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Benefits and barriers of utilizing data in business development

A Comparative Case Study

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ABSTRACT:
The normalization of digitalization and data collection within companies has become more widespread, but the way companies use data for business development varies significantly between organizations. As a result, companies are increasingly investing in data utilization and digital tools. Simply having a strategy and decisions based on the core business operations are no longer enough to maintain competitive advantage. Companies must also adopt more digital capabilities. Data has become an essential enabler of competitiveness for companies, but the internal processes of the company must be ready for this.

This research aims to explore the opportunities and challenges associated with using data for business development and what solutions could be applied to address these issues. The purpose of the research is to identify similarities in these challenges and opportunities through two example companies. The theoretical framework of the study focuses on data strategy, data quality and governance, big data, and how different companies collect data.

Previous studies have found that, although companies collect a significant amount of data from both internal and external sources, its use for business development still has room for improvement. Previous research also highlights the role of employees and management as enablers and potential barriers to effective utilization. The research method used was a comparative case study, and data was collected through semi-structured thematic interviews, with a total of six interviews conducted. The interviewees were selected based on their experience in the subject area and their current role in the target company.

The research findings indicated that the target companies are increasingly utilizing data, but data fragmentation due to systems and organizational resources limit the potential benefits derived from the data. Despite the fact that the target companies operate in different sectors—one being a domestic company and the other a global enterprise—the same obstacles were observed in both sets of research materials.

KEYWORDS: Data utilization, Business development, Data strategy, Big data, Data governance

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1 Introduction

Companies have always studied ways to enhance their performance or to gain competitive advantage. (Davenport et al., 2023) presents that in today's business field data has become the power to separate winners from losers. Integrating use of data in organizations activities does not require investing artificial intelligence but to learn how to use basic analyses and develop processes which use data-analytics in the help of decision making. These small steps will help the transition to become data driven organization. Accorging to Blasco-Arcas et al. (2022) the amount of data is constantly increasing as the number of devices producing and capturing data continues to grow. Cao and Duan (2017) adds that data is also increasing because it is possible to make more and more versatile use of the resulting data. Companies utilize data in a number of different ways in different areas of their business. The data can be used in decision-making and forecasting. Although data seems to be the solution to everything, it must first be structured as well as processed in order to be used in decision-making.

However, identifying benefits of data is different than using it effectively. Mikalef et al. (2020) argue that big data analytics is found to be breakthrough technological development in business and academic fields but companies struggle to recognize its use in developing competitive advantage. Davenport et al. (2023) continues that including data in organizations strategy needs every one's involvement to utilize the value in data. According to a survey by Accenture, only 32% of companies reported receiving tangible and measurable value from their data, while just 27% indicated that data and analytics projects generate highly actionable insights and recommendations. For years, companies have been accumulating vast assets without recognizing their true value, with data being one of the most significant. Many businesses collect data but fail to leverage it effectively, or they neglect its potential to drive business growth. (Accenture, 2019)

Kenett and Redman (2019) also states that many companies take advantage of only a fraction of the value that the company's data analysts as well as other data analysts

generate for them. They also add that business leaders should be aware of their value as well as raise awareness of the usefulness of the data. This would change the structure of the entire organization towards data positivity. The data collected by companies may appear to managers as mere numbers, but data analysts can extract the most relevant data from any issue for a selected problem and analyse it in a way that provides benefits to support decision-making. Proposals made on the basis of the data must be clear and easy to understand so that the decisions made on them are properly targeted.

Companies should be aware about data quality, especially as data volumes surge with the rapid adoption of various data collection technologies, including the Internet of Things (IoT). Nagle et al. (2017) write that no industry or sector is protected from poor quality data. They also state that when investigating the total amount of data, the amount of bad data is considerable. Kenett and Redman (2019) presents that companies which uses data in their decision making and developing them in their everyday business can be defined to be data driven companies. When company acts data-driven they reduce uncertainty of the made decisions with data. Data-driven organisation needs deep cultural commitment and training to become sufficiently data-driven.

The data enables companies to perform more reliable competitor analyses more easily and in real time. The data also enables real-time monitoring of various consumption trends and technology trends and to adjust the company's operations based on them. (Gupta & George, 2016) By improving organisational data strategy companies could enable better competitive advantage, enhance customer experience and improve operational excellence in value chain.

Popularity of incorporating new technologies and data to support creation of competitive strategies has grown significantly. Despite the increasing prevalence of various data strategies, some companies still fail to recognize the potential of data for business development. Organizations must understand the different mechanisms, such as how Big Data, for example, can create value. (Mikalef et al., 2016) With the help of data,

companies can monitor consumer behaviour and adapt their business to meet new needs or re-target their focus areas. On the other hand, information available from existing systems can be used to optimize production volumes and create forecasting models that help predict demand.(Mcafee & Brynjolfsson, 2012)

Utilizing data does not only mean optimizing production capacity or launching a new product but also makes it easier for companies to comply with increasingly tightening regulation and rules. Increasing the level of automation also increases efficiency, and company resources can be allocated to more productive areas when manual work decreases. With digital tools, companies can also make more reliable plans for the future and better anticipate risks.(Davenport & Ronanki, 2021)

There are multiple reasons why organizations may fail to capitalize on the potential of data. These can include a lack of knowledge or expertise within the company work-force to leverage data effectively, or limitations in the company's systems to organize and transform raw data into an analysable format.(Henke et al., 2016; Mcafee & Brynjolfsson, 2012) Morales-Serazzi et al. (2023) continues that organizations face challenges in creating value from new collected data and combining and comparing it to the existing data to form analysis. Also combining the results from the analytics to specific processes and objectives can be difficult from some companies.

Using data more efficiently in business development has been grown over the last decade and the use of data in different applications is increasing fast. Companies collect, process and utilize data in many ways to improve business functions, develop new products and services and so on. Big data, digitalization and data strategy have been included in company strategies and vision for many years but the utilization rate has been shallow and only a fraction of these opportunities have been utilized to it extend. (Fosso Wamba et al., 2015)

Benefits of using data in business development is discussed among researchers greatly and it is identified that companies collect data more than ever before (Davenport & Alavi, 2023; Mikalef et al., 2020). But there is a gap in the research to combine these findings and to find what barriers there are when increasing the utilization of data in business development. This suggests the need for this research to find out what prevents companies to use data effectively and how it can be used if those barriers are exceeded.

