it can also restrict the use of the service, since digitality requires the users to have both the computer or smartphone and Internet connection, not to mention the skills to use them. (Williams et al., 2008.) On the other hand, digital services are independent of time and place and thus accessible to a large number of users (Ministry of Finance, 2021c).

The effects of customer behavior and digitalization on each other have also been noticed in previous research. Ilmarinen and Koskela (2015) argue the change in customer behavior is a strong driver of digitalization (Ilmarinen & Koskela, 2015). Gerdt and Eskelinen (2018), meanwhile, state the companies that are able to change with their customers thrive in the business (Gerdt & Eskelinen, 2018). Based on the case study conducted by Vehmas et al. (2015), can be stated the digitalization has changed the customer behavior and this must be considered in the development of digital services. The early involving of customers to co-innovate services is emphasized by the researchers. Overall, the co-development leads to the improved service quality and stronger customer commitment and loyalty. (Vehmas et al., 2015.) Also, Hämäläinen et al. (2016) underline both participatory and experimental development with customers. The experimental development is iterative, agile and from parts to whole proceeding digital service development. (Hämäläinen et al., 2016.)

Co-development with service users is strongly emphasized by the researchers, but are there specifics in the digital service development compared to the non-digital ones? Williams et al. (2008) note the services are increasingly being provided digitally, whereby the service users do not necessarily interact with the service provider (or employee) at all (Williams et al., 2008). Rather, the users interact with a software system (Hofeman et al., 2014). Stickdorn and Schneider (2017) also predict the role of employees in the customer interface will increasingly be replaced by technology and the digital interaction will be the central part of service delivery (Stickdorn & Schneider, 2017).

Initially, Service Design methods have been used to develop traditional, face-to-face services. Hofeman et al. (2014), however, applied Service Design, specifically prototyping, for the digital service development. They argue digital service is basically a software provided for the service users although software is perceived more as a product than a service. Unlike development by using Service Design methods, the software engineering is considered as a technology-driven development with a precisely defined scope. Furthermore, unlike software engineering which focuses on developing the desired solution, the Service Design is

aimed at a comprehensive insight of customer needs. (Hofeman et al., 2014.) Rytilahti et al. (2016) also share the view that software engineering relies strongly on technical value propositions rather than achieving the holistic customer understanding. Digital business development is still technology-oriented, and collaborative and creative processes are not commonly utilized. They suggest service design should be started by creating a common understanding of digitalization as a phenomenon involving the technical, economic, and socio-cultural views equally. (Rytilahti et al., 2016.) Saunila et al. (2017) also agree digital services are fundamentally technological solutions requiring technological skills but communication and information sharing between customer and service provider create the foundation for the mutual trust. As the customer is not actually involved in the service production, the openness and communication are the characteristics of creating customer value in the digital service development. (Saunila et al., 2017.) In fact, according to Hofeman et al. (2014), thinking about software as a service requires a change in the understanding of the concept of value. Since the perceived value varies depending on the user, the service must support personal customer journeys. The user defines the value of the service subjectively and the value must be understood as a value-in-use, not as a value-in-exchange. (Hofeman et al., 2014.) Miettinen, Rytilahti, Vuontisjärvi, Kuure & Rontti (2015), in turn, summarize Service Design methods may well be exploited in the software engineering. As Service Design is finding its position as a method of service and service business development, it can also support digital business by providing tools to deliver value. The basis of the digital service design is the real-time value delivery which is based on in-depth customer insight and understanding. By using Service Design methods like service design prototyping, service scenarios, and co-design tools this can be achieved. (Miettinen et al., 2015). Also, Hofeman et al. (2014) state that applying service design is beneficial for digital service development because a better understanding of customer needs and a holistic service experience can be achieved by using service design practices. In addition, the communication among different stakeholders improves. (Hofeman et al., 2014.)

Despite several advantages, Hofeman et al. (2014) point out that there are also challenges, at least on a practical level. Service Design methods have mainly been used for traditional services and cannot be directly applied to the development of digital services. It is characteristic for digital service that the user interacts with the software, not with a person, thus the service provider cannot control the service experience as in a traditional service. Consequently, a digital service does not adapt to the different needs and behaviors of the customer with the same flexibility as a traditional service where the service provider (e.g., front stage employee) controls the situation. When developing a digital service, the customer journey must be fully understood because the service must support a wide variety of individual customer journeys. (Hofeman et al., 2014.) In summary, Hofeman et al. (2014) state that considering the special features of digital services, the Service Design methods must be adapted to the digital service development. Creating the practical guidelines would be helpful for this (Hofeman et al., 2014).

4.6 Literature Review Summary

The literature review examined the digital transformation brought about by new and emerging digital technologies. The literature indicated digitalization is a complex and rapidly changing phenomenon that inexorably affects all levels of society and aspects of individual life. It can be considered as a cultural change, a social phenomenon changing the structures of societies and organizations, and an opportunity to develop and create new business models. With digitalization and globalization, societies have transformed from industrial societies to networked information societies. At the same time, the economic structure of societies has changed from an agriculture and goods production-based industrial economy to a service economy. In the service societies, the customer's role is emphasized, and organizations are required to have an in-depth understanding of customers' needs and life. Furthermore, the interaction between service provider and user and common value-in-use is essential prerequisites for success in the digital era. Based on the literature, it can be concluded that the change in customer behavior has forced organizations to focus on customer experience, but on the other hand, the importance of positive customer experience for customer satisfaction and loyalty has been identified for a long time.

As the literature review progressed through the digital transformation and service economy to the customer experience, it was discovered that this study is strongly associated with the concept of Service Design. Several models of Service Design process are presented in the literature describing the process from the starting point to the outcome. Based on the literature Service Design is a holistic, user-centered, and co-creative methodology for designing and developing services. Common characteristics for Service Design practices are also tangibility, divergence, convergence, iterativity, and interdisciplinarity.

