

UNIVERSITY OF TARTU  
Faculty of Social Sciences  
School of Economics and Business Administration

Mia Heleen Herman

AI IN BUSINESS MODEL INNOVATION: OPPORTUNITIES AND RISKS  
BASED ON SCENARIO ANALYSIS

Bachelor thesis

Supervisor: Junior lecturer Kristian Pentus

Tartu 2025

I have written this thesis independently. Any ideas or data taken from other authors or other sources have been fully referenced.

**Table of contents**

Introduction.....	4
1. Overview of AI, business model innovation and scenario analysis.....	6
1.1. Defining AI, business model and their relationship.....	6
1.2. Opportunities, challenges and risks with utilising AI in business models.....	13
1.3. Scenario analysis and its links to business model innovation and AI.....	16
2. Scenario analysis of artificial intelligence in innovating business models.....	19
2.1. Data and methodology of the empirical study.....	19
2.2. Interview results and discussion.....	28
2.3. Scenario analysis.....	34
Conclusion.....	43
List of references.....	48
APPENDIX A.....	53
APPENDIX B.....	54
APPENDIX C.....	55
APPENDIX D.....	56
APPENDIX E.....	57
Resümee.....	59

### **Introduction**

In today's world, companies are increasingly shifting their focus from not only developing new products or services, but also drawing their focus towards gaining a competitive advantage through business model innovations. In a study conducted already in 2005 it was assumed by the majority of executives interviewed that business models will become a new source of competitive advantage by the year 2010 (EIU, 2005, as cited in Bashir & Verma, 2017). When products as well as services can be more or less effortlessly copied by the competitors of the firm, Amit and Zott (2012), as cited in Bashir & Verma (2017) state that business models on an another hand are more complicated to replicate since they incorporate a unique system of operations, giving business models a favourable chance to be used as a competitive advantage.

The corporate landscapes are additionally changing with the rapid development and growing relevance of artificial intelligence (AI), by providing businesses with formerly unseen concepts that have the possibility to change creativity and productivity within companies business strategies. More precisely, Kemp (2023), cited in Climent et al. (2024) has put an emphasis that with organizations customising AI to perform specific tasks as well as by being adaptive to shifting conditions, companies have the ability to gain competitive advantage. The authors state that for a successful competitive advantage, firms must strategically embed AI into their business model architecture by grounding the use of AI in order to match the applications of AI to the objectives of the business model. The companies should bound the use of AI with the aim to establish certain parameters for utilising AI to prevent overuse. Additionally, firms should practise recasting which suggests contextualising AI in a firm by adaptation of internal technologies.

Today, the use of AI to innovate business models continues to expand. Jorzik et al. (2024) has defined AI's key roles in business model innovation today as a supporter, enabler, innovator, and disrupter. AI as a supporter is frequently utilised with the aim to improve the current operations of the firm without drastically altering the business model. Aguzarova et al. (2023) has similarly emphasised that AI has the possibility to enhance processes within a company, which therefore enables the company to automate their processes and reduce costs. As the enabler, AI is perceived to provide organizations the ability to welcome new capabilities as well as redefine more conventional procedures. Authors Shrinivas & Shetty (2024) similarly emphasise that AI enables companies to become more responsive and adaptable to market changes, which therefore can lead to enhanced innovation within the company. It can be additionally said that artificial intelligence as a way for innovation offers

firms the possibility to develop new goods but also to further enhance different operations within the company. Since AI by its nature in business model innovation is reframing fundamental business procedures, AI has the possibility to completely transform industries as a whole from its disruptive manner.

As mentioned above, with the introduction of AI, companies can make their operations and business model more efficient, however it is also worth considering what risks may be associated with the wider introduction of AI. One of the primary risks associated with artificial intelligence is the lack of transparency, more precisely when users of AI cannot fully understand how artificial intelligence operates - how the given inputs yield in specific outputs (Reim et al., 2020). Followed by the ethical and bias related risks, which emphasises issues related to fairness, as well as not understanding how certain judgements are made by AI (Mahbub & Ayman, 2024). Lastly, one of the primary risks associated with AI is the inaccuracy or low quality of AI generated data, resulting in flawed decisions or results, therefore it emphasises that the quality of inputted data can determine the accuracy and quality of the AI outputted data (Zdrok, 2024).

Given that the topic of AI has become more relevant within the past few years, a large variety of research has already been conducted on the topic of AI and business models, yet there are still topics and questions which have been failed to cover. When some sort of information has been given in terms of AI's use in today's business models and innovation processes, there is a research gap in examining what could be the next steps and how future capabilities of AI can influence business models in the future. It can be additionally said that very few researches that have been conducted this far have considered a scenario-analysis based approach.

The present paper aims to bring out opportunities and risks associated with integration of AI in innovating business models, based on a scenario analysis approach.

The research tasks set by the author for the following research are:

- To define the concept of business model innovation and artificial intelligence,
- To conduct a theoretical analysis based on the existing studies on the topic of artificial intelligence in business model innovations, including an analysis of the opportunities and risks associated with AI,
- To define the concept of scenario analysis and determine the concepts links between business model innovation and analysing artificial intelligence,

- To conduct interviews with companies to determine how they utilise AI today as well as to determine the future prospects and risks associated with AI-driven business model innovation,
- To conduct a scenario based analysis in order to predict how AI may influence the future development of business models.

The thesis is divided into two major parts - theoretical and empirical. Throughout the research paper the theoretical part of the thesis has been prepared. The theoretical part covers analysis of definitions as well as explores AI's transformative potential in business model innovation by analysing previously conducted studies on the matter. Additionally, future prospects of AI as well as risks and challenges associated with wider AI implementation are discussed. Lastly, the concept of scenario analysis is explained in addition to determining scenario analysis links to business model innovation and analysing AI. The first three research tasks are carried out within the theoretical part of the study. Remaining tasks will be executed within the empirical aspect of the study.

The second part of the thesis consists of the author presenting their empirical aspect of the research, which consists of carrying out interviews, conducting the scenario analysis and the discussion of results. As the final aspect of the thesis the author will conclude the conducted research.

**Keywords:** business model, business model innovation, artificial intelligence, scenario analysis.

## **1. Overview of AI, business model innovation and scenario analysis**

### **1.1. Defining AI, business model and their relationship**

The theoretical part of the study examines the role of artificial intelligence as a driver of business model innovation. Utilization of AI within different industries is explored in addition to identifying internal and external drivers of successful utilization of AI. Additionally, opportunities, risks and challenges that may arise with adoption of artificial intelligence are discussed. Lastly, the concept of scenario analysis and its links to business model innovation as well as to exploring AI are defined.

Artificial intelligence can be defined from different viewpoints, however, the four analysed definitions seen from Table 1 have a common similarity of AI being able to perform tasks that are typical of humans. More precisely, the first definition by Lee et al. (2019) perceives AI as an autonomous machine that can perform various tasks and does not need any additional programming to do so. Lee et al. (2019) emphasise that autonomy from AI is what allows companies to innovate their business models since AI's ability to function without

regular human input allows it to transform how value is created and delivered to the customers. Similarly, the definition by Demlehner & Laumer (2020) as cited in Enholm et al. (2022) also emphasises that artificial intelligence has been programmed in order to be able to perform different tasks which are inherent to humans, such as learning or judging. This definition suggests that artificial intelligence has human-like skills, which makes it potentially possible to replace humans with artificial intelligence. Meanwhile, Mikalef & Gupta (2021), have defined AI as a tool from an organizational perspective, more precisely that the capabilities of AI such as data analysis, pattern recognition, etc. enables organizations to fulfill their goals by streamlining processes and by allowing companies to make more informed decisions. However, Mikalef & Gupta (2021), emphasise that in order to maximise the potential of AI there is the importance of establishing additional resources within a company such as competent employees and good infrastructure. The last definition by Schmidt et al. (2020) as cited in Enholm et al. (2022), suggests that AI is a machine that is able to mimic the behaviours and skills of humans. The given definition highlights the ability to create human-like machines, which could also lead to the replacement of humans with AI. Thus within the context of this study we define artificial intelligence as a system that is able to analyse data and carry out processes that generate outputs which are characteristic to human intelligence.

Table 1

*Definitions of artificial intelligence*

Author	Definition
Lee et al. (2019)	“Artificial Intelligence (AI) - Intelligent systems created to use data, analysis, and observations to perform certain tasks without needing to be programmed to do so.”
Demlehner & Laumer (2020) as cited in Enholm et al. (2022)	“Artificial Intelligence: a computer system having the ability to percept, learn, judge, or plan without being explicitly programmed to follow predetermined rules or action sequences throughout the whole process.”
Mikalef & Gupta (2021)	“AI is the ability of a system to identify, interpret, make inferences, and learn from data to achieve predetermined organizational and societal goals.”
Schmidt et al. (2020) as cited in Enholm et al. (2022)	“Artificial Intelligence: The endeavor to mimic cognitive and human capabilities on computers.”

Source: Compiled by the author based on sources presented in the table.

With artificial intelligence rapidly developing and becoming more competent in performing different tasks, businesses are finding new ways to effectively apply it in everyday business activities. As AI advances further, businesses have great chances to transform their business models to be more efficient and innovative. Business models can also be defined from different viewpoints as can be seen from Table 2. Firstly, Rappa (2000) as cited in Fielt (2013) emphasises that the center focus of a business model is money, more precisely focusing on the specific business practices that sustain the company and generate revenue. The core idea of the definition emphasises how different processes are important and contribute to revenue generation.

The second definition by Shafer et al. (2005) focuses on a more comprehensive view, emphasising that the organization's logic as well as choices in regards to value creation are what makes up the business model of the company. More precisely, this definition leaves aside the financial aspect and is rather focused on the strategy, because strategy and logic are what determine the company's processes and success in creating value for the customer. However, the last definition provided by Teece (2010) emphasises that the idea of a business model is centered around value creation for the customer and how it enables revenue generation. The specific viewpoint suggests that providing value for customers and generating revenue go hand in hand. These definitions embody that even if the core idea of a business model can vary, the main focus is still drawn to generating value either for customers or as revenue for the company. Thus within the context of this study we define a business model as the way that the company operates to create value to customers which enables to generate revenue for the company.

Table 2

*Definitions of business model*

Author	Definition
Rappa (2000) as cited in Fiel (2013)	“In the most basic sense, a business model is the method of doing business by which a company can sustain itself - that is, generate revenue. The business model spells-out how a company makes money by specifying where it is positioned in the value chain.”
Shafer et al. (2005)	“We define a business model as a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network.”
Teece (2010)	“In short, a business model defines how the enterprise creates and delivers value to customers, and then converts payments received to profits.”

Source: Compiled by the author based on sources presented in the table.

Numerous different studies have been conducted within the previous few years addressing the capabilities of AI in business models as well as business model innovation. Innovation can be defined as a process which begins with an idea that will result in a new function, with the aim to improve the product or a service of the organization (Tohidi & Jabbari, 2012). Business model innovation on the other hand, was defined by Joubert (2020) as a process through which an organization modifies its existing business model through a fundamental shift in how the company serves value to its customers. Within this thesis innovation is looked at from the perspective of how wider utilisation of artificial intelligence can foster innovation within an organization, by investigating the capabilities of AI.

When examining the previously conducted studies on the topic of AI and business model innovation within the recent years, three notable empirical studies caught the attention of the author. All three of the studies have analysed as well as studied the impact of AI on business model innovation from different aspects as can be seen from Table 3. Unfortunately, none of the three studies addressed the risks and challenges that might arise with the wider adoption of AI in business model innovation. The first study, conducted by Sjödin et al. (2021), investigates how manufacturing firms can develop and scale AI capabilities to drive business model innovation in the context of digital servitization. Meanwhile, Lee et al. (2019), investigates how business model innovation is fuelled by artificial intelligence, with an emphasis on how businesses proactively employ AI to change their business models.

Black, Samson and Ellis (2024) determined the elements that allow already established companies to successfully implement AI-enabled business model innovations.

Table 3

*Overview of Empirical Literature on AI in Business Model Innovation*

Author, year	Aim of the research	Methods used	Findings
Sjödín et al., 2021	To investigate how manufacturing firms can develop and scale AI capabilities to drive business model innovation in the context of digital servitisation.	Qualitative research. 42 open-ended interviews for data collection with employees of 6 Swedish B2B companies.	Three fundamental AI capabilities are identified: data pipeline, algorithm development and AI democratisation.
Lee et al., 2019	To investigate how business model innovation is fuelled by artificial intelligence, with an emphasis on how businesses proactively employ AI to change their business models.	Qualitative research. Case studies of 2 companies including company records, prior work experience, performance evaluations, and operational metrics.	AI enhances organisational effectiveness and solves complex issues traditional methods overlook.
Black, Samson & Ellis, 2024	To determine the elements that allow already established companies to successfully implement AI-enabled business model innovations.	Two approaches of analysis. Qualitative research. Case studies of 10 companies, who have undergone the AI-enabled business model transformation. 30 interviews with employees of the 10 companies. Additionally, the applicability check was conducted.	Three key factors essential for implementing AI-driven business model innovation: internal behaviours, internal capabilities and external conditions.

Source: Compiled by the author based on the sources mentioned in the table.

All three studies used a qualitative approach for conducting their data analysis. Sjödin et al. (2021), studied six globally active Swedish B2B providers involved in digital servitization or with successfully established AI-enhancement procedures and active in the manufacturing, shipping, construction and mining industries to determine the capabilities needed for efficient AI implementation. However, by selecting only Swedish B2B companies for analysis the study can lack generalisability. Sjödin et al. (2021) conducted 42 interviews in total across the 6 chosen companies. Similarly, Black, Samson and Ellis (2024) also interviewed 30 employees from 30 different Australian companies that were established, embraced AI as a technological enabler, indicated significant improvement to their business model, had executive involvement as well as were willing to speak publicly. The authors additionally aimed to include a variety of different organisations.

Based on the interviews, Black, Samson and Ellis (2024) composed a model illustrating how the determined elements align to achieve a successful business model transition. Unique to this study the authors conducted an applicability with executives, advisors and practice-oriented researchers, which was carried out on the formulated model based on the findings of the interviews. With the largest sample size of different companies this study presents the reader with a more thorough understanding of the elements that have an influence on the effective application of AI. In contrast, Lee et al. (2019), conducted its analysis based on case studies of 2 companies, based on their applicability to the development of AI-driven business models. Out of the three, this research serves the smallest sample size, thus it can be said that the scope of findings might be narrowed and not provide the reader with the most authentic information. This specific research differs the most from the above mentioned two researches particularly in terms of data collection. More precisely, as the first two studies were conducted on the basis of interviews, the third study used company records, prior work experience, performance evaluations, and operational metrics as the baseline of the analysis.

