Author
Sultan Khan

UNDERSTANDING THE ADOPTION OF ARTIFICIAL INTELLIGENCE IN THE NORWEGIAN BANKING SECTOR: AN ANALYSES OF TRUST, PERCEIVED RISK, AND BENEFITS

SUPERVISOR

Ilias O. Pappas

University of Agder, 2023
Faculty of Social Sciences
Department of Informaiton Systems

Preface

This master's thesis is a culmination of an intense exploration into the realm of Artificial Intelligence (AI) and its adoption in the banking sector, particularly within the Norwegian market. The technological revolution brought about by AI is transforming industries globally, with the banking sector being no exception. AI becomes increasingly intertwined with banking services; it becomes imperative to understand the factors influencing the adoption of these AI-based services.

The main purpose to work on the concept and issues is based on the identification that plenty of research has been dedicated to the technological aspects of AI within the banking industry, there has been a lack of focus on the human aspect. More specifically, there was a knowledge gap regarding how trust in AI, perceived risk, benefits of AI adoption, and trust in banks influence the adoption intention of AI technologies in banking. These factors form the core of this thesis, creating a customer-centric perspective towards the understanding of AI adoption in banking.

The research journey was quite challenging with numerous learning opportunities and insights. The process of conceptualizing, implementing, and analysing this research has not only provided me with a deeper understanding of the complexities of technology adoption but has also enriched my abilities as a researcher.

I would like to extend my gratitude to my supervisor Ilias O. Pappas at the Department of Information System at UiA. I am grateful for his unwavering support and guidance throughout this journey. I would also like to thank all the participants who took part in this research, without whom this study would not have been possible.

The journey of writing this thesis has been both challenging and rewarding. I hope the readers find value in this work and that it contributes meaningfully to the conversation around AI adoption in the banking sector.

Oslo, 14.06.2023

Sultan Khan

Abstract

The swift advancement in AI technology has ushered in new frontiers in various sectors, including banking. This heightened interest has extended to Norway's banking sector, which is gradually integrating AI into its services. Despite the broadened adoption, there's a discernible gap in understanding the factors that influence trust in AI and its subsequent adoption within the banking landscape. This thesis thereby on exploring the critical elements influencing trust in AI and the intent to adopt AI in the Norwegian banking sector, rooted in the conceptual framework of trust, perceived risk, perceived benefits of AI adoption, and trust in banks.

The guiding research question was "What factors influence the trust in AI and the intention to adopt AI in the Norwegian banking sector?". To answer this question, the thesis aims to 1) identify the key factors influencing trust in AI, 2) measure the impact of perceived risk, benefits of AI adoption, and trust in banks on the intention to adopt AI, 3) evaluate how these factors interplay to affect the adoption intention and 4) investigate how individual characteristics shape these relationships.

The study employed quantitative methodology, utilizing a survey questionnaire completed by individuals using banking services. Detailed information on the population characteristics is presented in the research approach section, while the data collected is assessed against the developed hypotheses. The survey involved a representative sample of Norwegian banking sector clients, while the interviews aimed at supplementing the survey findings. The collected data was analysed using structural equation modelling and open coding techniques.

The findings reveal that trust in AI, perceived risk, perceived benefits of AI adoption, and trust in banks significantly influence the intention to adopt AI-based services in the banking sector. The study also discloses that individual characteristics can shape these relationships. This comprehensive model provides insight into the complex interplay of these factors in determining the adoption of AI in the banking sector.

These hypotheses were evaluated using statistical analysis, specifically correlation and regression analysis, to determine associations and identify significance. The main goal was to assess whether the hypotheses held true or not. The research findings affirm all the hypotheses, indicating a positive relationship. The discussion section provides recommendations for improving consumer trust and promoting the adoption of AI services in Norway's banking sector based on these results.

This research is among the pioneering studies that encompass the factors influencing trust in AI and the intention to adopt it in the Norwegian banking sector. The findings offer invaluable

insight for stakeholders engaged in developing, managing, and promoting AI technologies within the banking sector and underscore the importance of trust-building measures. Future research should further explore these factors in the broader context of AI adoption across various sectors.

Keywords: Trust in AI, Perceived Risk, Benefits of AI Adoption, Trust in Banks, AI Adoption Intention, Norwegian Banking Sector

Table of contents

1 INTRODUCTION

The financial sector has experienced substantial transformations and progressions owing to the digital upheaval and the advent of innovative technologies like artificial intelligence (AI). Financial institutions have increasingly adopted AI to improve customer service, reduce costs, and enhance operational efficiency (Huang & Lee, 2022; Mogaji et al., 2021). In particular, using AI in e-banking has transformed how customers interact with their banks. AI-powered virtual assistants, chatbots, and personalized recommendation systems have made banking more convenient and accessible to customers (Margaret et al., 2023).

However, adopting AI in e-banking also raises concerns about customer trust and adoption. Customer trust is critical for adopting new technologies in the banking industry (Noreen et al., 2023). The sensitive nature of financial transactions and the complexity of AI-based systems may create doubts about their reliability, accuracy, and security in customers' minds. Therefore, understanding the role of trust and adoption in AI-based e-banking is crucial for successfully implementing and adopting these systems.

Research has shown that trust plays a vital role in adopting new technologies in the banking industry. Studies have indicated that customer trust predicts adoption intention and behaviour toward new banking technologies (Lin & Lee, 2023; Noreen et al., 2023). In AI-based e-banking, trust becomes even more crucial due to the potential risks associated with these systems. Trust enables customers to feel secure and confident using these systems, leading to increased adoption rates.

This study seeks to evaluate the significance of trust in the context of AI adoption within the electronic banking landscape. The study delves into determining the elements that shape consumer faith in AI-integrated e-banking, encompassing aspects like perceived utility, user-friendliness, perceived threats, and apprehensions regarding privacy (Mogaji et al., 2021; Margarret at al., 2023). Additionally, the study aims to identify the factors contributing to adopting AI-based e-banking, including customer satisfaction, perceived benefits, and trust (Huang & Lee, 2022; Noreen et al., 2023).

The findings of this study will contribute to understanding the role of trust and adoption in the context of AI-based e-banking. The study will provide insights into the factors influencing customer trust and adoption, which can be used to develop strategies for successfully implementing and adopting AI-based e-banking systems. Ultimately, the study aims to promote

the widespread adoption of AI-based e-banking systems by addressing customers' concerns and improving their trust and adoption.

1.1 Motivation

While there has been significant growth in the development and implementation of Artificial Intelligence (AI) within the banking sector globally, there is limited research on understanding the factors influencing the adoption of these AI-based services in the Norwegian banking sector (Schaefer et al., n.d.). Prior research on AI adoption in the banking sector has primarily focused on technical aspects, overlooking the user perspective, particularly aspects like trust in AI, perceived risk, benefits of AI adoption, and trust in banks. These aspects are crucial to comprehend as they directly impact a customer's intention to use AI-based services in banking (Margaret et al., 2023).

Existing research establishes that trust, perceived risk, and perceived benefits are significant determinants of technology adoption across different domains. However, these factors have not been comprehensively investigated in the context of AI adoption in banking. Moreover, the unique influence of trust in banks on the acceptance of AI technologies in banking services remains under-explored.

In the context of the banking sector, the adoption of AI technologies is not just a technological change but also requires customers' trust in these new technologies, an understanding of the associated risks, and the perceived benefits (Noreen et al., 2023). Therefore, a comprehensive understanding of these influencing factors from a customer's perspective becomes critical for banks looking to successfully implement and adopt AI technologies.

