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UNIVERSITY OF VAASA

Laura Kivelä

Utilizing Data Analytics in Private Healthcare Companies' CXM

A Multiple Case Study

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Author:	Laura Kivelä
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ABSTRACT:

The customer experience and its management have become the focus of business in the intensifying competition. Thanks to the development of technology and the increase in data, companies have more insights and options than ever before for developing their customer experience. Also in the healthcare sector, competition is emerging and customer awareness is constantly growing. Therefore, industry players need new ways to develop their operations towards more customer-oriented and personalized services.

This study aims to find out what kind of customer data Finnish private healthcare service companies collect to support the management of their customer experience and how this data is utilized in concrete decision-making. Data is collected through four interviews from different companies. The interviews sought to find out the current state of case companies' data-driven customer experience management.

The results identified that case companies collect a lot of diverse customer data. Also the importance of the customer experience has been actively raised at the center of thinking. However, interviews showed that there is still very little knowledge-based customer experience management in case companies compared to their potential and available opportunities.

KEYWORDS: Customer experience, Customer Experience Management, Data-analytics, Big Data

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Abbreviations

AI	Artificial intelligence
BD	Big Data
BDA	Big Data Analytics
CX	Customer Experience
CXM	Customer Experience Management
IoT	Internet of Things
KPI	Key Performance Indicator
NPS	Net-promoter-score
VOC	Voice of Customer

1 Introduction

Managing the customer experience is said to be central to creating profitable customer relationships and creating a competitive advantage (Frow & Payne, 2007). Customer experience management is not a new phenomenon, but its importance has been significantly emphasized in recent decades (e.g., Jain, Aagja & Bagdare, 2017; Frow & Payne, 2007). This is well illustrated by a study commissioned by Accenture and Forrester (2015). Their research found that the customer experience was the most popular development area among 400 decision-makers interviewed. Therefore, for a company to succeed in this era, it must have the ability to create a valuable experience for the customer as a whole (Jain et al., 2017).

In addition to customer-centric thinking, business models and technology development has also been significant in recent years. Automation, artificial intelligence, and robotics are constantly revolutionizing information management (Heymann, 2018), while various online information systems have generated vast amounts of information, commonly referred to as big data (Jeble, Kumari & Patil, 2018). Indeed, companies and researchers have developed different ways in which this data could be utilized in decision-making. Therefore, recent developments in big data analytics can be seen as revealing opportunities to open up insights into customer experience management (Holmlund & al. 2020).

This research aims to find out the current state of data-based customer experience management in Finnish private healthcare companies. The study compares the views of four companies and their representatives. The goal was to find out what kind of data companies identify to help manage their customer experience and how they utilize it.

1.1 Motivation for the study

Several studies show the challenges faced by healthcare companies in managing the customer experience and leveraging big data. In healthcare, tightening competition is now being identified, which increases the need for actors to focus on service quality to improve their competitive position (Cheng Lim & Tang, 2000). However, Schiavone and al. (2020) state in their study that a client-centered approach is particularly innovative in healthcare, where so far, the focus has been more on the quality of the service itself than on the client experience. Also, according to Worlu et al. (2016), today's consumers have more essential knowledge, and they are willing to take responsibility for their health. As a result, clients expect an innovative approach to healthcare and demand better services than before. Therefore, Worlu et al. (2016) state that rapid changes in the healthcare business environments and customer expectations require the management of the CX to achieve competitive advantage.

Several researchers note that healthcare organizations face significant challenges also in exploiting Big Data. Wang et al. (2018) state that healthcare organizations are struggling to reap the benefits of their investment in BDA, which in turn increases skepticism about its effectiveness. According to Wang and Hajli (2017), the healthcare industry lags in utilizing analytical tools and methods, for example, because actors lack an understanding of the economic potential of BDA. Omachonu and Einspruch (2010), for their part, state that although information technology has played a significant role in the innovation of healthcare systems, it often spreads very poorly from one organization to another. Therefore, Wang and al. (2018) argue that the introduction of BDA is still in its infancy and requires a lot of research, attention, and new strategies to enable healthcare organizations to move more effectively to take advantage of BDA.

In addition to the challenges healthcare providers face in these areas, Holmlund et al.'s (2020) literature review shows that very little research has combined these themes. Reflecting on these views, the management of a customer experience utilizing data analytics can be a topical research topic for private healthcare companies.

1.2 Aim and research questions

Customer experience management is a broad and holistic concept. This research is limited to combining data analytics and customer experience management in Finnish private sector healthcare companies. The first goal of this study is to identify what kind of data these companies have to manage the customer experience. Another goal is to identify different ways these companies leverage this data to manage the customer experience.

The research questions are as follows:

1. What kind of data do private healthcare companies use to manage the customer experience?
2. How the private healthcare companies use data analytics to establish practices for managing the customer experience?

The aim is to answer these research questions through thematic interviews. The target group of the interviews is Finnish private healthcare companies. The theoretical basis of the work aims to find the latest scientific publications on customer experience and the use of big-data analytics in its management. The theoretical framework also shows how previous scientific research sees the importance of data analytics in managing the customer experience.

1.3 Thesis structure

In this chapter, I present the structure of my thesis in progress. The research begins with a presentation of the backgrounds. The first chapter justifies the necessity of the work and opens up the issues that led to the choice of this research topic. In addition to this,

the aim of the research and the research questions to which the research seeks to find answers are defined. In addition, the structure of the study is briefly reviewed.

The next section presents the literature review of the work. This section defines the most relevant concepts for the research, intending to give the reader a clear idea of the research topic. The overarching concepts in this study are customer experience and big data analytics. In addition, the theory of combining big data analytics and customer experience management is presented. The chapter also introduces the theoretical framework derived from the literature review, which is used for reference in the empirical section of the study.

The theoretical part is followed by the empirical part of the work, which begins with defining the direction and approach of the research. This is followed by a review and justification of the selected semi-structured interview and content analysis methods. Once those have been reviewed, the process for collecting research data is presented. Finally, the data collected from the interviews are analyzed. Both within-case analysis and cross-case analysis are used to analyse the interviews. The results contribute to the customer experience management literature by exploring what kind of data companies in the target industry utilize in managing the customer experience and how they transform it into actions.

Finally comes the conclusions section, which briefly reviews the content of the entire study and its results. This section also assesses challenges identified in the study and any emerging areas for further research. Overall, the structure of the study follows pretty closely the established practices of scientific research.

2 Literature review

The theoretical part of this research reviews the most important concepts, models, and theories for research questions. Its primary goals are to give the reader the best possible understanding of the topic and compile a theoretical frame of reference regarding using data analytics in managing the customer experience. This frame of reference is intended to be used for reflections on the ideas of service business leaders on the same topic that emerges in the empirical section of the study.

2.1 Customer experience (CX)

This study aims to contribute to the customer experience management literature by bringing new perspectives to it. The concept of customer experience (CX) and its management and measurement can therefore be considered relevant concepts to be defined for this research. The terms service experience, customer service experience, and customer experience have been commonly used in several studies (Aagja & Bagdare, 2017). Lemon and Verhoef (2016) have traced the origin of the CX study to the 1960s. They divide research into three different streams. The first stream is research focusing on the process, behavior, and resulting value. This includes early consumer purchasing behavior process models and CRM and customer engagement research. Another stream is research related to process outcomes such as satisfaction, service quality, and relationship marketing. The third stream is customer orientation research, which focuses on the internal organizational aspects of the CX. According to Aagja and Bagdare (2017), CX has been approached in research both as a process and as a result. When experience is treated as a result, it refers to continuous perceptions, emotions, and immediate perception. As a process, experience, in turn, refers to the gathering of knowledge, skills, feelings, and attitudes.

In their article, Pine and Gilmore (1998) describe our economy's transition toward experiences. According to them, the commoditization of services has led to the current state

of the experience economy, where experiences are the next step in the development of economic value. To be able to differentiate themselves in the growing competition, companies need to provide superior customer value, and this means continually creating business experiences that exceed customer expectations (Weinstein, 2016). According to Lemon and Verhoef (2016), companies should strive for customer centrality, which is an important factor in creating a strong CX. To be customer-oriented, companies need to deeply understand their customers' needs and goals that influence their consumer behavior (Kwortnik & Thompson, 2009; Hsieh & Yuan, 2010). These needs and goals should form the basis of an organization's service promise, stating how the company delivers the desired benefits to its customers (Kwortnik & Thompson, 2009). In their article, Hsieh and Yuan (2010) state that when designing a service experience, firms should consider the fact that customer needs are extremely dynamic in terms of external and internal factors. Therefore, companies must pay attention to external (e.g., reputation or service environment) and internal (e.g., customer expectations and feelings) factors to meet these different customer needs.

Gentile, Spiller, and Noci (2007) divided the CX into six dimensions. Sensorial, Emotional, Cognitive, Pragmatic, Lifestyle, and Relational. The sensorial component affects the senses and tries to evoke, for example, aesthetic pleasure, excitement, and satisfaction. The emotional component participates in the affective system by generating moods and emotions. The cognitive component relates to thinking and the pragmatic component to practical action. The lifestyle component concerns a person's value system and beliefs, and the related component concerns a person and his or her social context. Aagja and Bagdare (2017) summarized the concept of CX as follows: "Customer *experience is the aggregate of feelings, perceptions, and attitudes formed during the entire process of decision making and consumption chain involving an integrated series of interaction with people, objects, processes, and environment, leading to cognitive, emotional, sensorial and behavioral responses*".

2.1.1 Customer value

Value is a concept that is strongly tied to the service business and customer experience management (CXM). Therefore, it is important to define it also in the context of this study. According to Weinstein (2016), value can be seen as concrete and abstract concepts. It is a service-like term, and the meaning and definition vary widely. Companies seek to leverage value strategically primarily to differentiate themselves from their competitors (Weinstein, 2016). From the customer's perspective, value can be described as a compromise between the benefits of an offer and the resources sacrificed to obtain it. Value is created when a product/service and a user encounter a specific use situation (Weinstein, 2016). According to McColl-Kennedy and al. (2019), customers create value with a company through CX. This is done through functions and interactions by integrating resources at different touchpoints.

McColl-Kennedy and al. (2019) have divided the value creation elements into five parts: resources, activities, context, interactions, and customer role. Resources refer to a company's core competencies, systems, and skills. The activities, in turn, are the functions performed by the company concerning the target company, key suppliers, the customer, and competitors. Context refers to contextual contexts that can positively or negatively affect a customer's experiences, while interactions refer to how individuals interact with others in their service network to integrate resources. The last is the customer role, which refers to the customers' learned behavior models. In addition to these different elements, value formation is created in three different value creation phases, creating the total experience (Aagja & Bagdare, 2017). In the pre-purchase phase of the process, the value develops as the customer acquires information, develops understanding, and, if possible, tries out the product or service before the actual purchase. This step helps clients shape their perceptions and attitudes that are important in decision making. Value in the purchase phase arises from the acquisition and consumption of products or services. There the focus is on customer interaction and collaboration. In the post-purchase phase, the value is created after the consumption experience.

2.1.2 Customer journey and touchpoints

In reviewing and developing the CX, customer journey and touchpoints help outline the CX concept. Organizations and customers work together to create experiences that build a relationship between them, and, over time, this generates cash flow for organizations (Bolton, 2016). These co-creation activities are said to be based on CX. According to Lemon and Verhoef (2016), interest in the CX has grown because customers' journeys with companies have become more complex than ever before. The number of touchpoints between customers and businesses has grown tremendously because of numerous different channels and media. In addition to this, the CXM is less and less in the hands of the company, as customers communicate not only with the company itself but also with each other. These changes have pressured companies to integrate their business operations such as IT, services, logistics, marketing, human resources, and external partners.

The CX process is often divided into three parts (Lemon and Verhoef, 2016). The process flow usually consists of prepurchase, purchase, and post-purchase steps, each containing different touchpoints (Figure 1). The overall experience the client is experiencing is always multidimensional and includes cognitive, emotional, behavioral, sensorial, and social components (Lemon and Verhoef, 2016; Keyser et al., 2020). In addition, the CX differs at different times due to the context in which the interaction situation is placed (Keyser et al., 2020). The experience itself consists of the interaction between the customer and the company at the various previously mentioned decision-making or purchasing process stages. Dhebar (2013) explains customer touchpoints as; "points of human, product, service, communication, spatial, and electronic interaction collectively constituting the interface between an enterprise and its customers throughout customers' experience cycles." According to Keyser and al. (2020), these touchpoints reflect the contacts between a company and a customer throughout the customer path that serve a specific purpose, such as collecting information, purchasing, and using a product or service.