As can be seen from Table 3, all of the three studies offer valuable information in regards to the ability of artificial intelligence to change firms as well as emphasise the connection between AI and data. Sjödin et al. (2021) highlighted in their findings the three fundamental capabilities of AI which consisted of: data pipeline capabilities, which involves gathering, combining, and storing data from various different sources; algorithm development, which serves as an ability to apply industry-specific knowledge and gain access to data needed to carry out efficient AI model training; and AI democratisation, which enables AI for all employees, with the aim of encouraging cooperation.

Black, Samson, and Ellis (2024) found that successful AI-enabled business model innovation in established companies depends on internal behaviors, internal capabilities, and external conditions. Similarly to Sjödin et al. (2021), the authors emphasised the importance of understanding the demand and needs of the market which comes down to the need and importance of data. The findings also indicated that for effective AI use within a firm, a collaborative setting amongst the work culture as well as the preparedness of the employees to utilise AI is necessary. By the internal capabilities Black, Samson, and Ellis (2024) denoted the need for tech-sensitive innovation culture which aligns with the findings by Sjödin et al. (2021), where the researchers have identified AI democratisation as one of the three fundamental capabilities of AI, which aims to make the tools of AI accessible for all of the employees of the firm. This initiative aims to foster collaboration within employees as well as help the organisation to further utilise the capabilities of artificial intelligence.

Meanwhile, Lee et al. (2019), emphasised the importance of data as it has been in the above mentioned studies. The importance of large datasets in terms of discovering new valuable insights was mentioned within the findings of the research. The idea emphasizes the practicality of incorporating AI in various different business procedures as it can oppose a positive impact on improving organisational effectiveness and can lead to great innovation. The findings of Lee et al. (2019) highlight that artificial intelligence in comparison to more conventional methods was proved to be effective in resolving complex issues raised by changing market settings and which were previously overlooked.

While the three studies have their own similarities, the differences between the studies cannot be ignored. Sjödin et al. (2021) is more focused on the company's infrastructure necessity in order to effectively utilise AI. Lee et al. (2019) has put a bigger emphasis on demonstrating how AI can impact specific processes within organisations, for example a company modifying their approach to hiring new people to be more efficient due to AI's ability to examine big datasets and to spot trends of success that led directly to targeting the workers of the desired sector. As a third different viewpoint, Black, Samson, and Ellis (2024) have mainly drawn their attention to identifying both internal and external factors that can facilitate adoption of AI in business contexts. Internal behaviours include proactive leadership, AI-sensitive risk tolerance, and a tech-sensitive innovation culture, whereas the internal capabilities include adaptability as well as the company being prepared to support artificial intelligence, a clean understanding of the market and client needs, in addition to sound strategic decision-making procedures.

Due to a broader scope of analysis of identifying both the internal and external factors as well as the biggest sample size in terms of analysed companies, Black, Samson and Ellis (2024) provide the broadest overview of the three analysed studies. In addition to bringing out various different internal and external elements that allow companies to effectively utilise AI, they also have put an emphasis on internal behaviours such as leadership and risk tolerance. The conducted research has accounted for cultural, strategic as well as environmental aspects, which have made the study more comprehensive and broad in comparison to the other two studies.

### **1.2. Opportunities, challenges and risks with utilising AI in business models**

Within this subchapter the author of the research discusses what are the perceived opportunities, challenges and risks that might arise with utilising artificial intelligence within business models and their innovation.

Artificial intelligence has an opportunity to provide companies with formerly unseen concepts that have the possibility to change creativity and productivity within companies business strategies. There is great potential for enterprises to use AI in terms of enhancing business models by exploiting the use of data-driven insights, automation of procedures, as well as developing their decision-making processes to be more agile, responsive and competitive.

Aguzarova et al. (2023) has identified various different prospects of implementing AI in the business model of a company as can be seen from Table 4. As one of the most notable prospects we can identify the potential of AI to change the efficiency of company processes, which means that companies have the opportunity to cut down on labor costs, at the same time boosting the productivity of their processes. More precisely, Terlecki (2025) emphasised that AI enables companies to cut their costs through various different activities such as automation of procedures, forecasting, enhanced manufacturing processes, better decision-making, etc. In addition, AI can serve as a pathway for innovation through providing firms the possibility to adjust or enhance their services or products. For example, by integrating chatbots to mobile apps or to websites that can be of assistance for the customers. These adjustments can also positively impact customer engagement as well as the company's competitive advantage.

Artificial intelligence can additionally be beneficial for a firm in terms of more accurate data analysis. Aguzarova et al. (2023) states that through more accurate and timely data analysis, the firm has the opportunity to make better informed decisions as well as potentially enhance the quality of the outcome of these decisions. For example, companies

operating in retail can utilise AI for analysing real time sales data, such as products which are currently popular or what time of day the traffic of customers is the highest. As an additional prospect of artificial intelligence, Shrinivas & Shetty (2024) have identified AI’s capability to enhance the decision-making process within a company. With utilising AI, firms have the possibility to more productively and efficiently analyze large volumes of data, which in turn enable the company to make better informed decisions in a more time-saving manner. By making more informed decisions, companies have the opportunity to be more aware of trends as well as make better strategic plans and decisions in general. Shrinivas & Shetty (2024) emphasise that in addition to more accurate decisions, the adoption of AI also offers the company the opportunity to be better informed about the condition of the market as well as to be more responsive to changes in external factors.

The ability to make the customer experience more personal is a further opportunity that the adoption of AI offers as determined by Shrinivas & Shetty (2024). More precisely, firms have the opportunity to utilise artificial intelligence in terms of turning the customer experience more personal, increasing customer satisfaction as well as brand loyalty. Eyo (2025) has emphasised that AI enables for more tailor-made customer solutions through AI’s ability to utilise the customer's past history and preferences. Therefore it serves as a possibility to analyse customer feedback, behaviour or patterns and utilise it to alter their goods or services to better meet the demands of the customers. In the company's perspective, increasing customer satisfaction the engagement of customers additionally increases as well as it helps to create competitive advantage for the company.

Table 4

*Potential opportunities and risks associated with AI implementation into business models*

Opportunities	Risks
<ul style="list-style-type: none"> <li>● Time-efficiency</li> <li>● Cost-efficiency</li> <li>● Higher productivity</li> <li>● Enhanced customer engagement</li> <li>● More personalised customer experience</li> <li>● Enhanced competitive advantage</li> <li>● Accurate data analysis</li> <li>● More informed decision-making</li> <li>● Better adaptability to market changes</li> </ul>	<ul style="list-style-type: none"> <li>● Issue of black-box</li> <li>● Lack of transparency</li> <li>● Ethical risks</li> <li>● Skill-gap amongst employees</li> <li>● Quality of data</li> <li>● Privacy and security</li> <li>● Lack of understanding of AI</li> <li>● Employee hesitancy</li> </ul>

Source: Compiled by the author based on Aguzarova et al. (2023); Terlecki (2025); Shrinivas & Shetty (2024); Eyo (2025); Reim et al. (2020); Mahbub & Ayman (2024).

In addition to offering firms a variety of opportunities, as can be seen from Table 4, AI's application in everyday operations of a firm can oppose different challenges and risks which need to be thoroughly considered by the organization before a wider utilisation of AI. Reim et al. (2020) has identified four primary complications that can arise with implementing AI. As the first challenge, lack of transparency was emphasised. More precisely the issue of "black-box", which in relation to AI, can be defined as the problem of not being able to either fully understand or access the internal operations of an AI model, meaning that the user can only observe the given inputs and produced outputs, without understanding how these outputs were reached (Glover, 2024). AI itself consists of several different technologies such as deep learning, machine learning, etc., which entail different levels of complexity, due to which it can be stated that procedures as well as judgements of AI can be complicated to either understand or to track. From a company's perspective, the black-box issue can raise potential risks in terms of the company utilising inaccurate data which comes from not knowing the background of AI operations. Mahbub & Ayman (2024) have similarly identified one of the primary risks following utilisation of AI as the ethical risk. That means ethical concerns regarding bias, fairness, transparency or accountability in terms of AI systems might arise. This specific risk is strongly related to the black-box issue because the complex nature of AI makes it extremely difficult to present to the user of how judgements are made by AI.

As a second challenge, Reim et al. (2020) identified an issue that might arise within the employees of the firm. More precisely, the lack of trust towards AI from the perspective of the employees. This challenge can be intertwined with the issue of black-box. That is to say, that employees might feel hesitant towards utilisation of AI due to not understanding the full picture of how AI operates. From the perspective of employees, Mahbub & Ayman (2024) additionally emphasise the risk of skills gap amongst employees. In order to successfully utilise the capabilities of AI, companies should put significant effort into reskilling and upskilling their workforce. Without reshaping the employees, the company might not be able to utilise AI to its full potential.

The third challenge can be defined as the need to digitize the analogous processes within the company. More precisely, since AI largely depends on large amounts of digital data, then in order for the AI model to operate efficiently and to avoid the "garbage in, garbage out" problem, companies must obtain data necessary to train and run the model. The garbage in, garbage out problem refers to the importance of using high-quality data. More precisely, Zdrok (2024) has defined the garbage in, garbage out as the quality of the input data influencing the accuracy of the output, thus usage of inaccurate, incomplete, outdated

data, etc., can significantly influence the accuracy of the output. Thus, in order to avoid the problem, the company has to digitalise their analogue processes related to data collection to ensure collection and usage of high-quality data.

Mahbub & Ayman (2024) have additionally identified an alternative risk that might come across with data, in consideration to privacy and security. Since AI functions based on large datasets, various different risks can be associated with the process of gathering, storing, processing, and usage of large datasets. Within the process of gathering data, challenges related to data accuracy, biases or incompleteness might arise. In terms of storing the data the most common risks include breaches of privacy and non-compliance to data protection regulations. Data corruption, computational faults, and scalability serve as the most common challenges related to processing of data. Lastly, risks such as misuse of insights and ethical concerns about privacy can be accounted as risks associated with using data. In addition, companies also must stay agile to changes in laws considering data - how it can be collected, stored, used, etc., to minimise potential risks.

As the last obstacle, the lack of understanding of AI was recognised by Reim et al. (2020). Since artificial intelligence is complex by its nature, complications of employees not mutually understanding the functions of AI might result in disturbance of cooperation within teams. This challenge could lead to miscommunication in teams regards to how to properly utilise AI, but also in regards to who in the team is responsible for what. Lack of understanding of artificial intelligence can turn employees more hesitant towards utilising AI in their everyday operations, making it more complex to foster a wider adoption of artificial intelligence within a company.

### **1.3. Scenario analysis and its links to business model innovation and AI**

Within this subchapter the author of the research discusses the concept of scenario analysis as well as what the scenario analysis process looks like. In addition, links between scenario planning and business model innovation as well as AI are determined. The method of scenario analysis will be applied in the empirical part of the thesis to analyze the findings from the conducted interviews and explore potential future impacts of AI on business models.

The business environment is changing rapidly and sometimes unexpectedly, due to which the concept of scenario planning has become especially essential for companies to manage the complexity of changing environments, but also for estimating possible challenges that might arise in the future. Cordova-Pozo & Rouwette (2023) emphasise that scenario analysis serves as a valuable tool that allows to address uncertainties that may arise within decision-making processes. The process of scenario analysis can be identified as the process

of making informed assumptions in regards to the future path of the company, more precisely the concept can be useful for companies to plan and adjust to different possible outcomes in the future (Mariton, 2016).

Scenario planning aims to explore different possible outcomes, rather than be focused on one specific scenario. The goal of the concept is not to predict the future, rather it is to forecast different possible future outcomes. Therefore, it is a strategic approach to considering different opportunities and risks that might arise with certain decisions or changes in uncertainties such as wars, crises, emerging technologies, etc. The process of scenario planning involves interrelated components, each of them being crucial for developing strategies. The process primarily consists of two phases, first of them being the creation of scenarios and the second being the incorporation of these scenarios into the decision-making processes. Both of these phases itself contain various different steps needed for achieving successful scenario planning. The process of creating the possible scenarios begins from the establishment of the core issue as well as the factors that could possibly influence this issue. When the core issue and factors are determined, story plots, which examine the ways how these determined factors interact. must be additionally established. Once the scenarios have been developed, the ramifications of these scenarios are studied based on qualitative or quantitative data. After identifying the possible complications, the second phase of scenario planning begins, where decision makers study the complications as well as determine the indicators used to track developments throughout the project for which the scenario planning is carried out for. Once the scenarios are finalised by decision makers, they are openly communicated to stakeholders in addition to embedding these scenarios into daily decision-making and organizational procedures. (Krueger et al., 2001; Cordova-Pozo and Rouwette, 2021)

It can be stated that the process of scenario analysis is intertwined with the process of business model innovation and various links can be detected amongst the two processes. The process of scenario planning directly links to business model innovation in a sense that through examining different possible future scenarios, it provides companies the possibility to detect weaknesses and opportunities for improvements. Thus, it serves as a possibility for the organization to analyse their business model, but also to innovate it to be more resilient for possible future difficulties. De La Parra (2021) has mentioned that scenario analysis is important from a company's business model perspective because planning for different future outcomes enables the firm to identify its vulnerabilities, rethink their processes and reduce risks. In addition, scenario analysis directly links to business model innovation by allowing

the firm to test and evaluate their innovations under different possible future circumstances to offer the company the opportunity to make calculated decisions with the knowledge of the various possibilities for the course of innovation in the future.

A link between business model innovation and scenario planning can be additionally detected in terms of scenario analysis offering a possibility for the company to analyze how changes in external factors to the company can affect the company's operations. A study conducted at the University of Zagreb by Tomičić-Pupek et al. (2023) emphasises that companies must take into consideration their capabilities for innovation and adaptation as a response for changes in external factors. For that necessity, scenario planning serves as a possibility for companies to analyze how changes in different external factors might influence their business dynamics, which on the other hand provides valuable insights for the company. For example, scenario planning can serve as an opportunity for a retail company to investigate how AI-powered customer support technologies can change consumer interaction and value creation for the firm.

Analyzing the development of AI through scenario analysis is particularly valuable talking about how the future of AI can affect companies. As it was highlighted in the above mentioned study conducted by Tomičić-Pupek et al. (2023), scenario analysis is a practical tool for analysing how changes in external factors influence the course of business. In that sense, enhancements in AI can be accounted as external factors that can influence how businesses operate. Thus, with scenario planning, companies can assess how their business models as well as the process of business model innovations can be affected by future advancement in AI. Planning for different future outcomes enables the firm to successfully exploit the capabilities of AI but also helps to prepare the company for larger-scale AI adoption. Analysing different outcomes enables the company to detect opportunities and risks, but also allows them to successfully use these opportunities as well as minimize the risks. Being aware of the potential future scenarios associated with AI, companies can make informed decisions about how and to what extent they want to utilise artificial intelligence.