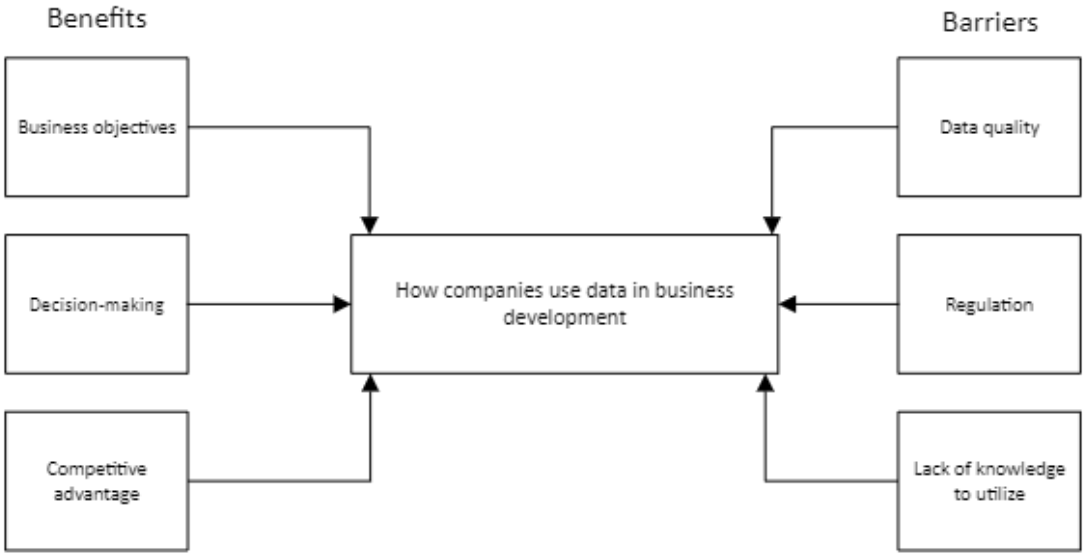

Figure 1: Resesearch Gap

Substantially of different studies have been done on big data and data analytics and it has been found out what opportunities they create for companies. By comparing different fields of business allows to see similarities between companies and their use of data to enable future research to study specific attributes behind these findings. Also, by identifying barriers using data more broadly will allow new research streams to emerge.
The goal of this research is to find out how companies use data in the development of a company's business, what benefits it has for the company and what prevents using it. In this thesis two research questions are made to meet the research goal. Research questions can be found below:

RQ 1. *How companies gather data and how they use it to develop their business*
RQ 2. *What barriers companies have in using data in business development*

1.1 Thesis structure

This thesis consists of five main chapters: Introduction, theoretical framework, methodology, results and conclusion. Thesis structure is presented in the structure below

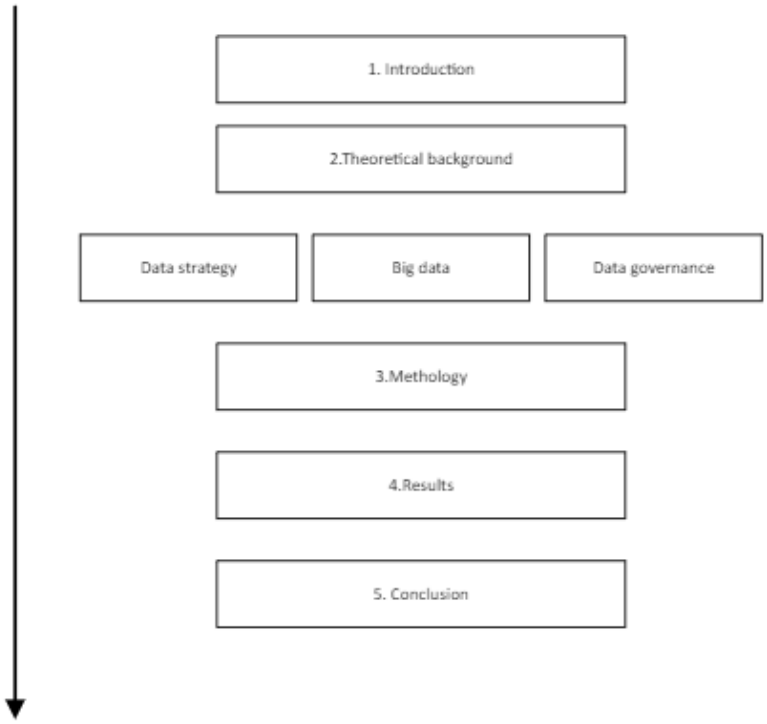

Figure 2: Thesis structure

2 Literature review

2.1 Data strategy

Medeiros et al. (2020) argues that gaining competitive advantage is directly related to organizations data strategy in modern day business spectrum. They continue that obtaining the true value from big data analytics companies must implement data strategy in their strategic objectives. Dallemule and Davenport (2017) have defined data strategy as “organizing, governing, analysing and deploying the information assets of an organization “. They continue that without strategic management to point these aspects out organizations will have challenges to leverage their data coherently. Medeiros et al. (2020) presents that having a clear data strategy helps organizations better understand market trends and make informed decisions more efficiently, allowing them to respond faster to competition and create differentiation through innovation. LaValle (2011) continues that one form of data strategy can be that organizations use data visualization to make insights more visible and easy to understand. This also enhances the decision making and targeting specific areas.

Data strategy is essential for the organizations to function effectively in modern day business field. Today’s technological advancements like big data analytics and AI have transformed managing customer and operational data to enhance products and services much faster and more reliable. Also, data analytics have been used across industries to enhance key functional areas such as customer service and marketing. (Dallemule & Davenport, 2017; Medeiros et al., 2020) Even small amounts of data can enable to conduct basic analyses and help decision-making which will improve in example team performance (Davenport et al., 2023). Mazzei and Noble (2019) also note that data strategy has reformed new market exploration of companies from the traditional strategic planning to analysing data flows to explore new opportunities and new knowledge creation.

When companies rush to adopt new tools and processes in their organization’s actions, they first need to have structured plan to do so. Implementing AI analytics or data

analytics firstly companies must integrate data governance and ensure that data quality is ensured and governance is accounted for.(Aldoseri et al., 2023) Structured plan and tools are important but also organizations cannot forget to take customer-centric approach when improving service quality and efficiency. Companies in service industry needs to implement data strategies in a way that it is answering the customer needs also. (Grassi et al., 2022)

While competitive advantage is closely linked to an organization's data strategy in today's business environment. Implementing a strategic approach to managing data allows companies to protect and leverage their information, especially in regulated sectors, or adopt a more aggressive stance in dynamic markets (Dallemule & Davenport, 2017). Incorporating data strategy into broader business objectives enables organizations to unlock the full potential of big data analytics, driving improvements in key areas like profitability, market expansion, and customer satisfaction. This also enhances decision-making speed, allowing businesses to outpace competitors through innovation and differentiation. (Vidgen et al., 2017; Wamba et al., 2017) By integrating data strategy, companies gain clearer insights into market trends and business opportunities, fostering more responsive and effective decision-making processes that promote competitive differentiation (LaValle, 2011). Incorporating data strategy successfully in strategic alignment is needed between traditional business strategy and to information-system strategies (Gao & Sarwar, 2022).

When discussing about the benefits obtaining data strategy in organizations strategic framework, many organizations face challenges when adopting data strategies in their business. One of the reasons are that gathered data is unscrutinized and scarce. Also making strategic decisions can have challenges due to problems when analysing raw data. (Dallemule & Davenport, 2017) Also gathered data can be inconsistent or used data for the analytics is low-quality which enables effective use of it and the value it proposes. (Aldoseri et al., 2023) Also when focusing on diving into organizational barriers we cannot forget the people working in them. Grover et al. (2018) mentions that cultural

resistance when adopting new strategies and data driven decision making into organizations everyday functions. Resistance is more greater in organizations with traditional approach to strategy. Morales-Serazzi et al. (2023) continues that effective utilization of data is relying heavily on employees because they are using their skills and knowledge to extract the meaningful information from the data. These insights are then used in decision-making and development

Mazzei and Noble, (2017) presents that especially smaller companies are likely to arrive to crossroads when considering data strategy adoption. They continue that companies might lack of skilled personnel with needed skills. There are high costs when implementing and developing such data driven infrastructure. This new strategic development might not guarantee competitive advantage and success but it might be needed to stay in the game.(Akter et al., 2016; Mazzei & Noble, 2017)

2.1.1 Data governance

Data governance has important role in organizations by ensuring, maintaining and enhancing data quality.Abraham et al. (2019) have described data governance as “exercise of authority and control over the management of data”. They continue that purpose of data governance is to ensure and increase the value of the data and to reduce the risk of data related cost. Morales-Serazzi et al. (2023) emphasize that data quality must meet specific criteria to be effective. They continue that it needs to be up to date, understandable and error free. Based on their study they propose that data quality could be seen as competitive advantage itself because of the value it contains. Data governance involves managing data's availability, usability, integrity, and security through policies, processes, and technologies. Effective data governance supports better decision-making, enhances operational efficiency, ensures regulatory compliance, and provides a competitive advantage by ensuring data quality to be used in example in analytics. (Aldoseri et al., 2023). In many organizations, there are pointed personnel resources who are responsible for ensuring data quality and making data-driven decisions. These people usually have title data officers or chief data officers. (Wang et al., 2019) It is crushial to point out

that the responsibility is not fully on data officers' shoulders, but they are key part of the management ensuring the data quality and identifying business opportunities.