The motivation for this thesis stems from the research gap in understanding AI adoption in the Norwegian banking sector. By investigating the roles of trust in AI, perceived risk, benefits of AI adoption, and trust in banks on AI adoption intention, this study will provide new insights into the factors influencing AI adoption in the banking sector (Margaret et al., 2023). Furthermore, the findings of this study can assist banks and policymakers in formulating strategies to promote the adoption of AI-based services in banking. This study's relevance and potential for significant contributions to the fields of information systems, banking, and AI technology adoption form the basis of its motivation.

1.2 Research problem

The incorporation of artificial intelligence (AI) in electronic banking has revolutionized customer-bank interactions, offering customized services at their convenience. However, adopting AI in e-banking also raises concerns about customer trust and adoption. There needs to be more literature regarding the lack of customer trust in AI-based e-banking services and products, which could hinder the widespread adoption of these systems (Noreen et al., 2023). Consequently, this investigation's focal issue revolves around the significance of trust and the assimilation of artificial intelligence (AI) within the e-banking industry. More specifically, this study endeavours to pinpoint the elements contributing to the deficit of customer trust in AI-enhanced e-banking services and products. Moreover, it seeks to determine how these elements can be resolved to foster a broader acceptance and utilization of AI-integrated e-banking systems. The study will focus on DNB Norway as a case study, which has implemented AI technology in its significant operations to improve customer services and prevent fraudulent activities (Finextra Research, 2023). The study aims to contribute to the existing literature on AI and its implementation in financial institutions. It also provides insights for policymakers and bankers to enhance the trust and adoption of AI-based e-banking systems.

1.3 Research aim

This research probes into the significance of trust alongside the integration of artificial intelligence (AI) in the realm of e-banking. The investigation zeroes in on discerning the aspects contributing to the dearth of consumer trust in AI-enhanced e-banking offerings and how these contributing aspects can be rectified to encourage a wider acceptance and application of AI-embedded e-banking frameworks. The study will be conducted using DNB Norway as a case study. It will contribute to the existing literature on AI and its implementation in financial institutions. It will provide insights for policymakers and bankers to enhance the trust and adoption of AI-based e-banking systems.

1.4 Research Objectives

1. The aim is to discern and scrutinize the crucial elements such as perceived utility, simplicity of use, perceived hazards, and issues related to privacy, which shape the customers' trust in e-banking systems that incorporate AI.
2. To assess the impact of customer trust on adopting and using AI-powered e-banking services in the context of DNB Norway.
3. To propose strategies and recommendations for addressing the identified factors to enhance customer trust and promote the adoption and usage of AI-based e-banking systems in DNB Norway and beyond.
4. The goal is to enrich the extant body of knowledge on AI and its integration in financial entities by delivering valuable perspectives to decision-makers and banking professionals to foster both the trust and acceptance of AI-enabled e-banking systems.

1.5 Research questions

RQ: In what ways do the perceived utility, user-friendliness, anticipated risks, and privacy considerations of AI-enabled e-banking solutions shape customer confidence? Additionally, how do these factors together affect the uptake and utilization of AI-driven e-banking services, specifically within the realm of DNB Norway?

To comprehensively address this research question, it is essential to:

- Investigate how perceived utility, user-friendliness, anticipated risks, and privacy concerns contribute to customer trust in AI-based e-banking systems.
- Examine how customer trust, influenced by these factors, impacts the adoption and usage of AI-powered e-banking services.
- Identify strategies to address the identified factors to enhance customer trust and promote the adoption and usage of AI-based e-banking systems.
- Analyse the case of DNB Norway to understand how the identified factors and trust issues play a role in adopting AI-based e-banking services in a real-world context and explore potential areas for improvement.

1.6 Research methodology

The present study utilizes the quantitative research methodology, employing a survey questionnaire as the primary tool for data collection. A total of 300 DNB bank customers will be chosen for participation using a straightforward random sampling strategy, ensuring that every customer has an equal opportunity of being represented in the sample. The questionnaire, comprising of closed-ended questions, will be distributed online via email or other available contact means.

Data obtained from the study will be scrutinized using descriptive statistical methods, including frequency analyses and measures of central tendency. SPSS software will be utilized for data analysis, facilitating the creation of graphical depictions to recognize patterns and discern trends. This methodology is expected to deliver a comprehensive perspective on the factors impacting customer trust and the adoption of AI-based e-banking systems, ultimately leading to practical suggestions to augment trust and adoption in the banking sector.

1.7 Significance of the study

This study has several significant aspects, including:

- Tackling the deficit of customer trust in AI-assisted e-banking services and offerings: This study will pinpoint pivotal factors, including perceived utility, simplicity of use, perceived risk, and privacy issues, which contribute to the low level of customer trust in e-banking systems underpinned by AI. Policymakers and bankers can use the findings to develop effective strategies for promoting customer trust and addressing AI concerns in e-banking.
- Promoting responsible AI development in the banking industry: The study will provide insights into how AI can be developed and implemented responsibly in the e-banking sector, considering factors influencing customer trust. Policymakers and bankers can use the findings to promote responsible AI development, mitigate potential risks, and enhance the adoption of AI-based e-banking systems.
- Enhancing customer confidence in AI-supported e-banking systems: The study will enhance customer confidence in AI-supported e-banking services and products by

addressing concerns such as perceived usefulness, ease of use, perceived risk, and privacy.

- Providing insights for other sectors: The findings of this study may have implications for other sectors that utilize AI services and products. The study may provide insights into how to address concerns related to customer trust and ethical issues surrounding AI in other industries.

1.8 Thesis organization

This thesis is organized into Seven chapters.

- Chapter One offers an introductory overview of the research issue, objectives, research queries, and the importance of the study.
- Chapter Two undertakes a literature review, scrutinizing and analysing related scholarly articles, papers, dissertations, and other academic works pertinent to the role of trust and adoption of AI in the e-banking sector. This chapter also covers the theoretical and conceptual frameworks employed in this study.
- Chapter Three explores the research model based on several testable hypotheses and key theoretical underpinnings to effectively respond to the research topic.
- Chapter Four lays out the philosophical standpoint and the techniques used for data gathering and analysis to tackle the research question. The analysis is carried out using SPSS software to identify the elements influencing the trust and adoption of AI-based e-banking systems.
- Chapter Five delves into the research findings and offers in-depth information about the results derived from the collected data, along with the implications of the study's outcomes and advice for policymakers and bankers to enhance the trust and adoption of AI.
- Chapter Six furnishes a comprehensive discussion of results and their practical implications, which could serve as a roadmap for AI implementation in the banking sector.
- Chapter Seven ultimately addresses the limitations of the study and provides a summary of the entire thesis work.

2 LITERATURE REVIEW

The following chapter deals with the provision of insights from literature regarding this concept. The literature review has been divided in different sections, collecting information regarding the Artificial Intelligence, Trust in Artificial Intelligence, Benefits of Artificial Intelligence, Perceived risk, Ethical implications of Artificial Intelligence and issues related to Artificial Intelligence implication and Consumer acceptance. Different ideas and research have been reviewed Critically with this chapter.

2.1 Introduction

Artificial Intelligence (AI) is changing how we interact with banking and financial services. It can potentially transform the banking sector, and the level of trust in customers will facilitate this transformation in the technology. Trust is one of the most critical factors affecting AI adoption in the banking sector. Artificial Intelligence is using intelligent machines to perform tasks that require human-like intelligence. The banking sector has been an early adopter of AI, and its impact on the industry has been significant. AI has enabled banks to provide better customer service, increase efficiency, and reduce costs. However, trust is crucial to the adoption of AI in e-banking.

