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Applying Service Design Methods for Multichannel Service Integration with Mobile Application in Automotive Industry

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ABSTRACT

The automotive industry transforming as new technologies are emerging. Not only do the new service channels require formulation, but they also have to be implemented to all stakeholders and integrated into the service journey. The objective of the study is to address the challenges the integration of the new mobile application generates. The study follows the frameworks of service design and user experience design and utilizes commonly used tools. Two experts are interviewed to acknowledge relevant methods to achieve the objectives of the study.

The empirical part of the study focuses on a single-case and consists of multiple customers' and dealers' experience regarding the mobile application introduction and deployment. The data is collected by conducting semi-structured interviews. Additionally, the study includes own interpretation and mobile application testing to comprehend the findings.

The basis of the study relies on experiences of customers and dealers, where the influence on the dealer's actions on the customer journey is studied. The study exposes the relationship between the commonly known service components. Additionally, the study reveals the connection between service design and user experience design. The study addresses the significant issues to take account of regarding the mobile application integration into the multichannel service journey. While the users of the mobile application arise, the challenges regarding the integration become more painstaking. The research reveals challenges that need to be considered.

KEYWORDS: Service design; UX design; Customer Journey; Mobile Application

1. INTRODUCTION

Digitalization offers incomparable opportunities to the businesses but may also create almost insurmountable challenges. Especially, the utilization of m-commerce services is increasing significantly (Kleijnen, Ruyter & Wetzels 2007). In a best-case scenario, new service opportunities generate a competitive advantage. New service development and implementation often cause organizational and other challenges. Challenges such as lack of knowledge to implement the transformation and operative pushback are depending on different factors (Majchrzak, Markus & Wareham 2016). The organizations must overcome those challenges to bring the connecting technologies and digital services together in a form that is practical and enjoyable for the customer.

The automotive industry is one of the leading innovators to discover new technologies (Gusikhin, Rychtyckyj & Filev 2007). Digital transformation has affected the automotive industry in multiple ways. The connectivity, sharing cars, digital safety, and autonomous driving are digital transformation trends within the industry (Newman 2019). Internet of Things (IoT), smartphones, and wireless communication provide the possibility to offer connected services. This transformation is open-ended, and the development of digital services, related to driving and movement, as well as the connecting technologies in the field, pursue to generate in the future.

Businesses may struggle with a question of how to successfully design a new service that meets the customer's needs and requirements. Both customer experience (CX) and user experience (UX) are getting increasingly attention (Garrett 2010). Still, numerous businesses are unsuccessful in understanding the customer's complete experience (Rawson, Duncan & Jones 2013). It is highly important to obtain knowledge on customers' preferences and needs to serve them in the best ways possible. As the fleet of cars is slowly renewing more connected cars will be in our traffic and the cars will be more integrated into our devices (Coppola & Morisio 2016). As the challenges in the development and implementation of the new digital services with connected technology already exist it is highly important to define the key factors and solutions to overcome them before the number of service users will increase significantly. The user experience must be developed foremost an insurmountable number of challenges generate.

1.1. Motivation for the study

Service development and innovation are exposed to be expensive but nowadays required to operate successfully in the long term (Brentani 1991). In the automotive industry, the connected technologies offer new service opportunities that allow the customers to be more aware of their driving (Gao, Kaas, Mohr & Wee 2016). Still, digital service development is a relatively new field for industrial organizations (Brentani 1991). In the automotive industry, the development focuses on the products instead of the services. Increasingly industrial organizations are developing services as an innovative way of increasing value (Kastalli, Looy, Neely 2013). Usually, through the new service development, businesses are seeking differentiation that provides a competitive advantage, however, in some cases, the businesses are just trying to keep up with the development (Baines, Lightfoot, Benedettini & Kay 2008). Nevertheless, several of the product-service providers are now trying hard to operate the services effectively (Kastalli et al. 2013).

Services should support the products the business offers. The organizations may face multiple challenges while implementing new services as they usually differ significantly from the businesses' core activities. The service design regarding the digital services are poorly comprehended practices, however, the current literature provides direction. Yet, innovative technologies and services develop continuously and demand broader knowledge in multiple dimensions regarding service design. (Zomerdijk & Voss 2010; Tax & Stuart 1997; Baines et al. 2008)

1.2. Research gap

Service design, customer experience, and user experience are closely related to each other (Polaine et al. 2013). Service design aims to create more superior services in the customer journey build of a string of touchpoints whereas the user experience design aims to improve the performance of individual touchpoint e.g. mobile application. While the service design is more commonly known among business scholars, the user experience design is more utilized by the scholars of engineering.

Service design, in general, is getting increased attention in the academic world. However, the new channel such as mobile application service design has not obtained the attention that it requires. Relatively, the field of m-commerce services in business research has not been extensively recognized. The existing literature does not consider implementation and integration challenges while delivering m-commerce services. Additionally, despite the inputs, the knowledge of the concerns and management issues related to the service design process is weak (Gummesson, 1993).

Contrasting the e-commerce study, experiential assessments of m-commerce have observed barely reasonable growth. One significant dilemma in m-commerce research is the absence of guidelines in conditions, models, and assumptions. Research of user experience is becoming more widely spoken of; however, existing shortages of data exploiting the outcomes in business-life situations are noticeable. (Okazaki 2005; Hassenzahl & Tractinsky 2006)

The study aims to develop a richer understanding of customers' and employees' adoption of mobile applications. Thus, mobile applications may pursue customer value in multiple ways and an in-depth understanding of the different aspects during the customer journey is considered as needed (Kleijnen, Ruyter, Wetzels 2007). Together with the approach of service design and user experience design, the study develops unique findings for timely concern. Additionally, the study builds a new style of academic research by basing the findings highly on experiences. The study focuses on understanding fully the aspects of how to integrate the mobile application to the service journey.

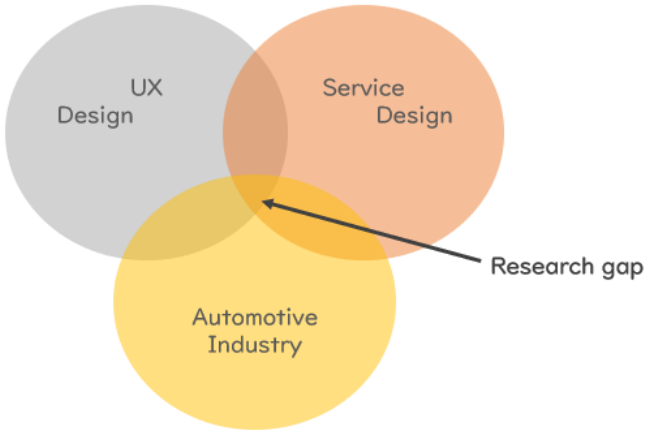

Figure 1. Research gap.

The research observes the service design and user experience design in the mobile application integration through the lenses on the automotive industry. The changing nature of the automotive industry provides an interesting viewpoint to the challenge of m-commerce integration to the service offering, that occurs in multiple other industries as well.

1.3. Research problem and theoretical contribution

The objective of the research is not to solve the existing challenges occurring while integrating a new mobile application to the service journey. Instead, the goal is to investigate the current challenges the automotive company faces while implementing a mobile application to the stakeholders focusing on the experiences of the deployment of the mobile application. Additionally, the aim is to discover an ideal journey to improve customer experience.

From the viewpoint of methodology, the inferior purpose is to comprehend the practice of customer journey supporting service design. The user experience design is reflected in the deployment of the mobile application and investigation of how those experiences influence the customer journey. The scope of the study is flexibly kept in purchase experience from both customers' and dealers' perspective. Other factors, such as regulations and application developers are not considered in this study. Based on the research objectives, the subsequent research question is generated to steer the study:

RQ: *"What kind of challenges generate from the integration of the mobile application within the multichannel service journey?"*

As the integration of mobile application comprises diverse aspects and elements, the following sub-questions are applied to support engender findings for each aspect:

SQ1: *How the journey from an employee's perspective influences the service outcome and the customer journey?*
SQ2: *How do the realized service components affect m-commerce adoption and deployment, and what kind of relationships exists between the service components?*

SQ3: *How the user experience of mobile application impacts the deployment during the service journey?*

By answering the research question the study develops the acknowledgment from both experimental and theoretical perspectives of mobile service implementation. The study builds a unique way of portraying the service journey from multiple aspects fully based on experiences. Additionally, the study develops experimental findings regarding a real business case. As mobile services are developing and becoming more relevant, the issue becomes even more significant. Therefore, the study develops a crucial background and viewpoint for managerial implications. The Figure 2 describes the contribution of the study.

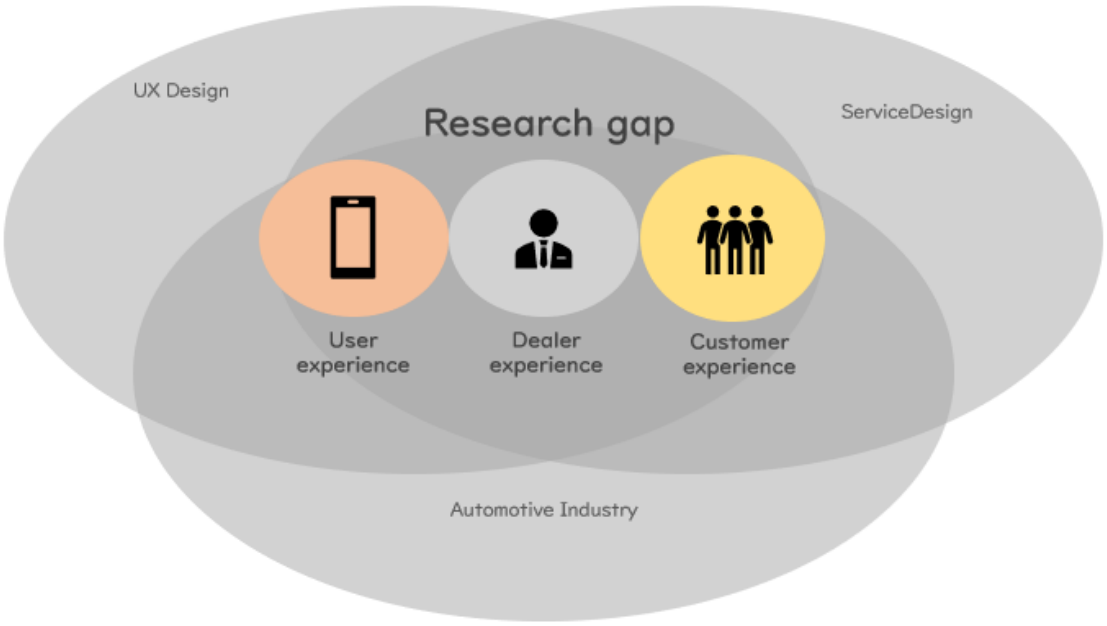

Figure 2. Fulfilling the research gap and generating theoretical contributions.

1.4. Thesis structure

The research approach of the study is design science (DS) which "attempts to create things that serve human purposes" (Simon 1969: 55). The DS is rather a new approach to research (Reubens 2016). DS intends to recognize organizational problems and for the research

contributions, it estimates the designs and mutually exchanges information of the results to proper audiences. (Lisetti & LeRounge 2004: 77; Hevner, March & Park 2004)

The study begins by describing a problem and motivation for the study followed by the definition of the objectives. The theoretical part of the study establishes the background of the empirical part. Baskerville et al. (2015) have addressed two commands of design science research; to exploit the expanded information to solve challenges, generate transformation or progress present solutions. The study purposes to address the challenges of m-commerce integration to the multichannel service journey.

Figure 3. The structure of the study.

2. INTRODUCTION TO SERVICE DESIGN AND UX DESIGN

The theory of service design provides a framework of the customer and business experience during the service offering including all the interactions. Furthermore, it develops an understanding of the components that affect the outcome of the service. Secondly, the literature review includes a study on UX design focusing on mobile applications and introducing the scene of m-commerce within the automotive industry. The study on UX design develops the acknowledgment of the aspects to consider while introducing a new touchpoint; mobile application. Lastly, the literature review ends by integrating all aspects to define the present state of mobile application integration within the multichannel service journey through service design methods. Figure 4 illustrates how the literature review by step by step provides the theory on the research question: *"What kind of challenges generate from the integration of the mobile application within the multichannel service journey?"*

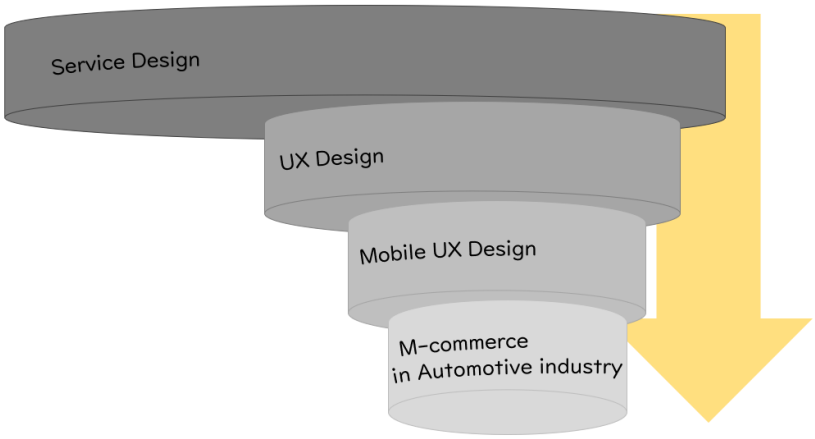

Figure 4. Modeling the whole of the theory.

Service design framework can be divided to three components; (1.) processes performing all service activities; (2.) people who generate, utilize or are somehow influenced by the service; (3.) physical and digital artifacts that are required to operate the service (Shostack 1984; Gibbons 2017). The components can also be considered as the company's resources. By designing and managing the business resources the service design aims to enhance the employee and customer experience (Gibbons 2017). The literature review on service design is divided into three sections by the service design components: the retail and e-tail service

processes, people, and physical and digital artifacts. In the end the service design framework, the literature review concludes the theory on customer lifecycle, customer journey, and service blueprint.

Additionally, the service design takes account on the customer journey including multiple touchpoints whereas UX design concentrates on single touchpoint e.g. mobile application. The study concentrates on the factors that affect the deployment of the application. The study tackles the issues presented in mobile user experience design regarding the application deployment and designing the user experience in a way that supports the multichannel customer experience.

2.1. Service design

Service design provides a way to comprehend business opportunities and identify internal and external issues. The most essential intention is to find a solution to customer-related issues. The knowledge of customers' needs helps to achieve the business objectives and to perform the organizational change. Looking at the service through customer's points of view may expose the pain points to the customer's experience. (Reason et al. 2016: 10-12)

The business environment has changed towards a more dynamic and competitive nature. Since the 1920s the human needs have changed dramatically, and the emphasis on service design has shifted from effective production to lean consumption (Polaine et al. 2013). Businesses are providing more services to obtain a competitive advantage whereas the new technologies create digital innovations (Riasanow, Galix & Böhm 2017). Since many businesses are used to deliver products, presumably, they face challenges while introducing a new service. Previous research states that industrial organizations are shifting towards the service-oriented and customer-centered business model and leaving the traditional product-only business model behind (Baines 2009). Additionally, Aurich et al. (2006) observe that from a managerial point of view the new skills, approaches, and tools are required to capture the customer value perspective and design of value propositions.

Moreover, Reason et al. (2016: 14) define multiple advantages of service design such as the increase of customer retention, decreased costs and successful service delivery.

Unexpectedly, finding a solution to the issue by considering the outside-in approach may be simple. Furthermore, investigating other businesses that have overcome similar issues by considering the customers' point of view might provide a solution. (Reason et al. 2016)

Service design pursues to block unintended service experiences. The purpose is to take considered activities that generate, deliver, and maintain progressive service experiences constantly and continually. Previously, service design only considered face-to-face interaction but ever since the digital channels have developed it has also extended into the design of digital services. The service developers must consider each service component during the service design and development. From a business perspective, service design means identifying an applicable combination of tangible and intangible components. (Goldstein et al. 2002; Kalbach 2016:227)

Grove et al. (2000) refer to service as a theatre. The front stage is visible for the customers and all the interaction between the customer and business occurs there whereas the hidden backstage supports the experiences taking place in the front (Grove et al. 2000). All the components; processes, digital and physical artifacts, and people enable the service delivery and can be divided into the backstage and frontstage components depending on whether the customer sees them or not (Gibbons 2017). The study takes account of both stages and aims to develop an integrated picture of multichannel service design.

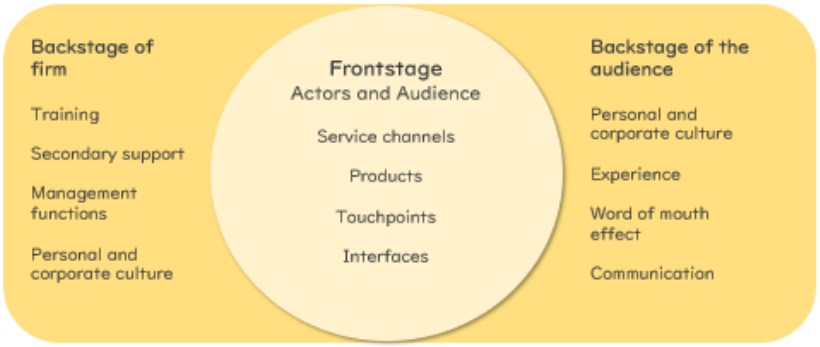

Figure 5. Services as Theatre (adopted from Grove et al. 2000).