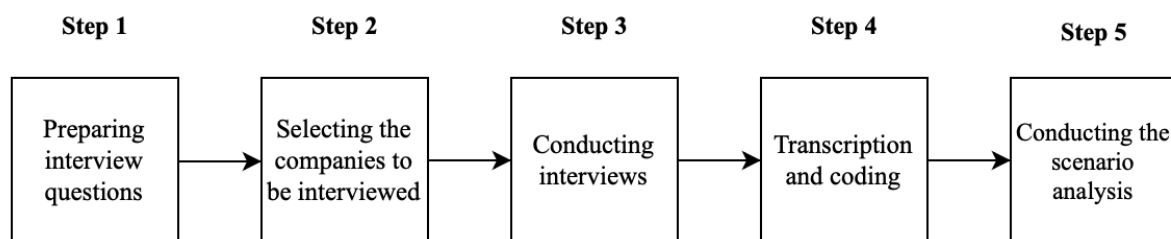
As one of the biggest fears and reservations considered in terms of wider utilisation of AI is the fear that AI will take over human jobs. The concern of job displacement has become more relevant due to advancements in AI processes such as AI being able to successfully execute repetitive tasks such as chatbots replacing human customer-support agents by answering frequently asked questions. According to a study conducted by Atkinson et al. (2024), by companies utilising AI in their everyday work processes, there is great potential amongst the private sector of the United Kingdom to save over quarter of the time spent

today by workers, which itself is equal to the annual labour hours of six million workers. This raises a question amongst companies how labour markets are adapting to these changes in the reflection of wider AI utilisation. Apart from cutting jobs, the study emphasises that the introduction of AI also creates new job opportunities which are seeking for newer skills in the labor market. Large-scale adoption of artificial intelligence creates a demand for more AI-competent people to manage AI-related processes. Thus, scenario analysis can be considered as a practical tool for companies to assess how wider utilisation of AI influences job displacement, as well as helps companies to determine new skills for which they might be in demand for. Through planning for different outcomes, the company gets a better overview of potential job changes as well as skills that may be necessary for the company in terms of different scenarios in the future.

## 2. Scenario analysis of artificial intelligence in innovating business models

### 2.1. Data and methodology of the empirical study

The second part of the study consists of the empirical aspect of the thesis. Within the empirical part, the author will focus on the scenario analysis of artificial intelligence in innovating business models. The following subchapter discusses the steps that make up the empirical aspect of the thesis as well as discusses why scenario analysis was chosen as the appropriate method. The process of conducting the scenario analysis and what data is generated as a result of the analysis is additionally described.



*Figure 1.* Sequential steps in conducting the empirical study

Source: Compiled by the author

The author of the thesis has chosen to use a qualitative approach for researching the topic of the thesis. Oranga and Matere (2023) have emphasised that qualitative approach creates an opportunity for more open-ended responses since this method aims to capture a wider angle and gives the respondent the opportunity to express their opinion in comparison

to closed questions, where the answer options are limited. The authors have additionally mentioned that the qualitative approach also offers an opportunity for a deeper discussion, which itself results in broader analysis results. The empirical part of the thesis is broadly divided into five steps as can be seen from Figure 1. The first part of the empirical part of the thesis consists of preparing the interview questions for carrying out the analysis. Similarly to previously conducted studies on the topic of AI in business model innovation conducted by Black, Samson and Ellis (2024) as well as Sjödin et al. (2021), the author has chosen to conduct open-ended interviews for data collection, in order to map companies' most authentic vision of AI's capabilities in business models. The interview questions aim to explore how companies utilise AI in their everyday operations as of now as well as investigate how firms perceive artificial intelligence's role in innovating business models in the future. More specifically, what might be the opportunities and difficulties that can surface with wider AI utilisation. Based on the insights of the interviews, scenario analysis method then will be used to detect and build possible future scenarios of AI in business models, relying on the opinions of the interviewees.

The prepared interview questions that can be found in Appendix A were divided into three main categories: current AI utilisation in the organization, AI and business model, and future prospects. The first question of the first category aims to assess the company's current AI integration and relies on the discussions of Enholm et al. (2022) of AI's potential to improve a firm's efficiency and automate difficult or time-consuming operations. The second question seeks for examples of efficient practices, focusing on the study of Lee et al. (2019), who emphasised AI's practical influence on different business processes, such as the hiring process within a company. The third question on the other hand seeks for the encountered difficulties and relies on the 4 primary AI associated risks identified by Reim et al. (2020). The last question of the first category aims to understand the extent of AI integration into decision-making processes, reliant on the study of Aguzarova et al. (2023), who emphasised AI's ability to make decision-making processes more effective. The answers to the first set of questions provide the author of the thesis the foundation for carrying out the scenario analysis, since it enables a better understanding of current AI practises, opportunities and difficulties faced within the companies.

The second set of interview questions aim to gain an overview of how the companies utilise AI specifically within their business model - what opportunities and difficulties has it created. The first question aims to understand how AI has influenced the business model in the company, relying on the further discussions of Aguzarova et al. (2023), viewing AI as a

transformative force. The second question, reliant on the discussions of Shrinivas & Shetty (2024) of AI creating new opportunities, aims to identify what new opportunities for income generation or consumer value delivery has AI presented. The third question seeks to get a comprehensive understanding of the difficulties the companies have faced while integrating AI into their business models, relying on the identified issues such as the black-box issue or employee resistance by Reim et al. (2020) and lack of transparency and possible trust issues determined by Glover (2024). The answers to the second set of questions enable the author of the thesis to better understand the extent of AI integration into business models, by understanding the created opportunities and faced difficulties.

The third set of questions aim to investigate what are the future prospects of integrating AI into business models. The last three questions aim to gain a better understanding of what future do the companies associate with wider AI adoption, what opportunities and risks do they perceive. These questions will most prominently guide the development of the 4 possible future scenarios within the scenario analysis. Therefore, the last questions are reliant on the work of Mariton (2016), who emphasised that the concepts of scenario analysis help the companies to analyse different future outcomes. The answers to these specific questions will be directly used in terms of the process of scenario analysis. More precisely, the responses will be utilised in determining important patterns and expectations for the company's use of AI. The answers allow the author to determine the key variables for the analysis.

These interview questions were set by the author of the thesis with the aim that the answers for the questions guide the scenario analysis procedure. Examining the current role of AI in business operations, decision-making and business models allows the author of the thesis to gain a better understanding to what extent the companies have integrated AI as of today and what are the current opportunities and faced challenges. The third part of the interview, regarding the future prospects, is the most useful in the later process of determining the scenarios. The questions guide companies to think about what they would like to do with AI in the future and what the biggest benefits and challenges could be based on their plans. The interview answers help the author of the paper to establish the key drivers and therefore establish potential futures of wider AI utilisation in companies and their business models.

The second step of the empirical analysis included the selection process of companies with whom to conduct the interviews with. In the process of selecting the desired companies, the author of the thesis relied on the following aspects:

- The company is based in Estonia,
- The company functions in the finance, technology or manufacturing industry,
- The company is medium to large-sized.

The author of the thesis chose to interview companies based in Estonia due to the country's well-known advancements in regards to the digital economy as well as the nation's creative attitude towards technology. These specific industries were chosen based on Statistics Estonia (2023), where the chosen industries ranked as one of the highest industries to utilise AI in their business operations, the finance and insurance sector has yielded the largest proportion of businesses in Estonia utilising AI technologies, with 28.2% of enterprises in this sector actively using AI. The ICT sector, also known as the information technology industry with 18.3%. The manufacturing companies with the highest AI usage volume of 11.9% of the firms in the industry are focused on manufacturing computers and electronics. Thus it can be stated that these industries demonstrate a keen interest in and active participation in using AI and therefore serve as good industries as a focus group to interview. The author decided to interview companies amongst different industries in order to determine whether different companies utilise AI and perceive AI's role in business model innovation similarly as well as to highlight what are the key differences between industries.

The focus of the interviews were medium to large sized enterprises, since more established enterprises possess a deeper understanding of industry-specific challenges and opportunities, providing a clearer picture of AI's potential within these sectors. According to OECD (n.d.) data, enterprises with 50 to 249 employees make up medium-sized enterprises and companies with 250 and more employees make up large enterprises. Thus when choosing the companies to be interviewed, the number of employees as of the fourth quarter of 2024 will be taken into account according to the data accessible from Teatmik.ee. Within the selection process of companies to interview, Estonian companies who met the above mentioned criteria and who can be considered as industry leaders were chosen. The selection of interviewed companies can be seen from Table 5.

Table 5

*Overview of the interviewed companies*

Name of the company	Industry	Number of employees	Description
AS LHV Pank	Finance	882	Established 26 years ago, functions as a part of the LHV Group. Belongs amongst the three biggest banks in Estonia.
Cybernetica AS	Technology	224	Established 28 years ago, contributes significantly to Estonia's e-governance. Offers services within 35 countries. Successful in cybersecurity and digital identity.
The Centre of Registers and Information Systems	Technology	277	Established 31 years ago, IT development center for Estonia's Ministry of Justice. Develops and manages key national IT systems. Focuses on intelligent and user-centered digital solutions.
OÜ Nordwood	Manufacturing	154	Established 23 years ago, it encompasses three sawmills. Produces cut wood from spruce and Nordic pine. Operates internationally in lumber production.
Osäühing Data Print	Manufacturing	69	Established 27 years ago, label manufacturer, part of Asteria Labels and Packaging Group. Recognized for innovation and continuous improvement.
Company A	Manufacturing	X	Large, over a century-old company based in the USA. Operates globally across various sectors.
Postimees Group	Information and communication	487	Established 168 years ago, part of a large Estonian holding company MM Group. Leading media group in the Baltic states with 30 different brands in their portfolio.

Source: Compiled by the author based on data available at Teatmik.ee; AS LHV Group, 2023; Eesti Pangaliit, n.d.; Cybernetica, n.d.; Centre of Registers and Information Systems, n.d.; Nordwood, n.d.; Postimees Grupp, n.d.

The author of the thesis chose a variety of different companies to be interviewed. Within the finance sector AS LHV Pank was interviewed. LHV bank was initially founded as an investment union, however throughout the first 10 years of operation the variety of services started to expand (AS LHV Group, 2023). As of today LHV Pank belongs amongst the top three biggest banks in Estonia based on their level of market share (Eesti Pangaliit, n.d.). The author of the thesis believes that LHV Pank offers the research valuable insights in terms of AI utilisation since the bank is well known for its innovativeness and high level of utilisation of digital services such as digital banking for its customers. From the technology sector the author decided to interview two companies - Cybernetica AS and The Centre of Registers and Information Systems, also known as RIK. Cybernetica AS provides substantial contributions to Estonia's e-governance infrastructure through cybersecurity, digital identification, various different privacy technologies, etc (Cybernetica, n.d.). Similarly, RIK functions as the IT development center of the Ministry of Justice of Estonia and therefore are responsible for developing as well as managing different IT systems vital for both the state and the citizens of Estonia (Centre of Registers and Information Systems, n.d.). Therefore, interviews with Cybernetica and RIK offer valuable insight of how AI can be applied within cybersecurity and e-governance as well as in national public services.

Within the manufacturing sector the author interviewed three companies: OÜ Nordwood, Data Print OÜ and Company A, who wished to stay anonymous. OÜ Nordwood is an Estonian joint brand which itself includes three well known Estonian sawmills who produce lumber: AS Viiratsi sawmill, AS Viru-Nigula sawmill and AS Aegviidu Puit (Nordwood, n.d.). Data Print OÜ is an innovative company that produces high-quality labels and belongs to the Asteria Labels and Packaging group since 2021 (Data Print, n.d.). The author of the thesis had an additional opportunity to interview a larger international manufacturing company in addition to the two Estonian manufacturing companies initially selected, which enables for an even deeper understanding of how companies utilise AI today and what is the perceived future. Since the company wished to remain anonymous within the scope of the thesis, the company is denoted in the work under the name Company A. The result of the interview creates a good opportunity to compare, so to speak, smaller and more local companies with a large international company as well as gives a good overview of whether Estonian companies are ahead or behind in the use of artificial intelligence in business operations and models.

The author of the thesis had an additional opportunity to interview, in addition to companies in the initially selected industries, also a media group that is a part of one of the

largest Estonian groups. MM Group is an Estonian based holding company, whose portfolio consists of 132 companies, which operate amongst different sectors. Some of the best known companies that belong to MM Group are Apollo cinema, Postimees news, Myhits radio channel, etc. (MM Grupp, n.d)

Within the thesis, a focus was drawn on how AI is utilised within the Postimees group, which is part of the MM Group. The focus on the Postimees Group came from the fact that today, of all the groups and companies in the MM group, Postimees uses artificial intelligence the most. Postimees Group offers various different services such as online media, television, radio, advertising, etc. (Postimees Grupp, n.d.)

The author of the thesis believes that Postimees Group's input on the use of artificial intelligence is valuable information for this thesis, because the group functions broadly on the internet. The interview provides valuable input into the thesis on how artificial intelligence plays a role in today's media, news portals, radios, etc.

Table 6

*The list of interviewed companies*

Name of the company	Industry	Interview date	Duration	Number of transcription pages
AS LHV Pank	Finance	10.03.2025	28 minutes	7 pages
Cybernetica AS	Technology	12.03.2025	27 minutes	7 pages
The Centre of Registers and Information Systems	Technology	14.03.2025	29 minutes	9 pages
OÜ Nordwood	Manufacturing	07.03.2025	31 minutes	10 pages
Osaühing Data Print	Manufacturing	14.03.2025	17 minutes	4 pages
Company A	Manufacturing	20.03.2025	20 minutes	6 pages
Postimees Group	Information and communication	24.03.2025	34 minutes	9 pages

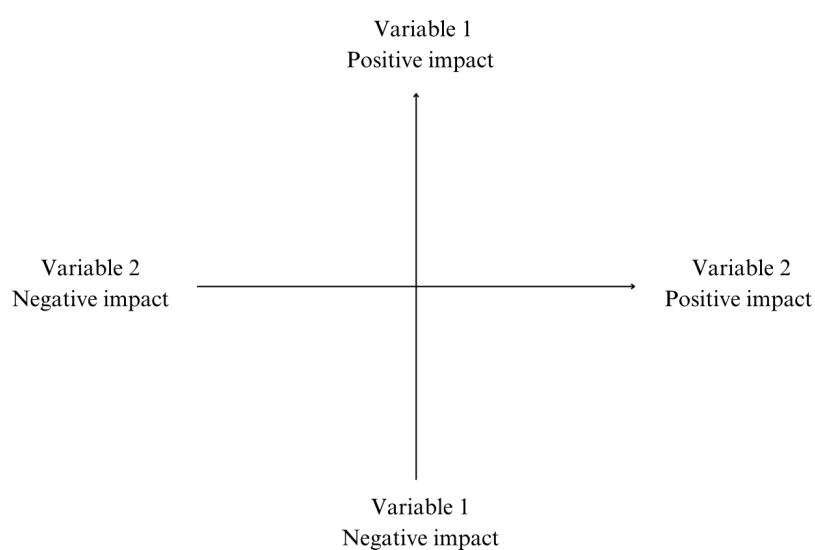
Source: Compiled by the author based on the compiled interviews.