With rapid technological advancements, Artificial Intelligence (AI) has become an integral part of many industries, including the banking sector (Wang & Siau, 2019). AI has the potential to revolutionize the banking sector by providing personalized services, enhanced customer experiences, and increased efficiency in banking operations (Qin et al., 2022). Banks use AI to improve customer experience, enhance security, automate processes, and reduce costs (Gupta et al., 2021). However, the adoption of AI in banking has its challenges. Building trust between customers and banks is one of the most significant challenges (Gille et al., 2020). Trust is essential in the banking sector, and AI adoption can only succeed if customers trust the technology and the banks that use it (Ameen et al., 2021).

The banking sector has witnessed significant changes and adopting Artificial Intelligence (AI) has become a game-changer (Kaur et al., 2020). AI is increasingly integrated into banking operations, from chatbots to fraud detection and many other applications (Kaur et al., 2020; Ameen et al., 2021). Nonetheless, the effective integration of AI into the banking sector largely hinges on the customer's faith in this advanced technology (Wang & Siau, 2019).

2.2 AI in the banking sector

AI has been increasingly integrated into various aspects of the e-banking sector to improve efficiency, security, and customer experience. One notable example is the implementation of chatbots, which have significantly reduced customer waiting times and improved satisfaction levels (Qin et al., 2022). An additional critical utility of AI in e-banking involves augmenting the proficiency in detecting fraud. AI protocols have the ability to recognize fraudulent undertakings and notify the bank's safety unit, thereby lessening the occurrence of fraud and boosting the customer's trust in the bank's security protocols (Chen et al., 2020).

By analysing customer data, AI algorithms can provide tailored recommendations, improving customer experience and increasing loyalty (Patel & Trivedi, 2020). As the banking sector continues to adopt AI technology, various applications are emerging that reduce costs, improve efficiency, and enhance customer experiences (Chen et al., 2020).

The successful adoption of AI in e-banking heavily on customers' trust in the technology (Wang & Siau, 2019). As Artificial Intelligent applications become more prevalent in the banking sector, understanding the factors influencing trust in AI and addressing the challenges associated with building trust between customers and banks using AI technology is essential. This literature review will explore these factors and challenges, providing insights into how the e-banking sector can foster trust in AI and promote its widespread adoption.

2.3 Significance of Trust for the Incorporation of AI in Banking

Establishing trust is crucial in all interactions, not least in the connection between a banking institution and its clientele (Raza et al., 2020). In the e-banking sector, trust is crucial in determining AI technology adoption. Customers who believe in AI technology are likelier to adopt it in the e-banking sector, whereas those who do not trust it are less likely to do so. To successfully adopt AI in e-banking, customers must trust AI's capabilities to provide accurate and dependable services, despite the complexity of the technology. Research shows several factors influence customers' trust in AI, including transparency, accountability, and security (Rahman, 2021).

- **Transparency:** Transparency is a significant factor in building trust in AI. Customers need to understand how AI works and how their data is used. Bedué & Fritzsche, (2022) found that transparency was a key determinant of customers' trust

in AI-based financial services. Customers who understand how AI is making decisions are more likely to trust the technology.

- **Accountability:** Customers need to know who is responsible for AI-based decisions. In e-banking, AI is used in credit scoring and fraud detection. If customers do not know who is responsible for these decisions, they may not trust the technology. Research shows accountability is crucial in building trust in AI (Shin, 2020).
- **Security:** Security is another critical factor in building trust in AI. Customers need to know that their data is being handled securely and that there is no risk of data breaches. Research shows that the system's security measures influence customers' trust in AI (Shin, 2020).

The e-banking sector can foster trust in AI and promote widespread adoption, improving customer experiences and operational efficiencies by addressing these factors.

2.4 The Integration of AI in Digital Banking

The successful adoption of AI in the e-banking sector relies on customers' trust in the technology and offers numerous benefits, including cost reduction, increased efficiency, and improved customer experience.

1. Economic Efficiency: The application of AI in banking can considerably lower operational costs by automating various tasks such as customer assistance and fraud detection, consequently enhancing the financial health of the institutions. Ashta & Hermann, (2021) asserted that the implementation of AI in the banking industry can usher in substantial cost-efficiency.
2. Operational Optimization: AI holds the potential to heighten the efficacy of banking services by automating routine tasks and delivering faster and more precise services. This leap in efficiency can amplify customer contentment and loyalty. Ashta & Hermann, (2021) established in their research that AI integration in digital banking could boost productivity and streamline operations.
3. Enhanced Customer Interaction: AI-powered solutions can enable banks to refine the customer experience by offering personalized services and swift responses. This augmentation in customer experience can elevate customer satisfaction and allegiance. A study by Goel (2021) revealed that AI-enabled chatbots in the digital banking sector significantly enrich the customer interaction process.

As the e-banking sector continues to adopt AI technology, addressing the factors that influence trust in AI and focusing on these benefits can foster widespread adoption and significantly improve the banking industry's operations and customer relations.

2.5 Trust in e-banking

Trust in e-banking is crucial, as customers entrust their money and personal information to banks (Mosa, 2022). Trust serves as the foundation of the banking industry, and any violation of trust can result in severe consequences for the bank. Building trust is achieved through transparency, reliability, and security. Customers expect banks to be transparent about their services, fees, and security measures, as well as provide reliable and excellent customer service, available 24/7. Finally, customers anticipate that banks should have robust security measures in place to safeguard their money and personal information. The deployment of AI in the banking industry encompasses a broad spectrum of uses, including identifying fraudulent activities, customizing banking services for individual clients, and enhancing customer assistance. However, customer trust is critical when implementing AI technology in these areas. Customers are more likely to trust AI technology if they believe that it will enhance their banking experience and increase their security. Lee & Chen (2022) found that customers who view AI technology as a tool that can improve their banking experience are more likely to trust it.

In the banking sector, trust is essential for customers to feel secure about their money, personal information, and the services they receive. Similarly, customers must trust AI technology to carry out tasks accurately, protect their data, and provide reliable and efficient services. Building trust in AI is a complex matter that relies on several factors, including transparency, explain ability, and accountability.

2.6 Different past Studies

Several studies have highlighted the importance of trust in adopting AI in the e-banking sector, demonstrating trust's significant role in shaping customers' perceptions and behaviours toward AI-based financial services.

1. **Liang, Wu, and Xue (2019):** This study found that trust was a significant factor in adopting AI-based financial services. The study revealed that trust was positively related to adopting AI-based financial services, and customers were more likely to adopt these services if they trusted the financial institution.
2. **Flavián et al., (2022):** This study found that trust significantly predicted adopting AI-based financial services. The study revealed that customers who trusted the financial institution were likelier to adopt AI-based financial services and perceived them as more useful and easier to use.
3. **Zailani, Ahmad, and Iranmanesh (2020):** The research concluded a positive correlation between trust and the intention to utilize AI-driven financial offerings. The findings suggest that customers with a higher degree of trust in their banking institution are more inclined to employ AI-enabled financial services, perceiving them as more secure.

The compilation of these studies underscores the pivotal role trust plays in promoting the uptake of AI-enabled financial services in the electronic banking domain. By tackling key trust determinants such as clarity, responsibility, and safety, digital banking entities can expedite AI technology adoption, leading to superior customer experiences and improved operational effectiveness.