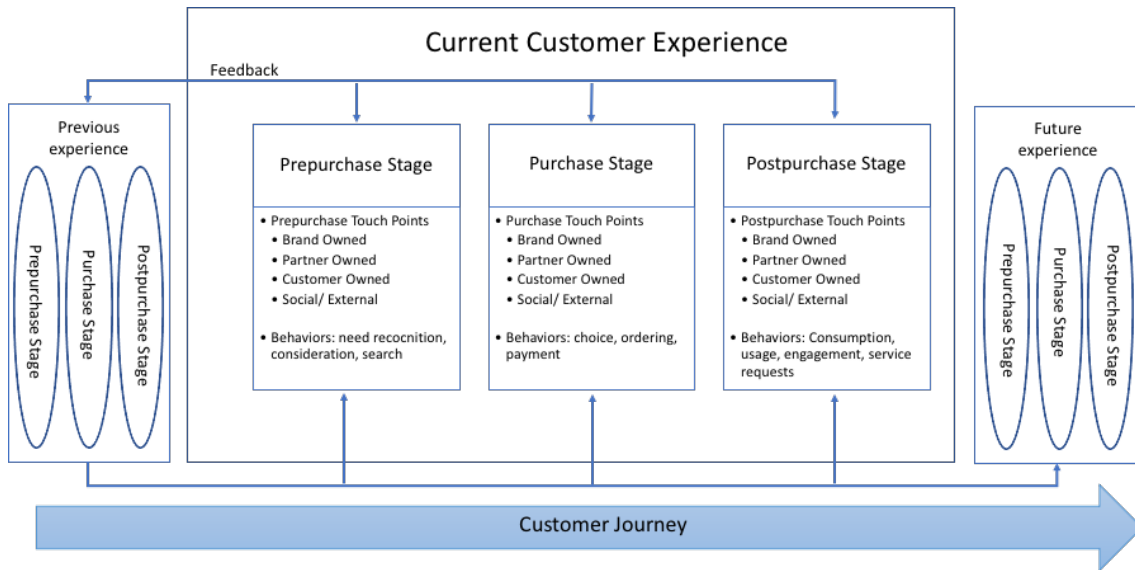


Figure 1 Process Model of Customer Journey and CX (Lemon & Verhoef, 2016)

In addition to the traditional customer journey, Vaerenbergh et al. (2019) highlight an aspect where the possible recovery phase after the purchase can be seen as a separate journey. This is called a service recovery journey (SRJ), and its stages can vary depending on the type of service disruption and the importance the customer and organization attach to a failure in the process. Their study found that organizational processes and touchpoints must be adapted to prevent failures. In addition, the study identified customer complaints gathering information about their goals and expectations that can be used to anticipate and prevent future failures and thus develop a competitive advantage.

The ownership, nature, and position of touchpoints vary on a customer journey (Keyser et al., 2020). Company-owned touchpoints are mainly designed and controlled touchpoints, such as the store environment, websites, and advertising. Contact points not owned by the company are controlled by other actors such as customers, influencers, or other companies. The number of these touchpoints has increased significantly in recent years. The nature reflects the role of the company in a specific touchpoint. The role can be human (e.g., front-line employee), digital (e.g. website), physical (e.g., shopping environment), or a combination of these. Touchpoint position refers to a particular stage in the process at which a touchpoint occurs.

A journey map is a framework that can be used to define the customer's interaction with the service step by step (Villani, 2019, s. 83). Therefore, the service process is mapped, especially from the customer's point of view. The goal is to outline all the points of contact and what obstacles and challenges the client may face at different stages of the process. The map can also include descriptions of the feelings experienced by the client. According to Rosenbaum, Otalora, and Ramírez (2017), the popularity of customer travel mapping as a valuable strategic tool has increased. Indeed, it is seen as excellent CXM tool that allows top management to work with multi-functional team members to use tactics that drive service innovation (Rosenbaum et al., 2017). According to Villani (2019, s. 85), the map can assist organizations in better understanding their customers, highlighting processes that require continuous improvement, promoting collaboration across the organization, and establishing an emotional connection between customers and the organization.

2.1.3 Customer experience management (CXM)

In their study about the development of CX literature, Jain, Aagda, and Bagdare (2017) stated that CX is a relatively new concept both in theory and in practice. The gradual shift of consumption from goods to services and experiences is considered the fourth wave of economic progress and is referred to as the "experience economy". This change is said to have increased over the last three decades. Because the traditional product/service value proposition is no longer enough to maintain a company's competitiveness, they need to focus on the overall CX. Thus, business management has shifted toward an experiential perspective that requires the need to develop new skills like partner network management and customer analytics (Lemon & Verhoef, 2016; Jain et al., 2017).

The CX's design, delivery, and management can be viewed from several different perspectives (Lemon & Verhoef, 2016). Companies can address CXM from a customer, company, or co-production perspective. It also requires a multidisciplinary approach in which

different functions work together to produce a CX. According to Jain and al. (2017), CXM primarily seeks to identify and send the right clues throughout the purchasing process to create value. On the other hand, Frow and Payne (2007) state that CXM aims to improve customer relationships and build customer loyalty. In order to manage the CX, you need to understand the customer's journey. It involves pre-experience expectations as well as post-experience assessments. Indeed, Jain and al. (2017) describe managing the CX as systematically identifying, prioritizing, and incorporating the right clues into touch-points at all stages. In practice, the goal is to design and develop interactive processes to create CX and measure these issues' success.

A customer experience strategy is a management tool and plan that guides operations and the allocation of resources according to customer expectations (Villani, 2019). A strategy allows an organization to define who its customers are and how they interact with the organization. In addition, the strategy aims for a consistent, seamless, diverse, and individual CX and decides who is responsible for its design. A good CX strategy also determines how all company members can be part of a good CX and how it can be measured (Villani, 2019). According to Villani (2019, pp. 34–36), a successful CX strategy requires the inclusion of the organisation's entire ecosystem. This is because the different elements of the business are in symbiotic relationships with each other, and each of them also has an impact on the CX. Frow and Payne (2007) also emphasize the importance of integration between functions. According to them, a complete CX requires an in-depth knowledge of customer needs, and this can only be achieved when all employees and departments in the organization work together in a multi-functional manner.

According to Bolton (2016, p.11–12), the service experience has several unique characteristics that pose challenges for managers. These include the intangibility and heterogeneity of the CX, the simultaneity of production and consumption, the perishability of the offering, the use of technology, and the challenges of new media. Although the importance of CXM has been recognized in both companies and academia, and much work has been done to develop the topic, several studies suggest that most companies

experience challenges in managing their CX (Keyser & al., 2020). According to Keyser and al. (2020), several firms that have significantly put effort into their CXM programs feel very little benefit from it. This is precisely because of failures. Frow and Payne (2007) emphasize that many firms have a certain perception of their own CX, which differs from the customers' view. In their study, McColl-Kennedy et al. (2019) found that customers named critical touchpoints that companies themselves did not recognize. In their study, Hsieh and Yuan (2010) also mention the gap between service providers and customers, which can be narrowed down with service experience planning. Indeed, companies should collect both qualitative and quantitative data from a variety of sources, such as research, social media, and CRM, to gain a holistic view of CX and to be able to manage it (McColl-Kennedy et al., 2019).

2.1.4 Customer experience measurement

The collection, analysis, and utilization of data from their own process in companies. Villani (2019) divided the activities related to corporate reporting into five phases. The first step is defining the problem or process to be measured. After this, the right measurement methods and metrics are created, and data are collected. In the third phase, the collected data is monitored and analyzed in as real-time as possible. The fourth step is sharing all the valuable data with the right stakeholders. The final step is continuous development and necessary corrective actions based on the gathered data. According to Weinstein (2016, p. 46), robust data for analysis and decision-making is key to effective CXM. The topic has also been widely identified in the field of research. Lemon and Verhoef (2016) identified one of the CX research streams focused on process outcomes, i.e., satisfaction, service quality, and relationship marketing. This research stream had also been summarized as Customer experience measurement.

Jain and al. (2017) state that measuring CX is perceived as challenging because of the personal and subjective nature of experiences. However, the importance of CX is constantly growing, which is why several CX studies emphasize the need to create robust

metrics (Jain & al., 2017). Palmer (2010) has opened these challenges even further. According to him, the biggest problem in creating an operationally acceptable CX measure is the complexity of context-specific variables, as experience is always dependent on differences between individuals and situations. In addition, he identifies the nonlinearity of the CX and the identification of the optimal level of experience as a problem for CX metrics.

Companies need to identify the right metrics that affect business performance because measuring everything is impossible (Weinstein, 2016, pp. 201–204). The right metrics to track the value of a customer event and relationships provide management with the tools to monitor market changes and business performance. A good starting point for measuring customer value is to collect Voice of the Customer (VOC) data (Weinstein, 2016, p.205). This term covers various tools, methods, and frameworks used to record and analyze customer opinions, opinions, and feedback (Villani, 2019). According to Villani (2019), the metrics used to measure the CX are not mutually exclusive but can be combined as needed. According to her, combining these metrics and methods creates the foundation for data analysis that allows an organization to increase its awareness of its customers 'perspectives. Also, Lemon and Verhoef (2016) state that multiple customer feedback metrics predict customer behavior better than a single metric. Some metrics created for measuring experiences are, e.g., experiential value scale, brand experience scale, experience quality scale, and customer experience index. However, there are no well-established and widely accepted measurement methods to assess all aspects of the CX throughout the customer journey (Lemon & Verhoef, 2016). Instead, companies have had to settle for several traditional approaches such as SERVQUAL, customer satisfaction, NPS, and WOMC (Lemon & Verhoef, 2016; Jain & al., 2017).

According to Weinstein (2016, p. 205), VOC data can be collected in three ways. The first way is to collect information directly from the customer, for example, through employees working in the customer interface. The information gathered in this way is often the most real-time and best reflects the current state, but its challenge can be the impact of

emotions on rational thinking. Another way of collecting data is through survey methods. These are useful and traditional ways of collecting data, but the insights might lag behind. The third approach is to leverage information that the organization obtains through other business practices. Villani (2019) also draws attention to the timeliness of the data brought by different indicators. He divides the metrics into lag indicators (output) and leads indicators (input). Lag indicators focus on measuring results and show how the organization has succeeded from a historical perspective. Lead indicators, in turn, are predictive metrics and helpful in measuring performance. Companies should also consider the importance of data analysis when collecting data (Weinstein, 2016, p.205). The data must be transformed into strategic insight to make better customer-oriented decisions.

2.2 Big data (BD)

Information systems combined with the Internet, cloud services, mobile devices, and the Internet of Things have steadily increased the amount of data over the past decade (Jeble et al., 2018). The amount of the data has grown so huge that it has been given a common name: big data (BD). According to Liu (2015), BD is considered a new “buzzword” in information technology precisely because of this explosion of the amount of information. He claims that the attention BD receives is due to the opportunities it offers, as by collecting, organizing, and analyzing data, companies can obtain information that is useful for their business. Indeed, BD can help managers make better decisions based on shreds of evidence rather than intuition (Jeble et al., 2018).

Sedkaoui (2018) generally defines data as a collection of facts, such as numbers, words, measurements, observations, or even just descriptions of things that provide more information about an individual, object, or perception. According to McKinsey, BD is those datasets that are too large to handle for traditional database programs (Liu, 2015). Jeble et al. (2018) suggest that BD comes from a variety of sources in addition to traditional information systems. If previously, data were defined in quantitative and qualitative

forms, today, data are often divided into internal and external data and structured, semi-structured, and unstructured data (Jeble et al., 2018; Sedkaoui, 2018).

One of the best-known definitions for BD comes from a tweet made by Gartner in 2012 where BD was defined as follows: *"Big data is high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision-making, and process automation."* A commonly used 3V model has been derived from this definition (Sedkaoui, 2018). It is used to describe the phenomenon of BD, the rise of new technologies, and a new approach to data. The 3V's that generally describe BD are volume, velocity, and variety (e.g., Jeble et al., 2018; Mothe et al., 2019; Sedkaoui, 2018). The volume of BD refers to the enormous amount of data, which, varies greatly depending on the industry and organization (Sedkaoui, 2018). The rate of data accumulation has also increased in all organizations, becoming the second measure describing BD, i.e., the velocity of data (Jeble et al., 2018). Variety, in turn, refers to numerous different sources and forms of BD such as systems, social media, texts, videos, images, and so on (Jeble et al., 2018). In addition to these three V's, researchers have added several alternative measures to the definition, the most extensive of which is presented by Sedkaoui (2018): The seven additional V's of big data. Although, the most common extended description of BD includes five Vs, adding veracity and value to the list (e.g., Jeble et al., 2018). These five Vs are summarized in Table 1.