Wang et al. (2019) presents that viewing data governance has shifted from technological tools and specific methods to practises and managing the people who have the ownership of the data. They continue that successful data governance in a data-driven environment involves creating clear data strategies and policies to guide analytic activities. Data governance could be seen also as a framework of ensuring and optimizing the value of the data to information which can be used in decision making.(Aldoseri et al., 2023; Wang et al., 2019)

General data protection regulation (GDPR) has required companies ensure that the data is storage properly and the handling of it has been done accordingly the rules. (Abraham et al., 2019) The gathered personal data can be categorized in two different categories: Personal data and sensitive personal data: personal data consist of information where the individual can be identified directly or indirectly. And sensitive personal data can cover information about ethnic origin, political opinions, and health information or religion in example. (Hofman et al., 2019) Data collected by organizations can differ based on their industry and usage and storing such information must be done by the regulations.

2.2 Big Data

There is not a clear or mutually agreed definition of the Big Data. Kaivo-Oja et al. (2015) presents one definition: big data refers to large quantities of data which it is not possible to process with traditional ways of using data-processing. The reasons for this are that the data itself is either too complicated or too big to be handled (Niebel et al., 2018).

These various definitions of big data, each highlighting different aspects of the concept. Some definitions focus more on the variety of data sources, while others emphasize the storage and analysis requirements. IDC identifies three main characteristics of big data:

the data itself, the analytics of the data, and the presentation of the results of analytics that allow business value creation.(Mikalef et al., 2020; Krogstie, et al., 2020b)

The term 'Big Data' has become increasingly popular in recent years, with the amount of information available online growing rapidly. The widespread adoption of mobile devices, social media platforms such as YouTube, and Twitter, and RFID technology has generated massive amounts of data. On other hand scholars and practitioners have defined big data in various ways, but the concept is generally characterized by its volume, velocity, variety, veracity, and value.(Akter et al., 2016)

The **volume** of big data refers to the vast amount of data generated, which requires significant storage capacity. The **velocity** of big data refers to the speed at which data is generated and disseminated. The **variety** of big data refers to the diverse sources and formats from which data are generated, including structured and unstructured data. The **veracity** of big data refers to the importance of quality data and the level of trust in various data sources. In order to extract actionable insights from big data, it is essential to ensure that the data is of sufficient quality and that the level of trust in the data sources is high. **Value** comes from the possibility to get meaningful insights and business value from the collected data sources. Value also means subtracting the useful and correct data for analysis from the big data. Some scholars and practitioners have added more dimension to the definition of big data: visualisation, variability and viability(Mazzei & Noble, 2019; Mikalef et al., 2020; Krogstie, et al., 2020b)

Attribute	*Description*
Volume	Increasing amount of data collected
Velocity	Rate at which data is retrieved, stored and achieved
Variety	Different forms and structure of data collected from various sources
Veracity	Quality and trustworthiness of data
Variability	Changing nature of data
Viability	Relevance of the collected data
Visualization	Comprehensibility of data
Value	Impact of the collected data in knowledge creation, business value and learning

Table 1: Eight common Vs of big data by(Mazzei & Noble, 2019).

Data can be in an organized or unorganized form depending on where the data is collected and whether it is already processed. Unorganized data means that it cannot be easily stored and organized in example social media posts. (Marr, 2015) The data can be collected from IoT devices which provide statistics. Big data enables to forecast group behaviour and individual preferences which can be used in marketing for example (Favaretto et al., 2020).

Many of the biggest companies in the world such as Amazon, Google and Walmart are using Big Data in their business. Marr (2015) presents in his book that Walmart can use weather reports and customers buying behaviour to send targeted advertisement to the customers' phones. He continues that Big Data is widely used by retail and sale industry to meet the requirements of their customers. Also, the manufacturing industry uses Big Data also to predict spare part consumption and to develop their products further.

Mcafee and Brynjolfsson, (2012) presents that there is a correlation between positive financial and operational results in companies which have identify themselves as data driven compared to other which are not. They found out that data driven companies had better profit and productive ratio compared to non-data driven companies in same industry. Companies can have new business innovations and possibilities when introducing

Big Data in their operations and start utilizing it more. It can improve service business and lead to new service design (NSD) practices (Kaivo-Oja et al., 2015).

Watson and Marjanovic, (2013) present that company executives have identified the opportunities what big data offers but they are unsure how it can be utilized in bigger picture. Executives have stated that in business-driven Big data projects there are uncertainty if the business requirements are not clearly stated. According to Niebel et al. (2019) using Big data in decision making may lead to misinterpretations if the raw data is not analysed accordingly or there has been error selecting the data patterns. Grover et al. (2018) agrees on this and points out that leveraging Big data often needs filtering, data hygiene and preprocessing before it can be used in analysis. Wielki (2013) proposes that companies can utilize Big data more efficiently and avoid these misinterpretations if they ensure that organizations are provided with enough resources to develop these analysis and tools and people.

Big data is a critical concept in today's world, given the vast amount of information that is generated and disseminated daily. Scholars and practitioners have defined big data in various ways, but the concept is generally characterized by its volume, velocity, variety, veracity, and value. To make the most of big data, it is necessary to develop high-level skills that allow the use of new generation IT tools and architectures to collect, store, organize, extract, analyse, and generate valuable insights.

In order to make the most of big data, it is necessary to develop high-level skills that allow the use of new generation IT tools and architectures to collect data from various sources, store, organize, extract, analyse, generate valuable insights, and share them with key stakeholders for competitive advantage co-creation and realization. Therefore, big data can be defined as a holistic approach to manage, process, and analyse in order to create actionable insights for sustained value delivery, measuring performance, and establishing competitive advantages.

2.3 IoT

The Internet of things (IoT) stands for things or products which are connected to the internet and other networks. These products have built in technology in example sensors which gather data from their environment and surroundings. Technology can be equipped in existing products to gather information of prevailing conditions. IoT can be used in numerous situations in and places (Cirani et al., 2018).

One example of IoT can be smartphone which collects GPS coordinates of the user. This data can be used to in example plan transportation schedules of a big concerts in future based on previous concerts. This data can be utilized other companies also.

IoT generates significant amounts of data, namely Big Data that was discussed in the previous chapter. This can be used to develop smart home systems, automation processes of different industries and in transportation industry. This will help to generate companies' competitive advantage over their rivals. Companies can use IoT with the help of data analytics to predict consumer behaviour and develop new appliances and services (Sestino et al., 2020). Gathering data from IoT environment does not enable company towards success itself.

Ahmed et al. (2017) proposes that to gain profit and benefit from IoT, companies need to establish a platform which collects and analyses gathered data. This data, Big Data is analysed to knowledge to plan business processes and used in managerial applications. Ahmed et al. (2017) Continues that smart grids are one large IoT environment which provides important data of power consumption and usage spikes.