2.7 Case Studies of AI Adoption in the Banking Sector

- **JPMorgan Chase** has strategically incorporated AI to augment their abilities in thwarting fraudulent operations (Kshetri, 2020). They formulated a system centered around machine learning for detecting fraudulent transactions in real-time, achieved by scrutinizing vast quantities of data. The implementation of this system has proven significantly efficient in diminishing false positive incidents and enhancing the precision of fraud detection.
- **HSBC** has been using AI to automate its compliance processes (Coombs & Chopra, 2019). They developed an AI-powered compliance platform that can analyse and interpret regulatory requirements and compliance data. The platform has helped HSBC improve its compliance capabilities and reduce the time and cost required for compliance-related tasks.

- **Bank of America** has been using AI to enhance its customer experience (Lee & Lee, 2020). They developed an AI-powered virtual assistant called Erica to assist customers with various tasks, such as account balance inquiries, transaction history, and bill payments. Erica has been highly successful in improving customer satisfaction and reducing the number of customer service calls.
- **Capital One** has been using AI to improve its risk management capabilities (Aziz & Dowling, 2019). They engineered a risk management system powered by AI, capable of scrutinizing extensive data volumes and pinpointing potential risks promptly and effectively. The system has helped Capital One improve its risk management capabilities and make better-informed decisions regarding risk management.
- **Santander** has been using AI to improve their loan approval process (Rao et al., 2022). They developed an AI-powered loan approval system to analyse customer data and credit history to make quicker and more accurate loan decisions. The system has helped Santander improve their loan approval process and reduce the time required.
- **ING** has been using AI to automate its financial forecasting and reporting processes (Peyravi et al., 2020). They developed an AI-powered tool called Katana to analyse financial data and provide real-time forecasts and reports. The tool has helped ING improve its financial forecasting accuracy and reduce the time required for financial reporting.
- **Wells Fargo** has been using AI to improve customer service capabilities (Indriasari et al., 2019). They developed an AI-powered chatbot, Eno that can assist customers with various tasks, such as account balance inquiries, transaction history, and bill payments. Eno has been highly successful in improving customer satisfaction and reducing the number of customer service calls.
- **Standard Chartered** has been using AI to enhance its anti-money laundering (AML) capabilities (Ray, 2021). They developed an AI-powered AML system to analyse transaction data and identify potential money laundering activities in real time. The system has helped Standard Chartered improve its AML capabilities and reduce the risk of money laundering activities.
- **DBS Bank** has used AI to enhance its loan processing capabilities (Sia et al., 2021). They developed an AI-powered loan processing system that analyses customer data

and provides loan approvals in real-time. The system has helped DBS Bank improve its loan processing speed and reduce the time required for loan approvals.

- **BBVA** has been using AI to enhance its customer experience (Moysan & Zeitoun, 2019). They developed an AI-powered virtual assistant called Blue to assist customers with various tasks, such as account balance inquiries, transaction history, and bill payments. Blue has been highly successful in improving customer satisfaction and reducing the number of customer service calls.

2.8 AI applications in E-Banking Sector

2.8.1 AI applications in investment banking:

1. **Portfolio optimization:** AI-powered algorithms can analyse historical data and market trends, helping investment bankers optimize their portfolios and make more informed investment decisions (Jia & Stan, 2021).
2. **Risk management:** AI-powered risk management tools can assist investment bankers in analysing and managing their risk exposure more effectively by predicting potential market disruptions and identifying emerging risks (Ivanov et al., 2019).
3. **Trading algorithms:** AI-powered trading algorithms can analyse real-time market data and execute trades automatically, enabling investment bankers to carry out trades faster and more accurately (Ivanov et al., 2019).
4. **Market analysis:** AI-powered tools can examine market data and identify emerging trends and investment opportunities, aiding investment bankers in making more informed investment decisions (Zhang et at., 2018).
5. **Fraud detection:** Fraud detection tools fuelled by AI possess the capability to scrutinize transactional data and highlight possible fraudulent undertakings, thereby assisting investment bankers in risk alleviation and the safeguarding of their clientele's assets (Jia & Stan, 2021).

2.8.2 AI applications in retail banking:

1. **Customer Assistance:** With the aid of AI-fuelled chatbots and virtual assistants, round-the-clock customer service becomes feasible. They can handle ordinary queries and manage routine transactions such as checking account balances and facilitating bill payments (Mohapatra, 2023).
2. **Tailored Financial Guidance**: AI-enhanced financial planning tools can scrutinize customer data and offer bespoke financial advice, empowering customers to make well-informed financial choices (Mohapatra, 2023).
3. **Protection against Fraud:** AI-enabled fraud detection instruments can examine transactional data and signal possible fraudulent behaviours, allowing retail banks to manage risks and safeguard their customers' assets (Mohapatra, 2023).
4. **Loan Processing:** AI-powered loan processing utilities can evaluate customer data and grant real-time loan approvals, cutting down on loan processing time and enhancing customer experiences (Chen et al., 2020).
5. **Credit Scoring:** AI-enhanced credit scoring tools can analyse customer data and generate more precise credit scores, aiding retail banks in making more informed lending decisions and mitigating credit risk (Mohapatra, 2023).

2.9 The Significance of Perceived Risk in the AI Adoption

The notion of perceived risk is a significant determinant affecting the integration of AI within the banking realm. This term encapsulates the degree of customer apprehension concerning the results emerging from the utilization of a particular technological innovation. If customers perceive AI technology as risky, they may be less inclined to adopt it (Ivanov et al., 2019). The perceived risk associated with AI technology can be mitigated by raising customer awareness about its advantages.

A study by Biswas et al. (2020) indicates that customers who know the benefits of AI technology are more likely to adopt it. Consequently, banks must enhance customer awareness of the advantages of AI technology to decrease the perceived risk associated with the technology. Banks can achieve this by disseminating information about the technology and its benefits to customers through educational materials, workshops, and marketing campaigns.

Moreover, ensuring transparency in the AI technology's functionality and providing customers with a clear understanding of the security measures can also contribute to reducing perceived risk. As trust in AI technology grows, the perceived risk decreases, and customers will be more likely to adopt AI-driven solutions in banking.

2.10 Trust and AI Ethics in Banking

AI technology in banking can potentially revolutionize the industry, but ethical considerations must guide its implementation. Ensuring the ethical use of AI technology is crucial for building trust among customers, who are more inclined to trust banks that employ AI ethically (Ryan, 2020).

Trust is critical for the adoption of AI in e-banking. Customers are often concerned about AI's potential impact on their personal information and security. To fully adopt AI systems, banks must establish trust with their customers. Trust can be fostered by being transparent about AI usage, the data collected, and the protection measures in place. Additionally, banks must ensure that their AI systems are reliable and deliver exceptional customer service. Robust security measures are also essential to safeguard customer data (Ryan, 2020).

Ethical AI technology usage requires banks to consider the technology's impact on various stakeholders, including customers, employees, and society. Banks prioritizing the ethical application of AI technology are more likely to engender customer trust (Ryan, 2020). Consequently, banks must ensure that their AI technology usage adheres to ethical guidelines and considers the well-being of all stakeholders.

2.11 The Benefits of AI Adoption

The adoption of AI in the banking realm can provide numerous benefits, including:

- **Enhanced Customer Experience:** AI can help banks offer personalized and convenient services to their customers, such as 24/7 customer support and real-time response to customer queries. This can improve customer satisfaction and retention (Chowdhury et al., 2023).