The literature indicated the organizational culture and strategy are crucial factors for digital success. A digitally mature organization is open, flexible, agile, inclusive and accepts risk-taking, experiments and failures. However, public sector organizations are often characterized as traditional, controlled, and bureaucratic organizations strongly governed by political decision-making and legislation. The literature review definitely revealed certain obstacles faced by public organizations in the rapidly changing operating environment of digital age. The silos between administrative sectors, resource shortage, incompatible information systems, inability to utilize technology and slow decision-making processes are mentioned as causing the lack of continuity in the digital service development. In summary, it can be stated the digitalization has multidimensional impacts on the operation of municipalities.

As a result of the literature review, a conceptual research framework was created for the thesis (figure 12). The framework is based on the model of Ilmarinen and Koskela (2015) presented in the chapter 3.2. The framework describes customer behavior change, technological revolution, and market change as three parallel drivers affecting the power, scope, and depth of digitalization.

The drivers affect simultaneously and there is a mutual connection between them. Since the context of the thesis is public sector, market change is applied from the perspective of public sector and treated as a change in the operating environment without competitiveness requirements.

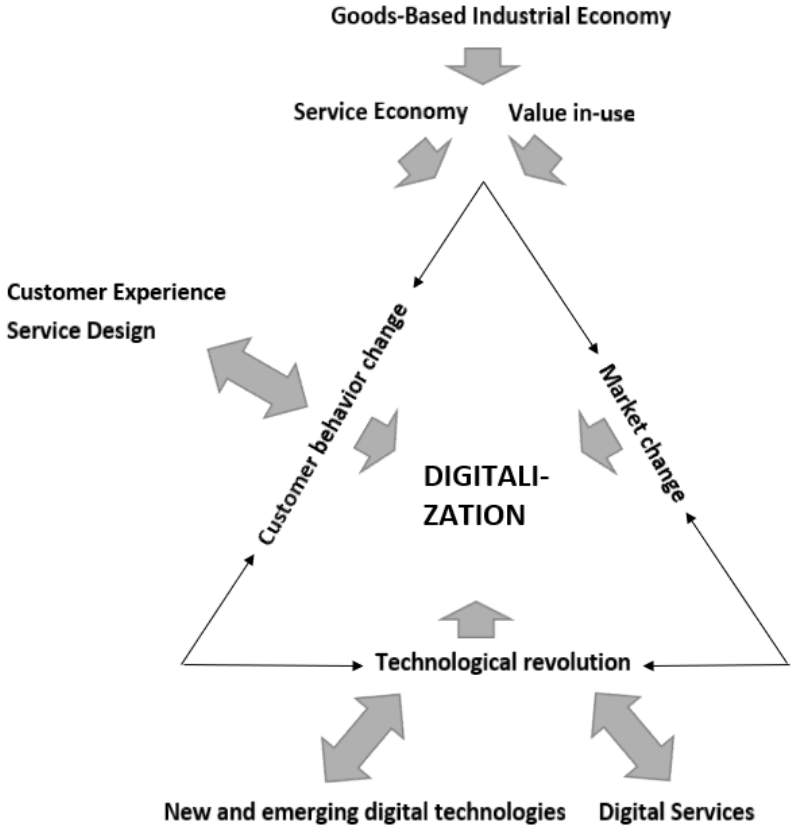

FIGURE 12 Study framework (adapted from Ilmarinen & Koskela, 2015, p. 52)

In the following empirical part of the thesis the effects of digitalization on the operation of municipal organizations are further investigated through interviews. In addition, it is examined whether Service Design practices are utilized in the digital service development.

5 RESEARCH METHODOLOGY

Master's thesis implementation is presented in this chapter. Firstly, the research objectives and questions presented in the introduction chapter are recapitulated. Secondly, the research method is presented. Thirdly the data collection process and selection of interviewees are described. Finally, the fourth subchapter includes data analysis and reliability and validity evaluation.

5.1 Research Objectives

The first objective of master's thesis is to investigate the digitalization both as a concept and as a phenomenon affecting societies, organizations, and people. As the emerging digital technologies have enabled the provision of digital services, the second objective is to explore Service Design process and principles in the service development. The theoretical contribution is formed by these two themes. According to Hirsjärvi, Remes & Sajavaara (2009), the familiarization with the literature introduces the researcher to the concepts and phenomena and guides in delineating research questions (Hirsjärvi et. al., 2009). Based on the literature review, it was noted the digitalization has been studied mostly from the private sector perspective, so the empirical research domain of the thesis is limited to the public sector. Consequently, the third objective is to explore both the impacts of digitalization on Finnish municipalities and the utilization of Service Design methods in the municipal digital services development. This forms the empirical part of the thesis.

5.2 Research Method

The master's thesis consists of two parts: theoretical and empirical. The theoretical background is implemented by the literature review. According to Hirsjärvi et al. (2009), the literature review is the foundation of the research and by

studying the previous literature systematically, the research scope can be determined (Hirsjärvi et al., 2009). The source literature was searched from various databases of scientific articles, journals, and library collections. In addition, some websites like Ministry of Finance and Association of Finnish Municipalities were exploited for the information search. The source material forms the theoretical foundation of the thesis. Based on the research articles and literature the digitalization is widely investigated as a societal and organizational phenomenon and the concepts of service-dominant-logic, customer experience and Service Design are introduced. The process and methods of Service Design are presented both in general and in terms of application to the digital service development. In addition, the theoretical part provides information about Finnish municipalities.

Since the comprehensive literature review creates a solid foundation for the research, Levy and Ellis (2006) state it also provides justification for choosing a relevant research approach and methodology (Levy & Ellis, 2006). Hirsjärvi et al. (2009), agree and state that the literature review guides the research method selection. Eriksson and Kovalainen (2016) describe the characteristics of different research approaches and mention that quantitative approaches deal with explanation, testing of hypothesis, and statistical analysis. Qualitative approaches, in turn, are concerning interpretation and understanding. (Eriksson & Kovalainen, 2016.) According to Tuomi and Sarajärvi (2018), rather than statistical generalizations, the intention of qualitative research is to understand, describe, and interpret the phenomenon, event, or activity under investigation (Tuomi & Sarajärvi, 2018). Further Hirsjärvi et al. (2009) define the primarily intention of qualitative research is the description of reality and real-life phenomenon as holistically as possible (Hirsjärvi et al., 2009). Myers (1997), meanwhile, notes the core of qualitative approach is understanding people and their social and cultural contexts (Myers, 1997). Based on the above considerations, the qualitative research method proved to be the optimal research method for this thesis as the objective is to explain digitalization as a phenomenon and investigate its real-life effects on societies, organizations, and people.