Characteristics	Description
Volume	The large amount of data that requires tools to organize
Velocity	Accelerated data accumulation rate due to new technologies and platforms
Variety	The diversity of data due to diverse sources (eg text, audio, image, video)
Veracity	The high quality of data that provides valuable information to support decision making
Value	Insights created from data that brings measurable value

Table 1 The 5V's of Big Data

2.2.1 Big-data analytics (BDA)

The utilization of data in decision-making involves many different terms, the meaning of which is good to understand. Verbeke et al. (2017) emphasize a significant difference between the terms data and information. According to them, data can be defined as a series of zeros and ones, while information also means a certain utility or value to the end-user. Therefore, data is information only if it is helpful to the recipient, and in most cases, it must first be processed, organized, summarized, and compared. "Analytics", "business analytics", and "business intelligence" (BI) are closely related terms in economic literature. Extensive use of data, statistical and quantitative analyzes, explanatory and predictive models, and fact-based management to guide decisions and actions are commonly referred to as analytics (Sedkaoui, 2018). Analysis, in turn, is a general term that encompasses a wide variety of computing technologies. At the same time, business intelligence includes applications, infrastructure, tools, and best practices to enable data

access and analysis to improve and optimize decision-making and performance (Verbeke et al., 2017).

Jeble et al. (2018) suggest that Big Data Analytics (BDA) can significantly affect business value and company performance. According to them, companies are increasingly incorporating business analytics into decision-making to improve the performance of their operations in terms of customer service, customer retention, and sourcing. Also, Sivrajah and al. (2017) claim that BDA is increasingly becoming a trendy practice that organizations leverage. According to them, the analytics process and BDA tools will improve operational efficiency, create competitive advantages, and make it easier to respond to new opportunities and challenges on time. According to a study by McAfee and Brynjolfs-son (2012), the more companies characterize themselves as data-driven, the better they perform on objective financial and operational performance measures. With analytics, companies can adopt a pragmatic, evidence-based approach to all aspects of their business (Sedkaoui, 2018). In this era of the data revolution, data-based decision-making can thus be used in, for example, corporate communications and marketing, logistics, and risk management. However, Verbeke et al. (2017) emphasize that for companies to embrace analytics as a business-building tool, both managers and data scientists need a change of mind.

Jeble et al. (2018) describe the utilization of BD for decision-making as a five-step process where the process begins with finding suitable data sources. The process proceeds to extract the data and is followed by analysing the data collected. From the organized information, conclusions and summaries can be made that guide decision-making in the final stage of the process. Tabesh et al. (2019), in turn, describe the analysis of BD as a four-step process (Figure 2). They claim that, in making important decisions, managers gather data, create several alternative strategies, and carefully evaluate these strategies and their outcomes before making final decisions. Finally, the decisions made will be evaluated and used in future decisions. According to them, the big data analysis process also follows this structure. In the first step, information is gathered from large datasets

from different sources and is processed using advanced analytical tools. In the second stage, these created insights are translated into decisions by the managers. In the third stage, the decisions are put into practice, and, lastly, the results and new data are recycled back into the process for future decisions.

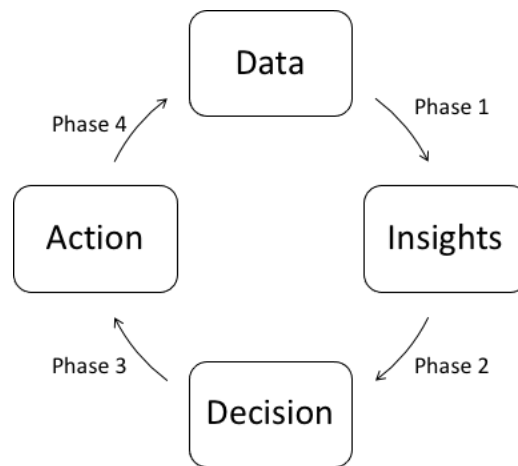


Figure 2 BDA Cycle (Tabes et al., 2019)

In the current information age, where information and data play a key role, healthcare has become one of the most important users of BD (Dimitrov, 2016). Over the past decade, physicians, and academics have extensively researched health information technology, which, according to Wang and Hajli (2017) can be seen as a message that the use of information technology is essential to improve the quality and financial performance of healthcare. In healthcare, BDA can be utilized, for example, in disease surveillance, epidemic control, clinical decision-making, and population health care (Wang & Alexander, 2018). Indeed, the amount of data available in the industry has encouraged healthcare organizations to make considerable investments in BDA (Wang & Hajli 2017).

2.2.2 Analytical tools

Different methods and techniques must be used to measure the performance of organizations (Heymann, 2018). BDA can be used for decision-making in government, science,

technology, and health, using database segmentation, graphical mining, and various analyses (Jeble et al., 2018). BDA combines statistics, data mining, text mining, machine learning, and mathematical modeling to create predictions (Liu, 2015). Companies can identify opportunities and risks and act more proactively with these forecasts. Tabesh and al. (2019) emphasize that to achieve desired results, organizations should invest in the deployment of BDA tools. This also means that it is essential for managers at different levels of the organization to become familiar with different technologies and the general concepts and applications associated with them.

Pinder (2016) and Jeble et al. (2018) divide analytics into three categories based on purpose. Descriptive Analytics uses data to report on a company's current and past performance. For example, it uses reports and aggregation panels to explain what has happened. The goal is to keep managers up to date on business metrics and measure trends and levels over time. Tabesh et al. (2019) named clustering, association rule discovery, and sequential patterns discovery as important descriptive tools. Predictive Analytics focuses on predicting the future and building predictive models (Pinder, 2016; Jeble et al., 2018). It helps to understand what can happen by taking advantage of correlations and predictions based on past data. Prescriptive Analytics uses data from predictive models to make the best decisions. Important predictive tools are, for example, classification, regression, and anomaly detection (Tabesh et al., 2019). On top of these, Sivara-jah et al. (2017) list one other method that can be used to utilize BD in decision-making. Inquisitive analytics examines data to validate or reject potential business ideas. Table 2 summarizes these different analytical approaches.

Analytical approach	Purpose	Tools
Descriptive	Uses data to report on a company's current and past performance.	E.g. reports, descriptive statistics, clustering, etc.
Predictive	Predicts the future and builds predictive models	E.g. linear regression, classification, graph-based methods, etc.
Prescriptive	Uses data from predictive models to make the best decisions	E.g. Mathematical programming models, simulation, etc.
Inquisitive	Examines data to validate or reject potential business ideas	E.g. Root cause analysis, experimental designs, etc.

Table 2 Analytical approaches (Adapted from: Pinder, 2016; Jebble et al., 2018; Tabesh et al., 2019)

2.2.3 Challenges in BDA

According to various researchers, there are many different challenges to exploiting BD in addition to the benefits. Sivarajah et al. (2017) have divided the challenges they identified into three categories: data challenges, process challenges, and management challenges. Data challenges are related to the features of the data itself that make its use complex. These features include data volume, variation, and speed. Sedkaoui (2018), for example, emphasizes the problems in a large amount of data. According to him, BD has posed a significant challenge for traditional statistical and computational methods, as a large amount of data makes data structures and models much more complex. According to Heymann (2018), the service sector, in particular, is often overwhelmed by the availability of BD. Iqbal and al. (2020) claim that to take advantage of BDA, organizations should develop solutions that reduce the complexity and cognitive burden of using and processing these large amounts of data.

Process challenges refer to data usage challenges such as how to collect data, integrate data, convert data, choose the suitable model for analysis, and deliver the results (Sivarajah et al., 2017). For example, Mothe et al. (2019) identify the lack of coordination

between database structures as a key problem in BDA. Also, Kaisler et al. (2013) highlight the challenges of BD processing, naming three different barriers. First is the challenge of finding the relevant and critical information that will benefit its user among the vast data. Another major challenge is formatting information, which can be presented in many different ways and angles. The third problem they identify in big data processing is finding the proper techniques and combinations.

Management challenges cover, for example, privacy, security, governance, and ethical aspects of data use (Sivarajah et al., 2017). McAfee and Brynjolfsson (2012) see leadership challenges as an even more significant threat than technical challenges. To succeed in managing the use of data, they name five things that companies should pay attention to. The first is leadership because data does not remove the importance of human decision-making. In order to take advantage of the ever-increasing amount of higher-quality data, companies' management teams must set clear goals, define what success looks like, and ask the right questions. Another area that requires attention is the company's talent management. As data becomes cheaper, the value of understanding it increases. Companies should therefore ensure that they have data scientists and other professionals who are skilled in working with large amounts of data. The third topic is technology because the basic features of BD, i.e., quantity, speed, and diversity, require more advanced tools. The fourth challenge relates to decision-making in organizations. In order to make effective use of data, companies should reorganize and strive to place data and related decision-making rights in the same place. Last is the company culture, which requires new knowledge-based decision-making. This means moving away from acting on a hunch and making decisions based on instinct.

The approach is different from the literature review by Tabesh et al. (2019). They divide these challenges identified by different researchers into two categories: technical and cultural. Technological barriers relate to the cost of the infrastructures required to acquire, store, and analyze BD and the skills of staff and managers. In addition to this, technological challenges include data ownership and privacy concerns. Cultural barriers, in

turn, refer to the challenges for organizations to create a data-driven culture where decision-making takes place based on information, as well as the challenges for organizations to create unified visions for their BD strategies.

2.3 BDA as part of CXM

This study explores the possibilities of using big data to manage the customer experience. The following sections discuss the combination of these themes and their appearance in previous studies.

Borges et al. (2021) state that the role and impact of IT on organizations have been discussed among researchers as early as the 1970s. Since then, researchers have begun to recognize the strategic use of IT in shaping organizations' business strategies and generating added value. Despite the attention of researchers and companies, the results of a literature review by Borges et al. (2021) show that the strategic use of artificial intelligence technologies, for example, to improve the CX, has not yet been adequately exploited, and research on that topic is scarce. Although, literature has observed a significant competitive advantage in the dynamic coordination of IT strategy and business strategy. For example, Henderson and Venkatraman (1999) have talked about targeting business and IT strategies in their research. However, Vidgen et al. (2017) note that several firms adhere to reactive "basic analytics" and do not address this business problem at the strategic level. In practice, this is reflected in the fact that BD and BDA are seen only as a matter for the IT department and not as a strategic resource for the benefit of the entire organization. Therefore, Vidgen et al. (2017) state that firms need an ecosystem that integrates different components to create a workable IT strategy.

Henderson and Venkatraman (1999) divide IT strategy into internal and external domains. The internal domain is related to the design and management of the organization's information systems and IT infrastructure, while the external domain concerns the company's position in the market. For organizations to leverage technology strategically, it

requires a set of new skills. Mikalef et al. (2020) describe the concept of IT capability as the ability of companies to mobilize and deploy IT-based resources in combination with other resources and capabilities. The benefits of these capabilities are their difficult imitability; thus, they provide a sustainable competitive advantage. In his study, Heymann (2018) takes a stand on the external domain, noting that firms often set their goals and make comparisons based on their industry averages, which quickly leads to underperformance. He emphasizes that companies should compare their results with the industry leaders rather than the average when creating an IT strategy and goals.

The situation of strategic BDA research is quite similar. Mikalef et al. (2020) note that there is still very little research on how BDA should be integrated into organizational structure and what capabilities organizations should strengthen to make it possible. Also, the results of the literature review by Holmlund et al. (2020) show that although there is a wealth of research data on both CX and BDA and the opportunities and challenges of using BDA have been discussed in the business and management literature, very little research has been done on combining the two. However, according to Holmlund et al. (2020), BDA shows significant potential in developing a company's CX. For example, according to Satish and Yusof (2017), the CXM should primarily aim for lasting customer relationships, and thus, BD could help find out what makes a customer stay and how to achieve customer loyalty. Holmlund et al. (2020) state that BDA makes it possible to effectively delve into organizations' customer paths and use the information to support decision-making in the rapidly evolving digital economy.