- **Cost Efficiency:** The deployment of AI can enable banks to automate routine tasks such as data entry and document processing, leading to enhanced operational efficiency and cost reductions.
- **Advanced Fraud Detection and Prevention:** With AI, banks can detect and pre-empt fraud promptly through real-time analysis of transaction data and identification of suspicious patterns.
- **Refined Risk Management:** AI provides an avenue for banks to scrutinize market trends, economic data, and customer behaviour, thereby enabling more accurate risk management decisions.
- **Back-End Process Automation:** AI allows for the automation of back-end processes such as customer onboarding and regulatory compliance, thereby improving efficiency and cost effectiveness (Chowdhury et al., 2023).
- **Informed Decision-Making:** AI enables banks to sift through vast data, delivering insights that can facilitate better strategic decision-making.
- **Regulatory Adherence:** AI aids banks in automating compliance processes, thus ensuring they align with regulatory norms.
- **Cybersecurity Enhancement:** By examining network traffic and detecting potential threats in real time, AI can boost a bank's cybersecurity capabilities.
- **Product Development:** AI can help banks develop new products and services based on customer data and market trends.
- **Innovation:** AI can help banks drive innovation in the industry by enabling the development of new technologies and business models.

AI can improve customer experience, cost savings, fraud detection, risk management, decision-making, regulatory compliance, cybersecurity, product development, and innovation, but banks must address data privacy, security, transparency, bias, and ethical considerations to build trust.

2.12 Factors affecting trust in AI in e-banking

Several factors can influence customers' trust in AI in e-banking. These factors encompass the perceived benefits of AI, the degree of control customers have over their data, the transparency of the AI system, and the perceived risk of AI. Customers are more likely to trust AI if they perceive it benefits them by providing personalized recommendations and enhancing customer

service (Li et al., 2021). In addition, customers prefer to have control over their data and understand how it is used (Golbeck & Pasquale, 2021). The transparency of the AI system is also critical, as customers want to comprehend how decisions are made and what data is utilized (Golbeck & Pasqualem 2021). Finally, customers may perceive the risk of AI differently, with some customers being more risk-averse than others (Li et al., 2021).

Several factors can influence customers' trust in AI-based banking services. The following are some of the most critical factors:

1. **Perceived Security:** Customers are inclined to place their trust in AI-enabled banking services when they view these services as safe. Banks must ensure their AI-based services incorporate robust data privacy policies, encryption, and authentication measures to enhance the perception of security and increase customers' trust in the technology (Ivanov et al., 2019).
2. **Transparency:** Clients are more apt to trust AI-driven banking services when they have a clear comprehension of the technology's operation. It's essential for banks to disclose the algorithms and data involved in their AI-powered services and articulate the functioning of the technology explicitly (Kshetri, 2020). Enhanced transparency can foster a higher degree of trust.
3. **Personalization:** AI-based banking services can provide personalized experiences for customers, leading to increased trust in the technology. Personalization includes customized recommendations, offers, and alerts based on customers' past behaviour and preferences (Liu et al., 2020). Delivering personalized services can foster a sense of trust between customers and the technology.
4. **Reliability:** Reliability is influenced by accuracy, consistency, and responsiveness (Chowdhury et al., 2023). Banks must ensure their AI-based services are reliable to build customers' trust in the technology.
5. **Familiarity:** Customers trust AI-based banking services if they are familiar with the technology. Familiarity can be increased through education and training programs that inform customers about the benefits and limitations of AI in banking (Belanche et al., 2019). Enhanced familiarity with AI technology can lead to increased trust.

Research shows that several factors, including perceived risk, knowledge, and experience with the technology, influence customers' trust in AI. A study by Liu and Wang (2018) found that perceived risk and perceived benefits played a significant role in shaping customers' trust in AI in the banking sector. Customers were more likely to trust AI when they perceived it as less risky and more beneficial to their banking experience.

Another study by Yang & Wibowo, (2020) revealed that customers' knowledge and experience with AI affected their trust in the technology. Customers who were more knowledgeable about AI and had more experience with the technology were more likely to trust it.

These are findings that highlight the importance of addressing customers' concerns, providing education about AI technology's benefits and risks, and offering opportunities for customers to become familiar with AI-based banking services. Banks can boost consumer trust in AI and champion its effective incorporation into the e-banking sector by mitigating perceived risks, amplifying perceived benefits, and cultivating a more profound comprehension of AI technology.

2.13 The Role of Explain ability in Trust

Explain ability plays a crucial role in fostering trust among customers regarding AI systems. In the banking sector, understanding and explaining the decisions made by AI systems is essential for building trust.

Research has demonstrated that customers believe in AI when they understand how it works and why it makes certain decisions. A study by Felzmann et al. (2019) found that customers were more likely to trust AI when the system clearly explained for its decision explain ability was critical in building trust in AI within the banking sector.

Customers need to comprehend how AI systems make decisions and the reasoning behind those decisions. Banks should strive to provide transparent explanations of the rationale behind AI-generated decisions. Explain ability helps build trust by giving customers control over the AI systems and their decisions (Ehsan et al., 2021).

Banks should prioritize explain ability in their AI systems to foster trust and ensure the successful adoption of AI in banking. By providing clear and understandable explanations for AI-generated decisions, banks can alleviate customers' concerns, enhance their trust in AI, and ultimately encourage the AI integration in the banking realm.

2.14 The Role of Ethics in Trust

Ethics influences customers' trust in AI-based banking services (Wang & Hajli, 2020). As AI becomes increasingly integrated into the banking industry, privacy, security, and bias concerns

arise (Kumar & Dhir, 2021). To establish trust in AI, addressing these ethical concerns is essential (Wang & Hajli, 2020).

A study by Kumar and Dhir (2021) found that customers were likelier to trust AI in the banking sector when they perceived it as ethical. The research indicated that ethics is crucial in building trust in AI within the banking industry (Kumar & Dhir, 2021). Consequently, resolving ethical concerns is necessary to implement AI in banking successfully.

2.15 The Role of Transparency and Accountability in Trust

Transparency is vital to fostering trust in AI. Customers need to understand how AI is employed in banking and its impact on their services. Customers should have access to information about AI systems and their operations (Tarafdar et al., 2019). Transparency helps build trust by offering customers information and reassurance about how their data is used and managed.

Accountability is also crucial in building trust in AI. Banks should take responsibility for the decisions made by AI systems and be held accountable for any negative consequences resulting from their use. Customers should be able to hold banks responsible for any adverse impacts caused by AI systems. Banks need to establish clear policies and procedures for handling complaints and disputes related to AI systems (Tarafdar et al., 2019). Accountability helps build trust by providing customers with a sense of security and assurance that they will be protected from any adverse outcomes caused by AI systems.

In short, to build trust in AI-based banking services, banks must address ethical concerns, be transparent about their AI systems and data usage, and establish accountability for AI-related decisions and consequences. These factors contribute to an environment where customers can feel confident using AI-powered banking services, paving the way for broader adoption of AI technology in the banking sector.

2.16 Benefits and Challenges of Incorporating AI into the Banking Sector

Artificial Intelligence (AI) has made significant inroads in the banking sector, and its adoption has opened up numerous opportunities for the industry (Yang & Wibowo, 2022). However, some limitations to adopting AI in banking should be considered.