Once the sample of interviewees was chosen, the author proceeded to move on to the third step of the empirical part, which entailed carrying out the interviews. Interviews with companies were conducted online via a video call using the Microsoft Teams platform. As can be seen from Table 6, the interviews took place throughout the month of March 2025. The interview durations varied in length from 17 minutes to 34 minutes, resulting in a total of 186 minutes. Since the interviews were recorded, then as the fourth step of the empirical analysis the interviews were transcribed. The author of the thesis personally transcribed the interviews by relistening to the recordings. The transcriptions of interviews additionally varied in length from 4 pages to 10 pages, resulting in a total of 52 pages. The interview transcriptions were then utilised for the fourth step of the empirical analysis, more precisely in terms of the process of coding. The coding process was carried out by the author manually, by creating interview specific coding tables. Within the coding tables as the appropriate themes the author chose: current AI utilisation in the organization, AI and business model, and future prospects. For each of the chosen teams different categories were defined. Within the first theme three categories were defined: AI uses in the company, perceived opportunities, and difficulties encountered. Within the second theme two categories were defined: opportunities in business model and difficulties in business model. Within the last theme two categories were also defined: opportunities and difficulties / risks. Coding the interviews enabled the author to analyze the findings more effectively, discovering patterns amongst the respondents. The coding table summarising the findings of the interviews, can be seen from Appendix B.

The fifth step within the empirical analysis consisted of analysing the findings of the interviews through carrying out the scenario analysis. The author of the thesis decided to utilise the concept of scenario analysis due to the concepts suitability to analyse different possible outcomes. Ho et al. (2021) has stated that the concept of scenario planning is ideal for analysing environments which are characterised by constant and ongoing change, which itself can be accompanied by uncertainty. Since AI as a technology is rapidly and constantly developing and it also comes with its share of uncertainty, the author of the research found it to be practical to use scenario analysis to study the development of AI and its impact on business model innovation. Jariwala (2024) additionally states that scenario planning is a practical tool for mitigating the uncertainties that arise with utilisation of AI, since by investigating different scenarios, firms are able to discover potential risks that might surface with AI. Thus, it allows companies to take proactive steps in mitigating risks and uncertainties. The author also puts an emphasis on scenario analysis practicality due to the

concept's suitability to explore the ever-changing environments that AI has with its constant change and further development.

To analyze the interview findings and to develop the potential future outcome, the author decided to use the two-axis diagram for conducting the analysis, which is one of the most commonly used methods in scenario planning introduced by Van der Heijden et al. (2002), as cited in Ashyrov et al. (2019). The two-axis diagram represents two variables which both represent uncertainties and are significant to the research aim. As can be seen from Figure 2, these two variables create four distinctive quadrants which each represent a different scenario or a possible outcome.

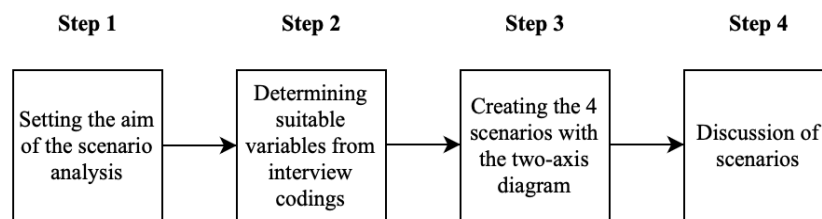


*Figure 2.* Visual representation of the two-axis diagram created through scenario analysis.

Source: Compiled by the author based on the framework of Van der Heijden et al. (2002), as cited in Ashyrov et al. (2019).

The author of the research decided to conduct their scenario analysis taking into account the above mentioned guidance by Krueger et al. (2001), but also similarly as was done by Ashyrov et al. (2019), which first focused on determining the aim of the scenario analysis, then determined the variables and then creating the scenarios. In order to identify suitable variables and come up with the four different scenarios, the findings of the interviews conducted with companies were utilised. The results of the interviews conducted are used to conduct the scenario analysis through the created coding tables. More precisely, the author of the thesis will thoroughly analyse the created coding tables to identify patterns within the viewpoints of different companies in regards to future prospects of AI utilisation

within business models. These identified patterns help to distinguish the most prominent variables which are used to create the axis shown in Figure 2. The axis itself creates four different scenarios, where the selected variables sometimes have a positive and sometimes a negative impact on the business model. The built scenarios are discussed in terms of their possible impact for the firm as well as the opportunities and risks that may arise, etc. The process of scenario analysis is illustrated on Figure 3.



*Figure 3.* Steps in scenario analysis.

Source: Compiled by the author

The scenario analysis is utilised as a tool to analyse and interpret the interview findings. The analysis allows the author to better understand the uncertainties that come across with wider utilisation of AI in the business model context. Through this method, the author of the thesis will be able to meet the set research aim of bringing out the future prospects of artificial intelligence in business model innovation, focusing on opportunities and potential risks associated with these developments.

## **2.2. Interview results and discussion**

The conducted interviews with companies active in different industries yielded diverse results as can be seen from Table 7. The interview results indicated that there are similarities between the current practices, concerns, and future plans related to AI in business models amongst companies active in different sectors. At the same time, there were also differences and a clear picture of which of the companies interviewed use artificial intelligence the most and in which the use of artificial intelligence is the most regulated.

Table 7

*Interview findings - similarities and differences across the industries, opportunities and risks of future perspectives.*

Theme	Similarities across industries	Differences across industries
AI current practises	Used for time-saving tasks, data analysis, reporting, and internal process automation.	<b>Finance:</b> automation and compliance tools. <b>Technology:</b> cybersecurity, chatbots, market analysis. <b>Manufacturing:</b> machine vision, letters, BI tools. <b>Media group:</b> transcription, SEO, writing assistant.
Opportunities of today's practises	Enhanced time efficiency and workload reduction.	<b>Technology:</b> simplifies work. <b>Manufacturing:</b> enhanced security and data analysis. <b>Media group:</b> automation of tasks and personalised customer experience.
Difficulties encountered	AI inaccuracy, not understanding how data is used, GDPR, lack of AI specialist and learning to use the tools.	<b>Finance:</b> regulations. <b>Technology:</b> intellectual property risk, cybersecurity. <b>Media group:</b> limitations with the Estonian language.
Integration into business model	Additional value to customers, decision making and data analysis.	<b>Finance:</b> enhanced quality of services. <b>Manufacturing:</b> production processes, faster delivery times.
Future perspective of opportunities	Workforce reduction, improved user experience and enhanced decision making.	<b>Finance and Manufacturing:</b> cautious, operations-focused. <b>Technology and Media group:</b> innovation-driven, focused on personalisation and content enhancement.
Future perspective of risks	Data leakage, cyber risks and high dependency on AI.	<b>Technology:</b> protecting intellectual property. <b>Manufacturing:</b> lack of knowledge of how AI is used. <b>Media Group:</b> GDPR.

Source: Compiled by the author based on the compiled interviews

In order to understand the overall results of the interviews, the author compared the coding tables and determined the similarities and differences between the responses. The current practices of AI within the interviewed companies indicated similarities as well as industry-specific use cases. One of the most prominent similarities is that as of today, companies utilise AI tools in their daily operations to fulfill time-consuming tasks, which enables the companies to use their time more efficiently and towards more important tasks. For example, according to the interviewee from Cybernetica, their software developers utilise AI tools for code writing, enabling them to create code snippets, which then reduces the developer's need to write routine lines of code and hence makes the code writing more time-efficient. As another example, the representative of the Postimees Group emphasised that their reporters utilise AI for transcriptions, translating texts, choosing suitable headlines, etc, which then frees up the time of the reporter to carry out the more important aspects of their work as can be seen from Appendix B. The companies interviewed today also widely use artificial intelligence for carrying out data analysis and writing different reports, which additionally enables companies to use their time more effectively.

Based on the results of the interviews it can be stated that as of today amongst the interviewed companies technology firms Cybernetica and The Centre of Registers and Information Systems utilise AI the most in their daily operations as can be seen from Appendix C. Both of the mentioned companies utilise AI in their daily operations through code writing as well as for carrying out different market analyses and automating different internal procedures. As of today, Cybernetica has been able to incorporate artificial intelligence into their services, which enables them to offer additional value to their customers and which is something that The Centre of Registers and Information Systems also aims towards. For example, Cybernetica utilises AI within their marine surveillance area. More precisely, AI has enabled them to better analyse movements of ships as well as with detecting anomalies and activities such as piracy. Meanwhile, The Centre of Registers and Information Systems utilises AI to make their public sector services more personalised. For example, they aim to develop a chatbot which allows citizens to understand laws in a simplified manner and in a context that is relevant to them. Thus, it can be stated that both companies have now widely implemented artificial intelligence in their business operations and are aiming to create additional value for their customers through it.

The results of the interviews reflected that LHV Pank might be the most regulated in how and to what extent they can utilise AI in their operations. The financial sector is largely limited in its inclusion of artificial intelligence due to regulations. One of the examples of

such regulations is the EU AI act, which regulates how financial institutions can use artificial intelligence. Nevertheless, as can be seen from Appendix D, LHV has similarly to the technology companies found use of AI within different operations, such as code writing as well as for automating different internal processes and use of internal sources.

The interviewed companies have also encountered various difficulties while implementing AI into their operations. As the primary difficulties, the companies identified the inaccuracy of AI in addition to not understanding how the inputted data is used by AI. Companies emphasised that people utilising the tool of AI must maintain the aspect of critical thinking, since artificial intelligence can produce false or fabricated information. The representative of Postimees Group emphasised that even in the work processes that involve the contribution of artificial intelligence, there must be a human hand additionally involved, because AI can produce false information and it does not understand that it is false. There is also no such situation where AI does not know the answer to the question, rather if necessary it fabricates it. Thus, critical thinking must be preserved and people must not descend into an excessive comfort zone with the use of AI. On the other hand, companies additionally highlighted that one of the main difficulties is that they do not fully understand how artificial intelligence uses the data inputted to them, how this data is stored, for how long, and who else can access it. The specific difficulty strongly relates to the data and privacy risk identified by Mahbub & Ayman (2024), mentioned in the theoretical part of the thesis. Thus, the companies have had to strongly consider how the use of AI correlates with GDPR data restrictions.

Based on the interview results, it can be stated that as of today, most of the companies interviewed have incorporated artificial intelligence into their business models, but to a rather small extent. Today, the role of artificial intelligence in the business model is most related to creating added value for customers through various solutions, as mentioned above. In addition, AI has also been impactful in business models by enabling employees to make better-informed decisions, by assisting in the preparation of various reports, market analyses, and more. Hence, it can be said that AI today supports the decision-making processes within a firm, however companies do not rely entirely on AI while making decisions. In the case of manufacturing companies as highlighted in Appendix E, AI has also found use in the manufacturing processes. For example, Nordwood utilises AI in the form of machine vision, which enables them to assess the quality of their product more efficiently. Previously, this procedure was carried out by employees, however as of today the company has been able to build this function upon AI by training the machine by showing different samples and

indicating which defects are acceptable and which are not for a given product. Therefore, the machine is able to make informed decisions about the quality of the product. Company A, also active in the manufacturing sector additionally emphasised that AI within their business model is beginning to speed up their manufacturing processes as well as enabling the company to cut down on their costs. However, it was emphasised that it is important to consider how AI can be utilised for speeding up processes and cutting down on costs, but without damaging and sacrificing the end product and its quality. Consequently, it can also be stated that both the Estonian manufacturing companies and the larger international company utilise artificial intelligence to a similar extent as of today.

Considering the future perspective, companies tend to associate the increasing impact of AI in the future from the perspective of the company's business model. As the primary effects of AI to business models workforce reduction was emphasised. Companies predict that implementing AI more widely into various activities and processes will lead to a reduction in the workforce in the future. More precisely, it will reduce specific jobs that AI will replace, but at the same time new roles will emerge, since there is a demand for employees who work hand in hand with AI, creating opportunities for people to also develop their careers. The representative of Postimees Group emphasised that the disappearance of certain existing job roles creates new opportunities for people to learn and undertake new career roles in their lives going forward. On the other hand, companies also emphasised that integrating artificial intelligence into business models also provides companies with the opportunity to make the experience of users of their company's services better and more personalized, creating added value for the customers. This is something that companies are already implementing step by step today and will see an increasing impact in the future. The representative of LHV Pank emphasised that their future plans and opportunities regarding AI implementation into business models are, in the big picture, linked to the user experience, how to make it better, more efficient, and more convenient.

In addition to workforce reduction and improved user experience, companies additionally identified more enhanced decision-making as one of the opportunities by further implementing AI in their business models. Artificial intelligence may assist companies by conducting various reports, market analyses, and potentially by analyzing the company's own customer base. The representatives of Nordwood emphasised that AI's capabilities through data analyses may allow them to build predictive models, which therefore could allow them to understand different patterns, such as customer behaviour, their profiles and demands. Better understanding can lead to better and more informed decisions, which itself can be

more profitable for the company. The company also emphasised that these predictive models can additionally be utilised for predicting the maintenance needs for the machines used in the manufacturing process. This would additionally allow companies to be better prepared to carry out maintenance of equipment and may help the company to reduce costs.