The customer experiences and service interactions between the customer and business happen in frontstage. The customer experience (CX) is given much consideration in service

design research (Mager 2009). The experience is generated by interacting with customers via touchpoints (Reason et al 2016: 26-27). The customers reply to the designed service offerings and usually, the outcome cannot be estimated (Teixeira, Patricio, Fisk & Constantine 2012). Additionally, Teixeira et al. (2012) conclude that successful services are not designed by the businesses, but they may be designed for the experiences.

The customer journey considers all activities related to the service from the customer's point of view by paying only attention to the front stage. It describes how the customer acts or feels throughout the journey. Furthermore, the journey takes into account the customer's motivation and attitude across the service. The literature review considers broadly the customer journey and aims to develop a comprehensive understanding of how to utilize it for the research question. (Zomerdijk 2010; Reason et al. 2016:12)

The literature considers different lifecycles such as customer, consumer, user and human lifecycle (Reason et al 2016:32-35). The study includes the literature on the customer lifecycle, customer journey, and service blueprint. To conclude the whole customer journey and lifecycle one should consider the CX (Reason et al. 2016: 22). The study includes the literature on CX aiming to define the key concepts of the importance of experience-centered service design. The Table 1 defines the principles of services design. The principles are reflected across the study.

Table 1. Defining the Principles of Service Design

Researchers	Principle
Holmlid (2005)	***User-centered*** "… it is of utmost importance that the methods employed are based on user-centredness." (p. 63)
Yu & Sangiorgi (2018)	***Experience-centered*** " The experience-centered approach uses users' personal context and experiences as a base for envisioning and developing superior service experiences and systems."
Brown (2008)	***Human-centered*** " … innovation is powered by a thorough understanding through direct observation, of what people want and need in their lives and what they like or dislike about the way particular products are made, packed, marketed, sold, and supported."
Fliess, Dyck & Schmelter (2014)	***Co-creation*** "… the service process becomes a process of mutual value creation between the customer and provider."
Stickdorn et al. (2018)	***Iterative*** "Service design is an exploratory, adaptive, and experimental approach, iterating toward implementation." (p. 27)
Teixeira et al. (2012)	***Holistic*** " Customer experience is a holistic concept that encompasses every aspect of a company's offering." (p. 363) "Following this holistic approach, service design orchestrates service elements such as the physical environment, people (customers and employees), and service delivery process to help customers co-create their desired experiences." (p. 363)

2.1.1. Background of service design

Industrial and product design have emerged due to mass manufacturing whereas the service design because of emerging trends (Reason et al 2016: 10). Polaine et al. (2013:18) argue that service design was developed from the tradition of industrial design from the 1920s. The American designers such as Raymond Loewy and Norman Bel Geddes were generating the use of new technology to increase the standard of living. During that time businesses begin to consider human needs. Since then, multiple service design methods have emerged, and the approach has been broadly acknowledged due to the realized benefits. (Reason et al. 2016: 10-12; Polaine et al. 2013:18)

Service design can be traced back to the 1980s when Shostack presented the study of "Designing Services that Deliver". The study highlights the meaning of experiments and faults. Services cannot be designed and developed in the same ways as products. Services differ from physical products where the customer carries a higher risk by buying a future result or experience. Moreover, services are likely to progress as time passes by answering to changes in customer needs or rivals' offerings. Not only do they differ by nature they also have different lifecycles. Physical products are first produced and then consumed for a while whereas traditionally services are comprehended and consumed instantaneously. (Shostack 1984; Brentani 1991; Aurich, Fuchs & Wagenknecht 2006)

The servitization has been emerging since the late 1980s when the approach of competitive manufacturing strategy was implemented for the first time. It emerged during the same time as service design and one may reflect the connection between the two. In manufacturing industry services such as maintenance, repair and insurance were acknowledged and became a competitive advantage. As well as in service design the servitization has strong customer-centricity. Servitization focuses on the practice of a product-centric approach to shift toward the service-centric orientation. While the servitization is seen more as a strategy related matter, the service design is a process to design and create improved services. In literature service, design tools and methods are deliberated as an operational solution. The study does not include servitization more broadly but an acknowledgment of the connection between the servitization and service design is essential to understand. (Roy, Shehab, Tiwari, Baines, Lightfoot, Benedettini & Kay 2009; Calabretta, De Lille, Beck & Tanfhe 2016)

2.1.2. Retail and e-tail service process design

Processes are a major part of the performance. In theatre, the actors perform the frontstage processes that are visible to the customer where the people and technology behind the stage support the performance. Before, after, and during the show there are multiple processes required enabling the actors to perform. Furthermore, the audience requires new ways of performance, therefore, the processes have to develop in a way that answers the audience's wishes and needs.

To survive the organizations must be able to keep up with the changing requirements. Reason et al. (2016: 74) define business impact as a capability to progress and change. The actions may be such as the current condition acknowledgment, solution development and implementation to the market. Furthermore, often the actions include customers that consume the products or services the business offers. Therefore, the new processes are not only adopted by the employees thus, they are also adopted by all the stakeholders. Service design provides a methodology for identifying the company requirements which begins with taking into account the external factors such as understanding the customers' lives. (Reason et al. 2016: 74-76)

"In a world that is changing as fast as ours is, what most companies need is not best practice but new practice." (Hamel 2001).

Because the services develop the processes must change as well. Old service processes are not in demand anymore (Bowers 1989). The development of the processes requires full acknowledgment of the existing processes. The service processes are divided into the backstage and frontstage processes which have operational differences (Hill et al. 2002). Backstage processes support the frontstage processes that are visible to the customer. The visible processes may be such as customers entering the store, salesperson introducing a product to the customer, customer ordering the product or customer leaving the store. The processes connected to the string of actions that must operate correctly in order that the service can be produced (Edvardsson & Olsson 1996). Service processes must be identified to understand service delivery (Shostack 1984). The creation of the process and outcome are the most essential in service development (Edvardsson & Olsson 1996). The processes consider both the customer and employee experience during service delivery (Gibbons 2017).

Hill et al. (2002) define four design service process topics; retail and e-tail service, call center workforce staffing, manufacturing, and re-engineering. However, the study concentrates on retail and e-tail service process design to develop an understanding of the research question to build acknowledgment to the difficulties and challenges the employees and customers face during the service delivery process while integrating new m-commerce. Is essential to understand which processes may influence the integration of mobile application during the service delivery from customers' and employees' perspective. The management of retail operations is the most vital, critical, and challenging operation (Hill et al. 2002).

The service outcome is generated during the service process where the customer takes part as a co-producer. Each service process is unique as the customer is part of creating and producing the outcome. Therefore, the process control is found difficult but important. (Edvardsson & Olsson 1996)

Figure 6 considers the vehicle sales process. It demonstrates the participation of the customer during the service process. The customer actions during the sales process have a significant influence on the journey. Additionally, customer participation in the service process increases customer engagement and loyalty (Harris, Harris & Baron 2001). There are two sides to service delivery on the customer perspective; the customer process and service outcome. The outcome depends on the service process. Therefore, the process quality is essential. The process and outcome rely upon the business resources that enable the service offering. From the customer's perspective, the service outcome is appealing when the service delivers quality and added value. Since the company cannot directly influence the actions of the customers to develop the service process it may improve the employee's actions and supportive processes. Developing the service process from the employee's point of view often improves the customer experience as well. The service processes should be designed in a way that supports both customer's and employee's experiences. (Edvardsson 1996; Jo Bitner, Faranda, Hubbert & Zeithaml 1997)

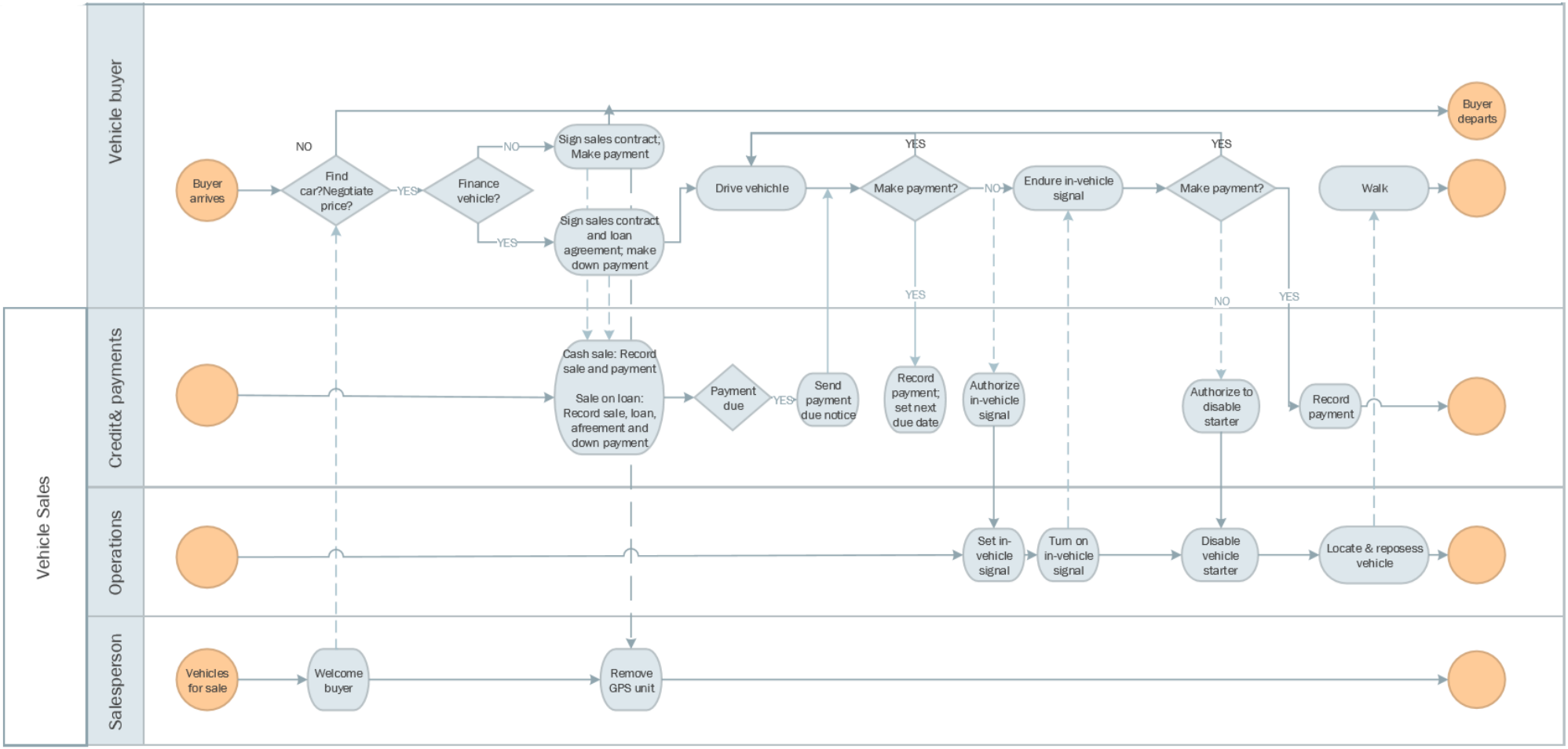

Figure 6. Flowchart of vehicle sales (adopted from Borthick & Schneider 2016)

The service system includes resources that are required to deliver the service (Edvardsson 1996). Because of technological contributions, service delivery includes a variety of new channels and customer touchpoints (Hill et al. 2002). The technologies and solutions are a major part of the service process (Ray et al. 2005). One may highlight the importance of educating and monitoring the employees' capability to utilize IT resources before and during the service process. Without an understanding, the benefits of the IT solutions the employees may not be motivated to learn the usage of the developed processes with new technologies. In the retail context of the service process design, one should pay highly attention to internal effectiveness and external impact on customers (Hill et al. 2002).

Williams et al (2008) describe the digital service delivery bringing limitations compared to traditional service delivery since the need for connectivity and use of the IP-based Internet. One may consider digital services to provide more opportunities where the service is not dependent on place or time. The organizations are aiming for operational effectiveness and superior customer service that deliver successful experiences (Bontis, Richards & Serenko 2011). Additionally, Bontis et al. (2011) take account of the importance of supporting employees' efficiency to improve the business operations. Employees demand relevant information to work effectively whereas the knowledge and motivation support the engagement with the functions successfully.

Service businesses have acknowledged the position of customer experience and its effect on customer satisfaction. Still, the companies prioritize operational efficiency over the customer experience (Kalbach 2016:1). The experience-centric service can be built by taking account of three dimensions of the service.

Firstly, the organization must have a connection with the customer that builds customer loyalty. Secondly, the business must consider the customer experience and understand that people change; the same customer might not act the same way for ten years. Finally, it is important to take care of after-sales. By keeping touch with the customer after the service by including after-sales processes strengthens the relationship. (Reason et al 2015: 23-25)

The customer value proposition is the sum of price, service characteristics and experience. By assigning the customer experience at the central the offering is considered as experience-

centric service. Experience-centric service delivery demands efficient and agile management and design while Pullman and Gross (2004) identify the importance of careful delivery management and planning. As such the service delivery system controls the resources and aims to accomplish defined objectives. The service delivery process has multiple steps that require actions from planning to implementation. (Alter 1990; Zomerdijk & Voss 2010)

2.1.3. People as part of service design

" Service design aims to generate value for the customers and employees, and by that to the business as well "(Ahtola 2019). Therefore, it is essential to consider the people within the process. The new digital channels offer more accessible and adaptable environments, challenge the traditional operational constraints, and create both modernized organizational structure and advanced customer experience (Lucas et al. 2013; Yoo et al. 2012; Piccini et al. 2015). While advanced technologies develop new managerial challenges arise (Piccini et al. 2015). Since the customer perceived value is created by the organizational members (Bowman & Ambrosini 2000) the organization should be aligned around the customers (Reason et al 2015: 14). The objective of service design is through social innovation meet to the social requirements and generate innovations that enhance the experience and establish improved solutions and business models (Murray et al. 2010: 3). The service design offers an approach that takes account of all people affecting the service; the customers and the company together to improve the service offering (Reason et al. 2015: 14). The study aims to develop an understanding of the customer-centered service design by considering the people who participate in the service interaction or are somehow influenced by the service. Additionally, it pays attention to the managerial challenges the service design generates.

"Services are highly complicated networks of relationships between the people inside and outside the service organization" (Polaine et al. 2013).

Customers are always involved in the service process. In multichannel service, the customer may have multiple interactions through different channels. Interactions between the employee and customer may be such as phone calls, chat or face-to-face conversation during the service delivery. The service structure is concluded by the teams, operations, and divisions. Yet, the employees have a major role in service delivery. It is highly important to

take both the employees and the customers into account during the service design process. (Reason at al. 2015: 21)

Since the services are delivered by the businesses the employees must be taken into account. Service design considers how the work of employees with the customer could be improved. The delivery of successful service requires that the organization is customer-centric, and the employees are engaged throughout the service delivery. The managers should develop a way to bring the business to an agreement with the new services. (Reason et al. 2015: 102-106)

Generally, discovering the vision of how improved customer experience may be relatively straightforward for the organizations, however, introducing the vision is more complicated (Reason et al. 2016: 102). By including the employees in the design process, the managers may suppress some service design challenges (Scheinder & Bowen 1984; Ian Stuart 1998). Traditionally, business managers are fully responsible for service development. Hamel (2001: 286) embraces the significance of all organizational members being part of building innovation. The change happens with the people (Hamel 2001).

The study focuses on co-designing of services and involving diverse experts including employees and customers into the design process. Involving both the customers and employees into the service design process usually generates greater success. Additional benefits vary from higher satisfaction, increased loyalty, lower costs, and new realized opportunities. (Steen, Manschot & Koning 2011)

Customers as a part of service design

Customers are the audience of services where the act of one customer may influence the service experience of another customer. The theatre should involve customers in the performance. Customers are key to successful service design. The previous study clarifies the difficulties to fully understand the customer experience. Therefore, one should acknowledge the customer experience entirely to understand the actions, feeling and difficulties the customer faces during the process. Primarily, the business should know its customers. (Trischler, Perven, Kelly & Scott 2018; Grove et al. 2000).

Often the businesses fail to build up decisions and operations that target the customer needs (Goldstein et al. 2002). To design a service that meets customer needs, one has to have a broad understanding of its customers. In service design, one method is to build customer personas which can be defined as a detailed group of quintessential people who are participating in the service.