Instead of BDA, various technological inventions have been studied concerning the development of the CX. Hoyer and al. (2020) list the development of the Internet, e-shops, mobile platforms and social media as the most significant technological inventions in terms of CX. Communication, interaction, and consumption have changed radically through all of this. Hoyer et al. (2020) also identify IoT, AR/VR/MR and virtual assistants/chatbots/robots as the most significant new technology clusters in terms of CX. The use of these clusters in the development of the CX has been investigated in several

studies (Hoyer et al., 2020) and has been relevant prior to the BD era (Duan et al., 2019). For example, Sidaoui et al. (2020) investigated the effectiveness of chatbot interviews in evoking and exploring CX emotions. Sujata et al. (2019) explored AI tools for personalization, better service quality, and effortless service, leading to a better CX. However, there have been many challenges in the development of AI that BD usage has gradually begun to address (Duan et al., 2019). Indeed, today, these evolving technologies can process and analyse vast amounts of data related to the CX about, for example, human behavior and emotions (Ameen et al., 2021).

2.3.1 CX data

New and emerging technologies create new value for customers, and several companies seek to leverage and increase that value (Hoyer et al., 2020). The combination of digital technologies such as social, mobile, analytical, the cloud, and the Internet of Things can bring much more far-reaching changes and help organizations understand their customers and their relationships with them (Zaki, 2019). Anshari et al. (2019) argue that BD provides value, especially for understanding people's needs and preferences. This is because, thanks to multiple sources and channels, BD can find hidden connections and patterns of customer behavior, thus providing much more accurate information. Indeed, Zaki (2019) states that advances in machine learning have made it possible to deepen the CX, as more detailed feedback from surveys, social media, reviews, and CRM systems can be analyzed more effectively.

Interactions between organizations and customers are constantly generating new data (Holmlund et al., 2020), and each situation creates a new data point (Moe & Ratchfor, 2018). Heymann (2018) notes that systems in the service sector, in particular, provide much valuable information, and managers generally understand this value. However, in the era of BD, ownership of data points and data itself may belong to external operators such as Google, Facebook, and cloud-based email systems (Kunz et al., 2017). Therefore,

Satish and Yusof (2017) emphasize that organizations need to track their customers across different channels, regardless of their own systems and data warehouses.

Holmlund et al. (2020) categorize digitally, physically, and socially produced CX data based on its structure and aggregation. According to them, data range from highly structured numerical data (e.g., sales data, geographic location coordinates, or customer satisfaction survey results) to highly unstructured and difficult-to-calculate data (e.g., multimedia formats such as text, audio, images, and video) (Holmlund et al., 2020). They also divide data into solicited and non-solicited. Solicited CX data refers to companies' actively collected feedback (e.g., surveys, review invitations, and feedback workshops), while unsolicited CX data is generated primarily at the initiative of customers (e.g., social media comments, feedback emails, and face-to-face feedback). Table 3 brings together these different data types in the CX context.

	Solicited - Structured	Solicited-Unstructured	Unsolicited - Structured	Unsolicited - Unstructured
Examples	Customer satisfaction, NPS	Open-ended survey questions	Ratings online, observed behaviour	Online reviews, social media posts, voice recordings
Format of CX Data	Numerical	Mainly text	Numerical	Text, audio, image, video
Complexity of capture	Low	Medium	Low to Medium	Medium to High
Customer effort	Medium	High	None to medium	None to medium
Privacy and legal concerns	Low	Low to medium	Low to medium	Medium to High
Fixed costs	Low	Low	High	High
Variable costs	High	Low	High	Low
Degree of applications in practise	High	Medium to High	Medium to High	Low

Table 3 CX Data types and their characteristics (Adapted from: Holmlund et al., 2020)

Because of the numerous data points today, Heymann (2018) emphasizes the importance of systematic processes. With careful planning, organizations ensure that the company's visions are not cluttered with unavailing information. Companies should therefore find relevant information to the CX, as only the large amount of data does not provide new insights into customer behavior (Zaki, 2019). In addition to a large amount

of data, the challenge is to combine customer data collected from different channels (Kunz et al., 2017). Traditional NPS scores and customer satisfaction surveys are easily manageable and presentable data, but their independent ability to produce real information about the state of the CX is questionable (Zaki, 2019). In the world of BD, companies must also keep in mind the problems associated with data ownership, leading to situations where companies may have difficulty accessing customer data that is useful to them (Kunz et al., 2017).

2.3.2 Business analytics and BD capabilities

Currently, so much customer data is available that obtaining it is no longer a problem for companies (Moe & Ratchfor, 2018). Instead, challenges have shifted to the ability of companies to process, analyze, and gain insight from the data. Vidgen and al. (2017) (Figure 3) illustrate the role of a firm's analytics capability as a knowledge intermediary between the (internal and external) data and value produced and used by the organization. The framework utilizes the diamond model borrowed from previous research, which consists of organization, people, processes, and technology.

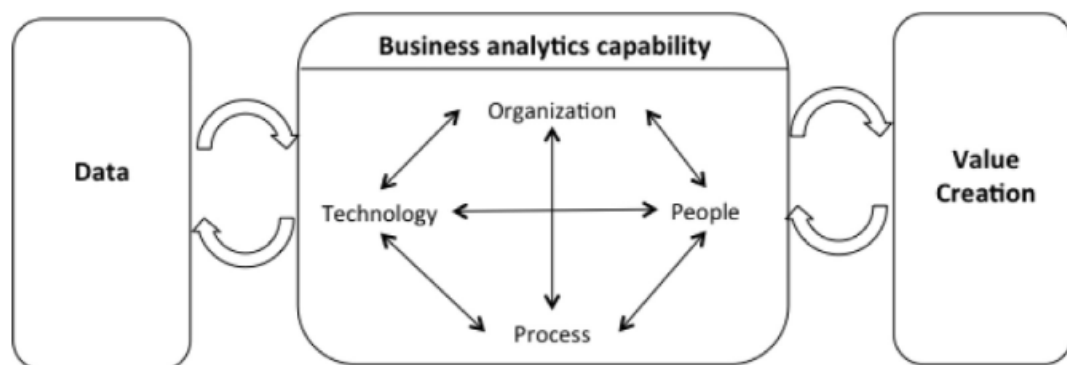


Figure 3 BAC role between the data and value (Vidgen et al., 2017)

Mikalef et al. (2020) state that the definitions of BD in previous studies do not include the organizational resources required to utilize the data. However, the literature has recognised that using big data to obtain value requires both technical and management-

oriented skills. For example, Satish and Yusof (2017) emphasize that achieving maximum business impact and drawing conclusions from large amounts of structured and unstructured data requires an appropriate mix of people, processes, and analytical tools from organizations. According to Vidgen et al. (2017), utilising an organization's data resources requires an assessment of data availability and use of data sources, data quality management, and addressing the limitations of existing IT platforms. In addition, the people and culture of the organization must direct resources to develop data and analytics skills.

According to Mikalef et al. (2020), the BDA capabilities of organizations consist of individuals' capabilities and knowledge, collaboration and information exchange processes, infrastructure, and data availability, collection, and processing methods. They note that data analytical thinking is no longer a critical skill only for data scientists, and organizations should ensure that individuals in decision-making roles are capable of technical and data-driven thinking. According to them, the quality of decisions made by organizations about BD is therefore extremely dependent on the BDA capability of the entire organization. For this reason, Mikalef and al. (2020) identify that the challenge for organizations in the future is to ensure the recruitment of people with a good technical and managerial understanding of BD, foster a culture of learning and embed BD decision-making, and ensure business value from BD investments.

In order to get useful insights from customer data, it requires analysis. Gacan and Wagner (2019) list, for example, market penetration analysis, geoanalysis, and peer-to-peer performance comparison methods that can be used to obtain business insights from customer data. In their study, Satish and Yusof (2017) describe different analysis methods from the perspective of the CX. The descriptive analysis makes it possible to extract CX to obtain real-time information about the company's current situation. Through proactive analysis, companies seek to identify and predict customer performance through various data models and historical data. The diagnostic analysis differs slightly from proactive analysis in understanding root causes and repetitive formulas, while prescriptive

analysis allows companies to develop new rules and recommendations derived from an increased understanding of the CX.

2.3.3 CX insights and CXM

Current efficient algorithms and platforms have changed the way companies communicate with their customers (Saha et al., 2021), and the technology industry is constantly striving to find new ways to collect data and develop these platforms (Moe & Ratchford, 2018). New information and communication technologies allow organizations to collect, analyze, and share a huge amount of customer intelligence using BD approaches (Kunz et al., 2017). This, in turn, has led to a better situation in various functions of organizations, such as marketing, sales, and customer service (Saha et al., 2021). This claim is also supported by Evans Data Corporation's study on BD and the advanced use of BDA in organizations which Anshari et al. (2019) discuss. According to this study, the customer-centric departments, such as marketing, sales, and customer service, are the most significant group utilizing BD and BDA in organizations.

Utilizing technology in customer relationship management allows companies to, e.g., identify customer habits, understand customer behavior, perform proactive analyses (Saha et al., 2021), and use these functions to change the CX (Zaki, 2019). Anshari et al. (2019) give several examples of the benefits of using BD. According to them, the insights can be used to meet customers' needs, for example, through personalization of marketing or personal treatment based on interests and needs. They also claim that the customer's commitment to providing feedback creates a competitive advantage, and the quick and appropriate response to feedback improves customer satisfaction, which, in turn, creates customer loyalty. In addition, BDA enables real-time measurement of both business and consumer value (Kunz et al., 2017). Gacan and Wagner (2019), for their part, argue in their study that well-designed data-driven CXM brings savings in organizations' operating and capital costs.

Saha et al. (2021) argue that customer relationship management technology combines front-end and back-office applications. According to them, the front office maintains a constant flow of information coming from customers, and the back office is responsible for analyzing the received data. With the data collected by the Front Office customer interactions, companies can get an overall picture of their customers' needs and predict what kind of product and service should be offered. Continuous data collection and analysis support the current reality where customer behavior is changing so rapidly that companies must constantly remain in a state of change and adaptation (Zaki, 2019). Therefore, Zaki (2019) states that firms not tracking their CX in real-time or relying on simplified metric measurement methods are often unaware of their customers' real thoughts.

The mere collection of customer data does not yet bring value to the company, but this data is intended to be transformed into CX insights through analysis. CX insight is thus information obtained from customers through BDA that continuously aims to improve CX (Holmlund et al., 2020). Holmlund et al. (2020) classify CX insights into attitudinal/psychographic, behavioral, and market insights. Attitudinal and behavioral insights examine the underlying factors of knowledge, such as individuals' perceptions of the CX, while market data describes an organization's performance and position in terms of CX relative to its competitors. These CX insights enable organizations to build a functional CXM system that seeks to manage and improve a company's CX through touchpoint tracking, prioritization, customization, and customer journey planning (Holmlund et al., 2020).

2.4 Strategic framework for BDA driven CXM

Figure 4 presents the theoretical framework of this study, which summarizes the themes covered in the literature review. The figure sections are numbered to demonstrate the links between research questions and aspects of the theory. The first question (1. *What kind of data do private healthcare companies use to manage the customer experience?*) seeks to answer by examining the customer experience data used by case companies.

The second question (2. *How do private healthcare companies use data analytics to establish practices for managing the customer experience?*) seeks to find answers by examining the used data analytics, the insights derived from the analytics, and the concrete practices derived from them. Therefore, the theoretical framework formats the process of managing the customer experience by utilizing Big Data analytics.

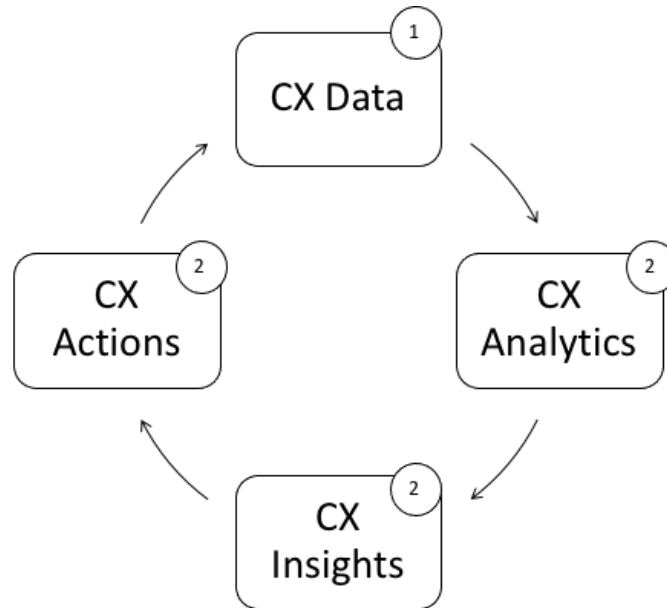


Figure 4 Strategic framework of the study

This strategic framework describes the continuous improvement of organizations CX, which combines CXM and BDA. The process aims to present the transformation of customer data into concrete CXM practices. Diverse (structured-unstructured and solicited-unsolicited) CX data can be gathered, stored, sorted, and integrated, followed by analysis and interpretation using descriptive, curious, predictive, and/or prescriptive BDA. The analysis allows organizations to create attitudinal/psychographic, behavioral, and market CX insights data that is then incorporated into decision-making and utilized in CXM activities such as touchpoint journey monitoring, prioritization, customization, and planning.