Hirsjärvi et al. (2009) designate as one characteristic feature of qualitative research the inductive analysis, meaning a detailed examination of research data instead of theory or hypothesis testing (Hirsjärvi et al., 2009). Furthermore, Hirsjärvi and Hurme (2008) state the qualitative research aims to connect the investigated phenomenon to a wider context and understand and interpret the perspectives of actors versatilely (Hirsjärvi & Hurme, 2008). To understand the actors, the researcher is observing and discussing instead of acquiring the data using the measuring instruments. Thus, the recommended qualitative research data collection methods are theme interviews, participative observations, group interviews, and discursive analyses of documents. (Hirsjärvi et al., 2009.) Since the context of thesis empirical part is public sector and the aim is to interpret and understand digitalization from the perspective of municipalities, employees responsible for digitalization can be considered as actors of the research. Further information about the target group of empirical study is provided in the next chapter, where the data collection process is presented.

5.3 Collection of Empirical Data

Hirsjärvi and Hurme (2008) emphasize the methods are central in the empirical research as the method must be suitable for solving the research problem. Efficiency, economy, accuracy, and reliability are often criteria for selecting the method. (Hirsjärvi & Hurme, 2008.) According to Hirsjärvi et al. (2009), the recommended data collection methods for qualitative research are interview, observation, and document analysis, of which the interview is the most used. (Hirsjärvi et al., 2009.) Although interviewing is an important and general data gathering method, it also has disadvantages (Myers & Newman, 2007; Hirsjärvi & Hurme, 2008; Hirsjärvi et al., 2009). The interview takes a lot of time, needs to be carefully planned and requires an experienced interviewer. Furthermore, the human tendency to give positive and socially expected answers rather than negative ones may reduce the interview's reliability. (Hirsjärvi et al., 2009.) Myers and Newman (2007) name disadvantages such as the lack of trust and time, difficulties of choosing the relevant interviewees, and the possibility to misunderstand both the questions and answers (Myers & Newman, 2007). On the other hand, according to Hirsjärvi et al. (2009), compared to a form survey the interview is a flexible data collection method because the interviewee is an active part of the research and the researcher has an opportunity to interpret answers and ask clarifying questions during the interview (Hirsjärvi et al., 2009). Hirsjärvi and Hurme (2008) mention an opportunity to motivate the interviewee and to obtain in-depth information, and justifications from the interviewee as the advantages of the interview (Hirsjärvi & Hurme, 2008). The disadvantages were weighed against advantages, and finally the interviews were chosen as the empirical data source for the thesis.

In the qualitative research literature, the interviews are usually divided into structured, semi-structured and unstructured interviews (Hirsjärvi & Hurme, 2008; Eriksson & Kovalainen, 2016; Myers & Newman, 2007). However, Hirsjärvi and Hurme (2008) argue the terms are not unambiguous. They classify the structured survey into the own category while the other types of interviews (unstructured, semi-structured, theme interview, in-depth interview, and qualitative interview) form their own category. (Hirsjärvi & Hurme, 2008.) Eriksson and Kovalainen (2016) emphasize that both the choice of interview type and interview questions should be considered through research approach and research questions. Interview questions do not directly provide answers to the research questions, but by analyzing the data provided by the questions, the research questions must be able to answer. (Eriksson & Kovalainen, 2016). According to Qu and Dumay (2011), a semi-structured interview is a conversation-based interview including in advance prepared questions on specific themes. The interviewer modifies the style and order of the questions, giving the interviewees an opportunity to respond using their own terms and language. This is valuable if the aim is to understand the social world of the interviewee. (Qu & Dumay, 2011.) Since the thesis aims to study digitalization as a societal phenomenon and understand its

effects on the operation of municipalities a semi-structured interview was considered an appropriate interview type for this thesis.

According to Tuomi and Sarajärvi (2018), in qualitative research, the persons the data are collected from should be experts in the phenomenon under study (Tuomi & Sarajärvi, 2018). Hirsjärvi et al. (2009) agree and state that in qualitative research the target group is chosen expediently, not by random sampling (Hirsjärvi et al., 2009). Quite obviously, the target group of this thesis is the municipal representatives. Qualified persons for the interviews were searched from the municipal websites by familiarizing with the organizational structure of the municipalities. Employees responsible for digitalization were found based on title and job description. The level of experience could not be ascertained in advance but based on the job title and the position in the organizational structure, it was assumed that the selected persons are professionals in the field of digitalization and therefore suitable interviewees. Geographically, the search extended across the whole country. Hove and Anda (2005) state that in addition to the actual interviewing several other activities related to the interviews are required, one of which is the scheduling of interviews (Hove & Anda, 2005). The scheduling was initiated by sending interview requests to the selected employees. The subject and themes of the thesis, the author and supervisor were presented in the interview request. The confidentiality of the interview was also mentioned. The request was sent by email to 15 employees responsible for digitalization and municipal digital service development. Six employees accepted the request, one of them recommended another person from their organization to be interviewed, and the interview was conducted with that person. All interviewees either lead or coordinate the development of digital services in their municipality. In three municipalities the service designer is a municipal employee, so called in-house service designer. In two of these municipalities the external service design consultants have also been used. In one municipality there is no employed service designer, but external service design consultants have been used. Two municipalities do not have an employed service designer nor have used external service design consultants. Five out of six municipalities have utilized Service Design methods in the development of digital services (table 3).