In addition to the various opportunities that the wider utilisation of artificial intelligence in business models may bring to companies, the potential risks that may accompany it must also be strongly considered and kept in mind. One of the most prominent risks that the companies associated with wider AI utilisation relates to possibility of data leakages as well as an increase of cyber crime. The fear of data leaks also falls down to the above mentioned fact that companies today lack a complete understanding of how artificial intelligence uses and stores the data they input into it, and who else may have access to it. Therefore, if employees use artificial intelligence by inputting sensitive data, it might become available for others to see. The representative of The Centre of Registers and Information Systems emphasised that it is convenient and easy for people to utilise AI, by implementing all sorts of data into it, because AI enables us to carry out tasks more time-efficiently. Therefore, it is important to set rules that guide how employees can utilise AI and what information can be inputted, in order to establish information security and avoid data leakage. This consideration is also highly important from the perspective of personal data in order to avoid possible GDPR also known as general data protection regulation incidents.

As an additional risk associated with AI is the growing proportion of cybercrimes. Artificial intelligence is an effective tool for frauds. Various artificial intelligence solutions allow fraudsters to carry out cybercrimes more effectively and convincingly. The representative of Postimees Group emphasised that in order to minimise the proportion of cybercrime incidents, employees must be educated in terms of artificial intelligence. More precisely, employees must be aware of the so to say good things that AI has the capabilities to do, but they also need to be aware of the risks. Better awareness of AI among employees and the ability to use it correctly will help companies to limit the occurrence of cybercrime. Similar point of view was given by Nordwood, who emphasised that employees who do not know how to use artificial intelligence effectively and use it with sensitive data can cause cybercrime to the company. Therefore awareness of AI and knowledge of how to utilise this tool is very important.

The last prominent risk, which was identified amongst the interviewed companies is that people may become overly dependent on AI and therefore will lose their ability to think critically. The critical thinking aspect also comes down to the above mentioned fact that

artificial intelligence can produce fabricated information. Therefore, if employees blindly trust the work done by artificial intelligence, it can lead to processes becoming less efficient and even to larger and more significant errors. Thus, companies today still see the importance of human intervention in AI-driven processes to some extent.

In conclusion the interview results indicated that as of today, the interviewed companies utilise the tool of AI mainly to make their operations more time-efficient. From the interview results it can be stated that the two interviewed technology companies as of today have found the most use of AI within their operations and have been able to start utilising the tool for creating added value for their customers. The primary challenges that companies have faced are related to the inaccuracy of AI as well as lack of transparency. From the future perspectives, companies believe that wider implementation of AI into business models will lead to significant changes in the business model from the perspective of workforce restructuring and by being able to provide extra value for their customers through personalisation. These specific insights will guide the next step of the empirical analysis through conducting the scenario analysis. These specific insights in terms of the future perspectives gathered from the interviews were then used to guide the subsequent scenario analysis, which is used to analyze and present the results.

### **2.3. Scenario analysis**

Within this chapter the process of scenario analysis is executed in steps as shown in Figure 3 and which was conducted as the primary method for analyzing the interview findings regarding the future impact of AI on business models. The goal of the scenario analysis is to investigate how the two main variables selected based on the interview results may change in the future due to larger-scale implementation of AI into the business model. This chapter outlines the selected prominent variables, creates the two-axis diagram as seen on Figure 4, and explains the four scenarios that emerged.

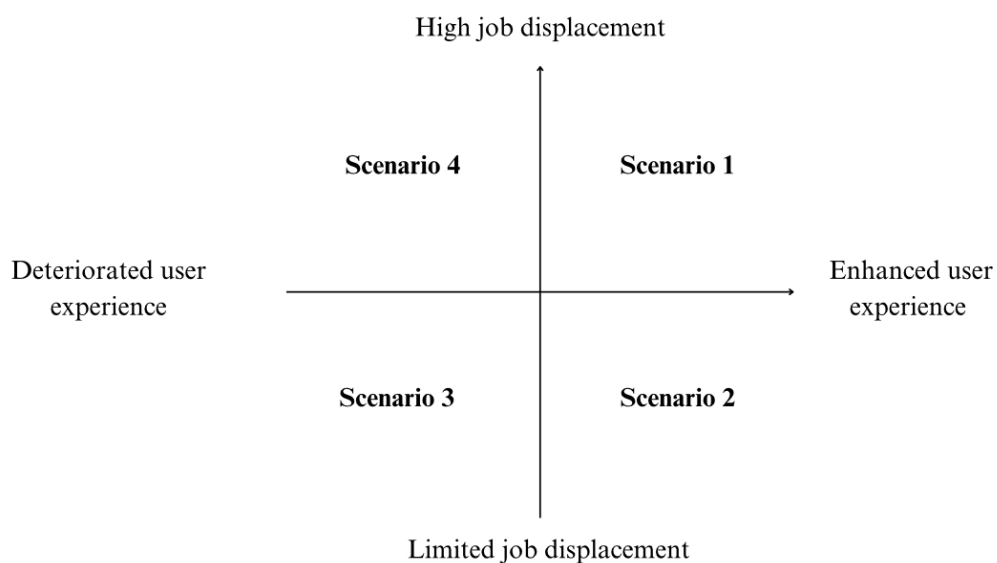
Through a systematic coding process as well as analysing the interview transcripts, the two most prominent variables that are utilised within the scenario analysis are changes in the workforce and changes in user experience (UX). The scenario analysis will examine and explain how implementing AI into a business model changes the business model from the perspective of the workforce and to the value offered to the customers. The two prominent variables selected for the scenario analysis are primarily reliant on the interviewed companies mentioning these factors for multiple times. However, the chosen variables are additionally supported by the theoretical aspect of the thesis. Firstly, the aspect of workforce change is supported in the theoretical part of the work by the study conducted by Aguzarova et al.

(2023), who emphasised AI's ability to transform the operations of the company more efficient and less costly, what can be offered to the company in the form of changes in the workforce. The possibility of changes in the workforce is additionally supported by the work of Reim et al. (2020), who emphasised the challenges that may arise with wider AI utilisation through employee hesitancy towards AI as well as the skill gaps between employees. Hence, it suggests that with wider utilisation of AI changes in the workforce are inevitable. Some job roles that exist today may be able to be taken over by AI, meanwhile some roles may require additional training to work alongside with AI.

The variable chosen as the second most important is also supported by the theoretical part of the thesis. More precisely, within the theoretical aspect of the work, Shrinivas & Shetty (2024) emphasised that artificial intelligence serves as a possibility to transform the customer experience more personalised. More precisely, the authors emphasised that through more enhanced data analysis provided by AI, companies can better analyse the feedback of their customers, better analyse and detect customer behaviour and patterns which therefore can be utilised for creating more personalised experiences for their customers. It was additionally emphasised by Aguzarova et al. (2023) that AI has the possibility to foster innovation within a company. Hence, it allows companies to innovate, adjust and enhance their products or services, which therefore may impact customer engagement and positively influence the company's competitive advantage.

Based on the two variables a two-axis diagram was then created, which itself created four possible future scenarios that can emerge from AI incorporation to the business model and which are visible in Figure 4. Changes in user experience was placed on the x-axis and the values range from deteriorated to enhanced. On the right side of the axis we can see notable enhancements in user experience. In this situation, we understand that through AI incorporation the company has managed to affect their business model by making their customer experience more personalized, seamless and efficient. Services and products have been made more tailor-made for customers based on their needs, past history, and data. In this situation, by improving the user experience, it creates added value, greater satisfaction, and a greater competitive advantage for the company. On the left side of the x-axis we can on the other hand see a deteriorated user experience, which emphasises that integrating AI into the business model has been carried out poorly. Meaning, that the user experience becomes more uncomfortable, unreliable, slower, more robotic, etc. for the customer, which therefore decreases satisfaction and can negatively impact brand loyalty.

Changes in job displacement was placed on the y-axis of the diagram and it ranges from high to limited. The upper part of the y-axis includes high job displacement as a result of integrating AI into the business model. More precisely, it emphasises that AI will be able to fulfill the tasks of certain employees more efficiently and accurately and therefore AI will take over certain job roles that exist today. This will lead to major changes in the structure of the company’s job roles, as people's roles change, they will have to learn new skills and work with AI. This change may also mean laying off certain employees. The lower part of the y-axis however emphasizes that when integrating AI into the business model, job displacement will be limited. That means that AI will be primarily used as a tool, which enables the employees to carry out certain tasks more time or cost-efficiently, rather than AI will become a tool that will replace a large number of employees or that will drastically change the nature of the work of the employee. In this situation, employees will learn to use AI better and more purposefully, which allows them to do their jobs more effectively. This means that AI and humans will work in harmony.



*Figure 4.* Two-axis diagram illustrating changes in user experience and job displacement upon AI integration into business models.

Source: Compiled by the author

The two-axis diagram created resulted in 4 possible scenarios that focus on how AI utilisation within a business model can affect the workforce as well as the user experience. The first of the four scenarios created involves both enhancing the user experience as well as

high level of job displacement, in other words the evolution of job roles when integrating AI into business models. Scenario 1 emphasises significant business model innovation through more personalised experiences for the customers as well as through automation of procedures and can therefore be considered a positive scenario. Firstly, there are a variety of possibilities of how AI can enable companies to improve their customer experience. For example, Eyo (2025) highlighted that AI has the possibility to make a customer's experience more personalised thanks to AI's ability to utilise the customer's past history and preferences. This allows artificial intelligence to make customer-specific offers, taking into account customer behavior patterns through data analysis. As an additional possibility to enhance customer experience, the author additionally identified the possibility to improve company's efficiency through AI utilisation. More precisely, utilising AI tools such as chatbots enables customers to get help or an answer to their question faster, versus waiting for someone to contact them. This allows customers to receive help and answers to their questions whenever they need it, not just on weekdays and during specific time slots when customer representatives are working. This also makes the customer's experience more positive and time-efficient. By providing more personalised and valuable experiences for the customer, there is a possibility of deriving a positive change in how customers perceive the company, how they interact with the company, hence the firm has the opportunity to enhance the brand loyalty of the customers as well as their competitive advantage.

Based on their current AI use cases and emphasised future perspectives, some interviewed companies already demonstrate characteristics that align with the aspects of Scenario 1. Among the companies interviewed, Postimees Group as of today uses artificial intelligence to make its users' experience more personal and seamless. More precisely, it was emphasised by the representative of the Postimees Group that they utilise AI to curate the newspaper for the reader based on the consumption habits of the consumer, which brings a new level of personalization for the consumer and enables a more enhanced user experience. Among the companies interviewed, LHV Pank also sees great potential in enriching the user experience with AI. The LHV representative gave an example of how an online bank could one day function thanks to AI through voice commands and would also be helpful to the customer on other inquiries in addition to banking topics.

In addition to enhancing the customer experience, scenario 1 additionally entails a high displacement of jobs. This change could mean that certain existing job roles relevant today will disappear with wider AI utilisation, because artificial intelligence might be able to do some specific jobs more efficiently. On the other hand, evolution of job roles can also entail that existing job roles will become such that humans will work hand in hand with AI. Sharps et al. (2024) has also identified that utilisation of AI will lead to both job displacement mostly affecting roles in administration, customer service, and sales, but also to job evolution, since AI is able to automate routine tasks, therefore in order to stay relevant in the changing labour market, employees must reskill and learn to be able to do something new.

It can be stated that evolving job roles through automation as well as employee development and self-improvement helps the company make its employees more skilled. However, it cannot be overlooked that the skills and willingness of employees to work hand in hand with AI are crucial in any transformation of the workforce. Within the conducted interviews, the manufacturing company Nordwood emphasised how through AI implementation they have been able to replace certain manufacturing job roles from humans to machines. At the same time, the representatives emphasised that with the use of AI there comes a new need for specialists who specialize in working hand in hand with AI, which also supports the first scenario that job roles within a company may change and certain jobs may be replaced by AI, while creating a need for new specialists. At the same time, LHV representative also pointed out in the interview that their goal in using AI is to consciously reduce the number of employees in order to optimize costs.

However, in terms of the first scenario, potential difficulties must also be kept in mind, mainly related to the complexity of the process of changing job roles within an organization and data protection as can be seen from Table 8. Based on the findings of Eurofund (2018), restructuring of the workforce can lead to various problems such as an increase of job intensity for the remaining employees which therefore can lead to various mental health problems and stress, as well as restructuring can also create the feeling of job insecurity for employees, which may cause dissatisfaction among employees regarding job retention in the future. In addition to potential difficulties in terms of restructuring, the use of data in personalizing the customer experience can also be highlighted as an implication in the first scenario. More precisely, in order for a company to be able to personalize its services to

its customers, based on existing customer data, it is also necessary to consider how the use of this data complies with GDPR regulations. ET Online (2023) has emphasised that in order for AI to make services more personal, it is necessary to provide personal data to the AI, but this raises questions about how this data is stored and used. This can lead to data leaks and, conversely, a decline in customer trust and loyalty. Accordingly, companies should first carefully consider how they use artificial intelligence, what data they can submit to it as well as make sure that customer data is used in accordance with GDPR regulations.

Table 8

*Outcomes and implications of the scenarios*

Scenario	Opportunities	Risks	Interview findings
<b>Scenario 1</b> - Enhanced user experience & high job displacement	Increased competitive advantage; Increased customer loyalty & Evolution towards a highly skilled workforce through the need for new job roles.	Challenges in workforce transition & Data protection and GDPR compliance concerns.	Workforce changes (Nordwood, LHV). Improved customer experience (Postimees, LHV).
<b>Scenario 2</b> - Enhanced user experience & limited job displacement	Competitive advantage; Increased customer loyalty & Enhancements towards human and AI collaboration.	Investments in AI infrastructure & Data protection and GDPR compliance concerns.	Workforce changes (LHV). Improved customer experience (Cybernetica, RIK).
<b>Scenario 3</b> - Deteriorated user experience & limited job displacement	Cost optimization	Decreased customer loyalty and competitive advantage & lack of employee skill enhancement.	Data inaccuracy/lack of understanding how data is used (Postimees, RIK, Company A). Over-reliance/decline in critical thinking (Postimees).
<b>Scenario 4</b> - Deteriorated user experience & high job displacement	Skilled workforce	Decreased customer loyalty & competitive advantage. Challenges in workforce transition.	Workforce changes (Nordwood, LHV). Data inaccuracy/lack of understanding how data is used (Postimees, RIK, Company A)

Source: Compiled by the author based on the scenario analysis

The second scenario emphasises that through integration of AI into business models the user experience is enhanced, but job displacement is rather low. Within the second scenario the business model innovation is reflected through how the services and products are delivered to customers and how the customer experience is enhanced. In scenario 2, the main focus is on creating a better and more personalized experience for the customer, and restructuring job roles to be more efficient falls behind. In the second scenario, we can understand that the company is incorporating artificial intelligence as a tool that allows it to create a better and more personalized customer experience for the customer in collaboration with an employee. This means that, unlike the first scenario, AI is a tool for employees to enable people to be more efficient in their work, rather than a technology that will replace an excessive number of employees or restructure the company's job roles. Mayer et al. (2025) emphasised that AI serves people the opportunity to develop their skills and maximize their capabilities, rather than replace their jobs. Therefore in the second scenario, AI integration in the business model will also lead towards a more skilled workforce. The representative of Cybernetica as well as RIK additionally both emphasised that they see AI as a tool for employees that helps them to perform certain tasks more efficiently, but it is not something that will largely replace human input in the working environment. It was additionally emphasised that AI offers employees the possibility to offer customers more personalised experiences, by utilising the tool for providing tailor-made solutions for customers, based on their needs and previous data. Therefore within this scenario there is also a positive impact on the brand loyalty and in creating competitive advantage through AI.