This study's literature review comprehensively reviews the themes and most significant studies of CX and BDA. In addition, the combination of the two themes is discussed. The literature review defines concepts relevant to the CX, such as customer value, customer journey and touchpoints, and customer experience management and measurement. Concerning BDA, the definition and features of big data, analytical tools, and the challenges for organizations in utilizing data are reviewed. This theoretical framework and the themes found in it are used in the analysis of empirical data to explore the potential of private healthcare services for data driven CXM.

3 Data and methods

The purpose of this chapter is to present and justify the research methods chosen for this thesis and explain the data collection process. First, the research strategy and methods are introduced. This is followed by a specification of the case companies and an explanation of the case company selection process. Next, the data collecting process will be introduced, and, finally, the tools selected for data analysis and the data analysis process will be described.

3.1 Research strategy and method

Qualitative research is typically highly descriptive and aims to understand social phenomena (Rynes & Gephart, 2004). Qualitative research is therefore excellent for answering how, when, and why questions. One characteristic of qualitative research is that it seeks to provide holistic descriptions of complex and multivariate realities (Rynes & Gephart, 2004). Miles and Huberman (1994) state that qualitative research is the most appropriate way to study people, their feelings, thoughts, and views. The empirical part of this study aims to answer research questions about what kind of available data private healthcare companies use to manage the CX and how these companies use BDA to create practices for CXM. Based on these research questions, it can be concluded that this is a qualitative study.

This research uses as the primary method a multiple case study. Beverland and Lindgreen (2010) define case studies as studies that use in-depth and detailed data collection and are limited to a specific time, place, or case. The research is limited to three case companies representing the selected service sector in this study. A case study that aims to produce results that extend beyond the specific case is called an instrumental case study (Eriksson & Kovalainen, 2008). The cases selected in the instrumental case study are used as instruments to provide broader general information. This study does not seek to

elucidate specifically the selected companies' ways of using data analytics to support CXM. Instead, the aim is to find general information about combining these two.

According to Yin (1994), a clear strategy must be chosen for research, and this begins by defining what is analyzed and why. He also notes that the most important goal of a research strategy is to help choose the proper techniques and guide the analytical part of the research. In other words, the strategy ensures fair treatment of the evidence, which gives the study's conclusions convincingness and narrows down the alternative interpretations. According to Eisenhardt and Gaebner (2007), in a case study, each case acts as an independent analytical unit on the basis of which the theory is created. Thus, the cases function as a series that serve as new copies, contrasts, and extensions of the theory. The formation of the theory itself takes place between case data, ascending theory, and later existing literature. When an inductive case study has theory-based research questions, the researcher must place the research in the context of this theory and demonstrate why inductive theory construction is necessary (Eisenhardt and Gaebner, 2007). The researcher should seek to demonstrate the ability of qualitative data to provide a better understanding of complex social processes that quantitative data cannot provide.

3.2 Case Selection Process

The population from which the cases are selected must first be defined (Eisenhardt, 1998). The selection of the population thus controls external variation and defines the boundaries for generalizing the study's findings. Since the purpose of this study is to develop a theory, its sampling is also theoretical. Eisenhardt and Gaebner (2007) state that when research develops theory rather than tests it, cases can be selected theoretically. This is because of the desire to select cases based on how well they explain the relationships and logic between structures. The aim is therefore to select a sample based on the probability that it will provide a theoretical view of the studied subject. In this study, the population is Finnish healthcare companies operating in the private sector.

CXM and BDA are themes that require companies to have resources and sufficient volume. For this reason, this research excluded micro-enterprises from the selection of the sample.

In a multi-case study, objectives and the research questions should influence the number of cases selected (Eriksson & Kovalainen, 2008). The case selection for this study was further challenging because the number of companies providing private medical services in Finland is low. The goal was to find 3-5 companies to participate in the research interviews. In the first round, the interview request was sent to nine companies. In this round, two companies responded to the message and were willing to participate in the study. In the second round, two more companies responded to the interview invitation. Thus, these four companies form the cases used in this research (Table 4). According to Eriksson and Kovalainen (2008), there is no rule on the minimum number of cases in a multi-case study. However, they note that often each case selected for the study gradually increases the generalizability of the findings.

Case Company	Description	Number of employees	Operating area in Finland
Company Alpha	A private healthcare service company focusing on only one field of medicine	>400	Whole Finland
Company Beta	A private healthcare services provider whose activities include a wide range of general and specialist medical services	>1000	Whole Finland
Company Gamma	A private healthcare services provider whose activities include a wide range of general and specialist medical services	>1000	Whole Finland
Company Delta	A private regional company providing healthcare services	<50	Only one operating unit

Table 4 Case Companies

Private healthcare services are concentrated in a few prominent players in the Finnish market. However, there are also smaller players in the field in addition to these actors. Four companies were selected for the sample of this study, two of which represent larger companies, one is a medium-sized service provider, and one is a smaller operator. Thus, the study looks at companies that differ greatly in their starting points, such as resources, customer numbers, and the amount of customer data.

The sample of the case-study study should take into account that the cases are sufficiently similar to be comparable, but they should not be completely similar (Kahwati, 2018). The similarity allows for a comparison of cases but excessive heterogeneity can pose challenges in the analysis phase. The diversity of the cases makes it possible to

compare the cases with the theoretical constructs. The sample selected for this study consists of companies whose services and business models correspond very closely to each other. However, the sample represents different-sized companies, which is a feature that significantly affects the available resources and to the complexity of the processes. It can therefore be concluded that the sampled companies fulfill both the criteria of sufficient similarity and difference.

3.3 Data collection

When conducting a case study, both qualitative and quantitative methods or combinations of these can be used to collect data (Dubois & Gibber, 2010). According to Eisenhardt and Graebner (2007), interviews are considered the primary source of information, mainly when the study includes multiple cases and the phenomenon under study focuses on intermittent and strategic phenomena. Therefore, interviews were selected as the data collection method for this study. Interviews are a very effective way to gather rich and empirical information (Eisenhardt & Graebner, 2007). Miles & Huberman (1994) state that the advantage of a semi-structured interview is the ability to better adapt to the conversation with the interviewee, whereas a pre-designed interview framework ensures systematicity. Because the interviews are semi-structured, themes and support questions are planned, but it is also possible to ask additional questions during the interviews.

Four semi-structured interviews were conducted for this study (Table 5). Due to the long distance between the interviewer and the interviewees and the prevailing pandemic situation, the interviews could not be conducted face-to-face. Thanks to the video connection, all interviews were conducted through the Microsoft Teams system, so the interview situation was as close as possible to the right meeting. Each interview was conducted with one person in the organization who is connected to the topic under study. The interviews lasted 39-53 minutes at a time. First, the interview focused on general information about the interviewee and the company they represented. The interview

then progressed thematically, focusing first on the data and data analytics used by the company, then on managing the company's customer experience, and finally on combining the two functions.

Interviewee	Role	Date	Length
Company Alpha	Unit Manager	10.1.2022	39 min.
Company Beta	Digital product owner	24.1.2022	53 min.
Company Gamma	Head of Customer Data & Marketing	15.3.2022	51 min.
Company Delta	Vice President, Service Business Functions	18.3.2022	50 min.

Table 5 Case Interviews

3.4 Data analysis

According to Beverland & Lindgreen (2010), both within-case and cross-case analysis can be performed in a multi-case study. The within-case analysis looks at individual cases as their own entities and seeks to find unique models for each case (Eisenhardt, 1989). The data is vast at the beginning of a multi-case study analysis process. Starting with within-case analysis facilitates the subsequent generalization of inter-case formulas in cross-case analysis. Esser & Vliegenthart (2017) state that cross-case analysis has several positive aspects. According to them, comparison can lead to a better understanding of different topics, increasing awareness of other thought and action models, and is a suitable way to test theories in different contexts to assess the extent and significance of certain phenomena. Thus, it can be assumed that the comparative research method also supports the goal of this study to outline the concept of combining CXM and BDA. Thus, this study analyses the results with both within-case and cross-case. According to Eisenhardt

(1989), a comparison between cases is best made by looking at the data in many different ways. One of the identified tactics is to choose categories or dimensions to look at the similarities and differences within the research population.

In this study, the mode of analysis is pattern-matching introduced by Yin (1994), in which empirical observations are compared with assumptions derived from theory. Eriksson and Kovalainen (2008) list data analysis methods, e.g., thematic analysis, narrative analysis, content analysis, and discourse analysis. Data analysis consists of combining the collected data, for example, by studying, categorizing, or tabulating, and according to Yin (1994), the good analysis combines these different techniques. Qualitative textual data is challenging to analyze with statistical analysis tools, so qualitative content analysis is often selected for its analysis (Bryman & Bell 2015). The qualitative content analysis method is implemented by categorization and interpretation (Eriksson & Kovalainen 2008). Categorization produces a description of the research phenomenon, and interpretation, in turn, describes the understood meaning of the description data to a certain contextual extent.

Data analysis for this study was performed in two steps. The first step in the analysis was within-case analysis, which sought to identify and classify the companies' customer data and the processes by which the companies seek to leverage this information for their CXM. At this point, all of the research data collected was transformed into case study records that were built around customer data, its collection, and its utilization. To support a consistent analysis, data were collected in a table. Thus, consistent analysis of data at the cross-case stage was easier. Next, a cross-sectional analysis of the cases was performed to identify the differences and similarities between the cases and identify emerging patterns. In this case, the cross-examination was primarily aimed at improving the external validity of the results and drawing broader conclusions. A structured cross-case analysis developed an understanding of BDA-driven customer experience management in private sector healthcare services. These findings are developed into a theoretical

framework that provides implications for further CXM research and implications for managers to move towards BDA driven CXM.

3.5 Trustworthiness of the study

Criteria for reliability, validity, and generalizability are commonly used to test and evaluate research design methods, results, and measurements (Adams et al., 2014). Reliability and validity are the most commonly used evaluation criteria for qualitative research (Eriksson & Kovalainen, 2008). Reliability aims to assess how likely the measuring instrument implemented in the study would produce the same result if the study were performed again (e.g., Adams et al., 2014; Eriksson & Kovalainen, 2008). The reliability of the study thus assesses the consistency of the measurements made. In other words, if the result of the measurement process of the study can be repeated, it can be assumed that the measuring instrument does not produce erroneous and unpredictable results, and thus the measurement can be considered reliable (Adams et al., 2014). In order to be sure of what is being measured, it is important to define precisely the measured variables. Especially in interview research, all the terms must be unambiguously defined in terms of the reliability of the measurement. The reliability of the study does not guarantee the validity of the measurement results but only refers to a consistent measurement method (Adams et al., 2014).

On the other hand, the validity aims to assess the accuracy of the conclusions made in the study and the fact that the results of the study are valid and certain (Eriksson & Kovalainen, 2008). Thus, the validity of a study refers to the extent to which the study's results correspond to what is intended to be measured (Adams et al., 2014). Adams et al. (2014) list four different types of validity that can be measured in the studies. Internal validity clarifies the relationship between reality and the obtained results. External validity refers to the generalizability of research results in other environments. The validity of the structure seeks to elucidate the relationship between the concepts of the study

and the actual causal relationship under study. Finally, the validity of the conclusions evaluates the relationship between the program and the observed outcome.

For this study, one expert from each of the three case organizations was invited to be interviewed. They are all key players in their organization to manage the customer experience. All interviews were arranged and recorded in the same manner, and transcription was started immediately after recording all interviews to ensure the best possible transparency. The atmosphere and arrangements of the interview situation were neutral and relaxed, and the informants had the opportunity to ask supplementary questions. However, due to the constructivist ontology, it must be remembered that all individuals form their own views, which is why the validity and reliability of this study cannot be traditionally assessed.