TABLE 3 Role of Service Design in the municipality

Code	In-house service designer	External service design consultants are used	Service Design methods are used
M1	No	No	Yes
M2	Yes	No	Yes
M3	No	Yes	Yes
M4	Yes	Yes	Yes
M5	Yes	Yes	Yes
M6	No	No	No

The interview was conducted at the time suggested by the interviewee via Zoom (a cloud-based video communication application) and with the permission of the

interviewee the session was recorded. The data collection was conducted between June 2022 and September 2022. The durations of the interview meetings varied from 31 to 43 minutes, with an average duration of 36 minutes. The interviews were conducted in Finnish. The municipalities that participated in the interviews are located on the map of Finland in the south, north, west, and east. The interview questions are introduced in Appendix 1.

5.4 Data Analysis and Research Reliability and Validity

According to Puusa and Juuti (2020), "the aim of the data analysis is to describe, interpret and understand the phenomenon under study." (Puusa & Juuti, 2020, p. 143). They designate systematicity, transparency, revisability, and justifiability as basic concepts of data analysis, but also note that there are only few standardized analysis methods in the qualitative research (Puusa & Juuti, 2020). Hirsjärvi and Hurme (2008) describe the stages of qualitative research analysis as a spiral which is proceeding from data description and coding to finding connections and finally reporting the results (Hirsjärvi & Hurme, 2008). Eriksson and Kovalainen (2016) introduce categorization and interpretation as the most common qualitative content analysis types. The aim of categorization is to achieve a comprehensive and real description of the phenomenon under study. Interpretation, in turn, is interested in how and why the meanings arise and what kind of relationship they have. However, they mention that due to familiarization with the data, the categorization of the content before interpretative analysis may also be necessary. (Eriksson & Kovalainen, 2016.) According to Tuomi and Sarajärvi (2018), content analysis can be based on either data or theory. When the analysis is based on collected data, theoretical concepts are created from the data and the research data thus form a theoretical entity. In the analysis based on theory, the theoretical concepts related to the phenomenon under study have already been defined, and the empirical data is connected to these concepts. However, it should be noted that both data-based and theory-based content analysis are driven by data. (Tuomi & Sarajärvi, 2018.) This thesis aims to examine the effects of digitalization on operating methods and environment in Finnish municipalities. As a result of the literature review, the theoretical concepts related to the digitalization were defined and the research framework was created. The literature review revealed that the technological revolution, changes in customers' behavior and change in market are powerful drivers of digitalization. These changes are parallel and affect each other simultaneously, changing the operating environment of organizations. The meanings and relationships of these drivers are analyzed and interpreted through data gathered in the interviews. The above-mentioned aspects thus support the theory-based interpretation as an analysis method of the thesis.

Hove and Anda (2005) advise the interviews should be carefully planned and conducted as it has an impact to the quality of collected data. The recording of interviews is thus appropriate since the data analysis is based on what has actually been said in the interview. They also note that both transcribing

interviews and data analysis are time-consuming phases in the qualitative research. (Hove & Anda, 2005.) All interviewees agreed to the recording, so each interview was written into the text format shortly after the session. After the transcription the text was read through and already at this phase issues relevant for the thesis were highlighted. According to Hirsjärvi and Hurme (2008), one characteristic of the interview is that the information provided by the interviewee is confidential (Hirsjärvi & Hurme, 2008). Confidentiality was emphasized by mentioning in the interview request that neither the municipality nor the interviewee participated in the study could be identified. For this reason, the interviews were anonymized by naming the interviewees as M1, M2 etc. The letter M is an abbreviation of the word "municipality".

After conducting all six interviews, transcribed interview texts were read carefully several times. Similarities and frequent issues were sought from the contents of the interviews, but simultaneously attention was also paid to the differences and unique issues. The findings were then compiled into a matrix in which each interviewee had own column and each question own row. The highlighted issues, gathered from answers, were written on the rows. This matrix provided a holistic view of data. With help of the matrix, the themes relevant to the thesis were categorized by marking each theme with its own font color. After that the texts were gathered into the text document. Each theme has its own document, and the interview data were analyzed theme by theme.

According to Hirsjärvi et al. (2009), the concepts of validity and reliability are usually related to quantitative research. Reliability means the repeatability of measurement results, with the aim of indicating the results are not coincidental. Validity, on the other hand, refers to the ability of the research method to measure exactly what is desired. (Hirsjärvi et al., 2009.) However, Puusa and Juuti (2020) point out that it is often claimed the concepts of validity and reliability used in quantitative research are not entirely applicable for evaluating the credibility of qualitative research. They state that credibility of qualitative research is formed through the description of research process, justifications, and analysis. (Puusa & Juuti, 2020.) Hirsjärvi et al. (2009) also state the accurate description of all phases of research increases the reliability of qualitative research (Hirsjärvi et al., 2009). Tuomi and Sarajärvi (2018) agree and state that in order to increase the clarity and comprehensibility of research results and to facilitate the evaluation of the results, the researcher must provide sufficient information about research process (Tuomi & Sarajärvi, 2018). In the Introduction chapter the need for this thesis is justified. Furthermore, this chapter 5 contains a detailed description of the research process and data analysis. To achieve a high level of validity and reliability, the choices made have been carefully evaluated and justified.

6 FINDINGS

In the following subchapters the findings based on the data analysis are presented. The thesis conceptual framework, based on framework of Ilmarinen & Koskela (2015), describes three parallel changes affecting the power of digitalization. The data analysis was formed based on this framework and data collected in the interviews. The impacts of technological revolution, customer behavior change, and operating environment changes are presented in own subchapters.

6.1 Technological Revolution and Digital Services

Ilmarinen and Koskela (2015) argue the emerging technical innovations and applications have initiated the digital transformation, but also state that technology merely creates opportunities, because only new, digital operating methods lead to digitalization (Ilmarinen & Koskela, 2015). The interviews revealed the technology is approached from different perspectives when developing digital services. In some municipalities the technology is perceived as a limiting factor.

> The immaturity of the technology is a challenge. The reality is revealed when it is found out whether technology can implement the desired features. (M2)

> There are no solutions or technology for everything that is desired. When you work with standard applications and identify issues that should be better, the technology is limited. On the other hand, it is challenging to start developing customized applications without a partner as there is no possibilities to develop service only for our municipality. (M3)

Despite the limitations of technology, the digital services are perceived mainly positive, and one advantage is the efficiency and transparency of operations. Most of the interviewees mentioned the enhancing of operations and cost savings as the motivation for the development of digital services.