This information is important when planning city power grids and electricity demands. To know electricity consumptions is important in future when planning charging stations of electric vehicles because the high usage is usually in nighttime. (Zhou et al., 2016)

2.4 How companies collect data

In today's world data collection and using data-analysis more often to help developing business activities and forming strategic implementations. Because of the technologies have become more sophisticated, companies have adopted more tools and skills to contextualize consumer information and generate actionable insights. Organizations collect, analyse and store information which is both quantitative and qualitative and is related to consumer behaviour and predictive analytics. This has transformed to new business models around consumer data, where some companies sell this personal information to third parties or develop targeted advertising for other companies to use.(Freedman, 2023) Data can be collected from company's own systems, external sources like company web services or from different sensors. Sources where the data is collected is significant, and each company must define the most important sources for their business functions to get the most out of it. (Henke et al., 2016)

Blasco-Arcas et al. (2022) argues that consumers share personal and consumption-related data through their interactions with companies, which shows in both declarative and non-declarative forms. Declarative data can be identified as consciously provided by customers when requested by companies, usually in exchange for discounts or personalized offers. This data can come from transactions, participation in loyalty pro-grams, or feedback through consumer panels and from market research. Declarative data can be also collected from social media or product reviews and this type of user generated data can be used to gain understanding of customer preferences and develop to engaging customers to co creation and development of products and services.

Data used by companies in decision making can be divided in two different categories based on their sources. These categories are internal and external data sources. Internal data is data what company already poses but does not used it yet. (Hartmann et al., 2016) Internal data is also actively collected in the company (Gupta & George, 2016). This data is located in company's IT systems and collected from everyday activities and channels. In example information in CRM or ERP systems contains internal data what company can

use in decision making and business development external data comprises usually purchased data what company acquires from data providers which is which is later processed for use as part of business development. Other common features are that the data is not publicly available. (Hartmann et al., 2016)

2.5 Theoretical framework

Data strategy is important part of creating organizations competitive advantage in modern day business environment. (Medeiros et al., 2020) presents that organizations must include data strategy in their strategic objectives to ensure that they can harness the full potential of the gathered vast amounts of data. (Aldoseri et al., 2023) continues this highlighting that organizations needs to have structured plan to start the strategy process and reviewing organizations tools and processes first. (Dallemule & Davenport, 2017) have presented about data strategy that efficient use of data allows organizations to identify new business objectives, market trends and customer behaviour. They also added that effective use of data enables innovation and based on the data analytics it can be used on decision making which can support competitive advantage. Some organizations have developed new business models around the data and analytics and provide them to the highest bidder. Data can contain in example customer behaviour or emerging market trends.(Freedman, 2023) Based on the previous research when organizations have identified these benefits and chosen the structure how to implement data strategy in the organizations strategy customer centricity cannot be forgotten. (Grassiet al., 2022)

Data governance is part of data strategy because it ensures that data quality is sufficient to use in analytics and furthermore. Abraham et al. (2019) argues that purpose of the data governance is to optimize the value of data and reduce the risk of using poor quality data in operations. Data governance in use ensures that company meets the regulatory requirements regarding the using and storing the data it has collected. They also argue that data quality itself is competitive advantage for the organization and contains value. Morales-Serazzi et al. (2023) continues on this and adds that one of the most important aspects of decision making and data analysis is the quality of data which is used in these

processes. While data governance has been identified as key part of the data strategy there is also aspects which will cause challenges to gain true value from data strategy. Wang et al. (2019) presents that without skilful employees' organizations cannot utilize the value what data contains because structuralising the data and enriching it to suit the organizations needs involves competent employees. They continue that data governance has shifted from utilizing software and analytics to managing the people who are responsible to use these tools.

Theoretical framework is visualized below based on the previous research and to support thesis purpose.

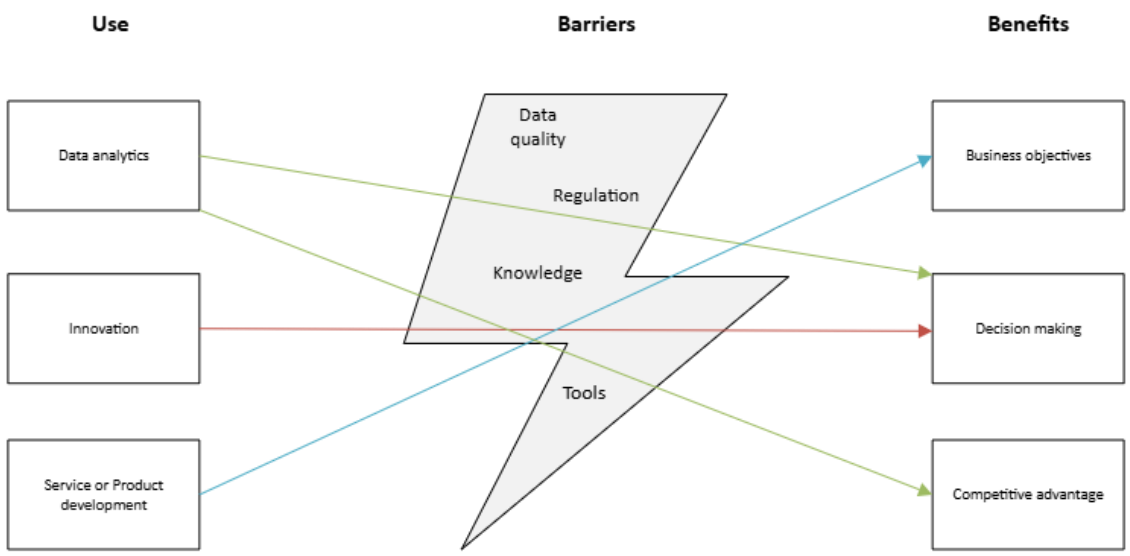

Figure 3: Theoretical framework of benefits and barriers of using data

3 Methodology

This part describes the chosen methodological approach for this thesis. In the first chapter research method and research strategy is described. In second chapter case companies are briefly introduced. In third chapter data collection method and data analysis method is presented. The last chapter focuses on the research quality.

3.1 Research method

This study was carried out as comparative case study and to investigate how two different companies use data in their business development activities. In this study two different private companies were compared. One of the companies was operating in financial industry and the other was machinery manufacturing company. The purpose of selecting two completely different fields was to see what similarities and differences there are regarding using the data. Also, by comparing these two companies and possible similarities it is a possible to identify common findings. By the scope of this thesis and the research questions, qualitative research method was selected. Qualitative research is commonly used in exploratory studies because usually researcher wants to gain insights and to investigate problems or phenomenon's which are not fully understood.(Saunders et al., 2007) More detailed explanation of the selected research method can be found below.

The purpose of qualitative research is to gain understanding from the point of participants who are taking part in the research. It seeks to have answers in some phenomenon by analysing feelings, thoughts and experiences from the participants.(Puusa & Juuti, 2020, p. 1)

Qualitative research includes various data collection methods and analytical procedures in general to form conceptual framework and in the end theoretical contribution. Qualitative research aims to make conclusions from the gathered material. One form of data can be sentences from the interview which is categorized in example. In qualitative

research the researcher's role is to gather and analyse the findings which are collected by chosen method and remain objective towards the results. In order to conduct reliable qualitative research researcher must be familiar with the basic principles of this type of research and remain as objective as possible during the process. (Puusa & Juuti, 2020, p. 1)

Qualitative research was chosen for this study because it fits with the research strategy. Semi-structured interview was selected as the data collection method because it fits the exploratory research approach. This approach focuses on understanding the phenomenon and enables further research based on the findings. In exploratory research method interview questions are generally formed to consider "how" and "why" questions to understand phenomenon or to seek new insights (Saunders et al., 2007, p. 313).