The lack of change in job roles may be additionally due to the belief that there should still be a human hand involved in every process to ensure the accuracy and quality of the work. The representative of LHV Pank emphasised that today there is an act created by the European Union on the topic of AI. Article 14 of the EU AI act emphasises the importance of human oversight of certain AI processes. More precisely, based on this specific article, human insight is important when using high-risk AI systems. By high-risk AI systems we understand processes that can cause significant harm to health, safety or rights of people. Therefore, Article 14 of the EU AI Act obliges in addition to AI also employees to be involved in processes related to these areas. Human insight in these processes is extremely important for several reasons. Firstly, one of the goals of including human oversight in these processes is to prevent damage. More precisely, that AI does not harm people in the three aforementioned areas of health, safety and human rights. Secondly, human inclusion in these processes is important because if there is actually any harm being caused by AI, for example

due to an incorrect decision, a human can step in and prevent or minimize the harm. Lastly, one of the key importances of why human involvement is important is due to the European Union's wish to remain a human-centric approach to AI utilisation, which entails that the final control lies with the human and not the machine. (Fink, 2025)

The potential implications in the second scenario are related to the establishment of AI infrastructure in the company, and similarly to the first scenario, data protection. More precisely, in order to adopt AI technology within the company, it is necessary to make larger investments in the right technologies as well as hiring AI specialists. Sajid (2024) emphasised that when companies are creating an AI infrastructure, costs related to data quality, customisation needs, hardware, AI specialists, AI maintenance, model training and security measures should be considered. These costs can be high for a company, thus companies should consider that creating an AI infrastructure is neither easy nor cheap. Similarly to the first scenario, companies need to draw their focus towards protecting their data and following GDPR regulations when using customer data.

The third scenario emphasises that implementation of AI into the business model has led the company to try to use artificial intelligence as a so-called assistant for the employee, but its use has not succeeded in improving the customer experience. The third scenario entails deteriorated user experience as well as limited job displacement with incorporating AI into business models, which entails a lack of positive business model innovation. In the third scenario, we can talk about business model innovation primarily in terms of cost optimization. Scenario 3 can be considered rather negative, because the use of artificial intelligence has not allowed the company to offer its customers a better or more personalized experience. Companies may implement artificial intelligence in their business model with an aim to reduce costs. However, as a result, the company's main focus when using AI may become cost optimization also in processes involving customers, but leaving customer needs and satisfaction in the background. As a result, customer-related processes may change through the use of AI, making them more inconvenient or unpleasant for customers, which makes the customer experience with the company more negative. A company's poor use of artificial intelligence can also negatively impact the customer experience. More precisely, low quality AI-integrated services such as chatbots on a company's website can create an unpleasant experience for the customer. Dilmegani and Ermut (2025) have emphasised that the use of poorly thought-out AI can lead to low-quality AI services and, as a result, various errors. The authors similarly pointed out a low-quality chatbot that is unable to correctly understand the customer's wishes and, as a result, cannot provide an adequate solution to the

customer's concern. This itself can negatively impact the satisfaction of the customer. Since within the third scenario AI functions as a so to say ineffective tool, then in this scenario skill enhancements of the workforce will also be limited. Ineffective use of AI or consistently receiving inaccurate data does not support the development of employee skills or collaboration with AI. The representatives of RIK, Postimees Group and Company A also emphasised that AI also comes with a high risk of inaccurate data, which can lead to poor decisions. This can also negatively impact the work of the employee as well as the customer experience if AI produces incorrect data. As a result, companies emphasized the importance of maintaining critical thinking as well as the need to include humans in processes carried out by AI. In the third scenario, it can be said that the company has not been able to improve the customer experience by implementing AI. Likewise, the introduction of AI in scenario 3 has not affected internal job roles.

The possible implications that can follow with the third scenario include a negative impact on the brand reputation due to poor integration of AI and declining customer satisfaction and damage to brand loyalty. Based on a study conducted by MarketingCharts (2022), 65% of respondents stated that a decline in product or service quality affects their loyalty to the brand. Therefore, if a company widely adopts artificial intelligence that negatively impacts their services for customers, there is a risk that customer loyalty to the brand will decline or be disrupted. As a result, customers start looking for alternatives and seek other companies and therefore in this scenario there is also a negative impact on the competitive advantage of the company. In the above mentioned AI chatbot example, if the chatbot is not able to respond correctly or adequately to a customer's request, the customer also risks losing trust in the company if they receive incorrect information from the chatbot. Consequently, in scenario 3, the major risk is losing customer trust, loyalty, and perhaps even customers to competitors.

In the last scenario, customer satisfaction has deteriorated, however the implementation of AI in the business model has led to changes in the company's job roles indicating a high job displacement. Therefore, within the fourth scenario business model innovation is reflected through automation of procedures and cost optimisation. In this situation, the company has not been able to utilise artificial intelligence to make the customer experience more positive and personalized and the reasons may be similar to the previous scenario. For example, the company has not been able to use AI effectively, or the company's focus on using AI has shifted elsewhere. For example, cost saving, which in this scenario may also be indicated by the restructuring of the company's job roles. Flatt (2024) has

emphasised that companies are utilising AI tools with the aim to reduce costs through automation of routine jobs and tasks. The author emphasised that AI tools can be especially useful in departments such as manufacturing, marketing and customer service, where it is possible to replace certain jobs with artificial intelligence and which therefore leads companies to relocate their human resources. Relocation of a given human resource does not only refer to the layoff of employees, but also to employee restructuring into another job role or department. However, using artificial intelligence to perform routine tasks helps a company to save operational costs, both financially and in terms of time. Restructuring of the job roles also makes employees more efficient because they do not waste their resources on performing routine tasks and therefore enables skill enhancement of the employees. However, as mentioned above, in scenario 4, excessive focus on cost optimization or workforce restructuring may reduce customer satisfaction, which, similarly to the previous scenario, may affect customer loyalty towards the brand and the overall competitive advantage of the company.

The implications of the fourth scenario are similar to scenario 1 and 3. More precisely, the deteriorated customer experience can lead to a negative impact on the customer's trust and loyalty towards the brand, which therefore can reduce the company's competitive advantage. Secondly, similarly to the implications of the first scenario, restructuring a company's job roles is not an easy task. This process is time-consuming and can be detrimental to employees in the form of increased workload, mental health problems or fear of losing their jobs.

The scenario analysis resulted in four different possible scenarios that can occur with integration of AI into business models. Every scenario comes with its own set of potential opportunities as well as difficulties and risks, which are important to keep in mind. As a result of the analysis, it can be said that in all scenarios, balanced decisions must be made in the business model with the introduction of artificial intelligence, so that AI allows the company to be more efficient and the employees to become more skillful as well as enhance customer loyalty and competitive advantage.

### **Conclusion**

The conducted thesis aimed to bring out potential opportunities and risks associated with integration of AI into business models, based on a scenario analysis approach. Through a comprehensive theoretical analysis and conducting a thorough empirical analysis, the aim of the study was met. The conducted thesis examined how companies utilise the tool of artificial intelligence within their business models as of today and what future is associated

with wider utilisation of AI. Through an extensive analysis of previously conducted studies on a similar topic, the author found three theoretical works compiled by the authors Sjödin et al. (2021), Lee et al. (2019), and Black, Samson, and Ellis (2024). The author of the thesis gained valuable information in regards to how artificial intelligence is utilised as of today for innovating business models. The biggest point of reference of the three analyzed studies is that data plays an important role in business model innovation when utilising AI. Significance of large datasets as well as to data being able to provide useful insights is emphasised within all of the three analysed studies. The studies have found that with wider utilisation of AI in business model innovations, serves as a possibility to improve organisational efficiency, giving companies a competitive advantage in dynamic marketplaces.

Furthermore, the theoretical aspect of the thesis additionally analysed different opportunities as well as risks which are considered with implementing AI into business models. Studies conducted by Aguzarova et al. (2023) and Shrinivas & Shetty (2024) highlighted different benefits of AI adaptation, such as improved innovation, individualised consumer experiences, better informed strategic planning, and increased operational efficiency. On the other hand, in addition to creating various opportunities for companies, the potential risks and complications related to AI must also be considered. Difficulties such as the issue of "black-box", ethical issues, worker reluctance, and data-related hazards, such as privacy, security, and quality of data. Reim et al. (2020) has emphasised that overcoming these obstacles requires an awareness of the complexities of AI systems, the development of organisational trust, and adherence to changing regulatory frameworks.

Within the theoretical part of the thesis the concept of scenario analysis was explored, by emphasising the concept's importance for navigating different possible future outcomes in constantly changing environments. By utilising the concept of scenario analysis, firms have the opportunity to plan for different future events, detect potential risks, but also take advantage of opportunities. The process of scenario analysis can be directly linked to the process of business model innovation since planning for different outcomes helps the firm to detect their vulnerabilities as well as help them reconsider different processes within their business model. The concept allows businesses to stay agile and responsive to changes in external factors.

The author conducted a comprehensive empirical research to identify how companies utilise AI within their daily operations and business models as of today, in addition to what future is associated with AI. The empirical part of the thesis consisted of conducting 7 semi-structured interviews with companies active in four different sectors: finance,

technology, manufacturing and a media group. The insights of the interviews revealed that some of the primary opportunities of utilising AI include time-efficiency, enhanced data analysis and decision-making, as well as opportunities to further enhance customer experience by providing customers with additional value through AI utilisation. In addition to highlighting various opportunities, companies additionally mentioned various risks that should be taken into account when using artificial intelligence. Risks such as data security, the lack of transparency of AI as well as over reliability of artificial intelligence, causing the critical thinking of employees to decline. The interviews were therefore transcribed and coded to identify key themes for carrying out scenario analysis.

Conducting the scenario analysis involved four key steps: setting the aim for the analysis, identifying the two most prominent variables from the interview results, creation and discussions of these 4 emerged scenarios. The two chosen prominent variables were workforce reduction and enhanced user experience and the aim of the analysis was to investigate how wider utilisation of AI can influence these determined variables. Therefore a two-axis diagram was created which itself created four possible future scenarios. The first possible scenario emphasises enhanced user experience and high job displacement. More precisely, the key outcomes of the first scenario include the possibility for the company to improve their competitive advantage, positively influence customer loyalty and enable their workforce to become more skilled and competent. However, the main implications that are associated with the first scenario include potential challenges associated with workforce transition as well as GDPR. The second scenario, similarly to the first one emphasised enhanced user experience, however within this scenario there is limited job displacement. The outcomes of the second scenario include that employees will begin to work hand in hand with AI, which enables them to carry out their responsibilities more efficiently and through which they will be able to create a more personalised experience for the customer. However, possible implications can include the need of robust investments into establishing an AI infrastructure within the company, which can be expensive. Possible implications related to GDPR cannot be left without a mention in this scenario either. The third scenario entails both a deteriorated user experience as well as limited job displacement. The possible outcome emphasises a decline in customer satisfaction and that AI does not influence the company role structure, rather it will be utilised as an assistive tool, which enables employees to fulfill tasks. The possible implications of the third scenario emphasise that through a deteriorated customer experience, there is a possibility of a negative impact on the brand reputation and therefore on the brand loyalty. The last emerged scenario similarly to the third one

emphasises a deteriorated customer experience, but the adoption of AI has also impacted the job roles of the company. Similarly to the previous scenario, the outcomes of this scenario entail a negative impact on customer experience, however restructuring of job roles can lead to better efficiency of the employee in addition to possible cost optimization. However, the implications of this scenario also emphasise the possibility of a negative impact to brand reputation and loyalty in addition to possible complications regarding workforce transition.

As the future opportunities of integrating AI into business models, we can define: enhanced competitive advantage, increased customer loyalty, the development of a skilled workforce, improved employee efficiency, and potential cost optimization. From the risks perspective, on the other hand, if AI is integrated poorly, we can determine: deteriorated customer experience, damage to brand reputation and loyalty, challenges in workforce transition, data security and privacy concerns, lack of AI transparency, and the potential for over-reliance on AI. In conclusion, it can be stated that wider utilisation of artificial intelligence within the concept of business models serves its opportunities as well as challenges. Both the positive as well as negative sides that might accompany AI should be thoroughly analysed beforehand. The process of scenario analysis offers companies a good opportunity to analyze various AI-related future outcomes as well as both positive and negative aspects of AI. Scenario analysis also empowers companies to maximize the potential of AI in their business processes.

Although the thesis provided valuable insights in terms of the opportunities and risks of further incorporating AI into business models, it is worthwhile to consider the limitations of the study. One of the primary limitations include the sample size and selection. More precisely, the study was primarily focused on Estonian companies within four different industries. Hence, the findings may not be as applicable to a larger population of businesses in different areas or sectors due to the small sample size and narrow geographic emphasis. As the second limitation, we can identify the decision to use the qualitative approach. The chosen method did enable to gather valuable and in-depth insights on the topic, however qualitative results can be subjective and not generalisable as is quantitative data. Therefore, future studies on a similar topic could benefit from larger and more geographically varied sampling of businesses to improve the findings' generalisability and spot regional or sector-specific variations. In order to make future studies even more generalizable, future studies could focus primarily on one specific industry, including companies of different sizes, which allows more detailed information on their distinct advantages and difficulties.

Focusing on one specific industry additionally offers opportunities for the scenario analysis side to explore even more industry-specific future prospects.