> Manual work is expensive, and the aim of digitalization is to make operations more efficient. (M1)
>
> We must automate services and by that extension make operations more efficient. (M2)
>
> After all, operations have become more efficient as services have been digitalized. We can work faster and more error-free and with a lower number of employees. Furthermore, the positive aspects that have been identified are that a lot of routine tasks have been automated with the help of e.g., software robotics. (M3)
>
> The aim of digitalization is cost-effectiveness and work efficiency. (M4)
>
> Digitalization saves time, this is clear. (M5)

On the other hand, one interviewee remarked the cost of digitalization should always be calculated and evaluated whether it is economically profitable to invest for digitalization if a service has only few transactions per year. Furthermore, all interviewees noted that municipalities cannot provide services only through digital channels. Despite the advantages offered by digital services, the telephone and face-to-face services must still be available for residents. The interviewees emphasized the importance of data acquired through digital services as a support for decision-making. The information generated by data-analytics is utilized in the knowledge-based management.

> We aim to collect data automatically and obtain higher quality information to support decision-making. (M1)
>
> It is easier to monitor the quality of service with the data generated from digital transactions. Data analytics will be utilized from the knowledge-based management perspective to better allocate resources. (M2)
>
> The feedback system helps with the knowledge-based management, because by analyzing the data, we know how much and what issues the questions concern. (M6)

Some of the interviewees stated the processes have not been digitalized comprehensively. If only part of the process is digitalized, new operating methods cannot be deployed completely, and the benefits of digitalization will not be realized.

> The whole process should be able to open, not just make a pdf-form. Also, the integrations with other systems are important to implement. (M1)
>
> We should evaluate the level of digitalization. The whole process should be digitalized, not only a form. For example, application from resident, decision-making and finally decision should be provided digitally. (M2)
>
> The whole process should be examined whether it is necessary to do all phases in the same way as before or whether some phase needs to be done at all. (M3)

> We still have phases where papers are used because the entire process has not been digitalized and there is still work to be done. (M4)

> When we only make an electronic form, the process is still the same and there are no benefits at all. (M6)

In summary, the immaturity of technology causes challenges when developing digital services. However, the digitalization of services benefits municipalities by providing higher quality of information for decision-making, reducing costs, and increasing operational efficiency, although to achieve a comprehensive benefit the whole process should be digital (table 4).

TABLE 4 Technological challenges and benefits

Technology and digital services	
Challenges	**Benefits**
Technological limitations Partially digitalized processes	Operational efficiency Cost savings Knowledge-based management

6.2 Customers and Value-in-use

With referring to the literature, customer behavior has changed with the development of digital services, and it is considered one driver of digitalization. People living in the municipality and companies operating in the municipality area are customers of the municipality. The interviews described the change of customer behavior as follows:

> After all, it comes from the residents that services must be digitalized. (M1)

> It is this development in the world and of course the customers. The public sector may be slow, but when companies and banks have begun to offer digital services, similar services are also expected from municipalities. (M2)

> There is pressure from the residents. They want to use services without visiting physically as they are used to use services digitally with banks and insurance companies. (M3)

> The residents demand that there must be an opportunity to use services digitally. (M4)

Even though the residents demand digital services, municipalities have also noticed the importance of a good customer experience. Several interviewees emphasize customer-centricity and feel that digital services are a new way to deliver value to the residents.

> Serving residents better is an important issue for municipalities nowadays. We strive for interaction, and we want feedback from our residents. (M1)

> A lot of benefits have been obtained from digitalization, e.g., better accessibility of services for customers. (M2)
>
> It is important to us that residents can use services with the municipality in the same way as with companies. That the residents can use services regardless of time and place. (M3)
>
> The aim is to make services easily available. That the services are easy to find, and they are not tied to office hours or a specific service location. In practice the daily life of residents becomes easier. Sometimes a municipal employee does not benefit from digitalization, but you must note that residents save time when service is digital. (M5)
>
> It is clear, that with digitalization, the customer service has improved. The optimal situation is that the administration and the supporting process and the information system are transparent to the customer. (M6)

However, Service Design as a concept and philosophy is familiar to all interviewees. They particularly emphasized customer-centricity, but one interviewee also mentioned the objectives of organization must be considered.

> When Service Design is included in the development of service, the customer is the most important thing. Either the resident or if it is an internal service, the employees working with the service. We have tried to forget the technology and looked for the best possible solution that meets the needs. (M2)
>
> I would say that customer-centricity is emphasized in Service Design. You have to think about how the service looks from the customer's point of view. (M3)
>
> It is important the customer's perspective is considered, but of course also the objectives of the organization. (M4)
>
> Service Design is the visioning of an optimal service with the residents or entrepreneurs. (M5)

The most common practical methods of Service Design used in municipalities are customer path mappings, service blueprints, interviews, surveys, workshops, prototyping and the creation of user profiles. The residents have also tested the beta version of service and provided feedback of the service experience. In municipalities with an in-house service designer, customer-centricity, co-development, and to some extent also the experimental culture are essential part of the development of digital services. The key tasks of in-house service designer are to strengthen co-operation, change the perspective on customer-centricity and act as a contact person if service design consultants are used. Furthermore, the service designer plans, coordinates, and often also runs the practical events e.g., workshops. The experiences with Service Design are mainly positive, but interviewees also brought up some challenges related to Service Design.

> Service Design requires time as it is not the basic work. It is often perceived as an additional work. The higher you are in the organization the less there is time. However, the commitment and views of managers are important. It is a challenge. (M2)
>
> Always workshops are not successful. It depends on how the workshops manage to find different use cases and user situations. (M3)
>
> Of course, it has been commented that workshops are demanding, and the efforts have to made, but in the end the experience has been positive. (M4)

Together with technological revolution and changes in the operating environment, the change of customer behavior is considered one driver of digitalization. This has been observed in municipalities, as most interviewees named the demands of residents as the main reason for starting to develop digital services. Table 5 presents the roles of residents and municipality in the interaction of service user and service provider.