The data obtained from the interviews correspond to the purpose of this study to find out the existing practices of the target companies in terms of customer data, data analytics, and customer experience management. Based on the received responses, the interviewees answer the research questions correctly, and successful conclusions can be drawn from the data, in which case the research fulfils the purpose set for it. Therefore, it can be argued that the validity of this research work has been confirmed. The research methodology section justifies the chosen techniques, strategy, and data collection and analysis methods that support the research.

4 Empirical Findings

In this section, the key findings of the empirical study are analyzed and presented based on interviews with representatives of four case studies. The importance of the customer experience and its management has been identified in all case organizations, and all case companies are collecting data to obtain a better overall picture of the current state of the customer experience.

First, the within-case analysis is conducted to find the most relevant information for the research questions for each company. The cross-case analysis adapts to the theoretical framework of the study by dividing the data analytics process into four areas: CX data, CX data analysis, data-derived CX insights, and CX actions. Based on these, the theoretical framework is supplemented to reflect the management of the customer experience of Finnish private healthcare service companies using data analytics.

4.1 Within-case analysis

This section presents and analyzes the key findings of the within-case analysis. The within-case analysis describes the current situation of each company, including four areas. Each company determines what kind of customer data it collects and where it is collected for each company. In addition, it is described how companies analyze the data they collect and determines who is responsible for analyzing the data. Next, the customer experience insights tracked by the case company are identified. The final aspect of the review is the practices of case companies to integrate data-analyzed insights into decision-making and service development.

4.1.1 Case Alpha

Company Alpha is a private health care service company focusing on only one field of medicine. The company has extensive offices throughout Finland, and it employs about 400 healthcare professionals. The interviewee was one of the unit managers and was responsible for managing the customer experience of her own unit.

The organization collects a wide range of customer data, such as the number of visits and procedures, data related to the effectiveness of treatment, data related to sick leave written by doctors, and data related to customer net promoter scores and customer feedback. Customer data is collected for the company in several different ways. For example, customer feedback can be requested interactively during a customer visit, the customer can receive an automated feedback survey, or the customer can apply for feedback through various channels like the company website and emails. Other data like customer visits are collected through booking systems and medical recordings. The organization owns all the data it collects, and it is not purchasing any data from external actors. The organization also does not systematically monitor freely available external data for CXM, for example, through social media. The company collects and organizes data using several different systems.

Unit supervisors and one controller are responsible for processing and analyzing customer data in the company Alpha. The controller is responsible for transferring data to reporting systems from which the organization's supervisors can analyze data concerning their own unit. The organization has ensured that all necessary employees have limited access to customer data based on their job descriptions. However, it is impossible to compare data between different units due to limitations, except at the management team level. No separate training has been provided for supervisors in data analysis or related systems, but the induction has covered the customer experience process and related tasks and roles. There is also no separate guidance in the organization on how customer data should be analyzed. However, the interviewee feels that the organization has sufficient resources and expertise to analyze the data concerning the level of

requirements. Customer feedback is handled promptly based on a strict process. The company management also expects supervisors to pay attention to the reasons behind the quantitative and qualitative feedback for the proactive development work.

The organization has metrics set to measure the customer experience, such as the response rate to the NPS survey and the NPS score. The company has set targets for these indicators on a team-by-team basis. There is no common way of communicating CX insights in the organization, which has led to different practices in each unit. The only information that is required to be shared is the KPI goals. There are several different options for communicating the CX insights, such as weekly newsletters, team meetings, and personal emails and meetings. Practices differ between different occupational groups and insights. Insights derived from the data are used to aid decision-making and lead to concrete practices. The two primary uses of data are to find areas for improvement and to assess the resource needs. For example, the insights about customer visits help unit managers ensure supply, optimize resources, and do budgeting. The development proposals that emerge from customer feedback are actively pursued. So far, the actions and changes made based on the feedback have been small and on a team level.

In short, company Alpha comprehensively monitors both requested and unsolicited incoming data regarding the customer experience. Data contains both structured and unstructured data. Company Alpha does not have separate instructions on how to analyze customer data. For this reason, practices differ between units. According to the interviewee, the analysis concerning customer feedback is both descriptive and diagnostic, as the management is obliged to pay attention to the reasons behind the customer feedback. Concerning the assessment of service needs, the data is analyzed proactively. From the data it collects and analyzes, Company Alpha forms attitudinal and behavioral Insights about CX through which it performs developmental actions in its customer journey and makes operational planning.

4.1.2 Case Beta

Company Beta is private social and health care services provider whose activities include a wide range of general and specialist medical services. The company has business units extensively throughout Finland, and it employs thousands of healthcare professionals. The research interview was conducted with an employee who, at the time of the interview, works in the company's digital services team and is also responsible for the management of the company's customer experience.

In company Beta, data on customer visits and actions are recorded manually and through various systems, for example, in an application or website. The company is independently collecting customer data into two different systems. One large data set is stored in the patient information system and contains mainly medical information about customers. The second entity is customer-related data stored in the CRM system, including information about customer loyalty programs and application usage. The information stored in both systems is owned and processed by the company. Customer feedback collection is organized through an external operator. The customer data stored in the different systems is transferred to a separate reporting tool through system integrations. The reporting tool analyzes the data and forms it into larger entities and insights. The reporting tool utilizes, for example, business indicators and data related to customer feedback. A separate IT team is responsible for the functionality and integrations of the reporting tool, and one employee acts as a support person in retrieving and analyzing the data for the company managers. In the organization, those responsible for business have access to data in their own domain. The company Beta also has clear instructions and minimum requirements for handling the data. In addition, individuals may have different practices for more detailed analysis.

At the company Beta, the customer experience is primarily measured using the NPS query. The NPS query produces a KPI that is actively monitored. This insight can also be targeted to different units, teams, or professionals. In addition to this, it is also possible for decision-makers to monitor, for example, the utilization rate of services and financial

information. However, the review of these is not tied to the process of managing the customer experience. In addition to quantitative data, customer feedback also provides a limited amount of qualitative data from which the company can derive insights into the current state of services and customer experience.

Customer experience and customer satisfaction rates are actively reflected in the company's everyday life. Insights related to the customer experience are handled consistently in the company and are actively sought in decision-making and development measures. This is ensured by defining clear, unified processes and people responsible for the customer experience and actively sharing information at all levels of the organization. Customer experience management is the responsibility of the unit supervisors. Supervisors are responsible for handling customer feedback following agreed practices and developing the operations of their own unit. They are required to review the NPS indicator regularly and do necessary development measures based on it. The NPS scores and the implementation of the development measures derived from them are monitored centrally and reported to the Management Team. Customer feedback is handled regularly in team meetings, and more extensive development proposals are sought for recurring feedback. The company has also defined a process for processing individual customer feedback to ensure that customers are responded to correctly and within a reasonable time. In addition to the customer, meaningful feedback is also handled internally by involved persons.

For Company Beta, the data-driven CXM can be summarized as follows. Company Beta collects customer data from different touchpoints through several different channels. Gathered data varies from solicited to unsolicited data and from structured to unstructured data. For Company Beta, data analysis is highly automated in the reporting system. With the help of integrations, the data transferred to the reporting tool is analyzed into predefined entities and insights. Analytics is very descriptive and focuses on the past. Indeed, the interviewee states that the company lacks a proactive and causal analysis of

customer data. The data is formed into attitudinal and behavioral insights that are utilized in the company primarily for developing customer journey and service processes.

4.1.3 Case Gamma

Company Gamma is a private social and healthcare services provider with a wide range of general and specialist medical services. The company has operations throughout Finland, and it employs thousands of healthcare professionals. The participant of this interview was an employee from the company's Marketing function responsible for B2C customers and the development of the data-driven CXM.

Company Gamma gathers demographic customer data from different touchpoints and NPS rates through an SMS survey. Data related to the customer experience also includes customer feedback from various channels, brand research material, and data from a customer panel in which customers can share their thoughts anonymously and voluntarily. Customer data is collected from all touchpoints, such as the company application, the website, and the patient information system. The company also monitors social media, but its data is not linked to the customer data pool. According to the interviewee, the company has a centralized customer database, but it is still perceived as very incomplete. The company has numerous business units that have more accurate customer data in their own databases that are not available to the entire organization. However, the company aims to develop its data management so that all information about the customers can be found in the same place in the future. At present, access to the customer database is restricted to a few people, and there is no CRM solution in use. The interviewee is optimistic about the possibility to move toward centralized customer data in the future.

According to the interviewee, Company Gamma has good competence in processing and analyzing customer data. However, the process is laborious, occasional, and focused on individual needs. The responsibility for maintaining customer data belongs to the IT department and the person responsible for the customer experience. In practice, data sets

are formed through automation. The interviewee claims that currently, the organization lacks an overall understanding of the data effects and integrations, and it is her responsibility to clarify and reorganize this matter. The organization has resources and capabilities, especially from the technical side, which is important for data collection. The person responsible for the company's CXM and its monitoring analyzes and compiles in-depth presentations of data related to the CX. She provides reports, including analyzes of the cause-and-effect relationships behind the insights. The process of CX data analysis is the responsibility of this one person and depends on her expertise. The data is analyzed at the organizational level and is shared with everyone. In addition, the data can be analyzed at the unit level upon request. According to the interviewee, the data should be used more efficiently and automatically. The data should be more available and automatically analyzed in other ways than just reporting in an optimal situation. The company has both capability and data at its disposal, and it is currently already able to produce much proactive analysis manually.

In addition to the NPS rates, the organization does not have regularly tracked insights, but different insights are created on a case-by-case basis as needed. The organisation forms insights from the collected data that can be utilized for targeted marketing, such as email marketing, outbound calls, and SMS advertising campaigns. The company also has a large pool of information at its disposal, through which it is possible to find out various customer insights about customer opinions and views, but the use of this data is occasional. The interviewee notes that the sustainable and comprehensive utilization of information is still in its infancy, and the transition to this would require investments in new technology.

Concerning the CX, insights are currently integrated into decision-making only by separate requests. If someone in the company identifies a challenge, the data will be used to find out more insights about the topic. The process is therefore based on the expertise and interest of individual decision-makers. According to the interviewee, because of the organization's excellent NPS scores, data-driven development is reduced or non-existent.

According to her, Company Gamma lacks a common understanding of when development measures are required. For this reason, data-driven development measures and actions are based on the initiatives of individual people.

For Company Gamma, the whole process can be summarized as follows. The company Gamma collects customer-related data from multiple sources. Gathered data varies from solicited to unsolicited data and from structured to unstructured data. At Company Gamma, descriptive reports and Insights are produced from the CX data, in addition to which the data is analyzed diagnostically to determine the underlying cause-and-effect relationships. Company Gamma also performs proactive analysis, but only in individual cases. From all collected and analyzed customer data, Company Gamma forms behavioral, attitudinal, and market insights that are utilized in e.g. personalization of services and marketing, operational planning, and development measures.

4.1.4 Case Delta

Company Delta is a small healthcare company operating only in one business unit. Its services include diverse medical service selection, and the company employs just under 50 employees. The company's CEO, who is responsible for the customer experience and related processes, participated in the research interview.

Company delta collects a wide range of data related to its customers, such as Patient Data, Health Information, and all touchpoints with the customer. Data collected directly from customers is obtained through various surveys online and on paper or face-to-face interactions. The company is also collecting billing data and data related to service utilization, which is collected on a customer-specific basis for corporate customers and as mass data for individual customers. In addition, customer feedback is collected from customers themselves through customer satisfaction surveys and different feedback channels. The company mainly owns all the data it collects, but some data related to the operating field is also obtained, for example, through membership in various

associations. A customer-related data is recorded in the patient information system at company Delta. All data is also integrated into the national Kanta system, but the customer has the opportunity to define the use of their own data in this matter. As a small operator, the company has decided not to build its own data system, but this has also been perceived as a competitive advantage because by using the national system, the customer's information can be utilized smoothly by other service providers.

In company Delta, the system administrator, service manager, head nurses, and doctors are responsible for processing the collected customer data. The system administrator processes the information only upon request. In the case of patient data, it will only be processed by specific professionals involved in the customer's service chain. Data is mainly analyzed only when needed, for example, in support of development measures. However, the interviewee feels that there are not enough knowledge and resources to process the data. She states that data is accumulated well due to operating models, but data analysis into insights is partly incomplete.