Tuomi and Sarajärvi (2018) presents that qualitative research rarely aims to obtain statistical generalization. Instead, qualitative research aims to increase understanding towards the phenomenon or create theoretical interpretation of this phenomenon. They also mention that is why it is important that individuals from whom the data is collected should have as much knowledge as possible about the phenomenon which is studied and to have relevant experience. Therefore, for example, the selection of interviewees should not be random, but rather deliberate and carefully planned in advance. (Tuomi & Sarajärvi, 2018)

3.2 Comparative case study

This study was conducted as a comparative case study. The research examines how companies utilize data in business development and what challenges they face in doing so. These topics were compared between two companies operating in different industries. One of the companies was also international, while the other operated only in Finland.

Yin (2009) defines case study as" A case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-world context, especially when

the boundaries between phenomenon and context may not be clearly evident.” Yin (2009) continues that in case study research can include either single- or multiple case studies depending on the researcher’s needs and the scope of the research. Case studies can include qualitative and quantitative data or both types of data.

In this study only qualitative data was used in comparative case study. In comparative case study multiple cases are compared to explore if findings are common between the case groups. If findings or phenomenon also occurs in another case, there is stronger evidence that these can be generalized. (Saunders et al., 2007, p. 140)

Case studies are usually designed to gain understanding and identifying what is happening and why. Case studies can be used for many purposes like exploratory, descriptive or explanatory purposes. (Saunderset al., 2007, p. 313; Yin, 2009)

3.3 Data collection and samples

For this study data was collected through interviews and the interview type was chosen to be semi-structured. Data collection consists of six semi-structured interviews between two companies and they were held between January 2025 to April 2025. All of the interviews were held over Microsoft Teams to ensure flexibility for the interviewees and to enable record these interviews for later analysis. During the interviews cameras were on including the interviewer and the participant. This was preselected approach to increase familiarity between the participants. Interviews were pre-arranged but interviewees did not get the interview questions beforehand. Interviewees only got information regarding the study and general information regarding recording the meeting and anonymity.

Identity of the interviewees or the company they work is not revealed in this research. It was highlighted for the participants that all the collected data would be used only for academic purposes and all the personal data collected would be saved as long it was necessary for the research. After the research was completed, this data was deleted to

ensure information security. Language for the interviews was Finnish as all the interviewees were native Finnish speakers. Interview length varied from 34- to 49 minutes.

For this research interviewees were selected based on their experience and knowledge towards the research topic and themes. All of the interviewees were working around data or business development activities or both. Interviewees work in different roles and have various lengths of working for the case company. By interviewing personnel with different organizational hierarchy was to achieve more broader range of opinions and perspectives. Also, they were working in different teams and different levels in the organisation.

Interview questions were drafted based on the target companies and based on the research questions. Some of the interview questions were so-called introductory or warm-up questions, intended to help the interviewees ease into the interview situation and get accustomed to answering questions. After these, the interviewees were asked about data utilization in their companies. The questions were deliberately designed to be high-level, allowing the interviewees to express their own views and interpret the questions more freely. The interviewer ensured the discussion stayed within the intended scope by occasionally guiding the interview gently back to the question, if necessary. However, excessive restriction was avoided to keep the interview as natural and conversational as possible for the participants.

During the questions and responses, the interviewer did not express their own opinions and aimed to remain as neutral as possible. At the end of a response, when transitioning to the next question, the interviewer sometimes summarized the interviewee's answers without adding interpretations. This approach turned out to be effective, as interviewees often continued elaborating on their responses after the summary, either recalling additional thoughts or clarifying previous points.

The overall atmosphere of the interviews was open and confident. There were no indications from facial expressions or word choices that the interviewees were avoiding certain topics or reluctant to express their personal opinions. It is also worth noting that although scheduling the interviews into already full calendars was occasionally challenging, none of the interviewees showed any signs of being in a hurry during the interviews.

In company X interviewees was working in Executive, middle- management or analyst level. Years in company varied from 3 years to 7 years.

Interviewee	Role	Years in company	Date	Length
Interviewee 1	Director of Commercial Management	4 years	23.1.2025	36min
Interviewee 2	Director of Digital Services	7 years	20.2.2025	49min
Interviewee 3	Business analyst	3 years	25.2.2025	34min

Table 2: Interviews from case company X

In company Y interviewees were working as Executive, upper management and middle-management level. Years in company varied from 2 years to 11 years.

Interviewee	Role	Years in company	Date	Length
Interviewee 4	Director of ICT	2 years	23.1.2025	36min
Interviewee 5	Director of KM	11 years	20.2.2025	49min
Interviewee 6	Development manager	2 years	25.2.2025	34min

Table 3: Interviews from case company Y

3.3.1 Semi structured interviews

In this study the data collection method was chosen to be semi-structured interview to guide the interviews topic around the research questions to avoid the interview going off topic. In semi-structured interview participants are asked pre-set questions generally

in the same order but the interviewer can change the order of the questions and add new questions to clarify certain topic. These new questions might be needed to give interviewee organizational context and allow more in-depth answers towards research objectives and research question. (Saunders et al., 2007, p. 313.)

Additional questions or subtle instructions can be also given if the participant drifts away from the topic. During the interviewing process it is important to not jump into conclusions or give the participants ready answers. Also, researcher should avoid making opinions during the interview because it might affect interviewees answers later on. By avoiding these the research validity can be ensured more reliably.

3.3.2 Samples

Samples were collected from two different private companies which are operating in Finland. Reason to choose different fields to conduct research was to see if there are similarities towards the topic of this thesis. First sample (X) consists of an industrial company that manufactures various types of work machinery and related accessories tailored to customer needs. The company operates in global markets and is a significant player in its industry. In recent years, Company X has experienced growth and expanded its product portfolio accordingly. It has operations both in Finland and internationally.
The second case company (Y) is a Finnish financial services company with offices across Finland. It serves both private and corporate customers through multiple channels. Customers can interact with the company via online services, by phone, or by visiting a physical branch. All three service channels are strategically important for Company Y and are intended to be maintained. Company Y is a key player in its regional market, both in terms of customer base and revenue.

3.4 Data analysis of the study

Once all the interviews were conducted and data had been collected, the analysis process began. The interviewees were listed in a table according to the company they

represented, and the duration and date of the interviews were also recorded. Once the interviews were organized, they were translated into English to facilitate the analysis and comparison of the results.

The interviews were analysed using the Gioia Method, which begins by identifying first-order concepts from the data. These concepts are then used to form broader second-order themes, which are subsequently grouped into overarching aggregate dimensions. The Gioia method enables the findings from the collected data to be enriched and synthesized into larger, meaningful conceptual categories. (Gioia et al., 2013)

For the Gioia analysis, the interview transcripts, originally transcribed in Microsoft Word, were organized into a single file for each company. Helping the transcription process Microsoft Co-pilot was used to make raw transcription from the interviews. Authenticity was checked during the process with recorded interviews to avoid mistakes. From the transcripts, connecting themes were identified partly based on the interview questions. These were visualized using colour codes to support easier observation and interpretation. The color-coded segments were then transferred to Microsoft Excel, where similarly coded segments were placed into dedicated tables. On the opposite side of the table, responses from the second company's interviewees were matched using the same colour scheme.