The study of Pullman et al. (2001) argues the importance of the determination of customer segments as they affect the customer's choice, satisfaction, and experience. The customer segments are demonstrated upon the personas where the personas clarify recognized customer segments by stereotypes (Stickdorn & Zehrer 2009). The clusters of customers can be recognized in the customer journey. Customer segments can be identified by different factors. Customers can be segmented based on factors such as demographics, customer needs, or customer behavior (Sharma & Lambert 1994; Hamka Bouwman, de Rauver & Kroesen 2014). Additionally, customers can be clustered by the channel they are using, for example, Cassab and MacLachlan (2009) have analyzed customer segments such as "call center-prone segment" and "web-focused customer segment". Through the customer segments, the business can understand the customer's actions, experiences, and needs. Additionally, they recognized that 30 percent of customers who discover and order products online favor after-sales interaction with the physical seller. (Cassab & MacLachlan 2009)

Furthermore, according to the innovation adoption lifecycle, only 2,5 percent of the customers immediately adopt new innovations (Rogers & Shoemaker 1971). As the new services develop, it usually takes time before majority of the customers adopt the services. The innovation adoption lifecycle is broadly acknowledged in the literature and describes how the users adopt new innovations such as mobile applications.

Recently the customer involvement in service development has received increasing attention. One may argue that since the customer's actions influence the outcome, they should be part of the development process. The aim is to understand the customer needs while the employees divert the needs into solutions. The degree of customer involvement varies from passive customer input and feedback to full customer attendance in the design. The research advocates that the customer types who are most helpful may differ in accordance with market characteristics. (Edvardsson 2006: 35-37)

The literature presents ideas on how to design service from the customer's perspective e.g. new service development (NSD). Edvardsson (2006) presents an idea on new service development and highlights the direct customer involvement in the value creation. High expectations towards customer involvement are built-in NSD and the businesses anticipate achieving superior improvements. Customers are now seen as "resources", "buyers", "products", "co-producers" and "users" (Lundkvist & Yakhlef 2004). Since the person entering the store is no longer just a customer, one may argue the complexity of the interaction between the business and the person. However, the study includes customer low-involvement by identifying the integration process of the mobile application. The study aims to build an understanding of the customer experiences and their needs.

Employees as a part of service design

In the theatre, customers are the audience, the employees are the actors. Outstanding customer service generates an experience that builds a feeling of importance for the customer (Garrett 2006). Generally, employees have a major role in customer service. The emotional bond build during the successful interaction creates customer loyalty (Garrett 2006). The attendance, competency level, and commitment of the service employees are vital for designing a suitable service for the customers (Grove et al. 2000).

Satisfied employees equal satisfied customers (Polaine et al. 2013: 44). Therefore, it is highly important to take account of the employee's perspective while designing a service. Traditionally employees are the ones interacting with the customer during the service delivery; employees perform, and customers assess. Recently the "co-design" has been applied as collective creation throughout the service delivery (Steen et al. 2011). In co-design, diverse experts are part of the design and cooperate efficiently.

Service employees can be divided into the ones working in the front line and to the ones who support them. All the service employees should be essential to service performance. The actions of the employees must be aligned with the service blueprint and it should reflect the customer requirements. The employees are the key factor to build a bridge between service delivery and customer expectations. (Lodorfor, Kostopoulos & Kaminakis 2015; Edvardsson 2006: 191)

While involving the employee in the design process they will be more engaged and more motivated to improve the service themselves. Additionally, the front stage employees are the most aware of the service processes and challenges. They offer the comprehensions into the service design that the managers could never provide without the same experience. (Polaine et al. 2013: 44)

2.1.4. Physical and digital artifacts in customer journey

Properties are considered as the physical and digital artifacts that are required to accomplish the service fruitfully (Gibbons 2017). In theatre, the physical artifacts play a major role where properties such as the facilities, stage, set and lighting are essential to the successful performance. The artifacts are included in frontstage and backstage. In retail, physical artifacts may be such as storefront, furnishing, and products whereas the digital artifacts may be such as social media, digital files, mobile application and webpages (Gibbons 2017). The physical artifacts are an important part of service design e.g. how the facilities make the customer feel or how the products are displayed in the store can have a major impact on the service delivery. (Reason et al. 2015: 27, 113).

Digital artifacts can be a part of the service offering or the core of the service. For example, Salesforce.com has developed software for the customers that are considered as service instead of a software product (Barrett, Davidson, Prabhu & Vargo 2015). The digital artifacts such as social media, mobile application and webpages are touchpoints among a multichannel service offering. Regularly, digital touchpoints are considered as products depending on the nature of the artifact.

The study mainly focuses on the artifacts within the multichannel service offering that are essential to the core and supportive activities during the service. Recently the growth in multi-channel service offerings has been witnessed which is related to the development of e-services and m-services (Sousa & Voss 2006). The multichannel environment includes service delivery touchpoints such as web-based platforms, mobile applications, physical facilities and phone (Sousa 2006). Porter (2001) indicates that the businesses which integrate web-based channels with the traditional channels are more profitable than the ones serving with only one channel e.g. retail store. However, the literature presents the importance of face-to-face communication between the customer and service employees especially on

customer loyalty (Cassab 2009). Additionally, the customers are more satisfied when the technology solves their requirements, the digital channel is convenient and timesaving, and generates efficiency (Cassab 2009).

The service offering may differ from the landscape of the services. Businesses have developed multi-channel services aiming to increase the effectiveness, cost-efficiency, and coherence of their service activities (Cassab 2009). Additionally, the multichannel service may improve the service and develop customer interaction. Typically, services using digital channels are multichannel (Sousa 2006). Especially the development of retail and logistics has increased histrionically by utilizing e-commerce (Vakulenko, Shams, Hellström & Hjort 2019). The number of channels in services is estimated to grow as more opportunities are discovered through the internet (Sousa 2006). Nevertheless, the services may combine traditional service channels with digital ones. Although the service begins in the digital environment, not all the interaction may be online e.g. multiple online stores provide the platform of shopping but also include delivery of physical goods (Williams, Chatterjee & Rossi 2008). The businesses' core service artifact may be digital whereas the supporting activities must be delivered through traditional channels or vice versa.

Reason et al. (2016: 29) consider the importance of different channels within the customer journey. The customers may move between the channels therefore it is urgent to guide the customers to use the channels that are most efficient for a certain task. Furthermore, the customer journey can be utilized when discovering a new channel for the customers. For instance, Audi has considered the customer journey aiming to discover relevant channels for its customers. (Reason et al. 2016: 29-31; McColl-Kennedy, Zaki, Lemon, Urmetzer & Neely 2019; Mocker & Fonstad 2017)

Mobile application as touchpoint is a relatively new service artifact. Kleijnen, Ruyter, and Wetzels (2007) assert the poor results in new mobile service introduction despite the popularity. Furthermore, their study considers the importance to comprehend the factors that generate value and offer the possibility to allocate the recourses efficiently to increase the customer value perceptions.

2.1.5. Drawing the customer experience

This chapter presents the current methods of service design to map the service interactions. It introduces methods that help to indicate the customer and employee experiences. Multiple new techniques are introduced continuously, though, the study focuses on the three known methods; customer lifecycle, customer journey, and service blueprint. The methods conclude the three components; processes, people, and physical and digital artifacts as they are all part of the interaction and enable the service.

Bitner et al. (2008) define the service process as a series of actions that enable the service to operate efficiently. Service success requires the business to understand how the customers appraise the service process. Hui et al. (2004) argue the importance of both process quality and outcome quality. This chapter introduces the recent methods of service design to understand customer experiences during the service offering. The service can be considered in three separate parts. The customer lifecycle takes into account the whole relationship with the company whereas the customer journey considers a specific sort of engagement. In conclusion, the service blueprint examines a particular sort of service confrontation

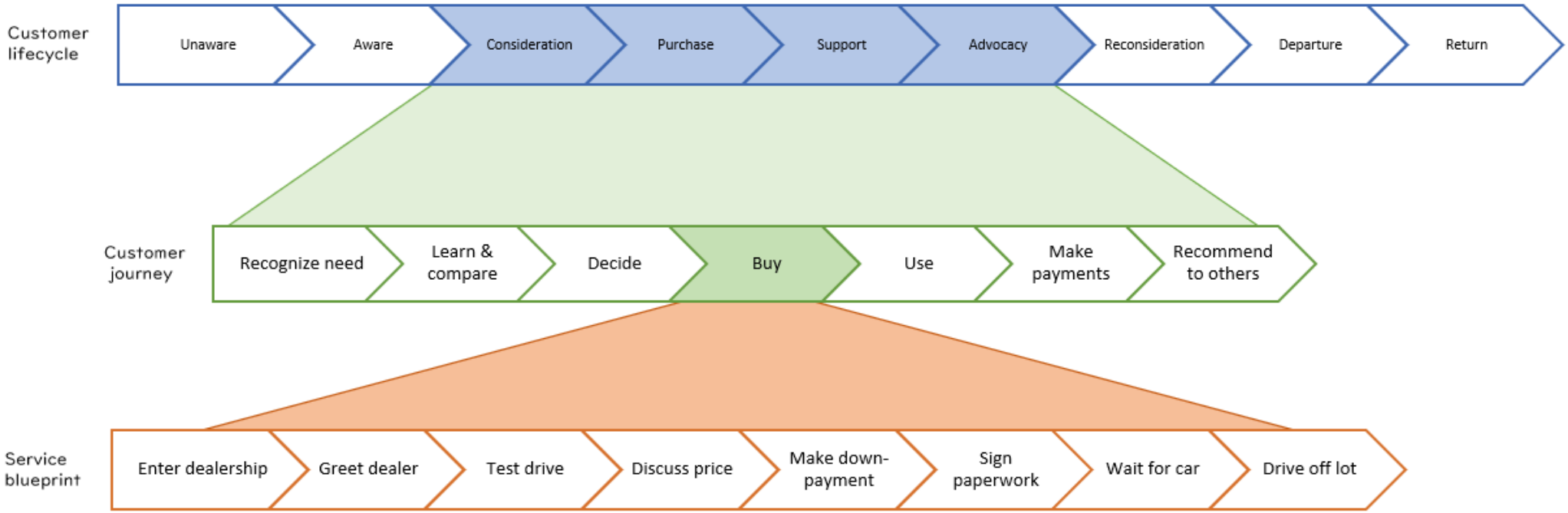

Figure 7. Model of customer lifecycle, customer journey, and service blueprint. (Kalbach 2016: 258)

Customer lifecycle

The customer lifecycle is defined as a framework of the service design process (Zomerdijk 2010). The customer lifecycle provides an understanding of the customer experiences and defines the way of delivering the service correctly for each customer (Reason et al. 2016; 26-28). The lifecycle framework concludes an understanding of the customers' service experience and designates the connection between the business and the customer (Reason et al. 2016: 26). Practically, lifecycle as a tool means including a step-by-step definition of all customer actions from realizing the service to evolving into a customer who utilizes the services and sooner or later either recommencing or exiting (Reason et al. 2016: 26).

As the customer lifecycle considers the whole relationship, the digital and physical artifacts play a role in multiple steps. Often artifacts such as store, website, and advertisement give the onset to perception, however, the artifacts are often reflected detailed through service blueprint. Nevertheless, the relationship between the people; business and customer, holds the interaction. The lifecycle, as well as customer journey and service blueprint, are a string of actions that create service processes.

The customer lifecycle offers a structure of the service experience while the customer journey considers all the experiences included in the complete framework. When the customer lifecycle offers a starting point for customer experience development the customer journey considers the context of the customer lifecycle and provides a way for businesses to actually design a better service. (Reason et al. 2016: 27-28)

Customer journey

In 2002, Colin Shaw, the customer experience expert introduced the concept of moment mapping. The customer journey defines the touchpoints across the service. During the customer journey, the customer may have multiple interactions with the company. The touchpoints are single interactions between the customer and the business across the multi-channel service offering. The customer journey is referred to as including series of touchpoints. (Zomerdijk et al 2010; Kalbach 2016:249)

Reason et al. (2016: 27) define that the customer journey generates value if the business receives an understanding of how to involve customers to create improved execution of services. Additionally, according to Norton and Pine (2013), the customer journey is managed correctly when it helps businesses to innovate, allocate resources and deliver the new service in a way that meets the customer needs.

"*Customer journey is universally used method, which characterizes the operational environments of an individual... The objective is to find out the most essential issues causing the challenges*." (Lammi 2019).

Companies such as Apple, Disney, BMW, Amazon, and IKEA have conducted an efficient customer journey design (Kuehnl, Jozic, Homburg 2019; Zomerdijk 2010). For instance, Amazon has developed a convenient online shopping experience that considers all customer touchpoints and customers' specific needs in a way that delivers additional value (Pisani 2018).

The customer journey goes into a deeper acknowledgment of customer's incentive and mindset and aims to answer questions such as; what makes them purchase or what keeps them satisfied. Furthermore, the sum of diverse fundamentals is comprised such as headaches, brand awareness, and critical moments. (Kalbach 2016:262)

Service blueprint

In the Figure 7 the service blueprint is illustrated as one lined process; however, the figure does not reflect the service blueprint correctly (see Figure 6 of service flowchart which demonstrates the service blueprint). The illustration is made to concrete which kind of processes may be designed with service blueprint however, the Figure 7 presented may be reflected as a zoomed customer journey as well. A service blueprint is more formulaic than the customer journey (Kalbach 2016: 262). It is a customer-centered method for service innovation and enhancement (Bitner et al. 2008). In addition to the customer lifecycle and customer journey, the blueprint provides an understanding of service structures (Reason et al. 2016: 32). The service structure comprises service channels, business structure and organizational environment (Reason et al. 2016: 32). Service blueprint describes a service offering through diagram (Kalbach 2016: 4)

Shostack (1984) introduced the service blueprint first time and described it as a flowchart of activities. The Figure 6 illustrates the service blueprint including all processes. Additionally, multiple scholars such as Wreiner et al., and Spraragen and Chan have extended the service blueprint by adding new elements such as emotions and multiple actors. Now the service blueprint can be seen as a more complex tool than it was before. (Shostack 1984; Kalbach 2016:229)

All the methods consider all three service design components; processes, people, and digital and physical artifacts. The physical evidence concludes the physical tools, digital software, and face-to-face interaction. The customer actions are considered as the essential points a customer interacts with the business's service. The frontstage actions where the touchpoints happen are visible to the customer whereas the backstage actions conclude an internal service facility that is hidden from the customer but directly influences the customer experience. Supportive activities differ from backstage actions where the supportive activities do not have a direct impact on the customer experience. Often, the supportive activities have interaction between the company, associates and third-party providers. (Kalbach 2016: 239-240)

The method of customer journey is seen as the most effective to conclude the understanding of the challenges of the integration of mobile application to the service journey. It reveals the customer experiences and may be considered from multiple perspectives. The ideal journey is based on the method of customer journey.

The service components are part of service design methods and must be fully comprehended. The literature review builds a theory of all the service design components and through the service design methods, they should be aligned together to meet the customer needs. The second framework of the study; mobile UX design aims to realize the complexities in mobile application deployment and reflect the challenges one may face during mobile application integration to the service journey.

2.2. User experience design in the mobile environment

UX design concentrates on certain touchpoint whereas the service design takes account on the whole service offering with multiple touchpoints likely one of them being the mobile application. The research question focuses on multichannel service offering including m-commerce where the study aims to build an understanding of how the challenges regarding mobile application integration to the service journey where the deployment and introduction should be the most efficient and painless for the customer and the business. Hence, the research requires the theory regarding the user experience design concentrating on mobile applications in addition to the service design.

The essential question for the mobile application developer is; are mobile applications services or products? Mobile applications may be used for different purposes and it may be difficult to divide them into products or services. The study reflects mobile applications providing e.g. books and games as products. On the other hand, there are existing mobile applications offering services such as transportation (Uber). Furthermore, while considering the automotive industry, mobile applications related to driving are often supporting the car owners by connecting the car with the mobile device.

The design of services usually differs from the design of mobile applications. Mobile application development is more similar to the development of products (Ballard 2007:1). The products and services differ by nature and the same methods and tools cannot be applied in the development (Coombs & Miles 2000). Nevertheless, the literature also supports the development of products and services being relatively similar (Nijssen, Hillebrand, Vermeulen & Kemp 2006). The two visions are divided into the “assimilation approach” and “demarcation approach” (Nijssen et al. 2006). The study comprises the literature reflecting the user experience in m-commerce and that focuses on the development of the mobile application in a way that improves user satisfaction.

Service design takes account of the customer experience during the service delivery and aims to develop successful customer service that meets the customer needs. Excellent customer service and service processes improve customer loyalty that is essential for businesses. Nevertheless, outstanding customer service and well-established processes with motivated employees and a well-functioning service environment with digital and physical artifacts are

not enough. The touchpoint e.g. car or mobile application delivers the most powerful emotional response (Garrett 2006). User experience design is essential for the fruitful application deployment (Charland & Leroux 2011). The UX design defines the experience between a user and an individual touchpoint.

The UX brings a "human" viewpoint focusing on positive emotions (Hassenzahl 2006). To succeed in today's competitive environment, one should provide superior user experiences via mobile devices (Djamasbi, McAuliffe, Gomez, Kardzhaliyski, Liu & Oglesby 2014). The users of mobile devices are expected to increase in the future and offer new opportunities for businesses (Djamasbi et al. 2014). Thus, the m-commerce is generating the future of e-commerce where the mobile devices are seen as human's partners (Tarasewich, Nickerson & Warkentin 2002).