**List of references**

1. Aguzarova, L., Aguzarova, F., & Tsallaeva, K. (2023). The Impact and Prospects of Using Artificial Intelligence In the Economy. *RT & A*, 18(5), 323-330. Retrieved from: <https://research-ebsco-com.ezproxy.utlib.ut.ee/c/rtfupc/viewer/pdf/cxgooquwhj?auth-callid=8d582131-cf81-4543-9ac7-ff927715aa8c>
2. Ashyrov, G., Alunurm, R., Pentus, K., & Vadi, M. (2019). The future of university-industry collaboration: scenario analysis based on case of Estonia. *Knowledge Management Research & Practice*, 17(4), 421-435. Retrieved from: <https://www-tandfonline-com.ezproxy.utlib.ut.ee/doi/pdf/10.1080/14778238.2019.1599307>
3. AS LHV Group. (2023). *Consolidated annual report 2023*. Retrieved March 4, 2025, from: [https://www.lhv.ee/assets/files/investor/LHV\\_Pank\\_Annual\\_Report\\_2023-EN.pdf](https://www.lhv.ee/assets/files/investor/LHV_Pank_Annual_Report_2023-EN.pdf)
4. Bashir, M., & Verma, R. (2017). What Business Model Innovation Is the New Competitive Advantage. *IUP*. Retrieved from: [https://www.researchgate.net/profile/Makhmoor-Bashir/publication/316644311\\_Why\\_Business\\_Model\\_Innovation\\_is\\_the\\_New\\_Competitive\\_Advantage/links/5a4f02eda6fdcc7b3cda8858/Why-Business-Model-Innovation-is-the-New-Competitive-Advantage.pdf](https://www.researchgate.net/profile/Makhmoor-Bashir/publication/316644311_Why_Business_Model_Innovation_is_the_New_Competitive_Advantage/links/5a4f02eda6fdcc7b3cda8858/Why-Business-Model-Innovation-is-the-New-Competitive-Advantage.pdf)
5. Black, S., Samson, D., & Ellis, A. (2024). Moving beyond ‘proof points’: Factors underpinning AI-enabled business model transformation. *International Journal of Information Management*, 77, 102796. Retrieved from: <https://doi.org/10.1016/J.IJINFOMGT.2024.102796>
6. Centre of Registers and Information Systems. (n.d.). *About us*. RIK. Retrieved March 13, 2025, from: <https://www.rik.ee/en/agency/about-us>
7. Climent, R. C., Haftor, D. M., & Staniewski, M. W. (2024). AI-enabled business models for competitive advantage. *Journal of Innovation & Knowledge*, 9(3), 100532. Retrieved from: <https://doi.org/10.1016/J.JIK.2024.100532>
8. Cordova-Pozo, K & Rouwette, E. A. (2021). Types of scenario planning and their effectiveness: A review of reviews. *Futures*, 149. Retrieved from: <https://doi.org/10.1016/j.futures.2023.103153>
9. Cybernetica. (n.d.). *Cybernetica*. Retrieved March 5, 2025, from: <https://cyber.ee/>
10. Data Print. (n.d.). *About the company*. Retrieved March 11, 2025 from: <https://dataprint.ee/en/about-the-company/>

11. De La Parra, S. (2021). *Scenario Analysis: An Essential Tool to Future-Proof Businesses*. FAIRR. Retrieved January 1, 2025, from: <https://www.fairr.org/news-events/insights/scenario-analysis-an-essential-tool-for-future-proofing-businesses>
12. Dilmegani, C., & Ermut, S. (2025). *AI Fail: 4 Root Causes & Real-life Examples in 2025*. AIMultiple. Retrieved April 12, 2025, from: <https://research.aimultiple.com/ai-fail/>
13. Eesti Pangaliit. (n.d.). *Overview of Estonian banking sector*. Retrieved March 4, 2025, from: <https://pangaliit.ee/welcome-to-estonian-banking-association/banking-information-market-shares-of-estonian-banks>
14. Eurofound. (2018). *Labour market change ERM report 2018: Impact of restructuring on working conditions*. Publications Office of the European Union. <https://www.eurofound.europa.eu/system/files/2018-10/ef18037en.pdf>
15. Enholm, I. M., Papagiannidis, E., Mikalef, P., & Krogstie, J. (2022). Artificial Intelligence and Business Value: a Literature Review. *Information Systems Frontiers*, 24, 1709-1734. Retrieved from: <https://doi.org/10.1007/s10796-021-10186-w>
16. ET Online. (2023). AI and Privacy: The privacy concerns surrounding AI, its potential impact on personal data. *Economic Times*. Retrieved April 11, 2025, from: <https://economictimes.indiatimes.com/news/how-to/ai-and-privacy-the-privacy-concerns-surrounding-ai-its-potential-impact-on-personal-data/articleshow/99738234.cms>
17. Eyo, I. (2025). *13 ways AI will improve the customer experience in 2025*. Zendesk. Retrieved April 11, 2025, from: <https://www.zendesk.com/blog/ai-customer-experience/>
18. Flatt, K. (2024). *AI efficiency: Cost reduction with AI*. InData Labs. Retrieved April 13, 2025, from: <https://indatalabs.com/blog/ai-cost-reduction>
19. Fielt, E. (2013). Conceptualising Business Models: Definitions, Frameworks and Classifications. *Journal of Business Models*, 1(1), 85-105. Retrieved from: [https://www.researchgate.net/publication/273381704\\_Conceptualising\\_Business\\_Models\\_Definitions\\_Frameworks\\_and\\_Classifications](https://www.researchgate.net/publication/273381704_Conceptualising_Business_Models_Definitions_Frameworks_and_Classifications)
20. Glover, E. (2024). *What Is Black Box AI? Artificial intelligence often makes decisions we don't understand*. Built In. Retrieved December 23, 2024, from: <https://builtin.com/articles/black-box-ai>
21. Ho, H., Wu, J.-Z., Khakifirooz, M., & Fathi, M. (2021). *An Integrated Model of Scenario Planning, Business Model Canvas, and Financial Modeling for the Early-stage*

- Enterprise Valuation*. SSRN. Retrieved from:  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4238118](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4238118)
22. Jariwala, M. (2024). Contingency Planning: The Need, Benefits, and Implementation of Scenario Planning. *International Journal of Trend in Scientific Research and Development*, 8(3), 866-869. Retrieved from:  
[https://www.researchgate.net/publication/373990738\\_Contingency\\_Planning\\_The\\_Need\\_Benefits\\_and\\_Implementation\\_of\\_Scenario\\_Planning](https://www.researchgate.net/publication/373990738_Contingency_Planning_The_Need_Benefits_and_Implementation_of_Scenario_Planning)
23. Jorzik, P., Klein, S. P., Kanbach, D. K., & Kraus, S. (2024). AI- driven business model innovation: A systematic review and research agenda. *Journal of Business Research*, 182, 114764. Retrieved from: <https://doi.org/10.1016/J.JBUSRES.2024.114764>
24. Joubert, S. (2020). *Business Model Innovation: What It Is And What It Is Not*. Northeastern University Graduate Programs. Retrieved December 23, 2024, from:  
<https://graduate.northeastern.edu/resources/implementing-business-model-innovation/>
25. Krueger, R., A., Casey, M., A., Donner, J., Kirsch, S., & Maack, J., N. (2001). Social Analysis: Selected Tools and Techniques. *Social Development Paper*, No. 36. World Bank. Retrieved from:  
<https://documents1.worldbank.org/curated/fr/568611468763498929/pdf/282790SDP136.pdf#page=68>
26. Lee, J., Suh, T., Roy, D., & Baucus, M. (2019). Emerging Technology and Business Model Innovation: The Case of Artificial Intelligence. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(3), 44. Retrieved from:  
<https://doi.org/10.3390/JOITMC5030044>
27. LHV. (n.d.). *About*. Retrieved March 4, 2025, from: <https://www.lhv.ee/en/about>
28. Mahbub, M., B., & Ayman, A. (2024). Utilising Artificial Intelligence - Prospects and Obstacles for Modern Businesses. *Malaysian E Commerce Journal*, 8(1), 23-28. Retrieved from: <http://doi.org/10.26480/mecj.01.2024.23.28>
29. Mariton, J. (2016). *What is Scenario Planning and How to Use It*. SME Strategy. Retrieved December 28, 2024, from:  
<https://www.smestrategy.net/blog/what-is-scenario-planning-and-how-to-use-it>
30. MarketingCharts. (2022). *What Might Cause You to Lose Your Customer's Loyalty?* Retrieved from:  
<https://www.marketingcharts.com/brand-related/brand-loyalty-224640>
31. Mayer, H., Yee, L., Chui, M., & Roberts, R. (2025). *Superagency in the workplace: Empowering people to unlock AI's full potential at work*. McKinsey & Company.

- Retrieved from:  
<https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/superagency-in-the-workplace-empowering-people-to-unlock-ais-full-potential-at-work>
32. Melanie Fink. (2025). *Human Oversight Under Article 14 of the EU AI Act*. Social Science Research Network. Retrieved from:  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=5147196](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5147196)
33. Mikalef, P., & Gupta, M. (2021). Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance. *Information & Management*, 58(1). Retrieved from:  
<https://doi.org/10.1016/j.im.2021.103434>
34. MM Grupp. (n.d.). *Grupist*. Retrieved March 18, 2025, from: <https://mmgrupp.ee/grupist>
35. Nordwood. (n.d.). *About Us*. Retrieved March 5, 2025, from:  
<https://nordwood.ee/en/our-company/about-us/>
36. OECD. (n.d.). *Enterprises by business size*. OECD Data. Retrieved February 12, 2025, from:  
<https://www.oecd.org/en/data/indicators/enterprises-by-business-size.html#:~:text=SMEs%20are%20further%20subdivided%20into,employees%20in%20the%20manufacturing%20sector.>
37. Oranga, J., & Matere, A. (2023). Qualitative Research: Essence, Types and Advantages. *Open Access Library Journal*, 10. Retrieved from:  
[https://www.researchgate.net/publication/376739890\\_Qualitative\\_Research\\_Essence\\_Types\\_and\\_Advantages](https://www.researchgate.net/publication/376739890_Qualitative_Research_Essence_Types_and_Advantages)
38. Postimees Grupp. (n.d.). *Home*. Retrieved March 31, 2025 from:  
<https://postimeesgrupp.ee/>
39. Reim, W., Åström, J., & Eriksson, O. (2020). Implementation of Artificial Intelligence (AI): A Roadmap for Business Model Innovation. *AI*, 1(2), 180-191. Retrieved from:  
<https://doi.org/10.3390/ai1020011>
40. Sajid, H. (2023). *AI Cost Structure - Business*. Picsellia. Retrieved April 12, 2025, from:  
<https://www.picsellia.com/post/ai-cost-structure-business>
41. Shafer, S. M., Smith, H. J., & Linder, J. C. (2005). The power of business models. *Business Horizons*, 48(3), 199-207. Retrieved from:  
<https://doi.org/10.1016/j.bushor.2004.10.014>
42. Sharps, S., Smith, T., Browne, J., Large, O., Subramanya, R., Tay, P., Ellina, D., Atkinson, I., Lythgow, J., & Muralidharan, R. (2024). *The Impact of AI on the Labour Market*.

- Tony Blair Institute for Global Change. Retrieved from:  
<https://assets.ctfassets.net/75ila1cntaeh/5yiS3TBdF96J4Kt0tFmj3k/c4b260667ed70fc791020268cfed443b/1mABBNuF6Anp7zTv1ZeIxe--155801112024>
43. Shrinivas, S., K., & Shetty, P. (2024). Impact of Artificial Intelligence on Business, Business Operations and Strategy. *International Journal of Creative Research Thoughts*, 12(8). Retrieved from:  
[https://www.researchgate.net/publication/382885484\\_IMPACT\\_OF\\_ARTIFICIAL\\_INTELLIGENCE\\_ON\\_BUSINESS\\_BUSINESS\\_OPERATIONS\\_AND\\_STRATEGY](https://www.researchgate.net/publication/382885484_IMPACT_OF_ARTIFICIAL_INTELLIGENCE_ON_BUSINESS_BUSINESS_OPERATIONS_AND_STRATEGY)
44. Sjödin, D., Parida, V., Palmié, M., & Wincent, J. (2021). How AI capabilities enable business model innovation: Scaling AI through co-evolutionary processes and feedback loops. *Journal of Business Research*, 134, 574-587. Retrieved from:  
<https://doi.org/10.1016/J.JBUSRES.2021.05.009>
45. Statistics Estonia. (2023). *Enterprises' use of AI technologies is on the rise*. Retrieved from: <https://stat.ee/en/news/enterprises-use-ai-technologies-rise>
46. Teece, D. J. (2010). Business Models, Business Strategy and Innovation. *Long Range Planning*, 43(2-3), 172-194. Retrieved from: <https://doi.org/10.1016/j.lrp.2009.07.003>
47. Terlecki, K. (2025). *How Does AI Reduce Costs: Start Savings In Your Business Today*. TTMS. Retrieved April 24, 2025, from:  
<https://ttms.com/how-does-ai-reduce-costs-start-savings-in-your-business-today/>
48. Tohidi, H., & Jabbari, M. M. (2012). The important of Innovation and its Crucial Role in Growth, Survival and Success of Organizations. *Procedia Technology*, 1, 535-538. Retrieved from: <https://doi.org/10.1016/j.protcy.2012.02.116>
49. Tomičić-Pupek, K., Tomičić Furjan, M., Pihir, I., & Vrčec, N. (2023). Disruptive Business Model Innovation and Digital Transformation. *Business Systems Research* 14(1), 1-25. Retrieved from: <https://hrcak.srce.hr/file/444451>
50. Zdrok, O. (2024). *Why “Garbage In, Garbage Out” Should Be the New Mantra for AI Implementation*. Shelf. Retrieved December 23, 2024, from:  
<https://shelf.io/blog/garbage-in-garbage-out-ai-implementation/>

**APPENDIX A**

**Interview questions**

Topic	Questions	Connection with theory
Current AI utilisation in the organization	To what extent is AI integrated into your company's daily operations?	Enholm et al., (2022) discussions on AI's potential to improve a firm's efficiency and automate difficult or time-consuming operations.
	Could you give examples of automation or AI-driven procedures that have been efficient for your firm?	Lee et al. (2019), discussions on AI's practical influence on different business processes, such as the hiring process within a company.
	Have you encountered many difficulties and vital mistakes with the introduction of AI?	The four primary risks associated with AI implementation identified by Reim et al. (2020).
	What role does AI play in your company's decision-making process?	Aguzarova et al. (2023) discussions of AI's potential to make decision-making processes more effective.
AI and business model	How has your business model changed or been affected as a result of wider utilisation of AI?	Aguzarova et al., (2023) discussions on AI being an transformative force in business models by creating different opportunities for firms to turn their business models more effective.
	What new opportunities for income generation or consumer value delivery has AI presented?	Shrinivas & Shetty (2024) discussions on AI's contribution for creating opportunities such as individualised client experiences as well as assisting the company to stay on top of market trends.
	What restrictions or difficulties have you run into while incorporating AI into your company's business model?	Reim et al. (2020) detected issues such as the black-box problem or employee resistance as well as the lack of transparency and possible trust issues determined by Glover (2024).
Future prospects	In what ways do you see the utilisation of AI developing in your company over the next one to three years?	Mariton (2016), who emphasised that the concepts of scenario analysis help the companies to analyse different future outcomes.