Once the structuring was complete, results were visualized and structured according to Gioia's methodology using Microsoft Visio. During the visual construction process, interviewees' responses were retained as they appeared in the recordings, although the language was refined for consistency. Instead of direct quotations, a condensed version of each response was presented, preserving the core message and voice of the interviewees.

Using Microsoft Visio allowed for a clear visual representation of the conceptual structure, where recurring themes were linked together with connecting lines. This resulted

in the final figure, in which first-order concepts are grouped into second-order themes, which in turn lead to analytically derived aggregate dimensions. The figure includes both the perceived benefits of data utilization and the barriers preventing its effective use.

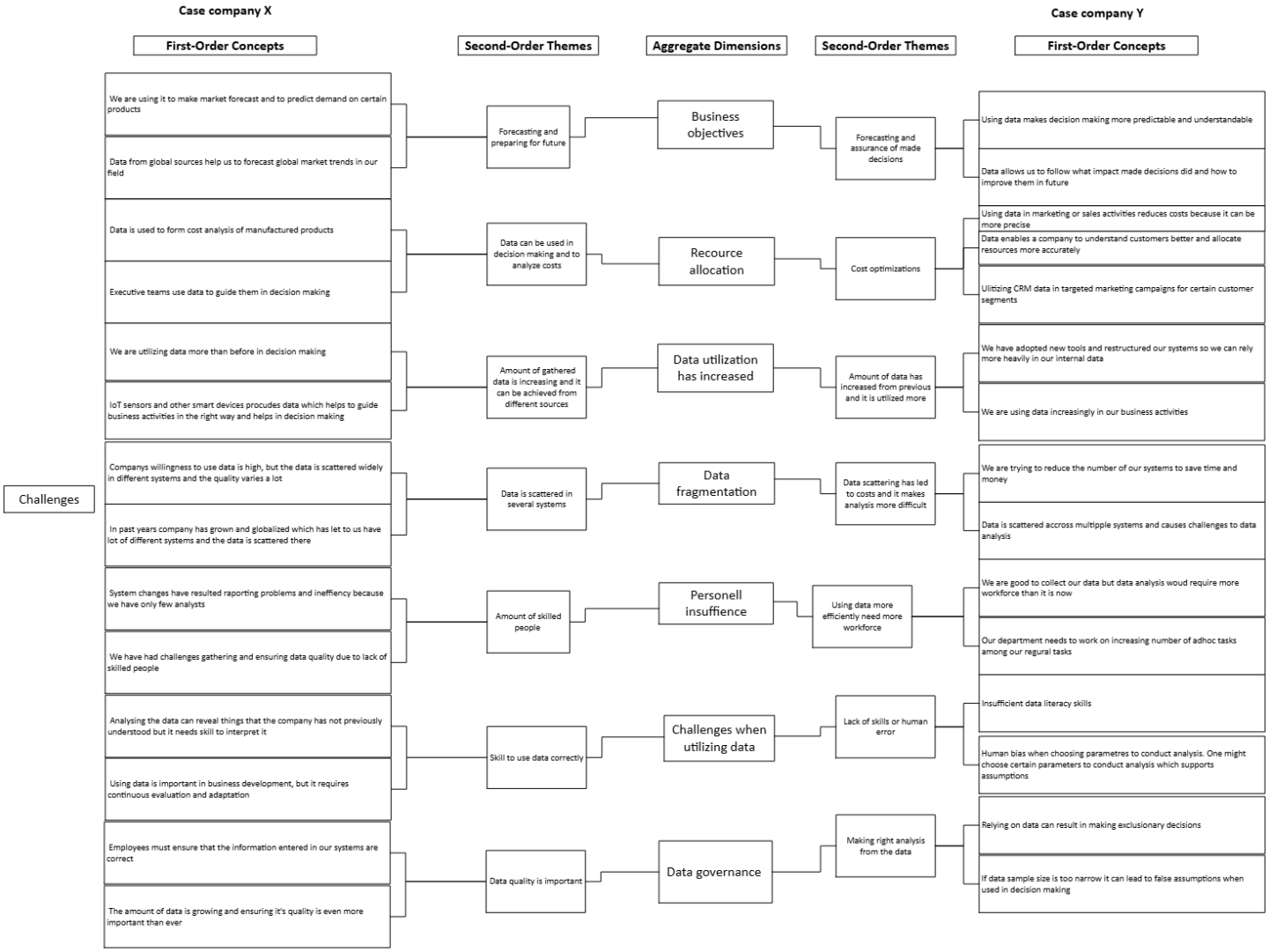

Table 4: Analysed data structure

3.5 Trustworthiness

The quality of the research is measured by validity and reliability. Validity measures are the methods used in research measuring what it was supposed to. Also are the methods

used to derive the results appropriate for their intended purpose.(Saunders et al., 2007, p.319.)

Reliability measures that are results which were from the research possible to recreate with the same sample group using the same methods. This type of reliability is also referred as external reliability. Reliability might not be easy to measure if focus is in repeating the research with the same questionnaire because the interview reflects the reality at the time they were executed. (Saunders et al., 2007, p. 319)

By analysing the reliability of the findings from research it is possible to see or rule out errors or biases in data collection or analysis. Also, by highlighting the anonymity of the interviews reduced the bias from the interviewees because they could answer freely without the fear of being identified later on. (Saunders et al., 2007, p. 319) One interviewee said that “I can now freely criticize our organisations strategic decisions”

By conducting qualitative research, it is important to keep detailed notes and in example recording of the interviews to reduce the risk of errors. Researcher might remember some answers wrong or make assumptions based on insufficient notes. This can alter the reliability of the research. In this research reliability was ensured by recording the interviews which helped the researcher to review the answers multiple times to avoid misunderstanding.

4 Findings

This chapter presents the results and findings based on six semi-structured interviews. In addition to the presentation of the findings, selected quotations from the interviews are included to support the observations. Each quotation is followed by the interviewee's company (X or Y) and their interviewee number. The Findings section is divided into two parts according to the research questions. Finally, the key findings are combined and summarized.

4.1 Data collection in selected companies

Both of the examined companies reported collecting large amounts of data from both external and internal sources. Company X stated that they collect data from sales reports in order to monitor product performance and pricing levels. Data is also retrieved from the company's CRM system, which includes information such as customers' previous orders and their volumes. Additionally, payment behaviour and received feedback are tracked through the system and can be utilized in various contexts.

Internal reports are also generated through different IoT sensors in Company X, which enable monitoring of equipment maintenance schedules. From external sources, the company follows global market changes as well as developments in the target country's legislation or political decisions.

" We are collecting data from global sources to monitor legislative and political decisions because those can affect straightly into our products. In example if somewhere in the world there is a new emission policy, we need to be able to act fast to meet those changed regulations." (Interview 1)

In Company Y, data is primarily collected from internal systems, but external data is also purchased from various service providers. The data contained in internal systems is generated, for example, from customer website visits or information stored in the CRM

system. Company Y has been collecting various types of data from its systems for decades. Data is also available in the company's product system, which includes billing and claims systems.

According to the interviewees, data collection in Company Y is at a good level, and increasing the use of data from internal systems enables reduced dependency on third-party data providers. Interviewee 3 mentioned that while the company is very capable at collecting data, there is still room for improvement in utilizing and integrating it effectively. All the interviewees from Company Y agreed on that collecting and storing data is expensive and these investments are lost if data is not analysed or used.

" It's moreover that we are really good at collecting data in certain places, but we are lacking the ability to cross reference it and to connect it with other information" (Interviewee 6)

4.1.1 Data utilization

As mentioned in the previous section, both companies collect large amounts of data for various purposes. This section focuses on how the companies utilize the data they collect to develop their business and support decision-making. In addition, future use cases are mentioned, as interviewees found it both interesting and useful to reflect on near-future applications of data.