2.16.1 **Benefits*:***

1. **Improved Client Interaction:** AI-integrated systems such as chatbots and voice assistants offer round-the-clock support to customers, thus streamlining banking processes and enhancing convenience (Felzmann et al., 2021).
2. **Fraud Identification and Mitigation:** AI algorithms can detect abnormal transaction patterns and behaviors, allowing banks to intervene and prevent fraudulent activities proactively (Malali et al., 2020).
3. **Risk Management:** By scrutinizing extensive data sets encompassing financial markets, economic patterns, and client behaviors, AI empowers banks to make well-informed risk management decisions (Malali et al., 2020).
4. **Automation of Processes:** AI can streamline tedious and time-intensive tasks, reducing the necessity for human involvement and decreasing potential errors (Malali et al., 2020).
5. **Personalized Outreach:** By analyzing customer data, AI can tailor marketing initiatives to enhance customer engagement and loyalty (Purohit et al., 2019).

2.16.2 Challenges:

1. **Data Privacy and Security:** Implementing AI in the banking sector necessitates the aggregation and examination of substantial customer data, thereby heightening the potential for data breaches and cyber threats (Bertino et al., 2021).
2. **Dependence on Data Quality:** AI algorithms require accurate and reliable data to work effectively. Poor-quality data can lead to incorrect insights, resulting in wrong business decisions (Malali et al., 2020).
3. **High Cost:** The development and implementation of AI systems require significant investments, which can hinder adoption by smaller banks (Purohit et al., 2021).
4. **Lack of Transparency:** AI algorithms can exhibit a high level of complexity, often making it challenging for both regulators and customers to comprehend the decision-making process. This complexity can lead to concerns about transparency and accountability (Bertino et al., 2021).
5. **Resistance to Change:** Implementing AI necessitates a significant change in organizational culture within banking institutions. This change could be met with

opposition from both employees and customers who are comfortable with conventional banking processes (Malali et al., 2020).

In conclusion, adopting AI in the banking sector offers significant benefits but has some limitations that must be considered (Purohit et al., 2021). To maximize the advantages of AI, banks need to ensure adequate data privacy and security measures, high-quality data, and transparent AI algorithms (Malali et al., 2020). Additionally, they need to be prepared to invest in developing and implementing AI systems and overcome resistance to change from employees and customers (Purohit et al., 2021).

2.17 Impact of AI adoption on banking industry

The impact of AI adoption on the banking industry is multifaceted, affecting competition, consolidation, and market concentration. Research on this topic presents varying perspectives: (Purohit et al., 2021) studied the impact of AI on banking industry competition among European banks. They found that AI adoption was linked to increased competition, as measured by the Herfindahl-Hirschman Index (HHI). They suggested that AI adoption could help smaller banks compete with larger ones by enhancing data analysis capabilities and enabling the products and services development.

Hua and Xu (2021) investigated the impact of AI on competition in Chinese banks through a survey. Their findings showed that AI adoption was positively associated with market share and profitability, implying that AI could provide banks with a competitive advantage. However, they also discovered that AI adoption was linked to increased market concentration, as larger banks were likelier to adopt AI than smaller ones.

Malali et al., (2020) examined the impact of AI on competition within the banking sector in the United States using a sample of over 6,000 banks. They found that AI adoption was connected to increased competition, as measured by the HHI. Nevertheless, they also noted that the influence of AI adoption on competition depended on the specific AI application. For instance, AI applications related to customer service and marketing were connected to increased competition, while those related to risk management were associated with the decreased competition.

Yang & Wibowo, (2022) analysed the impact of AI on banking industry competition in Pakistan using a sample of commercial banks. They found that AI adoption was positively associated with market share and profitability, suggesting that AI could help banks gain a

competitive edge. However, they also discovered that AI adoption was linked to increased market concentration, as larger banks were likelier to adopt AI than smaller ones.

The influence of AI incorporation on competition within the banking sector is intricate. It is contingent upon several elements, such as the kind of AI application, the scale of the banking institution, and the prevailing regulatory landscape. While some studies indicate that AI adoption can increase competition among banks, others argue that it may lead to increased consolidation and market concentration.

2.18 Challenges in the Trust and Adoption of AI

The adoption of AI in the banking sector has the potential to transform the industry, but it also presents challenges in building trust with customers and stakeholders. These include:

- Lack of transparency in AI algorithms
- Data privacy and security measures
- Bias and fairness concerns
- Skills and knowledge gap
- Ethical considerations
- Regulatory compliance

To address these challenges, banks need to ensure transparency in AI algorithms, implement robust data privacy and security measures, address bias and fairness concerns, acquire the necessary skills and knowledge, consider ethical implications, and comply with regulatory requirements. To address these challenges, banks need to ensure transparency in AI algorithms, implement robust data privacy and security measures, address bias and fairness concerns, acquire the necessary skills and knowledge, consider ethical implications, and comply with regulatory requirements (Königstorfer & Thalmann, 2020).

2.19 AI adoption and regulatory compliance

AI adoption has significant implications for regulatory compliance. On the one hand, AI can help banks meet regulatory requirements more efficiently and effectively, while on the other hand, it can also create new regulatory challenges. Here are some key points on this topic:

- **Benefits of AI for regulatory compliance:** AI can help banks automate compliance processes, such as anti-money laundering (AML) and know-your-customer (KYC) checks, which are time-consuming and resource-intensive. By analysing large amounts of data in real time, AI can identify potential compliance issues more quickly and accurately than humans, thereby reducing the risk of non-compliance (Bartlett & Morse, 2021).
- **Regulatory challenges of AI adoption:** AI create new regulatory challenges, such as the need for transparency and explain ability. Regulators are increasingly concerned about the potential biases and lack of transparency associated with some AI models, which can make it difficult to assess their accuracy and reliability. Moreover, using AI can raise data privacy and security issues, as banks need to ensure that they are using customer data in a way that complies with applicable regulations (Kshetri, 2020).
- **Regulatory response to AI adoption:** Regulators are responding to the challenges of AI adoption by developing new guidelines and regulations. For example, in 2020, the Basel Committee on Banking Supervision issued a report on using AI in financial services, emphasizing the importance of governance and risk management in AI adoption. In the same vein, regulations such as the General Data Protection Regulation (GDPR) in the European Union include stipulations that govern AI and automated decision-making systems (European Commission, 2018).

Case studies

Several case studies demonstrate the impact of AI adoption on regulatory compliance in the banking sector, both in terms of efficiency improvements and the emergence of new regulatory challenges.

1. **JPMorgan Chase**: The bank developed a system called COiN that employs machine learning algorithms to automate the review of legal documents. By reducing the time required for compliance checks from 360,000 hours to just a few seconds, COiN has significantly improved compliance efficiency (Wang & Zhang, 2020).
2. **Danske Bank**: The bank has used AI to automate Anti-Money Laundering (AML) checks. This has reduced the number of false positives and improved the accuracy of compliance checks (Liao, 2020).

3. **HSBC**: The bank has employed AI to enhance its ability to detect money laundering and financial crime. Through AI-driven transaction monitoring, HSBC has identified suspicious activity better and improved its compliance with AML regulations (Qi & Qi, 2019).
4. **Deutsche Bank**: Deutsche Bank implemented an AI-based system to monitor its communications and identify potential compliance breaches, such as insider trading or market manipulation. The system has improved the bank's ability to detect and prevent compliance breaches, reducing regulatory risk (Miguel et al., 2019).

While AI adoption in the banking sector has helped improve compliance efficiency and accuracy, it has also created new regulatory challenges related to transparency, explain ability, and data privacy. Regulators are working to address these challenges by developing new guidelines and regulations to govern AI adoption in the banking sector.

For example, the European Commission has proposed regulations for AI systems, including those used in the financial sector, to ensure transparency, accountability, and the protection of individuals' rights (European Commission, 2021). Similarly, the US Federal Reserve has issued guidance on using AI in banking, emphasizing the importance of sound risk management practices and adherence to existing regulations (US Federal Reserve, 2021).