The company strives to create a variety of insights from the data it collects. The aim is to form insight on, for example, which services are selling well and why. Another insight is the optimal use of resources, i.e. whether there is the right amount of resources in the right place and whether the organization has the right expertise at different stages of the processes. The key figures and insights defined by the organization are qualitative customer feedback from all channels, business indicators such as growth and profitability, the development of customer numbers, and the utilization rate of various services. In addition, the development of customer satisfaction survey results in different sections is monitored. Due to the organisation's small size, sharing and transferring insights is perceived as easy, and all relevant people have access to the information.

In the organization, all decision-makers have easy access to data. However, the interviewee feels a lack of interest in information utilization. The reporting and data retrieving are complicated with the used system, and its usage requires expertise. This contributes

to reducing the employees' willingness to use it for decision-making. In addition, some feel that the use of data in decision-making does not bring sufficient benefits. Because of the organisation's small size, turning the customer experience insights into practices is quick and simple. In practice, the insights are discussed with all the relevant parties, after which a decision will be taken fairly quickly to put the new idea into practice. For negative customer feedback, there is a separate handling process. Also, Customer feedback that detects a clear error in operations initiates a review of processes to prevent the error from recurring.

Therefore, Company Delta's data-driven CXM can be described as follows. The company has both solicited and unsolicited data at its disposal but the company itself only collects unstructured data from its customers. Other structured data considering customers accumulate in the company through other channels. At Company Delta, customer data is analyzed descriptively, in addition to which, company Delta also uses the data it collects to plan operations using predictive analysis. In company Delta, data-driven attitudinal and behavioral insights are utilized for operational planning and development, such as budgeting, service offering planning, process development, and resourcing. In addition, information from patient data is used to design and evaluate the client's personal care plan.

4.2 Cross-case analysis

This section presents the main results of the cross-case analysis. The case companies are compared through four different areas in the cross-case analysis. First, the analysis provides an insight into how case companies collect customer data and the types of data collected. This is followed by an evaluation of the analytical methods used in the case companies to analyze customer data and a discussion of the companies' data analytical capabilities. The third section discusses companies' CX Insights, followed by comparing companies' ways of incorporating these into decision-making and concrete development

measures. Finally, the situation of data-driven CXM in case companies is summarized, and a theoretical framework supplemented by an empirical section is presented.

4.2.1 Customer data and its collection

All of the organizations in the study sample recognize that they collect various data related to their customers. In general, the data are usually divided into medical data and other data related to customers' actions and thoughts. The collected data related to the customer experience are, e.g., data related to service usage, demographic data, and data related to customer satisfaction. The collected data sets vary between each case company.

“We have patient information in the patient information system, in addition to which we have a CRM system that has other data about our customers” (Company Beta)

Holmlund et al. (2020) classified CX data into four categories based on its structure and aggregation. Data varies from structured numerical data to unstructured and difficult-to-calculate data and solicited and unsolicited data. Table 6 presents the customer data collected by the case companies divided into these four categories. As can be seen from the table, all case companies collect a wide variety of customer data from almost all categories.

	Data gathered			
	Solicited – Structured	Solicited - Unstructured	Unsolicited - Structured	Unsolicited - Unstructured
Company Alpha	✓	✓	✓	✓
Company Beta	✓	✓	✓	✓
Company Gamma	✓	✓	✓	✓
Company Delta		✓	✓	✓

Table 6 Types of data in case companies

Company Delta is the only company that does not collect numerically requested structured data such as net-promoter-score data. Otherwise, all companies collect unstructured feedback from their customers and receive it informally without request, for example, by e-mail. Unsolicited and structured data is collected, for example, from customer visits and customer actions in mobile applications.

Patient data is classified as sensitive data, so its processing involves limiting factors that require special attention. Such data may only be processed by professionals taking part in the customer's service chain, and it cannot be used, for example, for targeted marketing. Of the four case companies, only Company Delta mentions utilizing patient data to provide a better customer experience.

“In the case of individual patient data, the data are the responsibility of the parties involved in the treatment. That data may only be used by those who participate in the customer care chain; no one else has access to this personal data.” (Company Delta)

“When a client comes to us, we grasp what is reflected in the client's historical data and strive to provide services from a health promotion perspective. “ (Company Delta)

Customer data is collected in multiple ways from different channels and different customer journey stages. Data on customer behavior is collected through automation (appointment bookings, application visits, etc.) and through manual logging (e.g., recorded medical data). Data related to customer satisfaction is actively collected in each case company, but it is also received without request. Each organization offers several different channels for feedback, such as paper forms, e-mails, text messages and online feedback forms. The data collection of all organizations is very strongly focused on their internal proprietary data. External data, for example, from social media, was monitored

only at Company Gamma and Company Delta, but neither named this as a significant data source for developing their operations or customer experience.

“We collect data from various touchpoints such as our application, appointment system and patient information system. The patient information system also contains customer data in addition to patient data.” (Company Beta)

“Data from social media is not integrated with customer data. It is currently kept separate in terms of social media.” (Company Gamma)

Organizations’ data retention solutions differ radically in every case company. Company Alpha collects data for many different platforms, while Company Beta shares data between the patient information system and the CRM system, from which the selected data is integrated into a separate reporting system. On the other hand, Company Gamma has several different platforms between which data is distributed, but this has been identified as a significant problem, and the target is one centralized customer data system. Company Delta has only one system where information is collected. Except for company Alpha, every company interviewed felt that their systems were incomplete or difficult to use. Everyone desired centralized and easier-to-use solutions for data collection.

“We have a centralized customer database, but it is incomplete. We have better data in the database of individual services and contact points, and the goal is to get centralized customer data created.” (Company Gamma)

“Reports from our current system are not easily available. The system is clumsy and requires expertise, which is definitely a weakness. “ (Company Delta)

4.2.2 Data processing and analytical capabilities

The customer data analysis processes of the organizations participating in the study differ significantly. Analytic processes range from automated to manual and from structured processes to random operations. Satish and Yusof (2017) listed four different analysis methods that can be used to generate valuable CX Insights from customer data. Table 7 gathers the data analytical methods used by the case companies.

“In each unit, the unit manager and team leader review information related to the customer experience on a monthly basis.” (Company Alpha)

“The process is very simple and is based on how interested in our individuals are in knowledge management. There are no structures for this, but it works very randomly.” (Company Gamma)

	Analytical methods			
	Descriptive	Proactive	Diagnostic	Prescriptive
Company Alpha	✓	✓	✓	
Company Beta	✓			
Company Gamma	✓	✓	✓	
Company Delta	✓	✓		

Table 7 Analytical methods used by the case companies

As shown in Table 7, none of the organizations can be expected to perform a prescriptive analysis that will allow companies to develop new rules and recommendations based on an increased understanding of their CX. Based on the interviews, companies Alpha, Gamma, and Delta utilize proactive analysis of customer data regularly, with which companies seek to identify and predict their customers' actions. Only companies Alpha and Delta utilize diagnostic analysis to understand the root causes and repetitive formulas for the CX. The analysis of

companies' CX data would therefore seem to focus on descriptive analysis, which produces information primarily about the company's current situation.

The responsibility for data analysis varies between case companies. At Company Alpha, the responsibility lies with the unit's supervisors, who can have support from one data controller who is responsible for transferring data to the systems. The reporting tool handles data analysis at Company Beta, and a separate IT team is responsible for its functionality and integrations. In addition, one controller acts as a support person in data retrieval and further analysis. At Company Gamma, the IT department and the person responsible for developing the CX are responsible for maintaining customer data. Analyzing CX data also belongs to the person in charge of the CXM and depends heavily on her expertise. At Company Delta, several people are responsible for processing customer data as needed. In each organization, separately designated person/ persons were responsible for analyzing CX data.

In terms of data-analytical capabilities, organizations are divided into two categories. Company Alpha and Gamma feel that their organization has sufficient resources and expertise to analyze data at the required level. However, both companies recognize a clear need for better systems that would allow for more advanced data analytics. Companies Beta and Delta, on the other hand, perceive the knowledge, resources, and systems to be deficient in the ideal situation. Any organisation provide separate training in data analytics for supervisors or those responsible for analytics. The core competencies of these organizations would also seem to focus on the skills and experience of only a few individuals.

*"I recognize a certain kind of fear and alienation in our organization towards ICT systems."
(Company Delta)*

*"Compared to the current level of requirements, I feel that we have sufficient skills to analyze and utilize the information."
(Company Alpha)*

“The person in charge of the customer experience is very analytical, and with a long experience, she makes in-depth presentations on certain aspects of the customer experience. In addition to key figures, we receive reports and analyzes from her of the factors that influenced the background. This is very strongly behind one person.”(Company Gamma)

“We have strong in-house expertise. We specifically have the technical capability and resources for all kinds of technical development and maintenance, and this works really well from development perspective right now.” (Company Gamma)

4.2.3 Insights and conclusions derived from the data

Holmlund et al. (2020) divided the CX insights into three categories. Attitudinal Insights strive to increase knowledge about customer satisfaction, beliefs, preferences, feelings, etc. Behavioral insight, in turn, provides information about the client’s concrete actions. The third area is market Insights, which aims to increase understanding of, for example, a company's brand or market position. As a whole, case companies produce all of these insights from their data. The most common insight associated with the customer experience is clearly attitudinal insights, which all case companies collect. NPS surveys and customer feedback are classified in this category. Examples of behavioral insights tracked by companies include customer visits that all companies track. In addition, other customer activity, such as clicks on the website or in the company App, is only tracked at company Beta. Market Insights such as brand-related information was only mentioned in an interview with company Delta. Table 8 summarises the CX insight categories collected by case companies.

Insight categories

	Attitudinal	Behavioural	Market
Company Alpha	✓	✓	
Company Beta	✓	✓	
Company Gamma	✓	✓	✓
Company Delta	✓	✓	

Table 8 Insight categories in case companies

The case companies have fairly similar metrics and target insights in terms of their customer experience. Of the four companies, three identify the NPS score as the most important measure of customer experience. In addition to this, another common insight was information about customer opinions and thoughts derived from qualitative customer feedback.

“Currently, NPS is the only indicator that is collected. Of course, the customer may choose to provide feedback, but this data is not tracked as a whole.” (Company Alpha)

Interviewees’ opinions on the adequacy and necessity of the NPS survey varied quite a lot. Studies (e.g., Zaki, 2019) have questioned the ability of traditional NPS scores and customer satisfaction surveys to provide real information about the state of CX. However, this is an easily collected and presented insight, which might be why the collection of such data is still common practice. Of the case companies, only Company Delta stated that it does not see the collection of NPS results as relevant to managing the customer experience. In addition to this, the interviewees of company Beta and company Gamma felt that the NPS survey alone was insufficient to find out the state of the customer experience.

“I think the current NPS data is good and adequate. I don’t feel there is a need to think about other data or metrics.” (Company Alpha)

“Regarding the customer experience, only the NPS result is monitored. We have been considering whether NPS, for example, is a good indicator of our telephone services, but so far we have stuck to it.” (Company Beta)

Although companies have a wide range of customer data and insights analyzed, it is poorly identified as related to the customer experience. For example, companies generate information on the utilization rate of services, but only company Delta states that this information is used to manage the customer experience. Company Delta also uses by far the most comprehensive data to create customer experience insights.

“We monitor what services are popular and try to analyze the reasons behind that. We consider whether the reason is that there is no demand or whether productization has failed, whether there is not enough information available, and so on.” (Company Delta)

Customer experience insight monitoring is done varying on a regular and irregular basis. The results of NPS surveys are monitored at regular intervals in companies, and customer feedback insights are processed on an ongoing basis. Other insights obtained from the customer data seem to be produced only for separate needs when required.

“Insights related to the customer experience is utilized at the unit level only based on the activity of the responsible persons. General information related to, for example, brand research or competition is always viewed from the perspective of the entire company.” (Company Gamma)

“There is one person in our company who is responsible of the NPS survey results. The transmission of the survey is automated and there is a process for the entire thing, which also includes monitoring and communication internally and externally. The process is straightforward and simple.” (Company Gamma)

4.2.4 Insight utilization and concrete measures

Previous studies mention several ways to utilize CX insights in decision-making and CXM. Anshari et al. (2019) listed that insights can be used to meet customer needs through, for example, personalizing marketing or treating interests and needs. They also claim that a quick and appropriate response to customer feedback improves customer satisfaction. In turn, Kunz et al. (2017) found that BDA enables real-time measurement of both business and consumer value.