TABLE 5 Customers and value-in-use

Customers and value-in-use	
Customers/residents	**Municipality**
Demands for services digitalization	Customer-centricity
Participation on service development	Value proposals and value-in-use
Value determination and value-in-use	Role of in-house service designer

6.3 Changes in Operating Environment

The literature indicates that with technological revolution and customer behavior change, the market, competitiveness, and operating environment of companies are also in the process of transformation. This has implications for the public sector too. Digital services are not required only by the residents, but also the legislation obliges municipalities to offer digital services. The interviewees referred to the law on the provision of digital services (Digital Services Act), which came into force in 2019. The law is applied to the municipalities, and it requires them to provide for residents the opportunity to use services digitally or through other electronic data transfer methods. The aim of the law is "to promote the access, quality, information security and content accessibility of digital services, and thus improve the opportunities for everyone to use digital services." (Digipalvelulaki, 2019.)

As the external environment is changing, there are changes also in the internal structures of the municipalities. The deployment of digital services affects inevitably the work tasks of employees. New tasks often require learning and acquiring new abilities. After all, this can lead to the need to re-evaluate the structure of the organization, both in the administrative sectors and in the ICT-

department. In some municipalities, the reorganization has already taken place, in some it is being planned.

> We are planning an organizational reform. Our municipality will have a development team and an ICT-designer will be hired. The Service Design and digital service development will be the focus of her/his work. (M1)

> It is digitalization that changes organizational structures and how services are produced. Job descriptions become different and so on. (Interviewee 2)

> We have a digitalization steering group that aims to coordinate digitalization holistically in our municipality. When a development idea arises in the administrative sector, they describe it to the steering group which examine the project proposal and check whether the same kind of system is already in use in another administrative sector. (M5)

When discussing the structural changes, the interviewees raised their views on the co-operation between administrative sectors. Only one interviewee mentioned the co-operation is fluent, the others stated the lack of co-operation between administrative sectors is a problem. On the other hand, the co-operation between different administration sectors and ICT-department was also perceived as a challenge. According to one interviewee, the silo effect is maintained by the fact that each administrative sector has its own money. In addition to common financial resources, it was also hoped that there would be more time for the co-development of services across administrative sector boundaries.

> We have pretty close co-operation between the administrative sectors in the municipality. We have appointed digital experts in each administrative sector. They bring up ideas and then we check the schedule and budget and plan how to proceed. (M3)

> The municipality has silos between different administrative sectors and things have been done in silos, which is a challenge. (M2)

> Each administrative sector has its own money which maintains the silo effect. There should be common financial resources for co-development of digital services. (M6)

On the other hand, the silo-effect between administrative sectors was also thought from the perspective of customers. It was seen both as an objective and a challenge that the municipality would be able to offer digital services comprehensively, hiding the different administrative sectors from customers.

> Perhaps the most challenging thing in the future is how different administrative sectors can be hidden from customers. How could we provide services in a way that administrative sectors are hidden? (M2)

> If I think about our online services, the aim was to make a comprehensive service so that the customer does not need to know which administrative sector provides the service. (M4)

In addition to organizational restructuring, changes in employees' duties and co-operation between administrative sectors, the importance of municipal networking emerged in the discussions. Co-operation in the development of digital services is already being done, but more of it would be needed. Networking would be beneficial both in terms of knowledge and economy.

> The networks between municipalities are important. One type of support is that kind of mental support. A lot of information is shared between municipalities. The exchange of information is important, and we encourage experts to network. (M3)

> Municipal co-operation has been done when applying for funding of various projects. Knowledge and sharing of best practices between municipalities. I would like more of that. (M4)

> Yes, we have connections with the Association of Finnish Municipalities, Ministry of Finance, and Digital, and Population Data Services Agency, but there should be more municipalities' own networks. We should network, not only in digitalization and ICT, but more holistically. (M6)

The changes in the operating environment can be classified as internal and external (table 6). The deployment of digital services is inevitably causing changes to the work tasks of employees. This often leads to the structural changes in the organization. Furthermore, to achieve a full benefit of digitalization, the entire process should be digitalized, and this often requires co-operation both between administrative sectors and with ICT-department. Three change factors affecting from outside the municipality can be listed and they are legislation, private sector digitalization and networking. Firstly, Digital Services Act obliges municipalities to provide digital services to the residents. Secondly, the digitalization of private sector has a significant impact on municipalities because the residents want to use services digitally in the same way as with companies. Thirdly, the co-operation between municipalities in the development of digital services would be beneficial both in terms of economy and knowledge.

TABLE 6 Operating environment change

Operating environment change	
Internal	**External**
Changes of work tasks Organizational restructure Co-operation between administrative sectors	Legislation Private sector digitalization Networking

7 DISCUSSION

Eriksson and Kovalainen (2016) remind that by analyzing the interview data, the research questions must be able to answer (Eriksson & Kovalainen, 2016). In this chapter the results of the study are discussed, and the following research questions are answered:

1. How does digitalization affect the operation of municipalities?
2. How is Service Design applied to the municipal digital service development?

This thesis explored both the effects of digitalization on operating environment, and the application of Service Design to the development of digital services in Finnish municipalities. The empirical data were collected through interviews with municipal employees and then analyzed using a theory-based interpretation method. The theoretical framework for thesis was established from the literature and the data were analyzed and interpreted based on this framework which emphasizes three parallel drivers for digitalization. These drivers and their impacts on municipal operations are discussed below.

The literature review considered the development of technology as the main driver of digitalization. However, in the municipalities, the change of customer behavior was perceived as the primary driver. Digitalization in the private sector has progressed rapidly and companies are increasingly offering services digitally. Consequently, the residents demand digital services from municipalities as well. The literature review indicates the share of services in the employment and production structure of societies has strengthened. As a result of this change, both the importance of a good customer experience and value creation with customer and service producer are emphasized. The understanding of value creation has developed, and it is assumed the service provider can only offer value propositions to customers (or service users). The customers ultimately determine the value, and it is based on their subjective experiences, and interactions with service provider as value-in-use. The municipalities participated in the research have also discovered the importance of positive customer experience, and

customer-oriented thinking is very common. The main reason for services digitalization is the demands of the residents, but on the other hand the interviewees emphasize the customer-centricity and the accessibility of services to make residents' everyday life smoother. Not forgetting that the legislation requires municipalities to provide digital services.