2.20 Prospect of AI in the banking realm

The potential and prospects of AI in the banking sector are truly intriguing and hold great promise. Below are some anticipated transformations that AI is poised to bring to the future of banking:

- **Enhanced customer experience:** AI is poised to become a crucial element in enriching the client experience within the banking industry. Customers can interact with banks through AI-powered chatbots, voice assistants, and other conversational interfaces, providing a more natural and intuitive experience (Qi & Qi, 2019). AI will also enable banks to personalize services based on customer preferences, history, and behaviour, providing a more customized experience. For example, banks may use AI to provide personalized investment advice, automated budgeting tools, and predictive alerts that notify customers of potential issues or opportunities.
- **Improved risk management:** The future of AI in banking offers numerous benefits and opportunities, including:

1. Improved risk management: AI will enable banks to assess risks more accurately and detect fraud by analysing large amounts of data and identifying patterns and anomalies. This will help banks respond to risks more quickly and reduce the likelihood of financial losses and reputational damage (Bertino et al., 2021).
2. Enhanced productivity and reduced costs: AI is set to simplify procedures and automate mundane tasks, resulting in heightened productivity and substantial cost reductions.
3. Evolution of services and offerings: AI will equip banking institutions to create state-of-the-art products and services that cater more effectively to client needs. Examples may include AI-driven financial advising tools, personalized investment counsel, and unique credit rating models.
4. Strengthened alliances with fintech and startup companies: The rising importance of AI in the banking sector will inspire banking entities to collaborate more with fintech firms and startups, harnessing their proficiency to forge new services and offerings, while granting startups access to resources and clientele.

2.21 Data quality and data management in the banking sector

The quality and management of data play a crucial role in successfully adopting AI in the banking sector (McKinsey & Company, 2018). Accurate and comprehensive data are essential for training and testing AI models and ensuring they comply with regulatory requirements. Proper data management is critical for protecting and using sensitive customer information by applicable regulations. Banks must have policies and procedures to govern customer data collection, storage, use, and sharing (Norton Rose Fulbright, 2018).

In the banking sector, data quality is fundamental for AI models to function effectively (McKinsey & Company, 2018). Poor data quality can lead to inaccurate predictions and recommendations by AI models, which can have severe consequences for banks and their customers. Therefore, banks must ensure that their data is accurate and up-to-date. Moreover, data governance practices are essential for addressing ethical issues related to using customer data in AI (Norton Rose Fulbright, 2018).

Regulatory requirements related to data quality and management are increasing in the banking sector (NY Department of Financial Services, n.d.). For example, the GDPR in the European Union imposes strict requirements on collecting, storing, and using customer data. Similarly, the NYDFS Cybersecurity Regulation requires banks to implement robust data governance and security controls.

Several case studies demonstrate the importance of data quality and management in AI adoption in the banking sector. For instance, BBVA, a Spanish bank, has implemented a data quality control process to ensure the accuracy of its AI-powered tool called PayStats, which uses transaction data to provide merchants with insights into their sales patterns. Similarly, HSBC, a UK-based bank, has implemented a data governance framework to ensure that its AI models are used in compliance with applicable regulations.

Data quality and management are essential for successful AI adoption in the banking sector. Banks must ensure their data is accurate, complete, and up-to-date and comply with regulatory requirements related to data governance and security. This will shape the future of AI adoption in the banking sector.

2.22 AI adoption in the banking sector in Norway

The adoption of AI in the banking sector in Norway is on the rise, and it has brought about several benefits. However, there are concerns about the level of trust in the technology, which can impact the adoption rate.

AI plays a key role in revolutionizing e-banking by enhancing the customer experience through personalized and streamlined services. Chatbots enable banks to quickly address customer inquiries, fostering customer satisfaction and loyalty (Soltani et al., 2021). AI also empowers banks to proactively identify and thwart potential fraudulent activities, safeguarding financial well-being and minimizing losses.

Banks need to be transparent about their use of AI and the data they collect, as well as assure customers that their data is being used for legitimate purposes and that AI-powered systems are reliable and secure. To overcome these challenges, banks need to be transparent about their use of AI and the data they collect, as well as assure customers that their data is being used only for legitimate purposes. Banks can also invest in educating their customers about the technology to increase trust in AI-powered systems. This can help customers understand how AI works and how it can benefit those (Tufte et al., 2020). By providing clear and concise

information, banks can help customers feel more comfortable using AI-powered systems and increase adoption rates.

Overall, while there are concerns about the level of trust in AI-powered systems in the banking sector in Norway, the benefits of the technology are clear. With transparency, education, and a focus on reliability and security, banks can increase trust in AI and encourage greater adoption.

2.23 Future Directions for AI Adoption in Banking

AI adoption in the banking sector is expected to significantly impact customer experience, risk management, efficiency, and cost savings. AI will enable banks to personalize services based on customer preferences, history, and behaviour, providing a more customized experience. AI will also help banks better manage risk by providing more accurate risk assessments and fraud detection capabilities. Additionally, AI-powered compliance monitoring tools will help banks stay updated with regulatory requirements. Finally, AI will help banks streamline processes and automate repetitive tasks, increasing efficiency and cost savings (Drewnowski & Goh, 2021).

AI-powered credit scoring models may allow banks to extend credit to underserved populations and reduce reliance on traditional credit scoring models. Additionally, AI-powered chatbots and virtual assistants will allow banks to offer new forms of financial education and support. Overall, the future of AI in the banking sector is expected to bring significant benefits to both banks and customers by enhancing the customer experience, improving risk management, increasing efficiency, developing new products and services, and collaborating with fintech and startups (Bahillo et al., 2016).

2.24 Conclusion

Trust is a key factor in the adoption of AI technology in the banking sector. Customers who trust AI technology are more likely to adopt it, while those who do not trust it are less likely. Trust is necessary for successful adoption of AI technology in the banking sector. Banks can build trust among their customers by increasing customer awareness of the benefits of AI technology, ensuring that the use of the technology is guided by ethical considerations, and using the technology to enhance the customer experience (Munoko et al., 2020).

AI has revolutionized the banking sector and has the potential to provide numerous benefits to customers (Wang, Xue, & Zheng, 2020). However, trust is essential to the adoption of AI in e-banking. Banks must be transparent, reliable, and secure to build trust with their customers. Factors affecting trust include the perceived benefits of AI, the degree of control customers have over their data, the transparency of the AI system, and the perceived risk of AI.

The adoption of AI in the banking sector has the potential to revolutionize the industry. However, the successful adoption of this technology is dependent on customers' trust in AI. Trust is influenced by several factors, including perceived risk, knowledge, experience, explain ability, and ethics. To build trust in AI, it is crucial to address these factors and ensure that customers understand how the technology works and why it makes certain decisions (Munoko et al., 2020; Wang, Xue & Zheng 2020). By addressing these factors, the banking sector can successfully adopt AI and provide customers with a better banking experience.

3 CONCEPTUAL MODEL AND HYPOTHESES

In this chapter, I created a research model based on different testable hypotheses and important theoretical foundational notions in order to be able to respond to the research topic.

3.1 Research Model

A research model serves as a framework that guides the research process and helps structure the study. It outlines the research design, variables, relationships between variables, and data collection and analysis methodology. The research model allows us to systematically investigate the role of trust and the adoption of artificial intelligence (AI) in the e-banking sector. It identifies the key concepts, variables, and relationships relevant to the research topic. For example, to consider trust as an independent variable and the adoption of AI in the e-banking sector as a dependent variable and explore how trust influences the adoption of AI (Grant & Osanloo, 2014).