2.2.1. User experience

UX aims to create better experiences in the use of the system that is divided into different aspects. Hassenzahl and Tractinsky (2006) define three aspects of UX (see Figure 8). The aspects provide characteristics to the acknowledgment of user interaction with technology. The first aspect refers to tackling the human needs beyond instrumental, to assure the influential value of the product or service. The second aspect is "emotion and affect" that considers the human perspective by focusing on positive emotions. The third aspect tackles the essence of experience where the "experimental" perspective highlights the situation engagement and temporality of the technology. (Ellman et al. 2016; Hassenzahl & Tractinsky 2006).

"Beyond the instrumental" reflects on the human needs, which can be argued through Maslow's hierarchy of human needs (Maslow 1943). Scholars such as Jordan (2000) argue the same model to be reflected with the user experience, where the lowest stage considers the functionality, second usability, and the third enjoyment.

The literature recognizes the significance of several elements affecting user satisfaction such as happiness, pleasure, attractiveness and practical attributes (Hassenzahl & Tractinsky 2006). Nevertheless, with the elements discovered, it is relatively difficult to conclude the user experience. The earlier studies are substituted by more theoretical research that aimed

to determine a collective base of what creates an excellent user experience (Hassenzahl 2006). The aspects define that the UX is the sum of different factors and does not only consider the usability and user interface design as many would define it. Furthermore, the model describes the fact that there is no single explanation of a well-established user experience. The UX design puts users into the spotlight within the multidisciplinary environment. Hassenzahl and Tractinsky (2006) discuss the perception of UX seeking to move beyond the task-oriented methods by passing out new aspects.

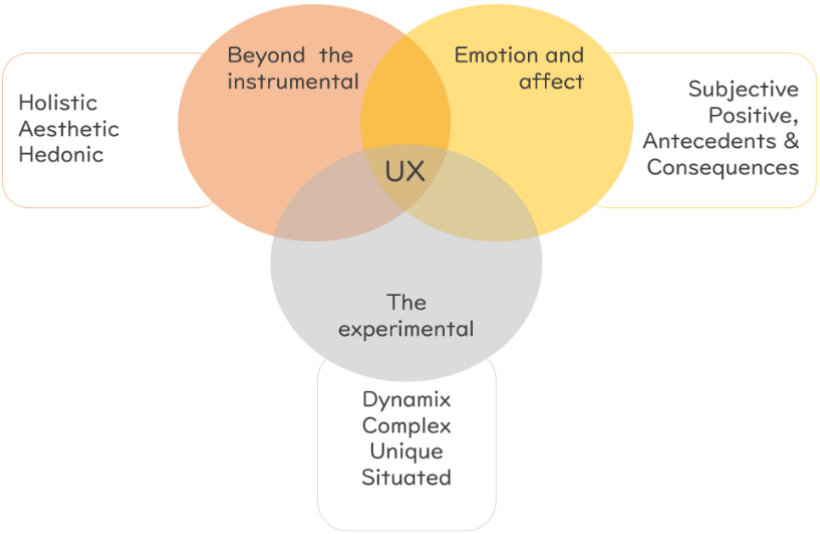

Figure 8. The aspects of UX. (Hassenzahl & Tractinsky 2006)

UX is associated with a broad range of out of focus and changing impressions containing emotive, sentimental, experimental, hedonic, and visual variables. The formation and expulsion of certain variables appear whimsical, relying on the writer's experiences and motivation. Additionally, the UX analysis is flexible, where the characteristics may range between single characteristics of a single end-user's interaction with a certain application to all characteristics of many end-users' interactions with the business. (Law, Roto, Hassenzahl, Vermeeren & Kort 2009).

Both the UX design and service design focus on experiences. In UX design the experience-centered methodology focuses on users as individuals and user experiences as a foundation

for service and product development (Yu & Sangiorgi 2018). Experience is a sum of multiple factors. Gaver and Martin (2000) discuss the relevance of experiences such as amazement, entertainment, and affection to be focused by the technology. Furthermore, emotional usability must be taken into account in the emerging aspects of interactive products. The products may support the users' self-expression, personal growth and self-maintenance (Hassenzahl & Tractinsky 2006). Presumably, to provide the aspects presented one must understand its users and their needs.

In addition to the service design requiring customer segmentation the UX design must be created and directed toward the user personas as well (McQuiggan et al. 2015). In UX design, one major factor is the user's age. Since the user experience is based on the technology the competencies to usage may differ by age. The research of McQuiggan et al. (2015) presents the user segmentation to the different age groups.

2.2.2. M-commerce applications

Electronic commerce (e-commerce) constantly influences the business environment. E-commerce allows business transactions over wireless tools. It is the electronic trade of data, goods, services, and expenses over technology. The actions of e-commerce comprise establishment and monitoring web-based connections between business and dealers, contractors, consumers, strategic associates and others related to traditional delivery channels. (Tarasewich, Nickerson & Warkentin 2002; Mueller-Veerse 1999)

The 21st century is described as the decade of mobile e-commerce (m-commerce), while, nowadays mobile devices are seen as private digital helpers. M-commerce has emerged due to emerging communication technologies. It is a relatively new trend and expected to drive the future development of e-commerce. M-commerce actions are associated with business transactions operated over telecom networks that integrate with mobile devices. (Tarasewitch et al. 2002; Maamar 2003; Mahatanankoon, Wen & Lim 2005)

Mobile devices are the most rapidly integrated customer products ever. Now it allows a platform for multiple different applications that serve customers in many ways. Consumer-based mobile commerce applications consider usual everyday commerce actions such as receiving driving instructions or following the driving analytics. The m-commerce provides

features that are emerging and not established in e-commerce. The mobile devices have GPS, and the applications have constantly the information about the location of the customer and may personalize the services. Furthermore, convenience allows the user to use the applications almost everywhere; looking for entertainment while waiting in line or searching recipes in the grocery store. (Mahatanankoon et al. 2005; Shih & Shim 2002)

The m-commerce process approaches can be concluded in two categories; content delivery applications and transaction applications. The content delivery includes the applications that notify and report important content messages such as stock news or car maintenance information. The information provided is personalized and should be relevant to the user. The user provides personal information to businesses to receive additional benefits. (Mahatanankoon et al. 2005)

The transaction applications in m-commerce include applications that allow the customer to look through the collection and order products online e.g. Zalando Lounge. The transaction applications may challenge with transaction safety, speed, and comfort of usage. In any eventuality, the m-commerce provides multiple new business opportunities through mobile applications. It allows the business to receive more information about the customers and provide personalized products and services. (Mahatanankoon et al. 2005)

The previous study concludes the importance of user recommendations. User recommendations are the most efficient way of advertising a mobile application. The total of 43 percent of people decides to download a mobile application based on personal recommendation. Logically, users satisfied with the service more likely recommend it to others. Likewise, factors such as customer value, and loyalty have a significant influence. (Xu, Peak & Prybutok 2015)

2.2.3. Designing m-commerce user experience

By means of the development of the mobile web and the increasing amount of mobile applications, the study of m-commerce design is more essential. As the users are seeking to benefit from the mobile application one should understand the user's needs. M-commerce application usage differs constantly for the reason of alternating conditions and dissimilar

user needs. Additionally, developers must acknowledge the requirements of the people and their interaction with surroundings. (Tarasewich 2003)

The design of a mobile application or web site for mobile phones is more similar to product design than service design (Ballard 2007:1-2). It has similarities with designing the best possible device such as watches or headphones (Ballard 2007:1-2). The study introduces the framework of UX design which is widely recognized in the study of mobile application design. User experience design is utilized to both product and service development, thus, mainly focused on the nature of products.

Hassenzahl and Tractinsky (2006) present the user experience as the integration of instrumental features, user's feelings and influence, product characteristics and conditions. The study of Chen and Zhu (2011) has reflected the study of Hassenzahl and Tractinsky and generated a four-dimensional mobile application user experience assessment system that concludes all dimensions affecting the mobile user. The study argues that users themselves, products, the matching of software and the user context are the influencing factors of mobile user experience. Yet, the study of Charland and Leroux (2011) reflects the mobile user experience as detached into two main sets: context and implementation. McQuiggan et al. (2015) consider usability in user experience design and define principles of mobile application design that around the importance of simple and easy usage.

The diverting legibility within the literature of mobile application user experience design highlights the complexity of the framework. Yet, the literature generally highlights the importance of an individual's differing characteristics regarding the emotions that influence user satisfaction. The influence of the context is simply described as the users may use the mobile application in different places and have diverse feelings depending on the environment. Furthermore, usability including software quality is widely recognized in mobile application design. The mobile application should be easy to use and learn, deliver positive feelings and satisfaction.

The study of Abras, Maloney-Krichmar, and Preece (2004) provides suggestions for the designers to practice. One should clearly address all the available actions at the time; make it simple to assess the present condition of the application; and monitor natural mapping

among purposes and the vital actions, among movements and the outcome, and among the apparent data and the understanding of the system situation. (Abras et al. 2004)

In the paper, the design process can be simple, however, while listening to the users the journey of the users may become complex to acknowledge. Usability may become essential as the designer may measure the factors affecting the mobile application usage such as; safety, serviceableness, or efficiency. One should test the usability including subjective user satisfaction to improve the user experience of the mobile application. (Abras et al. 2004)

2.2.4. M-commerce services in the automotive industry

The increase of transportation levels and time spent in a car, and the rising technological know-how of consumers are generating the requirement for the up-to-date connected technology to be accessible in all the vehicles (Schrauben, Solak & Tanniru 2003). The automotive connectivity based on IoT is emerging and the estimated worth by 2022 is $82,79 billion (Timokhina 2017). The automotive companies have recognized the business potential and develop mobile application features continuously. Additionally, the motivation for the data collection usage is high. Whereas it can be the automotive company or a player such as Google collecting and holding the data.

According to the McKinsey&Company's report (2016), the future revenues within the automotive industry will change; the revenue pool will rise and differentiate in the direction of on-demand mobility services and data-driven services. Shared mobility and data-connectivity services will increase revenues. Furthermore, the revenue of the after-sales market is estimated to increase from the rising growth of sold vehicles. In vehicle sales around a 2 percent annual increase are expected.

Multiple new business opportunities can be found through the integration of mobile devices and vehicles. The impact of technology affects the activities on the automotive value chain such as; stage progress and controlling; systems and software development; advertising and brand management; customer service; maintenance, repair and service parts processes; and warranty and financial services. (Schrauben et al. 2003)

The environment of automotive technology is developing rapidly. The study of Schrauben et al. (2003) argues the relevance of partnerships and industry relationships with multiple technology suppliers and competitors to improve products and services and generate them successfully to the customers. Already the automotive businesses have built partnerships to reach sufficient level and resources (e.g. acquisition of HERE by Mercedes, Audi, and BMW). As the innovations generate the customers become more aware of the current technologies and require beneficial products and services. The growing demand for collecting and evaluating customer preference statistics and increasing requests by customers to connect multimedia and communications with their vehicle form the industry's applications. (Schrauben et al. 2003; McKinsey&Company 2015)

At the moment the mobile applications within the automotive industry can be considered products that provide additional information and are part of the vehicle. The features provided by the car manufacturers can be mainly divided into two; ones working as remote control of the car, and the ones which provide additional information about the car itself and driving. The ones providing customer service and support expand the mobile application to the combination of service and product.

As the features are emerging the applications are also shifting towards transaction application where the customer may order products or services related to driving. In addition to car manufacturing companies, also other companies have found the potential in the market and are designing applications such as CarDekho that includes a platform where the user can buy or sell a new or used car.

Car manufacturers mostly use mobile applications for after-sale purposes. The features include insurance reformation, maintenance, purchase of spare parts, navigation to the closest dealer and others. Additionally, safety and efficiency play a huge role in the development of the features. The customers' concern about digital safety and data privacy (McKinsey&Company 2015). Overall, the customers become more aware of data utilized by third parties from their mobile devices (McKinsey&Company 2015).

2.3. Synthesis – A framework for studying service design together with UX design to build acknowledgment on m-commerce implementation

One may believe that the connectivity will change the entire automotive industry. Through the new technologies the value driving sources will transform, and customer experience will develop toward digitalization including new data driven products and services. The change does not happen over the night and demands new capabilities. Overall, the literature review provides a basis regarding the earliest steps toward the digitalized services and which factors and dimensions must be considered while integrating a new mobile channel into the service journey.

The design of experiences has recognized to generate innovation. The innovation into products and services deliver successful customer experiences. The design begins with the observation of customers, users, and employees. In both service design and UX design, the experiences, journeys, and involvement of people (business and customers) are essential. The service design and UX design differ by the scope, mindset, and nature. (Gruber, De Leon, George & Thompson 2015)

The nature of service design is more physical, involving interactions with people, and physical and digital artifacts whereas the nature of UX is mainly concentrating on digital software but also products. Furthermore, the service design aims to create new ways of serving people by including new business models with social innovations, while, UX design with a more narrowed mindset aims to develop new improved technologies that meet the individual needs. Earlier the study considered the theory on customer journey where the service experience is fully comprehended (see chapter 2.1.5.). In addition to the customer experiences, the service design takes account of the employees' point of view in the designing process while the UX design only reflects the user experience. The UX design tackles deeply one of the touchpoints that in tandem create the customer journey by interactions between the customer and the company. Figure 9 illustrates the comparison of service design and UX design. (Gruber, De Leon, George & Thompson 2015)

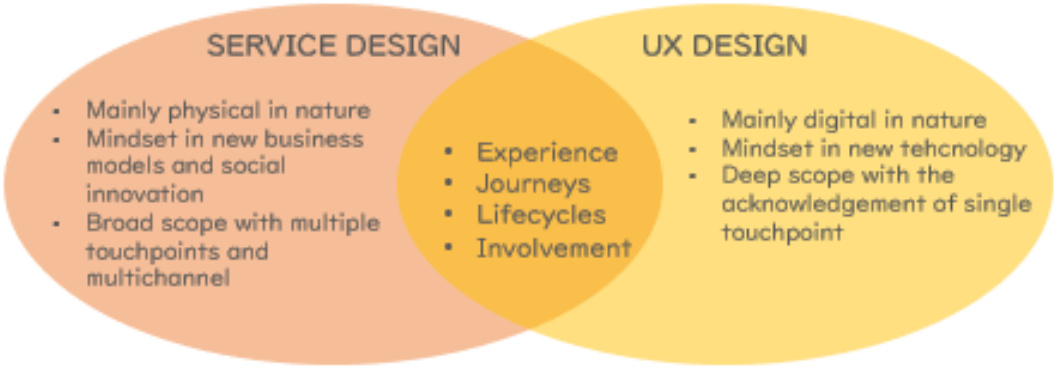

Figure 9. Comparison of Service Design and UX design.

One may consider user experience as an artifact, however, it cannot only be limited to that. The user experience is a narrow concept of customer experience. In theory, if the customer is loyal to the brand and is satisfied with the overall service or product, it affects positively the experience he faces while deploying the mobile application and vise verse. Additionally, poorly designed mobile application deployment affects negatively the overall experience of the customer's faces and affects customer loyalty and another way around. Therefore, in addition to the service design, UX design plays a major role in customer experience. (Low et al. 2009)

The framework considers service as a theatre where the journey is built from different touchpoints. The mobile application is only one touchpoint within the multichannel service offering. The customer experience is affected by multiple interactions and the outcome of the service is always unique as during the act. To support the adoption of m-commerce service the string of processes should be designed in a way that is efficient and effortless for the customer and business. To design effective service delivery one should understand its audience, customers. Both service design and UX design highlight the importance of customer and employee involvement in the design process. Users use the product, service or artifact to finish a job or aim (Abras et al. 2004). The successful design of a mobile application must consider the stakeholders of the artifact.

As the fleet of cars with connectivity increases the challenges in new channel integration with the multichannel service process must be solved. The methods from service design must

be considered and the customer journey described to understand the challenges. The study takes account of the three service design components; processes, people, and digital and physical artifacts that affect the outcome of the service. All the components must be aligned efficiently in a way that serves the customer in the best way.

As the features of the mobile applications became more valid for the car owners it is essential that the service process including the artifacts and people are playing along. Currently, the literature does not tackle the issues the dealers and car manufacturing companies struggle with the integration of the mobile application into the service journey. The empirical part of the study aims to develop acknowledgment of the current struggles of mobile application integration focusing on the introduction and deployment of the application.

The combination of service design and user experience design is a rather broad approach and concludes multiple aspects within the service and product design. However, the study mainly considers the influence of UX in the customer journey. Since the integration of new technologies causes challenges in multiple areas, one should understand the whole picture of the service delivery process, people and artifacts. Likewise, the new technology, must be well-understood and designed in mind with aspects of user experience. Frequently, scholars aim for a deeper understanding of the customer experience, while the complete journey is too broad to study; beginning from the awareness to for example 30 years of owning the vehicle. The journey map is typically zoomed (Stickdorn et al.2018:44). The study zooms to describe the customer journey beginning from the first time the customer enters the dealer, finishing to the car delivery. The Figure 10 reflects the investigated journey. Additionally, it describes in which steps the dealer and mobile application are present in the customer journey.

The study aims to understand how the actions of dealer affect the customer journey, additionally, it aims to acknowledge the service design components that influence the integration of the mobile application in the service journey. The study addresses the relationship between the components and creates a synthesis including the UX. The influence of UX on the mobile application integration is comprehended.