In both companies, data was used for forecasting and preparing for future developments. In Company X, forecasting was employed to predict demand for various products as well as to prepare for potential maintenance needs. Future forecasts were also created using existing IoT sensors, enabling the company to predict the maintenance and spare parts needs for sold products. This is why, Company X leveraged sensor data to predict the servicing requirements and life cycle development of their machines in various usage environments. Interviewee 1 mentioned that data is increasingly being used to support decision-making and emphasized that its use in decision-making is partly person

dependent. Those accustomed to using data analyses tend to require and apply such data more actively. Data was also used to support strategic decision-making, as well as to monitor and improve operational activities. For example, data has helped in deviation management and in developing customer offerings.

“We can identify customer needs on a global scale – for example, if a customer operating in a certain region needs feature X, we can investigate whether another customer in the same region also needs it. This could even be a globally desired feature that others have not yet identified.” (Interviewee 2)

Company X has increased its investment in data utilization in recent years. The transition from several legacy systems to unified global systems has enabled more efficient data collection and usage. For example, sales system data has been used to create various analyses and reports, which have supported pricing strategies for specific customer segments during tendering processes. Collected data has also been used to develop sales enablement tools, such as analytical models with selected parameters.

In case company Y, data utilization varies across different business units and departments, but its usage has significantly increased over the past five years. Data enables marketing activities to be more accurately targeted to specific customer segments, leading to reduced costs when evaluating marketing effectiveness. It also allows for more precise personalized marketing and measurement of its impact.

“Progress of digitalization is inevitable”, "It's important that we don't target our actions randomly, but rather that we see which customers are worth investing in and that those actions are timely. The better the data we have, the more precise our communication and marketing efforts will be. This way, the output-input (cost) ratio is better."
(Interviewee 5)

Data is also broadly used to support decision-making and to assess the effects of decisions already made. For example, data from market sources about the competitive environment or emerging megatrends and regulations can support strategic planning. Internally collected data can also be used to evaluate how specific decisions affect metrics such as revenue or profit.

"*When data is utilized in this way, it makes the decision-making more proactive and understandable. Consequently, you can also, on the other hand, distinguish the effects of the decisions made, because it's based on the utilization of data in a defined and demonstrable way, so we can see how our decision impacted things."(*Interviewee 4)

By utilizing customer data, Company Y is able to understand its customers better, both in terms of regulatory requirements and in optimizing product offerings and value creation. Company Y operates in a highly competitive industry where customer experience is a key factor in strengthening competitive advantage. One of the company's strategic priorities is to provide the best customer experience in the industry, regardless of the service channel.

With the help of data, we can understand customer needs better and also, we can answer to regulatory need related to knowing the customer more easily because we can show the data any time if needed (interviewee 4) "*It is crucial to us that our customer data is up to date and answers the compliance and to official requirements"* (Interviewee 5)

Data is utilized heavily also in sales reporting and maintaining customer base. Leading sales is one of key components in case company Y, which is constantly monitored. Also, sales reporting allows company to make future sales targets. These are widely used to conduct analyses and used to support decision making and also to form future strategic objectives around the core business operations.

In core business operations, data is utilized to define product pricing based on various attributes derived from either external or internal systems. Data also enables process automation, which results in both cost reduction and enhanced customer experience. For example, automated decision-making can be leveraged to facilitate and accelerate customer interactions online. By implementing automated decision-making, companies can reduce manual, routine tasks and allocate the same resources to areas where they generate greater value for the business.

"Our automation processes have increased and they will increase inevitable in future. Also, our customers are adopting digital channels and tools to interact with us even more. This will naturally be affected to our basic tasks" (Interviewee 5)

4.2 Benefits of using data

The previous chapter presented how the two case companies utilize the data they collect. The purpose of this section is to summarize the findings from the earlier chapters into concrete benefits that companies gain through data utilization.

The utilization of data enables companies to monitor the impact of their business decisions. It also supports general market and competitor monitoring and facilitates responding to these developments. By tracking market dynamics, companies can prepare for global change as in the case of Company X or to respond megatrends, as demonstrated by Company Y. As the name suggests, using data to support decision-making provided a clear benefit: management was able to link decisions to observed patterns or conducted analyses. A general advantage of data utilization was the ability to respond to customer needs and maintain competitiveness. A shared insight among the companies was that data enables adaptation of product offerings to better match customer wishes and demands.

In case company Y, one of the perceived benefits of utilizing data was the increased efficiency of marketing from a cost perspective, as data improves the effectiveness of

marketing activities, particularly in personalized marketing, when more information is available about the customer segment.

"We can track our logged in customers interaction in our web portal and see what catches their interest. We can also buy third-party data to increase the effectiveness of our marketing activities and we are able to test marketing campaigns for certain group." (Interviewee 6)

Data utilization also enhances operational efficiency by enabling automation, thereby reducing the amount of manual work required. In case company X, information provided by various IoT- sensors and smart products allows for improved service delivery to customers, and it also supports product development and the anticipation of maintenance needs. The data generated by these sensors can further be used to develop new tools, for example, for reporting purposes.

"We collect data from our IoT sensors and smart products. We can utilize this data in our operational field by understanding that how environmental differences affect in the wear of the products and how we could optimize maintenance breaks to avoid down time." (interviewee 2)

4.3 Challenges in data utilization in business development

Both companies suffer from a lack of personnel, and top management support is essential for recognizing the value of data utilization. In Company X, rapid growth has led to the adoption of data-driven approaches only recently, meaning the organization is still relatively new to this. However, there is resistance and hesitation at the middle management level to invest more substantially in data initiatives. Overcoming this requires a shift in mindset from focusing solely on core business operations to embracing the development of digital business, which is becoming a central part of modern business.

*“We are data positive or you could say data neutral company but also one person’s own intuition can affect in the decision to use the data in decision making or not. We need to remember here that we are quite traditional manufacturing company and to guide business from the traditional to using more data in decision making and other operations takes time “(*Interviewee 1)

The shortage of personnel was occurring in both companies, as existing resources did not allow sufficient time for data analysis or the production of reports and development suggestions. This created a bottleneck in data utilization and led to a need to prioritize the allocation of human resources to specific tasks. Both the availability of personnel and employees’ attitudes towards data utilization affected the challenges of using data effectively.

“If we want to use data or increase the collection of data, we need someone to conduct analyses from it. We could increase our data collection and utilization way more but it would need more resources, data is useless if it is not analysed” (Interviewee 1)

In Company X, it was observed that if top management was not accustomed to using data to support decision making, they were less likely to utilize it compared to those who were more familiar with data-driven approaches. In Company Y, the increase in data usage was approached with caution, as it was feared that automation could lead to workforce reductions. This might have contributed to resistance among employees towards adopting or learning to use new tools. Additionally, top management did not see investing in digital development as relevant, as the core business was already highly profitable with the current level of investment.

“*The main reason data utilization development curve has somewhat reduced is because in top management in business organization they can decide what targets we have for next strategic period and if they value more the traditional core business over investing in the digitalization tools and practices.” (*Interviewee 5)

The quality of data was considered good in both companies and was not seen as a barrier to data utilization. However, a human factor was identified in both organizations, either in the process of data analysis or in data creation. For example, if a report is generated using an existing tool to support decision-making, but the selected attributes are unconsciously chosen to support pre-existing assumptions, it is possible that the report may not accurately reflect reality. Additionally, if errors occur in the inputted information, they may go unnoticed altogether. This highlights the importance of not relying blindly on data, but rather, its analysis and the decisions based on it should always involve careful consideration and critical thinking.