Based in the literature it is argued that there are no design traditions in the public sector and therefore no service design skills either (Tuulaniemi, 2011). In some articles the organization's design thinking maturity is evaluated by classifying it into different levels (Junginger, 2009; SEE Platform Report, 2013). The maturity level can vary from absence of design thinking to a situation where it is embedded in the organization's strategy and business model. This is supported by the empirical study as different levels can be observed in the maturity of design thinking. As mentioned above, three municipalities have hired a service designer. The in-house service designer participates in digital service development projects with emphasis on customer-centricity, residents' participation, and cooperation between both ICT-department and different administrative sectors. In these municipalities service design methods are a core part of digitalization projects. However, none of the municipalities are at the level that service design thinking is a key part of organization's strategy.

As observed by the literature, new and emerging digital technologies have enabled the digital transformation of societies (Ilmarinen & Koskela, 2015; Nwankpa & Roumani, 2016; Parviainen et al., 2017; Legner et al., 2017). Digital applications have made the use of services possible regardless of time and place. This was also stated in the interviews, and the municipalities participated in the research, mostly have a positive attitude towards technology, although the immaturity of technology sometimes causes challenges for digital services deployment. Several municipalities prefer standard solutions when acquiring information systems as the software customization often means additional costs. In addition to the technological limitations, the interviewees mentioned the partial digitalization of a process as a problem. The process should be explored step by step with the goal of whole process digitalization leading to the change of operating methods. This finding is supported by the literature which emphasizes that the whole process must be digitalized to achieve the operational efficiency (Sofigate, 2019; Sofigate, 2021). The literature review identified that in addition to technological changes, there is also need for changes in the organization's structure, processes, and culture (Kane et al., 2015; Kane et al., 2017; Morakanyane, et al., 2017; Vial, 2019). This conclusion is also supported by the empirical data. Digitalization changes employees' working tasks and renews processes and restructuring of the organization is often needed.

According to the literature, public sector organizations are considered traditional, controlled, and bureaucratic organizations that are strongly guided by political decision-making and legislation (Virtanen & Stenvall, 2014; Gartner, 2017; Virtanen & Stenvall, 2019). The silos between administrative sectors (Sydänmaanlakka, 2015), lack of resources, incompatible information systems, inability to utilize technology and slow decision-making processes are designated as

challenges for the long-term development of digital services (Hyvärinen & Parviainen, 2018). In the empirical study, the lack of financial and time resources, and silos between administrative sectors emerged among the above-mentioned challenges. Both the co-operation between administrative sectors and co-operation with ICT-department is often incomplete and digital services are not developed holistically. On the other hand, in those municipalities where organizational restructures have already been made, the co-operation has increased. In addition, in municipalities where service design methods are used in the development of digital services and the process is examined from the perspective of all administrative sectors and residents, the co-operation has increased. It can be concluded that changes in the organizational structure, and co-development of digital services increase co-operation and decrease the silo effect.

Unlike companies, municipalities do not have to compete for market shares and customers, but municipalities are still expected to be effective. Reducing costs and rationalizing operations are required even though the resources of public organizations have decreased. (Työ- ja elinkeinoministeriö, 2011; Ministry of Finance, 2021b.) The interviewees supported this view by naming the cost savings and operational efficiency as reasons for developing digital services. As mentioned above municipalities usually buy standard applications because customization is expensive, and municipalities do not have financial resources to develop digital services only for their own use. According to the interviewees the solution to this problem would be the co-operation between municipalities. Networking was considered very important and in some municipalities the employees are encouraged to share knowledge and best practices.

Figure 13 presents the modified study framework, with the addition of the empirical results. The market change can be considered as a change in the operating environment in the public sector. The external factors affecting the operating environment are the legislation, private sector digitalization and networking. Organizational restructuring can be seen as an internal change factor caused by changes of work tasks. Technological revolution has its challenges and benefits. The limitations of technology and partially digitalized processes cause challenges for comprehensive digital development. However, the advantages achieved by using digital technologies are the operational efficiency, cost savings and knowledge-based management. The third driver of digitalization – the customer behavior change – can be described from the perspective of the interaction between the residents and municipality where the role of in-house service designer is significant. The residents demand digital services, to which the municipalities respond by adopting a customer-centric approach and involving residents in the digital services development. The municipality offers value proposals, and the residents determine the value of service.