Although the investigated journey is zoomed one should not overlook the effect of the other factors outside of the investigated journey. The study does not disregard the other factors during the customer lifecycle and total customer journey in case they are perceived as

generating the challenges. While the key challenges are defined the aim is to examine the base of the problems. The findings may be investigated and utilized generating the managerial implications.

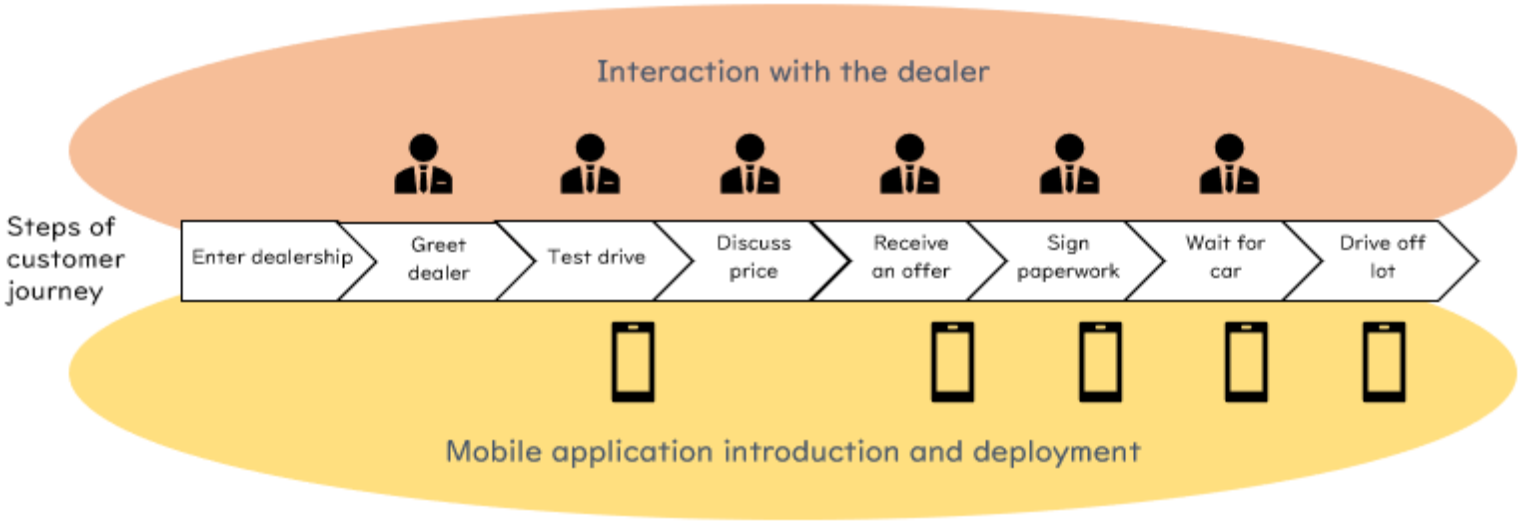

Figure 10. Describing how the dealer and mobile application appear in the customer journey.

3. METHODOLOGY

This chapter concludes the distinction as regards the methodology of the research are introduced and rationalized. The chosen strategy and approach of the research are suggested and introduced, followed by the indication of philosophical assumptions, research design concluding the research method regards the empirical data collection approaches and evaluating method. Moreover, the study presents the case selection process. Finally, the validity and reliability of the research are deliberated.

3.1. Philosophical assumptions

Scholars are individuals who are disrupted by their own beliefs and assumptions. Therefore, research philosophy always exists regardless of how it is made. The research philosophy is defined as a classification of presumptions and assumptions regarding the development of awareness. The research concludes assumptions of ontological, epistemological, and axiological perspective. A set of assumptions allows comprising a credible research philosophy that underpins the methodological choice, research strategy, and data collection techniques and analysis procedures. In business and management study the Johnson and Clark (2006) argue the relevancy of the awareness of philosophical obligations scholars make through the preference of research strategy because of its impact on what the scholars do and how they acknowledge the investigated matter. (Saunders, Lewis & Thornhill 2016:130-131; Johnson & Clark 2001)

Scholars do not agree on single best philosophy, additionally, one may observe a discrepancy between the assumed best philosophy and own beliefs and assumptions, therefore, there are no shorter routes. In business and management studies the philosophical differences are inherent. The understanding of research philosophy enables one to acknowledge why scholars are concerned with diverse issues; why the study can be completed in various ways; why the information can be gathered and examined in various ways; and why different approaches are utilized in data analysis. (Saunders, Lewis & Thornhill 2016:132; Eriksson & Kovalainen 2008:10).

“Ontology, epistemology, methodology, methods, and paradigm are key concepts in the philosophy of social sciences” (Eriksson & Kovalainen 2008:12) where the methodology, epistemology, and ontology are creating the study framework. Furthermore, all the concepts are associated with each other and rely upon the study’s philosophical position. The ontology pays attention to the presence and relation between individuals, community, and humanity overall, while, the ontological assumptions support all ideas and methodological stances. The ontological perspective must be acknowledged, given that the study relies highly on employees’ and customers’ perspectives. In the study, the interviewees are believed to be truthful, regardless of the personalities, attitudes or social identities. (Eriksson & Kovalainen 2008:12-14)

The epistemology is often discussed together with ontology. “What is knowledge and what are the sources and limits of knowledge” (Eriksson & Kovalainen 2008:4), is the question the epistemological perspective is involved with. Therefore, one should acknowledge the assumption of how one may understand the world. This assumption is involved with the approaches, methodological tools, and methods. The epistemological views are associated with several philosophical positions such as positivism, interpretivism, and critical realism. (Eriksson & Kovalainen 2008: 14-15)

The study follows the interpretivism and constructionism position where the interest is in how individuals comprehend experiences and situations. The findings of the study are based on individuals; employees and customers, understanding of the processes and practices, while the study aims to acknowledge the current challenges to develop new reality. The interpretive and constructionist scholars believe that the entrance to joint transforming and independently structured reality is only beyond social creation as language and mutual implications. Therefore, in addition to the contents of empirical data, the study concerns how the contents are produced through different practices. Communication plays an essential role. (Eriksson & Kovalainen 2008: 19-20)

There are two existing models of research; deduction and induction that answer the question of how to present the understanding about the entity in the study. The deductive approach matters with the creation of hypothesis and formulation theories whence specific phenomena may be clarified. While inductive reasoning develops a theory based on the findings by creating empirical research first. It generates from the meanings of individuals attribute to

actions. Additionally, several scholars apply abduction logic since the two ideal types of research logic hardly ever exist. Therefore, abductive reasoning may be comprehended as a combination of the two types. The study applies abductive reasoning by utilizing the existing theory as a basis of the research. Additionally, the study develops a continuation of an existing theory. (Saunders et al. 2016: 128; Eriksson & Kovalainen 2008: 20-23)

3.2. Research strategy

The study is based on the research question "*What kind of challenges generate from the integration of the mobile application within the multichannel service journey?*" that requires to be answered. The case study method depends on the constant evaluation of data and theory starting with data collection. The case study may be considered as a research strategy that concentrates on comprehending the dynamics introduce within single situations. Traditionally, single case studies exploit an entrenched design; numerous stages of analysis in a single study. Multiple scholars such as Mintzberg and McHugh (1985), and Eisenhardt and Bourgeois (1988) have gathered qualitative data from interviews and observations. (Eisenhardt 1989)

As well as other studies, the case studies may be sort into three study classifications: descriptive, exploratory, and explanatory research. As the name "exploratory" indicates, the exploratory study proposes to explore the research question and provide answers to the problems defined. The research objective of this study is to understand the current difficulties the automotive companies face in mobile application integration within the multichannel service offering. The study aims to build an acknowledgment of current factors that generate challenges in the mobile application adoption and hamper the implementation of customer and user-friendly mobile application deployment.

Additionally, the study aims to develop an ideal journey from the perspective of the dealers taken into account on the customer and employee experience. Consequently, the type of this study is reflected exploratory, the study does not offer conclusive solutions to existing challenges, thus, the study indicates the challenges, and proposes an interpretation of clarifications to be considered. Additionally, the study indicates the exploratory pieces of evidence by offering insights into a relatively new field of mobile applications, and while

answering the indicated research gap of mobile application integration to the multichannel service offering in an automotive context. (Yin 2014: 8; Eriksson & Kovalainen 2008)

Since the study aims to offer a deep acknowledgment of the challenges regarding the mobile application implementation to the stakeholders, the single case study is reflected as the most suitable one. The data is gathered through qualitative methods. Integrating quantitative research with qualitative methods is generally known in service design study (Reason et al. 2016: 15).

The findings are based on experiences that build a journey of customers and dealers. The journeys conclude the integration of the mobile application within the multichannel service offering. Since the study follows the design science research the study is human-centered by acknowledging multiple actors' experiences and creating an ideal journey based on customers' and employees' experiences on the introduction and deployment of mobile application, and user experience. The ideal journey takes account of the benchmark journey that delivers better user and/or customer experiences, furthermore, the journey of the benchmark dealer pleases all stakeholders. The ideal journey created is reviewed by the actors, which performs as a weak market test. Unlike traditional DSR researches, the study does not provide solutions to the existing problems based on a new reality. Additionally, the author has deployed the application several times and tested the features, to appreciate the upcoming issues.

3.3. Research method

The service design approach emphasizes on completing a qualitative study with qualitative methods. The qualitative research approaches enable acknowledgment of socially formulated reality (Eriksson & Kovalainen 2008:4). Thus, the study is involved with understanding and comprehension. Additionally, the qualitative methods are used to offer a better acknowledgment of factors.

The research design in this paper is established on a qualitative single-case study methodology with semi-constructed interviews. Semi-structured interviews guarantee that the journey can be developed regarding the mobile application introduction, deployment, and

usage. Additionally, semi-structured interviews enable the freedom to gather knowledge on experiences outside of the planned questions and topics. The semi-structured interviews deliver a more flexible structure for understanding the experiences, feelings, and concerns regarding the journey. (Eriksson & Kovalainen 2008: 82)

The paper seeks to answer the research question by primary data being the semi-structured interviews and parallel the theories with the data collected. The study investigates the single case, automotive company by observing the service design and user experience design challenges. The study involves customers and employees to identify the challenges and to create an ideal journey for mobile application integration.

Table 2. The steps of the research following the DSR approach.

Research steps
1. Description of the problem and motivation
2. Definition of the objectives
3. Data collection
4. Data analysis
5. Design and develop
6. Demonstration

3.4. Sampling and case selection process

The case is based on a car dealer network that represents one of the world-leading automotive company. The study is conducted locally, including only the dealers in Finland, since, the challenges and networks differ majorly between the countries. The case study focuses on the service occurring between the customer and the dealer, however, there are other parties; global manufacturers, regional headquarters, and domestic importers, that influence the service journey. The study does not focus on global parties; however, the domestic importers have a direct influence on customer experience and is included in some parts of the research.

Dealers are the closest to the customers and therefore, the case study focuses on investigating the dealers and customers to acknowledge the difficulties and challenges while introducing

and deploying the mobile application within the multichannel service offering. Additionally, the study aims to build a “theatre” including the service components.

3.5. Data collection and analysis

The data is mostly collected through semi-structured interviews with customers and dealers. The interviews with the dealers are conducted one-on-one, except one dealer interviews where the sales manager was also present in the interview to build a piece of knowledge on how the dealership is planning to implement the mobile application more effectively. The interviews were conducted in dealerships, in different cities of Finland. The face-to-face interviews enabled an examination of the nonverbal communication of the interviewees. The interviews were executed in Finnish.

The interviews with the customers were completed by phone call, which was the most efficient way to reach the customers. The interviews with the customers were relatively short and aimed to understand the customer journey and experiences regarding the mobile application introduction and deployment. The interviews were semi-structured, however, similar questions for all customers were intended to ask from all customers to create journeys from the same perspective. All the interviews were recorded and cite applied in the findings are translated into English by the writer. Additionally, the records were transcribed verbatim to assemble all the data from the interviews.

Table 3. Specifics of the interviews.

Interviewee	Date	Duration
Service Designer, Hanna Ahtola	24.10.2019	55 min
Development Manager, Miia Lammi	19.12.2019	44 min
Dealer 1	2.12.2019	31 min
Dealer 2	3.12.2019	53 min
Dealer 3	9.12.2019	41 min
Benchmark Dealer	28.11.2019	39 min
Customer 1	28.1.2020	12 min
Customer 2	28.1.2020	15 min
Customer 3	29.1.2020	21 min
Customer 4	6.2.2020	12 min

Two experts on service design are interviewed to gather an understanding of the methods, service components, and viewpoints. Four customers are interviewed to understand both the customer experience and user experience regarding mobile application deployment and introduction. Three dealers representing the case company are interviewed to explore the challenges the employees face during the mobile application implementation. Additionally, one interview is made to benchmark the case journey to a service journey of another company by interviewing a dealer that represents another company.

The study follows within- and across-case analysis strategies. The objective is to gather analytic preoccupation in all interviews, to conclude the intellect of the existed experience of the phenomenon. Additionally, the analysis assembles immersion in each interview and acknowledges the recognition of substantial assertions. However, the analysis categorizes classifications of assertions shared with interviewees, which follows the analytic focus on

across cases. The analysis supports free writing including intuiting, and critical reflection that are common for both within- and across-case analysis. (Ayres, Kavanaugh & Knafl 2003)

3.6. Validity and reliability

"Validity and reliability are key aspects of all research" (Brink 1993), additionally, they determine the quality and ethics of the study. It is highly important to discourse the tactics and strategies in qualitative research. The validity considers the accuracy and truthfulness of the findings, and the reliability reflects the constancy, stability, and repeatability of the results. (Brink 1993)

The validity of the research is protected by defining the questions that enable the interviewee to describe the service journey and experiences. The theme was common for all respondents and covers the research objectives. Additionally, the interviews were conducted anonymously. The interviews consisted of questions regarding the competencies and interest toward mobile applications and new digital services, which set the basis for attitude and experience examined.

The case study aims to apply numerous foundations of deposition and found a chain of evidence though data collection. However, Eriksson and Kovalainen (2008: 292) argue the uniqueness of the case study, the exact data rarely is repeatable. Additionally, the freedom of semi-structured interviews makes the data impossible to repeat. The case study reflects multiple perspectives. Furthermore, the study focuses on the experiences that differ individually, however, similar paths are described and acknowledged. The experiences are compared. The reliability is supported by broad and precise data assortment and accurate data analysis. The methodology and findings are discussed with experts. The results of the study can be applied to other automotive companies with similar services. Likewise, the results may be utilized in other comparable industries. (Eriksson & Kovalainen 2008:292)

4. FINDINGS

The automotive industry is shifting from a product-centric business model towards a solution-based business model. The first steps towards the change are made whereas the cars are transforming more autonomous and new data-driven products and services are developed to create additional value for the customers. However, as is witnessed, the change does not happen overnight, and the new approach must be implemented to all stakeholders.

In the end the people; dealers have the most significant role while introducing the services to the customers. As m-commerce is becoming more essential touchpoint it is more important to clarify the difficulties and challenges the organization faces during the implementation and adoption of new mobile service channels. At the moment, the m-commerce services the automotive companies provide are mainly targeted to the car owners. This chapter concludes the difficulties the stakeholders face regarding the m-commerce service integration within the service process. The findings cover the deployment and introduction where the introduction of the mobile application includes the process when the mobile application is introduced to the customer, additionally, the deployment means that the application is installed and all the features available are activated.

The chapter aims to answer the main research questions of

What kind of challenges generate from the deployment of the mobile application within the multichannel service journey?

To answer the main research question, the study focuses on fulfilling the three sub-questions:

SQ1: *How the dealer journey influences the service outcome and the customer journey?*
SQ2: *How do the realized service components affect m-commerce adoption and deployment, and what kind of relationships exists between the service components?*
SQ3: *How the user experience of mobile application impacts the deployment during the service journey?*
Each question is discussed and answered in the findings in separate chapters.

The findings begin by establishing the case to the method of drawing the customer experience through a customer journey that identifies all steps the customer experiences during the purchase process. The separate journey from a dealer's perspective is created to support the customer journey and to comprehend how the journey of the dealer affects the customer journey and outcome regarding the deployment of the mobile application. Figure 10 (page 44) describes the limited journey of the purchase process the study focuses on. The customer journey is built with the mentality of the mobile application deployment and how it is integrated into the service process. Additionally, the findings provide a discussion about an ideal customer journey that is build based on their interpretation supported by the interviews.

After the journeys are presented the study builds a definition of the service components regarding the case; people, processes, and properties. The study aims to understand deeply how the components affect the customer journey and the relationships between them. Finally, the study builds an interpretation of the current challenges of user experience that affect the dealers' and customers' journeys. The study defines the difficulties the dealers and customers face during the introduction and deployment process and discusses the influence on the implementation process.

4.1. Case description

In addition to the transportation equipment, cars are one way of personal expression (Gao, Hensley & Zielke 2014). It is rather important to understand the impact of the car individually. Overall, for an individual, purchasing a car is a big investment and there are multiple feelings and experiences involved. The new mobile services are developed to create more superior experiences and help drivers in various ways.

The competitiveness within the industry will intensify and technological developments will make a major influence (Gao et al. 2014). Therefore, in the future not only do the players within the automotive industry compete with the vehicles but also with the digitality. The aim of connectivity through mobile applications is to deliver unified transportation, logical interaction, and dynamic safety (Gao et al. 2014).