" If we focus on sales data reports it is entirely the salesperson responsibility to determine what information they enter there and whether it is correct or incorrect. Luckily, we can spot anomalies by comparing new data to our historical sales reports. (Interviewee 3)

Both companies had made changes to their core systems and adopted new systems, either to replace legacy systems or to supplement them. This has led to data silos, which complicate data analysis, as information is dispersed across different systems, making integration slow and challenging. This also creates difficulties in leveraging automation or artificial intelligence across systems, as the databases may contain different values for the same attribute, even if the core data itself is consistent. However, both companies recognized that the current situation is temporary and expected improvements in the near future.

*" Our data is fragmented in many systems and if we think the possibility to use artificial intelligence to make analysis, it cannot differentiate the same values because it can be written in different format in different systems. In example the interest rate may be different in one system than in another, so it is a bad idea to let artificial intelligence do the analysis if it doesn't know what to compare." (*Interviewee 4)

"During the transition phase from the old system to new, our resources were tight on doing analysis, because we all needed to be updating data templates and values there. Still, we have data in other old systems and we need to collect data from various sources to make simple analysis sometimes" (Interviewee 3)

5 Discussion

This chapter provides a summary of the study and presents the theoretical contributions. After that, managerial implications and suggestions for future research are discussed. Finally, the limitations of the study are addressed.

5.1 Theoretical contributions

The purpose of this study was to examine how companies utilize data in business development and what barriers exist to its effective use. The study begins with an introduction to the research topic, followed by the research questions, objectives, and the structure of the thesis. Literature review allows to connect this thesis to findings to existing literature by providing insights into the barriers companies face when utilizing data effectively. Research questions were: "*How companies gather data and how they use it to develop their business"* and*" What barriers companies have in using data in business development".* In addition to the primary research questions, the study also explored the benefits of data utilization in enhancing business development as a sub question.

First research question was "*How companies gather data and how they use it to develop their business".* Davenport et al. (2023) argue in their research that by integrating use of data in companies' activities is reforming companies to become data-driven organizations. They continue that this can be achieved by adopting basic processes and data analysis in decision making. Also, Mikalef et al. (2020) has added that companies struggle to recognize the use of big data analytics in developing competitive advantage. Findings of this study supported these findings by discovering that case companies use data analytics to support decision making and in some cases the value of big data analytics is not realized. Based on the interviews it was clear that both of the companies had started utilizing data first in their basic operations and when the benefits and practices became clear they increased the use of data in their activities. Also, in some cases the need to adopt data utilization came from regulatory needs. Davenport and Ronanki (2021) mentions that data utilization does not always mean optimizing production or creating new

products but it also means complying with the regulation and allocating resources more efficiently. They also continue that data utilization can reduce manual work when company resources are allocated to more productive areas. In case company Y this was emerging from the interviews also, interviewees stated that data utilization can help company to adapt in changing regulatory requirements more effectively.

In previous studies the use of data has numerous different uses for data and case companies described these commonly used as following. Case company Y uses data to perform cost efficient marketing and more precisely targeted marketing for selected customer segments. Case company X in other hand uses data to offer new products and services to customers based on historical data in same geographical location or data from IoT sensors to predict maintenance. These areas are also mentioned in previous research by (Dallemule & Davenport, 2017; Mazzei & Noble, 2019).

Second research question was "*What barriers companies have in using data in business development".* During the interviews there were couple common topics which emerged from the interviewee's responses. These were related in organizations work culture, resources and tools. Henke et al. (2016); Mcafee & Brynjolfsson (2012) mentions in their research that there are multiple reasons why organizations may face barriers when trying to capture the full potential of data. One of the reasons is if organization lacks knowledge or expertise among its employees it can struggle to capture the full potential of data. Systems what companies use might also cause inefficiency towards data utilization and analysis. In case companies this was visible in data siloing due to multiple systems and limitations in workforce who analyses the data. Also reducing manual work was identified but it was also a barrier of adopting more data utilization in company because of the fear of resistance among employees. Organizational barriers are mentioned in previous research by (Grover et al., 2018).

In conclusion, it is clear that using data in business development is beneficial for the company in a ways of cost reduction and supporting decision making. Data can be used

also to develop new services and meeting regulatory requirements. This also brings along challenges which company needs to face before it can fully utilize the potential of the data it collects. One of key findings from this research is that companies need to ensure that it has enough human resources to analyse the data which can be later used in many different ways. When ensuring these resources, it is important to communicate clearly the benefits to the upper management and also to the employees. This will reduce the risk resistance towards data utilization. If these aspects are considered company is in the right direction to become functional data driven organization.

5.2 Managerial implications

Managerial implications are formed around the importance of human resources utilizing the data company collects. By avoiding bottlenecks which are from lack of skilful employees' companies could benefit more from the data they have collected. One approach to avoiding this could be increasing the training of existing employees or hiring new employees. Management needs to understand limitations of resources because it can affect in employee satisfaction. In other hand by investing more in data capabilities company can increase their visibility as modern employer.

Another factor for managerial implications is to create data positive atmosphere inside the company. They need to communicate the possibilities what utilizing more data can achieve to upper management. This can increase the amount upper management uses data in decision making and investments in digital tools and practises. Also, open communication can reduce the fear of losing jobs and managers should offer training and other tasks in place of reduced jobs for employees.

5.3 Suggestions for future research

The topic of this study opens up several avenues for future research. By expanding the scope to include foreign companies or by focusing on comparisons within a specific industry, the findings of this study could be broadened. Extending the dataset to include,

for example, all financial sector companies operating in Finland could reveal new insights or deepen the understanding of already identified phenomena. Additionally, incorporating artificial intelligence into the research themes is another direction in which future studies could be developed.

5.4 Limitations

The study was conducted as a qualitative research project, comparing two companies operating in Finland. The case companies differed in terms of workforce size and industry. Additionally, one of the companies was in a phase of strong growth and undergoing a transformation, while the other had operated in its sector for a longer period and was further along in terms of digital development both culturally and in terms of tools used.

Due to the nature of qualitative research, the findings of this study cannot be generalized to apply to all companies, as it focused on only two Finnish companies from different industries. Therefore, direct industry-specific generalizations are not possible. However, the study presents an interesting foundation for further research. Future studies could build on the findings and insights of this research, either with a larger sample size or by focusing on a specific industry.

The reliability of this study can be considered good. Despite the differences in industries, the responses from interviewees followed a similar pattern and the observations were largely aligned. The interviews were also recorded, which enabled thorough and reliable analysis of the material. The number of interviews was sufficient to provide a broad enough dataset, and saturation was achieved, as the responses began to repeat similar themes.

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APPENDICES

Appendix 1. Interview questions

A semi-structured interview

Background:

- How long have you worked at the company?
- Describe your current role within the company.

Data utilization:

- How do you see data being utilized within the company?
- What benefits do you think this brings?
- Do you consider this important?
- How do the things you mentioned benefit business development?
- Can you mention any examples?

Data quality:

- Is the data used by the company of good quality? Have you encountered any errors?
- Has enough effort been invested in ensuring data quality within the company?
- Is there anything you wish the company would do more of regarding data utilization?

Barriers:

- What do you think is preventing this?
- How do you think these problems could be solved?
- What do you think are the biggest obstacles to implementing what you mentioned in the company?
- Have you heard of any other company doing things differently/better?
- What could be the reason for this?