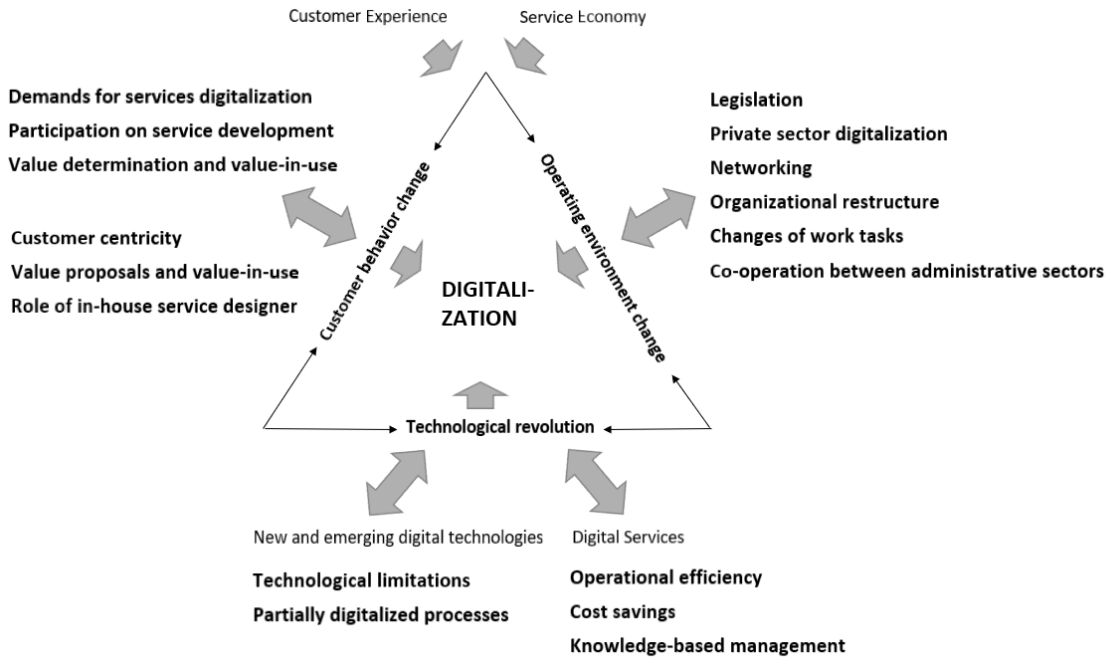

FIGURE 13 Modified study framework based on the empirical results (adapted from Ilmarinen & Koskela, 2015, p. 52)

As answers to the research questions, it can be stated digitalization has many different effects on the operation of municipalities. External change factors such as digitalization of private sector, legislation and change in customer behavior force municipalities to digitalize their services. Digital services inevitably change processes and work tasks which in turn leads to the changes in the organizational structure. On the other hand, municipalities are required to reduce costs and improve efficiency, and digitalization responds to these requirements. Digital services make operations more efficient, save operating costs and facilitate knowledge-based management, which in turn accelerate digitalization. In addition, both financial and knowledge benefits can be achieved through municipal networking. Service design as a concept and principle is known in the municipalities. Service design is applied in the development of services at some level in all municipalities, especially in those municipalities with in-house service designer. Service design methods, such as co-development, workshops, customer journey mappings and co-development with residents are mainly considered an effective means of developing services. Admittedly, the technological limitations and challenges posed by financial resources have been also understood.

8 SUMMARY AND FURTHER RESEARCH

The objectives of this thesis were to study digitalization and Service Design both at the theoretical level and in the context of Finnish municipalities. The literature review examined the digital transformation and digitalization both at the conceptual level and as a phenomenon. The digitalization was found to be a complex and rapidly changing phenomenon affecting societies, organizations, and individuals. The literature review also described the transformation of societies from product-oriented industrial societies to the service economies. In service societies, organizations are required to have an in-depth understanding of customers' lives and needs and the interaction between service provider and service user and common value-in-use are emphasized. Furthermore, the process and principles of Service Design and the application of service design methods in the digital service development were explored. Based on the literature review, three drivers of digitalization were identified. Customer behavior change, technological revolution and market change are simultaneously affecting digital development.

The empirical part of the thesis examined the effects of digitalization on the operation of Finnish municipalities. Furthermore, the application of Service Design methods in digital services development was explored. The empirical data of the thesis consists of six interviews and the interviewees are either leading or coordinating the development of digital services in their municipality. The data were analyzed based on the theoretical framework describing three parallel drivers of digitalization influencing each other. Study framework is based on the model of Ilmarinen and Koskela (2015).

The literature found the development of new digital technologies is the strongest driver of digitalization. However, in Finnish municipalities, the change of customer behavior proved to be the main factor driving the change. The residents demand services independent of time and place. The results of the study showed that the municipalities have responded to these expectations by adopting a customer-oriented approach to the services delivery. Services are developed in collaboration with residents and feedback is collected to improve the quality of services. Furthermore, the municipalities change the organizational structures to reflect the digital age and hire in-house service designers. Digitalization is

included in the municipal strategy or has its own strategy. Municipalities are required to develop and provide new user-oriented services, but simultaneously the resources have decreased. In conclusion, the external changes in the operating environment force the municipalities to provide digital services, but on the on the other hand, digitalization creates opportunities to improve operational efficiency, save costs and above all, serve the residents better.

There are also limitations to this study. The themes of the thesis are both digitalization and application of Service Design in the digital service development in Finnish municipalities. To achieve an in-depth understanding of both themes it would have been necessary to interview both the digitalization expert and in-house service designer working in the municipality. Now the expertise of the interviewees, except for two interviewees, was focused on the digitalization. Secondly, the aim was to interview at least ten employees and fifteen interview requests were sent, but the number of interviews was only six. The sampling group represents about two percent of 309 municipalities in Finland. Therefore, the results cannot be straightforwardly generalized, although the findings support the theoretical background of the study.

Maybe the limitations mentioned above can be the proposals for further research. To achieve a comprehensive understanding of the digitalization's effects on Finnish municipalities, the number of municipalities participating in the research should be larger. Instead of qualitative research, perhaps this could be accomplished by the quantitative research method. One further research proposal would be to study digitalization based on the municipalities' demographic factors such as geographical location or population. In this case, the research could focus on the largest municipalities in population or on the contrary, on the smallest ones. A group interview with representatives from both digitalization and service design could be a way of exploring the themes wider. It would be valuable to study digitalization also from the residents' perspective. Digitalization is a complex and rapidly changing phenomenon, the effects of which extend to each of us. This thesis made a tiny research journey into the digital world both at the general level and from the perspective of Finnish municipalities.

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APPENDIX 1 INTERVIEW QUESTIONS

1. Is there a digital strategy or is digitalization included in the municipal strategy? Please, describe the strategy.
2. Which services provided by the municipality have been digitalized??
3. What factors have influenced to the initiation of the digital services development?
4. Please, describe the effects of digitalization on the operation of municipality.
5. Please, describe a typical digital service design and deployment process.
6. Please, evaluate what kind of benefits and advantages have been obtained from the deployment of digital services.
7. What challenges have been experienced in the development and deployment of digital services?
8. Have Service Design methods been used in the development of digital services?
9. If Service Design methods have been used, what have they been and what experiences have been gained from them?
10. Please, describe the benefits of using Service Design methods in the development of digital services?
11. Please, describe the challenges that have been experienced in using Service Design methods in the development of digital services?
12. Please, evaluate how successful the digitalization of services has been.
13. Have you received support for the digital service development from outside the municipality?
14. What are the plans regarding the digitalization of services in the future?