At the moment, the mobile application the case study focuses on does have features that may appeal to the customers in several aspects. The application delivers safety, cost-saving, and time-saving features. The customer can, for example, follow the consumption, EV driving and other data regarding the driving, search the location of the car, follow how many kilometers are left before the next kilometer-based maintenance, and send routes to the car. Additionally, the customer can follow the car's journey from the factory to the dealer. Many new features are still to come, and therefore, it is essential to integrate the mobile application deployment within the customer journey.

The study aims to build an acknowledgment of the experiences both the dealer and the customer encounter during the service journey. The dealers interviewed are from separate locations and have diverse knowledge and background. Three different dealers are interviewed to find out the challenges of the case, and one dealer from another brand representative is interviewed to benchmark the case company's performance to external criteria.

While considering service as a theatre, there may be different lengths of journeys. The journey the study focuses on may be reflected in the theatre performance; customer's entering the theatre, buying the tickets, waiting for the show to start, watching the performance, leaving the theatre. The study gathers the journey of new car purchases from customers entering the dealership to customer driving of a lot with a new car.

4.2. Service as a theatre

Figure 5 (p. 19) describes the framework of service as a theatre. In the context of the purchase of a new vehicle, **service providers** create the service experience for the customers, and the **service environment** of the dealership is where the service delivery takes place. The **processes** include both backstage and frontstage actions where frontstage is visible for the customer while purchasing a new car. The frontstage includes all the service channels, products, touchpoints, and interfaces, whereas, the backstage activities involve planning and implementation (Grove et al. 2000; Gibbons 2017). Additionally, the backstage operations conclude the training, support, management functions, and personal, and corporate culture

(Gibbons 2017). The interplay between the components; processes, people, and digital and physical artifacts creates service delivery.

4.2.1. Drawing the customer experience

The study builds service journeys based on both customer and dealer interviews. Four customer experiences are examined to comprehend how the customers have faced the journey, and in particular, the mobile application introduction and deployment. Additionally, three separate journeys are developed to understand the dealer's journey, furthermore, one journey is built as a benchmark journey. From the findings, the study fosters an ideal journey that takes account of how the employee may improve the journey step by step. That way the study answers the sub-question of:

SQ1: *How the journey from the employee's perspective influences the outcome and customer journey?*

At first, the study builds customer journey based on customer interviews. The aim is to understand how the customers perceive information regarding the mobile application from the dealer or through other channels, their experiences regarding the application, and finally the deployment of the mobile application. The customers have installed the application and tried to use the application after the pickup. The study distributes them to the group of early adopters.

Frequently, the contemplation of customer journey begins from customer awareness, when the customer has recognized a need. *"The customer journey can be also focused…Where the current journey is described in a way that opens the businesses to recognize how to develop the process."* (Lammi 2019). The study focuses on telling a story about the service beginning from the customer entering the dealership and finishing when the customer drives home with his new car. The Picture 1 aims to build a storyline from the customer perspective.

The storyline is built to comprehend the customer journey so that the study can discover which processes the touchpoint of a mobile application is appropriate. Additionally, the customer journey discovers the processes that are challenging and may reveal issues caused by a different component.

Picture 1. The storyline of the customer journey: 1. Customer enters the dealership 2. Customer greets the dealer and tells the dealer about his needs, 3. Customer test drives a car, 4. Customer receives an offer, 5. Customer makes a purchase decision, goes to the dealership, and the papers are signed with the dealer, 6. Customer waits for car and possibly follows the journey of the vehicle, 7. Customer goes to the dealership to pick up the car, 8. Customer drives off the lot with his new car. (Created with Pixton 2020)

After acknowledging the storyline of the customer journey, the focus shifts toward the objective of the study. The aim is to develop an understanding of:

- the first encounter with the mobile application,
- how the customer received information about the application,
- the successes and challenges the customers experienced during the customer journey regarding the application deployment.

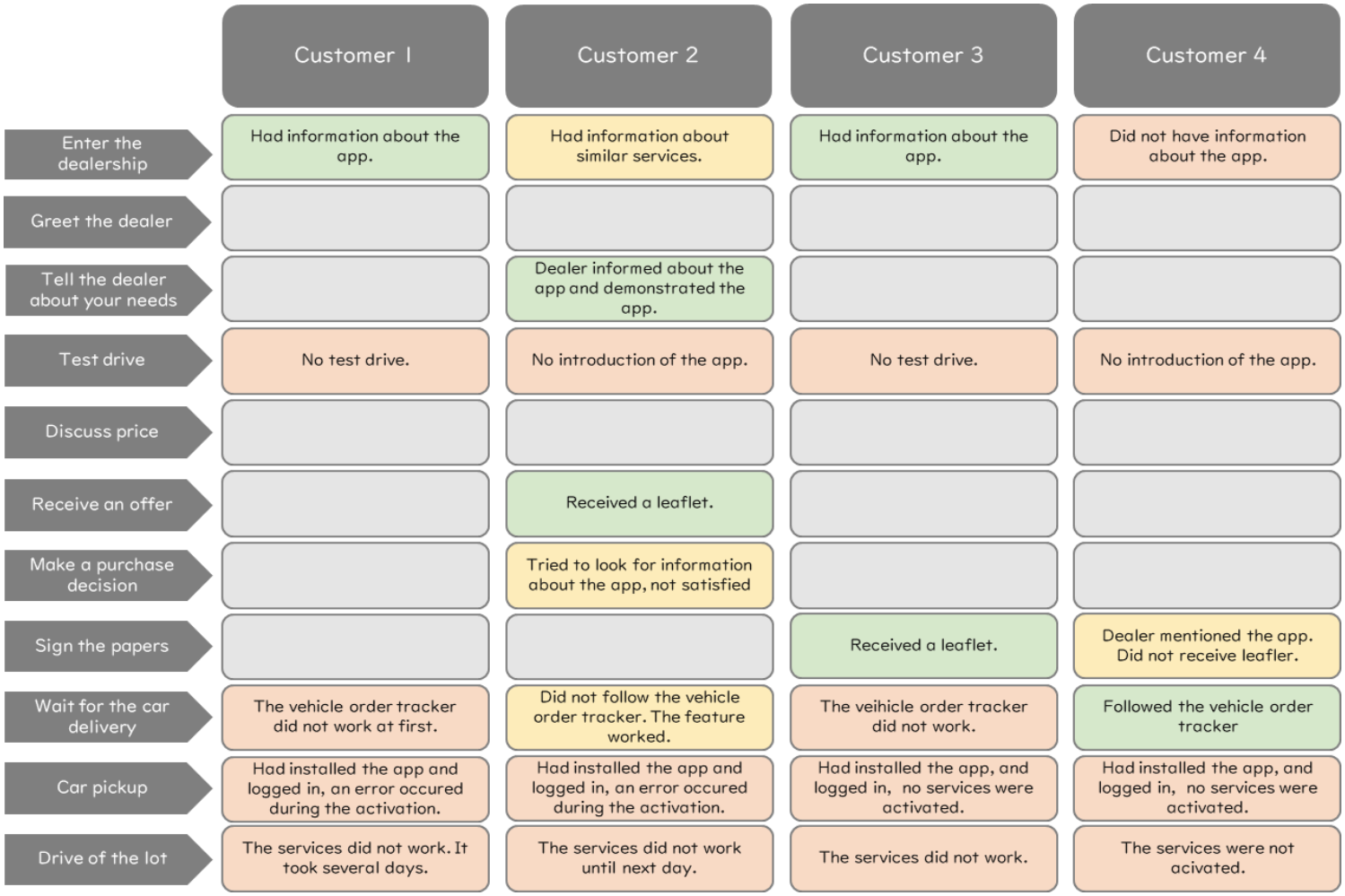

Figure 11. Customer journey and the mobile application touchpoint.

The customer journey regarding mobile application integration varies between the customers, where the customer's interest in the mobile application plays a critical role. All the interviewed customers have been self-initiated with the application. They have searched for

information about the application and installed it independently. *"There is not much information regarding the application online. There is a need for information. Usually, the videos are best where someone shows how things work."* (Customer 2).

The customers receive information about the app from the dealers, website, and from the leaflet which describes the features. Additionally, some of the customers have acknowledged that similar mobile applications have existed made by other automotive companies, especially Tesla.

The experiences involving the application have not been satisfying, even though some customers use the application actively, the process of deployment has not been fluent. All customers had struggled with the deployment, with the dealer or individually. None of the customers had the application working properly while driving a new car out of the dealership.

In the worst case, the dealer has only mentioned the application briefly while signing the papers. Customer 4 is interested in mobile applications in general: *"I use a lot of applications and I install applications very easily."* Customer 4 is open-minded and downloads applications if it somehow makes the experience more pleasant and easier. The dealer informed about the application, but that did not generate the customer to install the application. The customer did not remember the existence of the application after the order, only when an automatic email was received and informed about the application, the customer installed it. Although the customer installed the application and followed the vehicle order tracker through the application, during the pickup the mobile application was not taken into account. Customer 4 added the car to the application independently after the pickup.

For all the customers the deployment process included difficulties. When the challenges appear already during the early stages, it is more likely that the deployment will not be completed. As the services could not be activated independently, or with a dealer without difficulties, the negative customer experience can have a significant impact on application usage; "*Everything is so difficult and usually crashes to some issue."* (Customer 3).

4.2.2. Dealer's journey

The study builds comprehension of the journey from a dealer's perspective. The aim is to acknowledge how the dealers' journey influences both the customer journey and the service outcome. The observations and interviews have enabled to develop an ideal journey. Figure 12 gathers the steps of regular customer journey that includes the steps of; 1. Greeting the customer; 2. Customer needs assessment; 3. Presenting the potential vehicles; 4. Customer goes for a test drive, preparing an offer; 5. Giving an offer; 6. Call to the customer; 7. Signing the papers with the customer; 8. Calling to the customer to arrange car pickup and; 9. Pickup. The journey is widespread, however, the integration of the mobile application to the journey varies significantly among the dealers. Figure 12 describes how the mobile application is integrated into each process by the dealers. Additionally, it portrays the benchmark journey and ideal journey built on self-interpretation and supported by the interviews.

		o	Implemented		Δ	Realized but not yet implemented/ executed intermittently		x	Not considered in the process		
	Service journey	Journey 1.	Process	Journey 2.	Process	Journey 3.	Process	Benchmark journey	Process	The ideal journey	Process
1.	Greeting the customer	x		x		x		x		x	
2.	Customer need assessment	x		x		x		x		x	
3.	Presenting the potential vehicles	x		x		x		o	Talking with the customers about the features, and showing the features from own phone most of the customers know about the app beforehand	o	Customer's would know about the application beforehand and would be as one of the sales arguments
4.	Customer goes for a test drive, preparing an offer	x		o	Demonstration with own mobile phone	Δ	The benefits of the demonstration have been announced but not yet realized	o	Demonstrating the features with own mobile phone, some customers already have the application installed	o	Demonstrating the features with own mobile phone
5.	Giving an offer	x		x		x		x		o	Giving a brochure about the app if needed
6.	Few days later calling to the customer	x		x		x		x		x	
7.	Customer comes back to the dealership and signs papers	x		o	Giving a brochure about the app, advising the customers to install the application	o	The mobile application is introduced because of the vehichle order tracker.	o	After the deal is made the mobile application services are reviewed	o	Advising the customer to download the app and follow the car's journey
8.	Calling to the customer to arrange car pickup	x		x		x		x		o	Reminding the customer to download the application if he hasn't yet
9.	Pickup	o	Introducing the mobile application and activating the services for all the customers	o	Deployment of the application or, sometimes arranging another meeting for the mobile application deployment	Δ	Deployment of the application, some customers	o	Activating the features and testing that they work	o	Activating the features and testing that the features work

Figure 12. Mobile application integration to the service journey.

Customer journey 1

Journey 1 is based on the interview with Dealer 1. The dealers have a different style of introducing the mobile application to the customers. As such, the Dealer 1 introduces the application to the customer during the pickup.

> *"The mobile application only appears in the process for the first time in the pickup situation… The application is introduced to all customers."* (Dealer 1)

The dealer introduces the mobile application to all the customers. Generally, the account is activated, the mobile application is installed, and the services are activated during the pickup so that the customer can use all the features the application offers.

> *"All the customers who own smartphones want mobile services to be activated."* (Dealer 1)

According to Dealer 1, during the pickup the process of deployment is not painless as there are many steps to do before the customer can use all the features of the application.

> *" The activation takes way too much time, there are too many steps to be done… The activation takes around 15 minutes while the whole pickup takes around 30 to 60 minutes, it contains telling about the features, installation of the application and activation of the features."* (Dealer 1)

Customer journey 2

Journey 2 is based on the interview with Dealer 2. The Dealer 2 introduces the service to the customer often during the sales process. The application is introduced by demonstrating the services with own mobile phone.

> *"The mobile application is usually introduced by demonstrating the services with own mobile phone, that way the customer can see what kind of application it is and what can be found from there. It is more concrete if the customer sees the application himself than just telling about it."* (Dealer 2)

The dealer introduces the services to all customers and the dealer reminds the customers to get familiar with the application. Additionally, the dealership has set uniform guidelines for how to proceed with the application.

> *"The connected services are introduced to all customers; I give the leaflet to all customers when the deal is done. Additionally, I advise all the customers to check out the application and install the application on the mobile phone. That is instructed to all dealers and that is the way everyone should do."* (Dealer 2)

If the dealer has not introduced the application before the ordering, it will occur in that situation at the latest.

> *"When the car is ordered the application comes up because of the vehicle order tracker."* (Dealer 2)

The customers are complaisant about the application, however, not all customers leave the dealership with the application installed. Whereas the activation of the services is considered challenging, the user experience may not be fruitful.

> *"Now almost all the customers install the application, however, some customers say that they want to activate the services themselves. Therefore, not all the customers that leave the dealership have installed the app and activated the services… Additionally, I suggest another meeting to talk about the mobile application or navigator if needed."* (Dealer 2)

Customer journey 3

Journey 3 is based on the interview with Dealer 3 and Sales Manager 3 of the same dealership. Currently, the implementation of the mobile application with the service process is incomplete. However, the dealership has an objective to develop the process and has acknowledged the ways of introducing the service.

> *"At the moment, the deployment of the mobile application is limited."* (Dealer 3)

The dealership is developing own guidelines of introducing the service to the customer in an ideal way that supports the customer experience.

> *"Now the dealers have a common account from where we can start to demonstrate the services for the customers."* (Sales Manager 3)

Occasionally, the application is introduced to the customer while ordering a vehicle. The dealer informs the customer about the vehicle order tracker. Additionally, the leaflet may be provided to customers when talking about the application.

> *"If the application comes up, I give a leaflet to the customer…The services are told to customers at some point, usually, when ordering the car, I tell them about the vehicle order tracker."* (Dealer 3)

Since the dealer has faced problems with the application, the challenging situations cause uncertainty. Moreover, these challenges affect the customer experience.

> *"The challenges sometimes occur during the pickup; I do not understand what is behind the issue which makes it very challenging."* (Dealer 3)

Benchmark customer journey

The benchmark journey is based on the interview with Benchmark Dealer. The Benchmark Dealer represents an application integration and deployment developed by another automotive company. The deployment of the application has been developed successfully, and the previously occurred challenges have been resolved. Since the services the applications offer are slightly different, and the customer segment is relatively diverse, the journeys are not completely comparable. However, the benchmark journey provides additional information to complete an acknowledgment of the successful processes.

Already during the need assessment, the dealer aims to find out the customer preferences regarding the features related to the application. The customers are aware of the application in advance, which facilitates the introduction process.

> *"During the need assessment, I tried to find out what the customer wants and how important different applications are for the customer…Usually, the customers know about the application beforehand… The services strongly visible in social media and the company's website, that promotes the awareness of the customers."* (Benchmark Dealer)

There is no customer who will leave the store without knowing about the mobile application. Additionally, the application is a sales argument during the sales process. The services are presented from the dealer's own mobile phone.

> *"During the sales, the mobile application is always presented and also acts as a trump card …It is easy to show the features of my own phone".* (Benchmark Dealer)

Sometimes the dealer is with the customer during the test drive when the features are presented in action. Intelligibly, the dealer does not have the resources to participate in the test drive every time with the customer.

> *"I am not always with the customer during the test drive, but if I am, I present the features to the customer".* (Benchmark Dealer)

When the papers are signed and the deal is made, the application is considered together with the other equipment.

> *"When the deal is made, I go through the mobile application and connected services and the customer signs a consent."* (Benchmark Dealer)

Regarding the deployment of the application, the pickup is the most essential. It is relatively painless since it takes around two minutes to activate the services. Most of the customers have already installed the application and created an account.

> *"The pickup is most critical regarding the mobile application. The features are tested…Usually, the customers have already the application installed, and account activated."* (Benchmark Dealer)

Ideal customer journey

"The customer journey can also describe how the journey should proceed." (Lammi 2019). The ideal journey acknowledges the ways of how the mobile application and its deployment should be integrated into the service process by the dealers in a way that meets the customer needs. The ideal journey is build based on the customer journey and dealers' experiences and highly relies on own perception. The ideal journey aims to describe a journey that creates the most pleasant experience for both; dealers and customers. It aims to tackle the issues especially regarding information, time spending, and support processes.