In all case companies, the utilization of insights is identified as part of decision-making and customer experience development. All organizations aim to respond to the received customer feedback and actively use the information to develop the services. They all have guidelines for processing, handling, and utilizing information from customer feedback. In the process, the information is directed to the person who has the power to make decisions and measures for development.

“Information is a very big thing in decision-making. If you think about the NPS survey, you will try to utilize development ideas and recognize things that need to be changed. The aim is always to improve the weaknesses and make changes according to what issues arise from the customers themselves. Of course, we also try to bring up the good things that come up.” (Company Alpha)

At Alpha, Beta, and Gamma, the most important customer experience insight is the NPS score, which is numerical information and does not provide a deeper understanding of the issues that affect results. For this reason, it is also challenging to derive any insight-based concrete measures to develop the customer experience. The targeted marketing mentioned by Anshar et al. (2019) is only done at company Gamma and the service provided according to customer interest and needs, on the other hand, was mentioned only in the company Delta.

“What is more needed is a qualitative perspective. I have often highlighted the importance of interviews. If our customer responds to NPS survey that the service has been really bad, then we should get more inside information about why.” (Company Beta)

In all case companies, very little consideration is given to the entire customer journey when evaluating and managing the customer experience. Company Beta's service processes have been described in detail, and all development measures are being updated to those Descriptions. At Company Delta, customer processes are developed using information from the perspective of whether there is the right amount of resources in the right place and whether the organization has the right expertise at different stages of the processes. However, interviews with companies Delta and Gamma, for example, made it clear that the evaluation and measurement of the customer experience in companies are very much limited to only parts of the entire customer journey.

“For a long time, the concept of customer experience has been understood only as a customer visiting our business units. Therefore, customer experience has been what happens at the reception and then the NPS survey. That has been the only management of the customer experience for a long time.” (Company Gamma)

“We only evaluate certain aspects of the customer experience. Customers' feelings are measured regularly, but there is no follow-up after that at all.” (Company Delta)

Figure 5 concludes the findings chapter. It illustrates the process of data analytics used to manage the customer experience in Finnish private healthcare service companies.

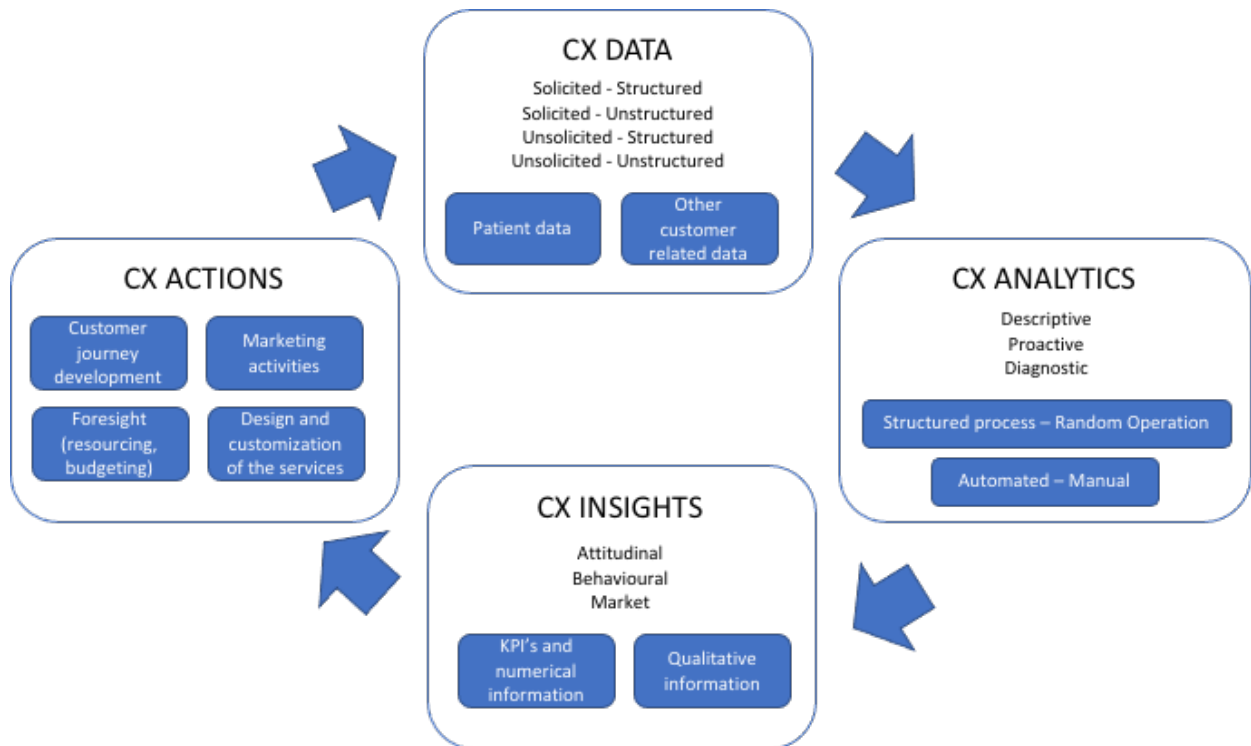


Figure 5 Data-driven CXM in Finnish private healthcare companies

Data-driven customer experience management begins with the collection of CX data. Private healthcare service companies collect a wide range of data, from solicited to unsolicited and structured to unstructured. The collected data is clearly divided into patient data and other customer-related data. Patient data is used significantly less in managing the customer experience than other customer data, essentially because of the sensitive nature and limitations on use.

The collected data are basically analyzed with descriptive, proactive and diagnostic methods. Data analysis processes range from regular structured processes to individual separate cases. Data is analyzed in companies using automation, manually and by combining the two.

The customer experience Insights generated by companies can be divided into attitudinal, behavioral and market insights. Companies have a wide range of numerical insights and key figures, and qualitative information for their decision-making.

The final process is concrete customer experience management actions based on the Insights. The actions identified in the companies were development measures related to the customer journey and touchpoints, targeted marketing measures, forecasting and planning activities such as resourcing of services, and measures related to service planning.

5 Conclusions

This study contributes to a common debate on customer experience management and how data analytics can be leveraged. In addition, this study focused on how this theme is currently reflected in Finnish private healthcare companies. This chapter presents the study's main findings and presents the theoretical and managerial implications. Finally, the chapter presents the study's limitations and suggestions for further research.

The first research question sought to determine what kind of data is currently being collected in case companies support customer experience management. All organizations participating in the study identified and collected many customer data, which was clearly divided into patient data and other customer data. Data were collected from various sources, but its combination into larger entities to better understand CX was still incomplete. All customer data were thus collected, analyzed, and utilized as very separate entities. The interviews also identified that there was much information internally that was not shared between different units, functions, or professional groups.

The second research question aimed to determine how the target companies utilize the data they collect to manage their customer experience. In all case companies, the importance of customer experience had already been recognized, and active efforts were made to put the customer experience at the center of thinking. However, interviews showed that there is still very little knowledge-based customer experience management in case companies. As Schiavone et al. (2020) noted, customer experience is still a new concept in healthcare, as the field is more focused on the quality of care. This study supports this argument, as the interviews revealed that the management of the customer experience in the case companies has only just begun to be extended to the entire customer journey. So far, the collected data were used mainly for individual development measures rather than for the systematic and comprehensive management of the customer experience.

Moe and Ratchford (2018) noted that obtaining data is no longer a problem for companies, and challenges have shifted to the ability to process, analyze, and gain insight from the data. Case companies identified a wide range of data analytical capabilities, but competencies were clearly focused on individuals. In addition, all companies felt they needed better technical tools to ensure more advanced analytics. Regardless of company size, adequacy of resources and time were also perceived as challenges in all companies. However, companies' perceptions of the need to develop a customer experience also affect their motivation to adopt new ways of managing the customer experience. All case organizations in the study felt no significant deficiencies in their customer experience. In particular, companies that tracked NPS scores found the results to be so high that developing the customer experience could easily be perceived as unnecessary. Because of the good results, respondents found it particularly challenging to define a common goal for CX that would guide development measures. This may partly explain why data-driven CXM is still in its infancy in these companies.

5.1 Theoretical and Managerial implications

Research on the customer experience has increased significantly, and, for example, Frow & Payne (2007) have identified customer experience management as one of the most important tools for achieving competitive advantage. Rapid technological development has brought companies new tools to manage and develop their operations. However, according to Borges et al.'s (2021) literature review, very little has been studied so far about using technology to manage the customer experience, for example. Holmlund et al. (2020) study identified the potential of big data analytics to manage the customer experience. The findings of this study complement the current literature on customer experience management and the utilization of data and data analytics in business development. The research presents a process in which development measures focusing on the customer experience are derived from customer data using data analytics. The study mirrors the existing theory with real practices and increases the understanding of the current state of companies in terms of data-driven CXM.

The theoretical framework resulting from this work and the empirical findings also provide several management implications for business organizations and executives interested in leveraging big data and data analytics to manage their customer experience. First, this study provides healthcare companies with an overview of what kind of customer data can be collected concerning the customer experience and how it can be integrated into customer experience management. For companies that do not have experience managing their customer experience or leveraging data analytics as part of decision-making, this study provides a good framework for developing their own data-driven customer experience management.

Also, companies providing social and healthcare services, in particular, can obtain information on the four case companies' operating models and use this in the planning of their own operations. In addition, the case companies themselves can compare their own practices with other case companies and use the information to develop their own operating models.

5.2 Research limitations and suggestions for future research

Although this research seeks to produce theoretical and managerial implications, the related research limitations must also be identified. From a macro perspective, research focuses only on the health care sector, so the research results cannot be generalized to other service sectors. In addition, all four cases selected for the study are Finnish organizations, which means that the results cannot be generalized to other market areas. If the study is viewed from a micro-perspective, it must be taken into account that only one person from each case study was interviewed. Although the interviewees are strongly involved in matters related to the research topic, they may not fully represent the company's perspective on managing the customer experience through data analytics or may lack significant information on the subject.

In the future study, it is possible to map more broadly the current state and plans of different healthcare companies to combine customer experience and data analytics by conducting more interviews and selecting more case studies. Thus, a better generalization of the results can be achieved. It is also possible to extend the research to cross-industry analysis. In the future, there is also a possibility for further research about knowledge-based customer experience management, as research is still relatively scarce and technologies are constantly evolving, creating new opportunities.

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Appendices

Appendix 1. Interview questions

Background

1. Can you tell me about your background (education, former work experience, current work)

CX management at the moment

1. Is there a systematic review of the customer experience in your organization?
2. Can you describe the process?
3. Who is in charge of and involved in this process?
4. What kind of KPI's do you have considering CX? What kind of measurements do you use?
5. How are CX views communicated in the organization?
6. What kind of CX insights would your organization require to support CXM actions?

Data and data analytic capabilities

1. What kind of customer data is available in your organization?
2. Is the data owned by the organization, its partners, or other parties?
3. How is the data captured, organized, and integrated?
4. What are the main privacy, ethical, or legal concerns when acquiring new data?
5. Who is in charge of processing and analyzing the customer data?
6. Can you describe the data analytic process?
7. How and for what purpose does your organization use the results of data analytics?
8. Do all decision-makers have access to the insights for real-time, easy decision-making?
9. Does your organization have sufficient expertise and resources to process and analyze data? What are they?
10. Have you recognized bottlenecks in the technological or decision-making process?

Combining CXM and data-analytics

1. What kind of CX analytics (descriptive, inquisitive, predictive, and/or prescriptive BDA) is necessary to generate CX Insights to support CXM actions?
2. What type of CX data (structured – unstructured, solicited – unsolicited) is required for the CX analytics?

3. Can these desired CX insights be gained using in-house CX analytics and CX data already being captured?
4. Have you mapped potential external solutions, and are they preferable to developing solutions in-house?
5. How would you integrate CX insights into decision making?
6. How would you integrate decisions into CXM actions?
7. How does your company translate analytics into real CXM practices.
8. Could you give me some examples of specific practices that are part of the CXM actions derived from the CX insights? What other actions/practices might emerge in the future?
9. Are your decision-makers trained and empowered to use CX insights for CX actions derived from new and sophisticated CX analytics?
10. What bottlenecks could be in the process of turning CX data into CXM actions?
11. What has been/ what would you assume to be the positive and negative consequences of employing BDA-empowered CX insights?