How do you perceive wider utilisation of AI in innovating business models but also AI becoming a part of a business model?

What are your perceived opportunities and risks that might arise within wider utilisation of AI?

Source: Compiled by the author based on Enholm et al., 2022; Lee et al., 2019; Reim et al., 2020; Aguzarova et al., 2023; Shrinivas & Shetty, 2024; Glover, 2024; Mariton, 2016.

**APPENDIX B**

**Media group interview coding table**

Theme of the topic	Codes from the interviews	Category
Current AI utilisation in the organization	- Text to speech	AI uses in the company
	- Transcriptions	
	- Assistant for article writing	
	- Text translation	
	- SEO	
	- In-house ChatGPT	
	- Time efficiency	Perceived opportunities
	- Automation of routinely tasks	
	- Cost efficiency	
	- Fabricated information	Difficulties encountered
	- Limitations with the Estonian language	
AI and business model	- Data analysis	Opportunities in business model
	- Time efficiency	
	- Personalised experience for the customer	
	- People need to be educated on AI	Difficulties in business model

---

Future prospects	<ul style="list-style-type: none"> <li>- Time efficiency</li> <li>- Accessibility to services will improve</li> <li>- New jobs will emerge</li> <li>- Automating routine tasks</li> <li>- Improving the efficiency of the employee</li> <li>- Contextual research</li> <li>- AI assistant for consumers</li> </ul>	Opportunities
	<ul style="list-style-type: none"> <li>- Ethical use of data</li> <li>- Cybercrime</li> <li>- Critical thinking declines</li> <li>- Trap of convenience</li> </ul>	Difficulties / risks

---

Source: Compiled by the author based on the compiled interviews

**APPENDIX C**

**Technology industry interview coding table**

---

Theme of the topic	Codes from the interviews	Category
Current AI utilisation in the organization	<ul style="list-style-type: none"> <li>- Programming / code writing</li> <li>- Conducting market analyses</li> <li>- Marine surveillance</li> <li>- Transcriptions and dialogues held by AI</li> <li>- Detecting malicious activities</li> <li>- Automation of procedures</li> <li>- Tools for summarising materials</li> <li>- Chatbots explaining legalities</li> <li>- Creating connections between issues and socio economic changes</li> </ul>	AI uses in the company
	<ul style="list-style-type: none"> <li>- Time efficiency</li> <li>- Simplifies work</li> <li>- Reduces workload</li> </ul>	Perceived opportunities
	<ul style="list-style-type: none"> <li>- Intellectual property risk</li> <li>- Training and understanding the AI model</li> <li>- AI's inaccuracy</li> <li>- You need a person who understands AI</li> <li>- Not understanding how our data is used</li> <li>- GDPR regulations</li> </ul>	Difficulties encountered

---

	<ul style="list-style-type: none"> <li>- Security issues</li> <li>- AI is expensive</li> </ul>	
AI and business model	<ul style="list-style-type: none"> <li>- Integrated into some products</li> <li>- Providing additional value to customers</li> <li>- Fewer employees</li> </ul>	Opportunities in business model
	<ul style="list-style-type: none"> <li>- Intellectual property</li> <li>- Human touch is better</li> <li>- Need for new specialists</li> </ul>	Difficulties in business model
Future prospects	<ul style="list-style-type: none"> <li>- Enhancing internal processes</li> <li>- Preparing proposals</li> <li>- Enhanced decision making</li> <li>- More personalised services</li> </ul>	Opportunities
	<ul style="list-style-type: none"> <li>- Business model is too complex for AI</li> <li>- Protecting intellectual property</li> <li>- Data breaches</li> <li>- High dependency of AI</li> </ul>	Difficulties / risks

Source: Compiled by the author based on the compiled interviews

**APPENDIX D**

**Finance industry interview coding table**

Theme of the topic	Codes from the interviews	Category
Current AI utilisation in the organization	<ul style="list-style-type: none"> <li>- Code writing</li> <li>- Reporting</li> <li>- Automation of sources for internal use</li> <li>- Incident director</li> <li>- Categorization</li> <li>- Establishment of standard tools</li> <li>- Statistical models</li> </ul>	AI uses in the company
	<ul style="list-style-type: none"> <li>- Time efficiency</li> <li>- Reducing workforce</li> </ul>	Perceived opportunities
	<ul style="list-style-type: none"> <li>- Client data management</li> <li>- Complexity of developing tools</li> <li>- Regulations</li> </ul>	Difficulties encountered

AI and business model	<ul style="list-style-type: none"> <li>- Reducing the number of employees</li> <li>- Routinely tasks done by AI</li> <li>- Enhanced quality</li> </ul>	Opportunities in business model
	<ul style="list-style-type: none"> <li>- Regulations</li> <li>- Human hand must be involved</li> </ul>	Difficulties in business model
Future prospects	<ul style="list-style-type: none"> <li>- Fewer employees</li> <li>- Improved user experience</li> <li>- Performing actions with voice commands</li> </ul>	Opportunities
	<ul style="list-style-type: none"> <li>- Regulations</li> <li>- Data leakage</li> <li>- Estonian language competence in AI models</li> </ul>	Difficulties / risks

Source: Compiled by the author based on the compiled interviews

**APPENDIX E**

**Manufacturing industry interview coding table**

Theme of the topic	Codes from the interviews	Category
Current AI utilisation in the organization	<ul style="list-style-type: none"> <li>- Preparing reports</li> <li>- Writing letters</li> <li>- Machine vision</li> <li>- AI for cybersecurity</li> <li>- Personal assistant</li> <li>- AI-driven business intelligence tools</li> <li>- Marketing activities</li> <li>- Data analysis</li> <li>- In-house ChatGPT</li> </ul>	AI uses in the company
	<ul style="list-style-type: none"> <li>- Time efficiency</li> <li>- Enhanced security</li> <li>- Enhanced data analysis</li> </ul>	Perceived opportunities
	<ul style="list-style-type: none"> <li>- Learning to use the tool</li> <li>- Changes in the trained initial condition</li> <li>- Lack of knowledge on how to use</li> <li>- Accuracy of data</li> <li>- Data protection</li> </ul>	Difficulties encountered

AI and business model	<ul style="list-style-type: none"> <li>- Time efficient decision making</li> <li>- Enhanced data analytics</li> <li>- Workforce reduction</li> <li>- More accurate production</li> <li>- Cost reduction</li> <li>- Enhanced product delivery time</li> <li>- Enables better visibility in the company</li> <li>- Investigating the market</li> <li>- Analysing consumer activity</li> <li>- Forecasting</li> </ul>	Opportunities in business model
	<ul style="list-style-type: none"> <li>- Integrating models into your systems</li> <li>- Finding people to work alongside AI</li> <li>- Stiffness of AI</li> <li>- Employee hesitancy in using AI</li> <li>- Data inaccuracy</li> <li>- Needs human touch</li> </ul>	Difficulties in business model
Future prospects	<ul style="list-style-type: none"> <li>- Data entry by AI</li> <li>- Data analysis for informed decisions</li> <li>- Predictive models for customer relationships</li> <li>- Predictive models for maintenance of equipment</li> <li>- Smoother operations</li> <li>- Forecasting</li> <li>- Market analysis</li> </ul>	Opportunities
	<ul style="list-style-type: none"> <li>- Cybersecurity</li> <li>- Lack of understanding of how data is used</li> <li>- Data breaches</li> <li>- Lack of AI specialists</li> <li>- Vigilance of employees</li> </ul>	Difficulties / risks

Source: Compiled by the author based on the compiled interviews

## Resümee

### AI ÄRIMUDELI INNOVATSIOONIS: VÕIMALUSED JA RISKID STSENAARIUMIANALÜÜSI PÕHJAL

Tänapäeva maailmas on ettevõtted muutmas viise konkurentsieelise saavutamiseks läbi oma ärimudeli innovatsiooni. 2005. aastal läbi viidud uuringu kohaselt nägi suurem osa intervjueeritavatest juhtidest, et ärimudelitel on potentsiaali kujuneda uueks konkurentsieeliseks 2010. aastaks (EIU, 2005, tsiteeritud Bashir & Verma, 2017). Ettevõtete jaoks mängib täna rolli ka tehisintellekt, mis pakub ettevõtetele võimalusi oma protsesside efektiivsemaks muutmiseks läbi tehisintellekti implementeerimise ärimudelisse. Tehisintellekti tark kasutamine erinevate protsesside läbiviimiseks ja efektiivsemaks muutmisel annab ettevõttele võimaluse suurendada enda konkurentsieelist. Samas peaksid ettevõtted laialdasema tehisintellekti kasutuselevõtuga, lisaks potentsiaalsetele võimalustele, läbi kaaluma potentsiaalsed riskid.

Käesoleva töö eesmärk on stsenaariumianalüüsi lähenemisviisi alusel välja tuua võimalused ja riskid, mis on seotud tehisintellekti integreerimisega ärimudelite innoveerimisel. Antud töö täidab lünga olemasolevatest sarnasel teemadel koostatud töödest, mis seni on käsitletud tehisintellekti tänast rolli ettevõttes ja ärimudelid, kuid mis ei ole käsitletud laialdasemalt tuleviku potentsiaale. Käesoleva bakalaureusetöö eesmärgid on järgnevad:

- Selgitada ja mõista ärimudeli innovatsiooni ja tehisintellekti kontseptsiooni;
- Teha ärimudeli innoveerimise ja tehisintellekti teemal olemasolevate uuringute põhjal teoreetiline analüüs, sh tehisintellektiga seotud võimaluste ja riskide analüüs,
- Selgitada stsenaariumianalüüsi meetodit ja tuua välja meetodi seoseid ning sobivust ärimudelite ja tehisintellekti uurimiseks;
- Viia läbi intervjuud ettevõtetega, et mõista, kuidas ettevõtted täna tehisintellekti kasutavad ning mõistmaks, milliseid tulevikuvõimalusi ja riske ettevõtted tunnetavad tehisintellekti abil ärimudelite innoveerimisel;
- Viia läbi stsenaariumianalüüs, et hinnata, kuidas tehisintellekt võib mõjutada ärimudelite tuleviku arengut.

Töö teoreetilises osas defineeritakse ärimudelite innovatsiooni, tehisintellekti kui ka stsenaariumi analüüsi olemus. Teoreetiline osa käsitleb varasemate sarnasel teemal koostatud tööde analüüsi kui ka tulemuste võrdlust. Töös tuuakse välja peamised viisid, kuidas tehisintellekt varasemate uuringute põhjal soosib ärimudelite innovatsiooni. Lisaks

rõhutatakse, millised on potentsiaalsed võimalused ja riskid tehisintellekti kasutamisel. Viimaks katab töö teoreetiline osa ka ülevaadet stsenaariumi analüüsi kontseptsioonist ning põhjendab antud meetodi sobivust käesoleva bakalaureuse töö kontekstis.

Töö empiiriline uurimus hõlmas seitsme poolstruktureeritud intervjuu läbiviimist nelja erineva sektori ettevõtetega: finants, tehnoloogia, tootmine ja meedia grupp. Intervjuude tulemused käsitlevad, kuidas ettevõtted täna tehisintellekti oma protsessides ja ärimudelites kasutavad, ning millist tulevikku sellega seostavad. Intervjuude tulemustes oli erinevate ettevõtete vahel sarnaseid kasutamisi viise ja tuleviku perspektiive kui ka valdkonna põhiseid erinevusi. Peamiste võimalustena AI rakendamisel toodi välja ajaline efektiivsus, efektiivsem andmeanalüüs, muutused tööjõus ja kliendikogemuse parendamine. Samas toodi peamiste tehisintellektiga kaasnevate riskide poolelt välja andmeturbe risk, läbipaistvuse puudumine kui ka inimeste sõltuvus tehisintellektist. Intervjuu tulemuste baasil identifitseeriti kaheks peamiseks muutujaks stsenaariumi analüüsis tööjõu muutumine ja kasutajakogemuse parendamine. Antud muutujate baasil loodi kahe teljega diagramm, läbi mille tekkis neli võimalikku stsenaariumi. Esimene stsenaarium hõlmab kasutajakogemuse parendamist ja töörollide muutumist läbi tehisintellekti kasutuselevõtu ärimudelis. Teine stsenaarium hõlmab samuti kasutajakogemuse parendamist, kuid antud stsenaariumis ei toimu ettevõttes töörollide ümberkorraldust. Kolmas stsenaarium rõhutab kasutajakogemuse halvemaks muutumist ning piiritletud ja vähest töörollide muutumist. Viimase stsenaariumi puhul halveneb kasutajakogemus, kuid ettevõtte töörollid muutuvad.

Kokkuvõttes võib öelda, et tehisintellekti kasutamine ärimudelis võib endaga kaasa tuua erinevaid võimalusi ja riske, mida ettevõtted peaksid esmalt sügavamalt kaaluma. Stsenaariumianalüüs on hea meetod, mis pakub ettevõtetele võimalust läbi mängida erinevaid potentsiaalseid tulevikke, mis tehisintellektiga seotud otsuste puhul juhtuda võivad. Antud meetod pakub ettevõtetele alternatiivset viisi võimaluste ja riskide kaardistamiseks ning aitab teha informeeritud otsuseid.

Non-exclusive licence to reproduce thesis and make thesis public

I, Mia Heleen Herman

herewith grant the University of Tartu a free permit (non-exclusive licence) to

reproduce, for the purpose of preservation, including for adding to the DSpace digital archives until the expiry of the term of copyright,

PROSPECTS OF AI IN INNOVATING BUSINESS MODELS: OPPORTUNITIES  
AND RISKS BASED ON A SCENARIO ANALYSIS APPROACH

supervised by Junior lecturer Kristian Pentus

2. I grant the University of Tartu a permit to make the work specified in p. 1 available to the public via the web environment of the University of Tartu, including via the DSpace digital archives, under the Creative Commons licence CC BY NC ND 3.0, which allows, by giving appropriate credit to the author, to reproduce, distribute the work and communicate it to the public, and prohibits the creation of derivative works and any commercial use of the work until the expiry of the term of copyright.

3. I am aware of the fact that the author retains the rights specified in p. 1 and 2.

4. I certify that granting the non-exclusive licence does not infringe other persons' intellectual property rights or rights arising from the personal data protection legislation.

*Mia Heleen Herman*

**12/05/2025**