Ideally, the customers would know about the application and its features beforehand. The customers receive a lot of information regarding the purchase such as car specifications, insurance, and finance. Therefore, knowing about the application and its features would deliver a more pleasant experience for the customer. Additionally, it would make the process more painless from the dealer's perspective as well. In the benchmark journey, the customers are familiar with the application through social media, web site, and own interests, which makes the introduction more straightforward.

The dealers have already acknowledged the value of demonstrating the features with their own mobile phones. Preferably, the dealer would show the customer's test drive from the mobile application and demonstrate the features. That way the customer can see the own route analyzed in the mobile application and have unique test drive experience. The increased interest in the application arises.

Admirably, after the demonstration, the dealer gives a leaflet about the application to the customer. Thus, the customer receives additional information and the leaflet leaves a memory of the services to which the customer can return later. Alternatively, the mobile application could be mentioned in the offer sent electronically to the customer.

While the order is made, the dealer informs about the vehicle order tracker that enables the customer to follow the car's journey from the factory to the dealership. The customer can track the journey through the mobile application and provides great motivation for the customer to install the application. Therefore, it is essential to recommend the customer to

activate the account and install the application. Impeccably, the dealer installs the application and activates the account with the customer.

Ideally, when the dealer calls to the customer to arrange a pickup time and if the application has not been installed and account activated together, the dealer reminds the customer to accomplish the steps. Thus, during the pickup, the dealer and customer must only activate the services and connect the multimedia device with the application and do a functional test. Moreover, the customer is somewhat comfortable with the features. This highly supports the experience of the Dealer 3:

> *"If the customer does not have the mobile application account, it has not been activated, and the application is not installed, it can take around 30 minutes to deploy the services, therefore, the duration varies a lot. If the customer has the account activated and application installed, it speeds ups the process drastically… If the customer has done everything properly and the system works, the deployment only takes 10 minutes."* (Dealer 3)

Additionally, ideally, when the problematic situations occur, the dealer has information about who to contact and when, and from where to find instructions on certain issues. At the moment, the dealers are struggling with the issue of who to contact or what to do if an error occurs.

Overall, the dealers have a major effect on the customer journey and service outcome regarding mobile application deployment. Since the challenges occur occasionally during the deployment of the application, the customer cannot always independently activate the services. Additionally, as the connectivity of the cars is relatively new technologies, not all the customers would be aware of them without the dealer.

4.3. Weak market test

The actions of the ideal journey were presented step-by-step to the dealers during the training session regarding the application introduction and deployment. The study follows the design science research that concludes the market test, and therefore, it is important to receive

feedback regarding the findings. The feedback regarding the journey was only positive. The dealers were pleased to receive step by step instructions regarding the mobile application introduction and deployment. As a fulfilling journey is described, the dealers now have to embrace the methods. As the ideal journey is not fully taken into action and tested, one may not conclude the genuine functionality of the ideal journey.

The ideal journey is believed to provide additional value for the stakeholders. However, the study aims to have a deeper acknowledgment of the components that build the service journey. Next, the study concludes the components in light of the mobile application introduction and deployment. The study describes all components and investigate is there a relationship between the components.

4.4. Components of the journey

The literature defines three service design components: people, processes, and digital and physical artifacts. The study aims to realize the components for the case study, constitute a framework of the realized components and consider their relationships. Overall, the chapter answers the research question of:

SQ2: *How do the realized service components affect the m-commerce adoption and deployment, and what kind of relationships exists between the service components?*

The chapter is built in parallel with the literature review which begins of service processes, followed by people, and finishing to physical and digital artifacts. The processes conclude, both front stage and backstage processes, the people consider dealers and customers, and digital and physical artifacts take account of the artifacts affecting the mobile application integration, and its introduction and deployment.

4.4.1. Processes

The service offering generates from both backstage and frontstage processes. This study focuses mainly on frontstage processes that are visible to the customers, however, the study

concludes the backstage processes that influence the adoption and implementation of mobile application as a new service channel. The frontstage processes are the most essential to the customer experience, however, the backstage processes such as training and support have a major influence on the service outcome.

As defined earlier, in a bigger picture the dealers' journey is relatively similar regardless of the dealership or an individual. However, a significant observation is that the processes regarding the mobile application introduction and deployment are diverse, for all the dealerships, and all dealers. A universal method of introducing the mobile application during the service journey does not occur. Inefficient change management is evidently observed.

Backstage processes

Backstage processes support the front stage processes and are essential regarding the implementation of a new mobile service. For the dealers interviewed the learning process of the application has been relatively easy. The dealers have been used to different mobile applications and have a genuine interest in this sort of service. The learning process is continuous since new features are continuously developed. All dealers argued that self-learning is the most efficient way to learn about the application.

The dealers also endorse the videos made by the importer as an effective way of learning, the dealers can go back to the video in case of need of repetition. The dealers assert that the material already existing is adequate. However, at the same time, the dealers argue that "*A strong communication constantly is necessary*." (Dealer 3). Additionally, the Dealer 1 states the challenges regarding the mobile application implementation being significant: "*Some of the dealers do not tell about the application, not even during the pickup. Those customers come back to the store and ask for deployment…This is a big problem, the dealers are not knowledgeable, they do not know how to deploy the services. There is a lack of information and motivation among them.*" (Dealer 1).

Additionally, the dealers require guidance during challenging situations. "*The wish is that the importer would clearly inform the phone numbers and whom to contact."* (Dealer 3). The dealers acknowledge that uncertainty affects the introduction. "*How the customer experiences the app if it is difficult and challenging and the threshold deployment growths.*

If the deployment would be easy… it would have a major influence on customer behavior and application deployment." (Dealer 3).

Rationally, an effective support channel does not exist. An interface for support is required, such as a question column on the network's website, where the dealers can inform issues and receive advice. A commonplace for the dealers and importers to discuss challenges regarding the application. The column is acknowledged as a component of a digital artifact for supportive and learning processes.

To conclude, the backstage of the employee may highly affect the customer journey, and the mobile application introduction and deployment. The attitude and motivation of the employee, organizational culture, the support processes, communication, and other factors may influence the service journey. Additionally, the backstage of the customer also affects the journey.

As defined earlier regarding the interviews with the customers, the own interest toward the mobile application plays critical roles. All the customers interviewed use different mobile applications, especially, the customers highly adored the applications that make life somehow easier. Therefore, it is important to acknowledge that mobile applications should not make processes more difficult.

Not many customers are aware of the mobile applications that are developed by the automotive companies that aim to bring value regarding the car ownerships. As mobile services develop, it is most likely that the customers are more aware of them. Already the customers, who have the mobile application installed, are sharing their experiences through different channels such as, online and word of mouth. There are customers that are keen to share their experiences of the mobile application with their family and friends. However, as the mobile application and the features taking account of mobility are relatively new, more information is required.

Front stage processes

The front stage processes are visible to the customers; therefore, they play an essential role in experiences. The Picture 1 (see page 57) describes the front stage processes in general,

additionally the Figure 11 illustrates the processes including the mobile application introduction and deployment. The deeper the processes are examined; the more diversity can be identified.

Usually, the customers do not ask about the mobile application services, thus, the dealer is in charge of introducing the application. The ideal journey presented in Figure 12 defines the processes regarding the mobile application deployment and introduction in an ideal way that supports both parties' experiences, customers and dealers. Additionally, the findings reveal that the dealers and dealerships are at different levels related to the mobile application adoption process where the backstage plays a critical role including the personal and organizational culture. However, the mobile application is considered valuable and providing value for the customers*; "Mobile application service is part of the process since it provides additional value for the customer"* (Dealer 2).

One should acknowledge that the backstage and frontstage processes are connected and affected by each other, one should not consider only one of them. The backstage processes affect the duration of the mobile application deployment, which the dealers argue taking too much time. Additionally, the statement from Dealer 3, defines how the backstage processes such as learning and teaching influence the front stage processes, and the backstage processes do not only reflect the dealers, but also other stakeholders as well.

> *"At the moment we are only taking the first steps…The threshold to learn and teach the customers to new things like this is difficult. This should be part of the sales process, not the first thing… The confidence to introduce the mobile application to the customer is lacking…Every time the customer has a question about the application, I have to investigate a bit."* (Dealer 3)

4.4.2. People

Both, the employees and customers are adopting the new mobile applications differently. The model of innovation adoption lifecycle that describes the market adaption of new innovation, product, or service (Hämäläinen, Nyman, Björk & Lammi 2019) may be applied in the case. At the moment, less than 34 percent, early majority, of all the customers deploy the mobile application. As the mobile application becomes technically more stable, the features develop,

and the mobile application is integrated more effectively into the process, more users will adopt the application.

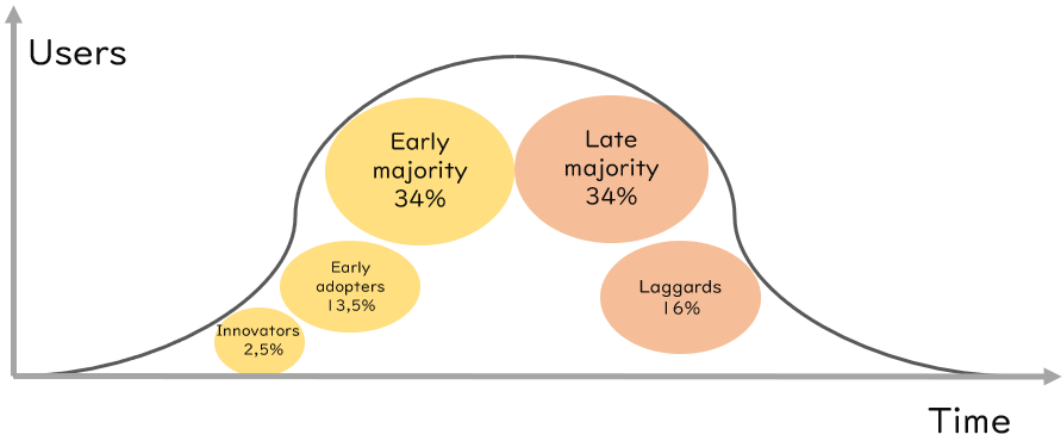

Figure 13. Innovation adoption lifecycle (adopted from Hämäläinen, Nyman, Björk & Lammi 2019)

It is important to acknowledge, that both, the employees, and customers have to adapt to the new innovations. The service should be designed to be delivered in a customer-centric way. Therefore, the service design method; customer journey; provides essential data regarding the integration challenges. The customers are keen to utilize services that provide value; "jobs to be done". Additionally, according to the Dealer 3, the customer behavior has been shifting more toward digitality: *"Different sales channels are used, online, email and phone are the most useful channels. Less and less the interaction is face to face, now there are contacts coming all the time electronically"* (Dealer 3). The digital change affects the employees as well, the tasks are changing, and they have to be more agile to change. This requires efficient change management, where the change happens naturally.

People are not against change, especially, if the change easiest their lives. For the dealer, it is often easier to communicate through digital channels than to arrange a face-to-face meeting with the customer. A similar viewpoint can be applied in the mobile application development and deployment, people would not be against it if it would somehow make things easier. The employees will introduce the application if they benefit from it, and the customers would be keen to adopt the application if they see value in it.

Additionally, it is essential to acknowledge that all people; customers and employees have different cultures and backgrounds, and therefore, they adapt the mobile services differently. Overall, within the service journey, the people play the most essential role, the employee has an important role in the introduction and deployment of the application. For the customer the deployment of the services is relatively difficult, e.g. Customer 4 tried to activate the services individually: *"I did not know what VIN is… I would have appreciated if the dealer would have added the VIN during the pickup."* (Customer 4). The mobile application deployment by the dealer is often necessary.

Likewise, the customer has a significant role, however, the need of the dealer is sometimes required. The interview with Customer 3 and Customer 4 reveals that if the dealer does not support the deployment, the customer will not be always able to use the features. The interview with Customer 3 discloses that the customer asked about the deployment of the application and all features several times from the dealer, but the issue was never solved, therefore, the customer is not able to use all the features. Furthermore, the interview with Customer 4 reveals, that if the customer does not ask the dealer about the application and its deployment, the customer may not be able to use all the features available.

4.4.3. Digital and physical artifacts

Different properties, digital and physical artifacts are essential for the mobile application integration. Cars and mobile applications enable the dealer to demonstrate the services after the test drive with the car, the leaflet informing about the application eases the introduction of the services, and the advertisements about the application in the TV-screens of the dealership may draw the customer's attention. Additionally, digital artifacts such as emails, websites, social media, etc., enable the customers and dealers to receive information, learn and gain support. It is important to acknowledge the influence of the artifacts within the customer journey.

Furthermore, it is important to acknowledge which communication channels are efficient and on the other hand which are unproductive. For example, all customers receiving the leaflet remember it, however, none of the customers mentioned recognizing the video played in the dealership's TV screen. Moreover, there are customers requiring more information digitally.

The physical artifacts play the most critical role during the front stage processes, whereas the digital artifacts are more essential during the backstage processes. The leaflet plays a strong role while introducing the services. The leaflet may trigger the customers to download the application. The customers recall the leaflet as an advertising communication and not much informative. The information provided in the leaflet regarding the application was agreed limited.

At the early steps, the customers require more information regarding the mobile application, and how it works. The benchmark company, which customers mostly know about the existence of mobile application share information strongly on their website and social media. For the case company, only a limited amount of information is visible on the website, and on social media, the evidence of the mobile application does not exist. Since many customers search for information regarding the car already in advance, the information regarding the mobile application online would be beneficial. That would serve both parties, customers, and dealers. The requirement of the information is supported by the statements of the dealers: *"...Not many customers are aware of the services before introducing them"*, and *"only around five percent of the customers ask about the connected services before introducing them".* (Dealer 2), and *"Customers more and more investigate the products in advance from the web. Therefore, the customer may know a lot already. Some customers even want to go straight to test drive and get an offer. "*(Dealer 3).

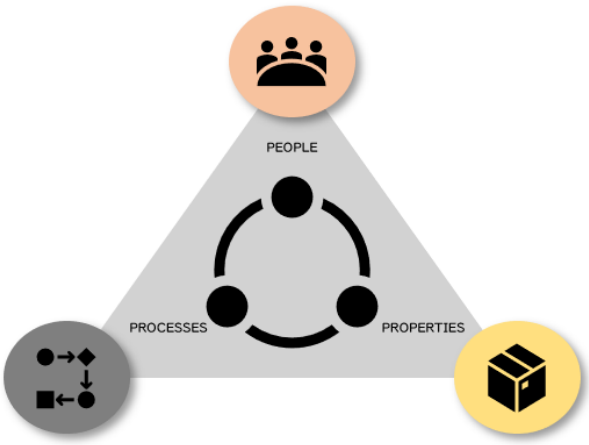

Figure 14. The triangle of service components.

Besides the finding that the components have a significant role in the customer journey, the strong relationship between the components is perceptible. Overall, people, customers, and employees utilize the physical and digital artifacts to complete processes. The integration of mobile application drives through multiple artifacts: car, mobile phone, leaflet, website, emails, and TV screens. Customers receive information through different channels from which some are physically present in the dealership, and some digitally reached the customer. Additionally, all processes include people and digital and physical artifacts. The interviews revealed that the process is not repeatable by the current processes, which is influenced by all the components. By those findings, the study developed a triangle presented in Figure 14 that describes the assimilation and strong relationship between the components during the service journey.

4.5. UX affecting the m-commerce adoption

The world is becoming more digital, where the importance of well-established user experience increases. The interviews reveal a significant correlation between the service experience and user experience. Poor user experience affects strongly the mobile application introduction and deployment. This chapter provides an acknowledgment regarding the sub-question of:

SQ3: *How the user experience of mobile application impacts the deployment during the service journey?*

In this study, the mobile application is considered as a touchpoint that occurs in multiple stages during the customer journey. Earlier the study considered the journey from the step customer first time entering the retailer until the customer drives off the lot with his new vehicle. During that journey, the mobile application should have been introduced, demonstrated, and deployed to the customer via different touchpoints. Garrett (2006) argues the touchpoints to deliver the most rewarding emotional response, where the touchpoint, e.g. mobile application should deliver exceptional user experiences to continue within the dynamic business nature (Djamishbi et al 2014).

The three aspects of UX introduced by Hassenzahl and Tractinsky (2006) present the dimension of influential value, human perspective, and experiences. The paradigm is utilized while acknowledging the challenges regarding the influence of mobile application user experience on its introduction and deployment. Beyond the instrumental signifies of realizing human needs. While following Jordan's (2000) hierarchy of needs the first level is to achieve the functionality, secondly the usability, and finally, the satisfaction and enjoyment of the mobile application. Currently, the mobile application under the study is not functioning properly since multiple inaccuracies are constantly recognized by the dealers. Since the application does not fulfill the requirements regarding the first step of the hierarchy, the enjoyment and satisfaction are unfeasible to fulfill. Thus, it is important to comprehend the basis of user experience, the study does not consider the design of the mobile application, whereas it aims to acknowledge on how the user experience influences the journey regarding the mobile application integration, focusing on the introduction and deployment.

Instinctively, in a stage of introduction and deployment, the user experience of the dealers is more legitimate since the customers are not used the application before. Moreover, the user experience of the dealers reflects the experience of the customers. *"If things do not work properly it is less likely that the customer will use the app. "*(Dealer 3) revealed his concern regarding the errors occurred while showing the mobile application to customers. The dealers as any human being avoid awkward situations outside of the comfort zone.

One must note that none of the customers interviewed had all the features working after the pickup that states about either somewhat poor implementation or major technical challenges, or both. The dealers realize the technical challenges; however, they have a belief for improvements.

> *"It seems like the early struggles are known and will be fixed. I believe that my own use will increase when certainty improves. I have my own uncertainties, but if I would know that the help exists, it would have a major effect*." (Dealer 3)

Besides the technical errors, all the dealers argue that the deployment takes too much time. The deployment includes multiple steps done with the application, the most painful being the registration of the multimedia device. For the customer trying to deploy the features himself

the deployment, especially the registration of the multimedia device was the most painful step.

> *"Really a lot of typing… It is too clumsy, and so poorly functioning. Usually crashes into some issue… Need to pair devices and connect to that and this."* (Customer 3)

> *"How the customer experiences, if it is challenging and difficult, the threshold to deploy the services growths… How easy the beginning is, has a major influence on the customer behavior and deployment of the application."* (Dealer 3).

Hence, not only does the user experience influence the dealers, but also the customers while reflecting the previous statements. One can clearly state that the functionality and the usability that influence the user experience have a major influence on the introduction and deployment of the application. The evidence cannot be denied. The dealers aim to be effective in their work, they like to avoid additional work caused by challenges the mobile application deployment generates. Additionally, the complexity of the deployment makes it difficult for the customer to deploy the application independently. However, besides the poor functioning, the dealers have acknowledged the value of the recent features for the customers. Whereas the deployment sometimes creates difficulties, the introduction of the application mainly generates superior emotions for the customers.

Moreover, the usage of the application is relatively easy after the deployment. The statements from the customers support the easy and painless user experience after the deployment: "*And otherwise, the usage of the application is pretty straightforward to use."* (Customer 4), "*I use it daily. I follow the EV drive and consumption, what should I change and hybrid scores."* (Customer 1), "*I have investigated how my own driving style adapts to this new car… Now as I have been using it there has not beet other problems."* (Customer 2), Customer 2 refers to the challenges that occurred while deploying the mobile application.

4.6. Synthesis

To conclude all the findings, firstly the study builds acknowledge on the research question of *how the journey from the employee's perspective influences the outcome and customer*

journey. The findings reveal a piece of evidence that the employees have a major influence on whether the customer had the mobile application installed and all the features available. The study gathers different processes to determine different factors that have an influence on the customer journey. Additionally, the study gathers evidence on *how the realized service components affect the m-commerce adoption and deployment, and what kind of relationships exists between the service components.* The evidence of the strong connection of the components within the customer journey is evident whereas the service components are the basis of the service journey and offers. Additionally, one should not reflect the components separately since a connection between them is apparent.

After the service journey, and service components are acknowledged, the study gathers the evidence of *how the user experience of mobile application impacts the deployment during the service journey.* During the interviews, the usability, and user experience are acknowledged, whereas it builds the core of the mobile application deployment. The functionality, the first stage within Jordan's (2002) hierarchy is a basis for the user experience, and without well-established functionality, the deployment of the mobile application is relatively difficult, and the user experiences poor. Lastly, the study aims to integrate the findings and develop an acknowledgment of the main research question of *what kind of challenges generated from the integration of the mobile application within the multichannel service journey.*

The challenges are widely discussed through different perspectives. The study gathers the findings and states challenges in light of the service design and user experience design. In chapter 2.3. the study builds a synthesis of service design and user experience design. The study includes both **natures**; physical and digital, both **mindsets**; business models and social innovations, and new technologies; from both **scopes**; broad and deep. The findings conclude experiences, journeys, and involvement typical for service and user experience design.

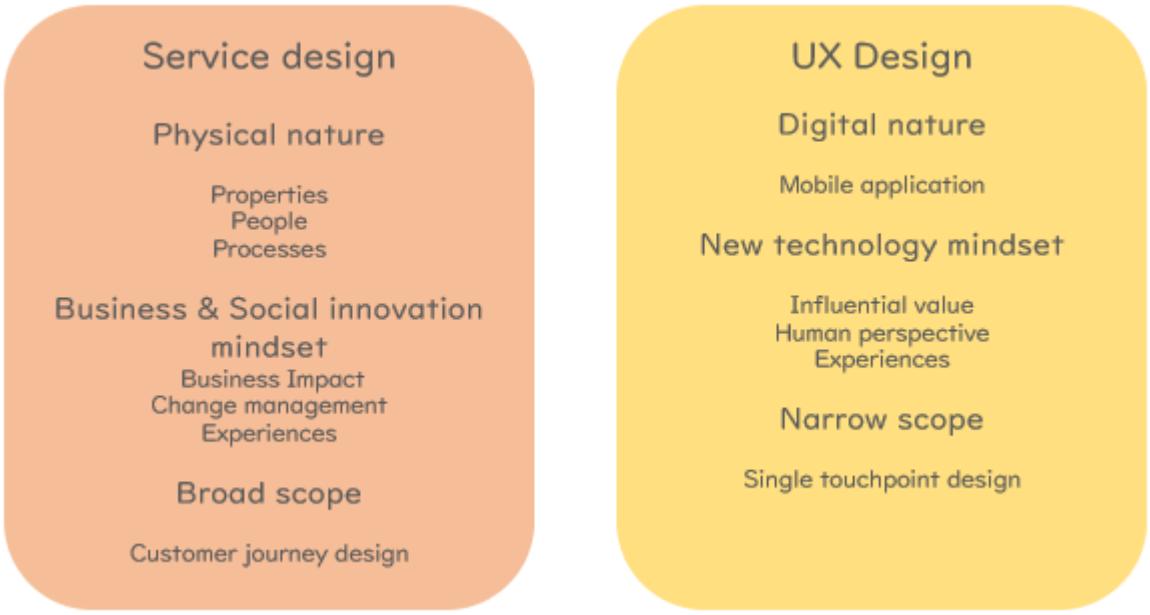

Figure 15. Challenges generating from mobile application integration.

A business integrating new m-commerce to the service journey including multiple other channels faces challenges from both frameworks, service design, and UX design. Figure 15 gathers the substances generating challenges. Nature of the design engenders multiple challenges including all service components in digital and physical nature. The theory separates the nature to physical and digital, however, as the service is shifting toward digitality, and new digital channels are integrated to the journey, they should not be disconnected, thus, considered together. The implementation and integration challenges require efficient change management, whereas, from the new technology mindset, one should focus on user experience from the three aspects of influential value, human perspective, and experiences. Additionally, one must acknowledge the impact of the integration of a new mobile application into the service journey to the core business.

Finally, the service design offers a tool for a smooth and integrated journey, whereas the user experience investigates a single touchpoint, the mobile application. Both scopes require examination, without a well-established mobile application with a well-designed user experience the customer journey suffers, and on the other hand, without mobile application implementation and integration, the users would not be able to use the mobile application.

5. DISCUSSION

The purpose of the research is to acknowledge *what kind of challenges generate from the integration of the mobile application within the multichannel service journey.* By following the DSR approach firstly the study defines objectives of the research and problems to solve within the study. Before revealing the findings, the study gathers a theoretical background on service design and user experience design that create the basis of the study. Furthermore, the study investigates mobile applications existing in the automotive industry.

The study of Barrett et al. (2015) discovers the importance of digital innovations that generate success. Their study addresses the need for attention related to the delivery of innovation and states the importance of the organizational commitment of service innovations, thus, on a broader scale. The study focuses on experiences of service delivery and aims to reveal the critical factors, such as individuals' own motivations and beliefs. The findings begin with the description of the customer journey, followed by the journey from the dealer's perspective. The findings consider *how the journey from the employee's perspective influences the service outcome and customer journey.* Moreover, an ideal journey is created and presented to the dealers.

The research of Bontis et al. (2011) investigate correlations between different factors such as efficiency, employee satisfaction, and job challenge. Their study addresses the importance of internal information sharing that plays a critical role in satisfaction, but also the adoption of new technologies. Their study is conducted by investigating quantitative data from employee's perspectives from a survey. Yet, this research aims to create a broader and holistic view by investigating qualitative, however, precise data gathered through semi-structured interviews. The study focuses on all components during the service journey to conclude *how do the realized service components affect the m-commerce adoption and deployment, and what kind of relationships exists between the service components.*

Lastly, the study considers the touchpoint of mobile application and aims to find evidence of *how the user experience of mobile application impacts the deployment during the service journey.* After concluding an acknowledgment regarding the sub-questions, the study shifts to broadly connect all dimensions and answer the research question of *what kind of*

challenges generated from the integration of the mobile application within the multichannel service journey. The literature has not provided evidence to this research question before. The findings are strongly based on the theory presented in the literature review, the models and tools are successfully utilized by modifying them suitable for the case. The study initially fulfills the research gap.

5.1. Theoretical implications

New technological developments create requirements for scholars to investigate. The transformation of the organizations enables the redefinition of the traditional processes (Bruger et al. 2015). The study creates a unique way of demonstrating the challenges the integration of mobile applications may generate. The existing study of mobile application integration to service journey is limited and barely exists. The case approaches the issues from an automotive industry perspective that delivers an interesting aspect of a mature industry that is shifting slowly toward servitization. Overall, the empirical part of the study is exceedingly practical and utilizes service design methods innovatively. The findings strongly rely on experiences of the customers and dealers, as the service design is strongly based on the acknowledgment of customer experience (Texeira et al. 2012).

As in strategy, the formulation plays a critical role, however, the implementation often does not receive the attention required (Gupta & Govindarajan 1984). The strategy formulation can be compared to the formulation of service design whereas the strategy implementation to the service design implementation that similarly has persisted quite narrow. The importance of execution and delivery are discussed in the existing literature. The study Norton et al. (2013) of provides a holistic view of the utilization of a journey concept that includes all units from the IT team to the marketing team to the journey and provides broadly the key processes for successful service delivery. As the formulation of new service innovation is largely recognized, the study aims to deliver acknowledgment of the implementation of a mobile application to the stakeholders through service design.

Additionally, the development and testing of the existing models and frameworks are required (Gruber et al. 2015). The study confirms that user experience design should not be separated from the service design. The literature rarely considers the UX and service design

together, however, as the digitalization emerges, and the services become more digital by nature, the service design should acknowledge more the aspects of user experience design. The study aims to build the challenges in light of both frameworks, together and separately.

The service quality has been studied relatively broadly, where the key factors have been stated. The previous literature acknowledges the importance of the quality of the service interface (Cassab et al. 2009). Additionally, the interaction between the touchpoints should be seamless (Cassab et al. 2009). The customer should be able to effortlessly interact between the channels of website, mobile application, and face-to-face. This leads to the main theoretical contribution of the study; finding of the challenges that disable seamless interaction, that together with both frameworks; user experience design and service design helped to recognize. The physical and digital nature considering the components must be identified, furthermore, their relationships should be realized. The integration of the m-commerce must consider both mindsets, business and social innovation mindset, and new technology mindset. Additionally, the design and integration should be reflected broadly and narrowly.

5.2. Managerial implications

The development of a fruitful service channel is comparatively difficult for multiple companies (de Brentani 1991). The study of Yu and Sangiorgi (2017) reveals the complexity of the service innovations and delivers a contribution to the integration of managerial and engineering processes. The service design practices enabling a holistic view are utilized while designing the methods of examining the data. The empirical part of the study is relatively practical utilizing different models. The findings present the current challenges of integration of the mobile application into the service journey based on the experiences of the customers and dealers. Additionally, the study builds ideal steps regarding the journey that can be effectively utilized by the dealers. As the study addresses the existing issues, the case company may take them into account and develop the service toward superior customer experiences.

Additionally, the case company has put effort to support and teach the dealers to acknowledge the mobile application, however, the customers have not received the information required.

To get more users, the company should increase the amount of information regarding the application on different channels. Thus, the customers are more aware of the application in advance, and the dealers have a motivation to learn more.

Furthermore, the management should consider when to implement a new mobile application, and in what manner. The study presents an excellent technology utilized in the new digital channel, however as the functionality of the application is uncertain, the acceptance of both parties; dealers and customers impair. Since the development of modern technologies is continuous the application may never be ready, however, one may consider that the first step of Jordan's (2002) hierarchy, functionality, should be fulfilled. The application was introduced the first time to the stakeholders while it still had multiple problems and caused challenges for the dealers. Still, that affects the challenges regarding the reliability among the dealers.

Overall, one should consider that currently, the most important thing is to develop the user experience by ensuring the functionality of the application. When the number of users increases, more challenges will be arising. That causes additional work for multiple parties; dealers, local importers, and regional headquarters.

5.3. Suggestions for future research

The automotive industry is changing rapidly, as multiple new technologies are arising. The technologies generate numerous new business opportunities and increased value for the customers. Currently, big steps are made, and the future of movement will be utilizing more advanced technologies. The case company is acknowledging the future and it aims to utilize the technologies to please the customers the best way possible and stay relevant. Moreover, superior customer experiences are significant in the future as well, as the business is becoming even more dynamic. A future study related to the field is expected.

The research of service design is argued lacking practical guidelines (Yu & Sangiorgi 2017). The study of service design and user experience design can be interminable; different perspectives, models and approaches can be utilized boundlessly. Whereas mobile applications are emerging as a new service channel in multiple industries, more scholars

should be addressing these issues. Additionally, nor should the study concentrate only on individuals. The study of Gruber et al. (2015) addresses the importance of organizational experiences and outcomes.

The study of usability is not conducted within the study; however, it is required. The emerging mobile applications have generated interest in the field (Zhang & Adipat 2005). The observation of the usage of the application would reveal narrowed issues to develop. Since the functionality of the application plays a critical role in mobile application adoption, a qualitative study based on this matter is relevant.

5.4. Limitations

Every study has its limitations; thus, the study would be unending. Firstly, the study aims only to address the challenges occurring from the integration of the mobile application into the service journey including multiple different other channels. There are different methods to utilize to define customer experiences. The study utilizes the method of the customer journey to describe the customer experiences step by step. Furthermore, the study does not attempt to solve the challenges occurring within the customer journey, however, an ideal journey for the dealers is created to support the integration. Additionally, some ideas are presented within the findings to support the outcomes.

Secondly, the study focuses on the journey from the customer entering the dealership to him driving off the lot with a new car. The study aims to understand what happens before the customer enters the dealership and after the customer drives off the lot to realize the outcomes however, not much attention is paid on that. The study included three dealers from the case company and one dealer from the benchmark company. Furthermore, the study included four customer interviews. The study focuses on experiences that create the basis for the findings. As the customer experience is unique, the interviews are not repeatable, therefore a conscious decision to limit the number of interviewees has to be made.

Additionally, a demographical limitation is made as the study focuses only on the customers and dealers in Finland. The study focuses mainly on the local dealers and customers, without paying much attention to the local importers or the regional headquarters.

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APPENDICES

Appendix 1. Interview questions for the customers

Background of the customer

1. Do you use mobile applications?
2. How well do you adopt new mobile applications?

Customer journey

1. Did you search for information before going to the dealership, if yes, how did you search for information?
2. Did you test drive the car?
3. What happened after the test drive?
4. Did the dealer show the mobile application, when and how?
5. Did you receive a leaflet about mobile applications?
6. Did you know about connected services before?
7. What do you think about these kinds of services?
8. Did you follow the journey of your car from the factory to the dealership after ordering the car?
9. From where did you follow the journey? Application, emails, or website?
10. How long did the pickup take?
11. Did you have an account before the pickup?
12. Did you install the application before the pickup?
13. Did you activate all the features with the dealer during the pickup?
14. How would you describe the deployment of the application?
15. Did the features work right away? Did you test them with the dealer?
16. How have you used the application after the pickup?
17. Have you faced any issues while using it?
18. Have you shown the application to your friends or family?
19. Do you have any additional comments?

Appendix 2. Interview questions for the dealers

*Disclaimer: the questions between the dealers were differing significantly.

1. How long have you been working in your current position?
2. How would you describe your normal workday?
3. How much time do you spend daily by using different mobile applications?
4. Generally, what do you think about the Connected services related to driving?
5. How do you use the application?
6. Has the process of introduction of the application changed since the launch on your behalf?
7. Have you had training regarding the usage of the application?
8. How have you learned to use the application?
9. Can you describe to me what happens during each step, the first step being customer entering the dealership?
10. After defining all steps, in which steps and when does the application come up? Can you describe to me all the steps including the mobile application?
    a. Need assessment?
    b. Introducing cars?
    c. Test drive?
    d. Ordering the car?
    e. Pickup?
    f. After the pickup?
11. How do you introduce a mobile application?
12. Do you demonstrate the features with your own phone?
13. To whom do you introduce the application?
14. Is the mobile application somehow visible in the store? Do you have a leaflet for the customers?
15. Can the customer deploy the application and all features independently?
16. How do the customers react to the mobile application?

17. What kind of feedback have you received?
18. Generally, what kind of mobile services do you consider as the best ones? Why?