The proposed study model for this research endeavours to explore the elements that contribute to establishing trust in the implementation of AI in Norway's banking sector. It further aims to conduct an organized and methodical examination of the interplay between trust and the assimilation of AI technologies in the realm of e-banking (Ramesh et al., 2020). The research model will be tested using quantitative research methods such as surveys and statistical analyses. Data will be collected from customers and stakeholders in the banking sector in Norway. SEM techniques will be used to analyse the data and test the proposed research model. The findings will help banks and policymakers enhance trust in AI adoption and facilitate its successful implementation.

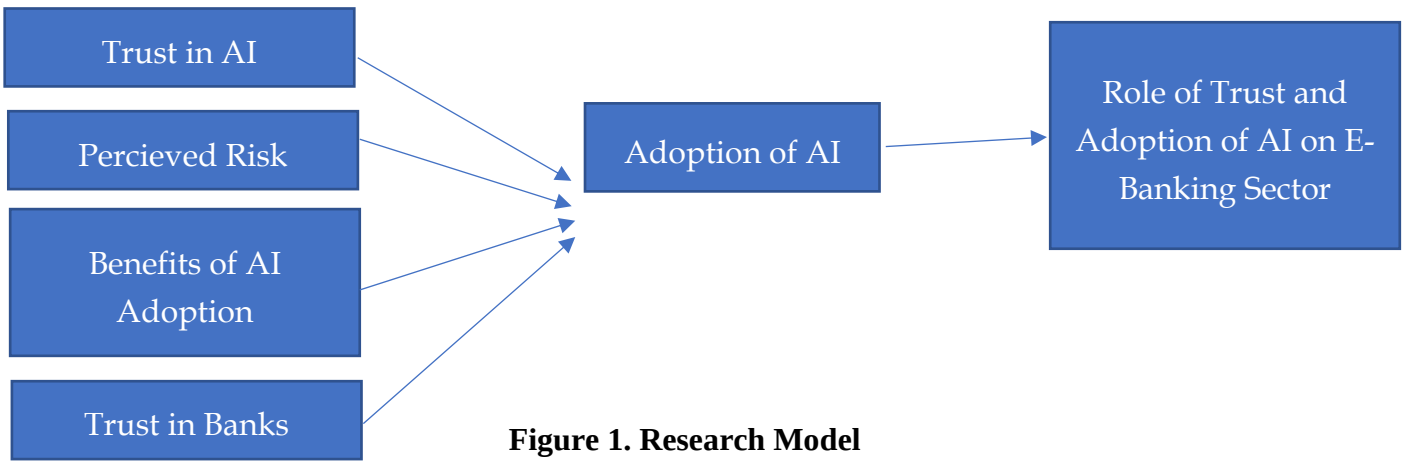

Figure 1. Research Model

3.2 Hypotheses

The following hypotheses can be formulated:

H1: Perceived risks associated with AI adoption in the banking sector in Norway will harm trust in AI.

It proposes that if individuals perceive risks associated with adopting AI in the banking sector in Norway, it will negatively impact their trust in AI (Noreen et al., 2023). Perceived risks may include concerns about data privacy, security, ethical implications, and potential job displacement due to AI adoption.

H2: Benefits of AI adoption in the banking sector in Norway will positively impact trust in AI.

This hypothesis suggests that if individuals perceive the benefits of AI adoption in the banking sector in Norway, such as improved efficiency, convenience, and customer service, it will positively impact their trust in AI (Rahman et al., 2021). Perceived benefits are expected to enhance trust in the technology.

H3: Trust in banks in Norway will positively impact trust in AI.

It proposes that individuals with higher trust in banks in Norway will also have higher trust in AI. Trust in banks is considered a precursor to trust in AI, as individuals may transfer their trust from banks to the technology they adopt (Zhang et al., 2018).

H4: Trust in AI will positively impact AI adoption intention in Norway.

The hypothesis posits that individuals with greater trust in AI are likely to exhibit a stronger inclination towards adopting AI in Norway's banking sector. It is anticipated that trust in AI would have a beneficial impact on adoption intent, given that individuals tend to embrace technologies they find trustworthy (Lee & Chen, 2022).

4 RESEARCH APPROACH

This chapter presents a philosophical viewpoint, the data collection and analysis techniques I employed to address the above research question. I will first discuss my philosophical viewpoint, followed by this thesis. The overarching research strategy is presented in the second section, followed by design for the quantitative portion of the study.

This chapter gives a philosophical perspective as well as the methods I used for data collecting and analysis in order to respond to the aforementioned research topic. I'll go through my philosophical stance before I get into this thesis. The design for the quantitative part of the study is described in the second section after the overall research approach.

4.1 Philosophical Perspective

The philosophical perspective underpinning this thesis is positivism. Understanding the philosophical perspective is essential, as it provides a foundation for the research design, data collection, and interpretation of results (Crotty, 1998). In this section, I discuss the essential tenets of positivism and explain how it informs the research process.

Positivism is a philosophical perspective that asserts that knowledge can be obtained through objective, empirical observations and scientific methods. This perspective is based on the belief that the social world, like the natural world, follows observable and measurable patterns. Positivism emphasizes the importance of systematic observation, experimentation, and quantifiable data to derive conclusions about the studied phenomena (Gartrell & Gartrell, 2002).

The choice of positivism, (Babbie, 2020), for this research is based on several factors:

1. **Objective and systematic approach**: Positivism provides a structured and systematic approach to research, essential for understanding the complex relationships between variables, such as trust in AI, perceived risks, benefits, and adoption intention in the e-banking sector (Bhattacherjee, 2012).
2. **Quantifiable data:** Positivism emphasizes the collection of quantifiable data, which allows for measuring variables, and allows testing hypotheses (Park et al., 2020). This research aims to discern the determinants affecting trust towards AI adoption and explore the dynamics of their interrelations.

3. **Generalizability:** Positivism allows generating generalizable findings, which can be applied to other contexts and settings. It is crucial in the context of this research, as it seeks to provide insights into trust in AI adoption in the banking sector, which can be helpful for banks, policymakers, and other stakeholders involved in developing and implementing AI-powered e-banking services.
4. **Rigor and transparency:** Positivism emphasizes the importance of rigor and transparency in the research process, ensuring that the methods used are systematic, replicable, and verifiable. This study, which aims to offer evidence-based insights into the elements impacting trust in AI adoption in the banking sector, is especially crucial (Bryman, 2016).

4.2 Research Design

The methodology for this study will adhere to a numeric strategy underpinned by a positivist philosophical viewpoint. This entails elements such as sample selection, gathering of data, its subsequent analysis, along with considerations for validity, reliability, and ethics. This approach is apt for methodically exploring connections between variables, testing hypotheses, and deriving results that can be generalized (Igwenagu, 2016). In this section, I outline the research design for this thesis:

1. Sampling
2. Data Collection
3. Data Analysis
4. Validity and Reliability
5. Ethical Considerations

4.3 Quantitative Approach

A survey approach is used to collect data from a larger pool of respondents and systematize it in a standardized and quantifiable way. This technique helps create a broad grasp of a topic where there needs to be more prior research, as well as being able to evaluate assumptions and research models. A questionnaire is chosen to gather data about customers' perceptions,

providing insights into the factors influencing trust in AI adoption in the banking sector (Dillman et al., 2016).

4.3.1 Constructs

The model consists of several key constructs, a construct refers to an abstract concept or theme that one aims to evaluate or measure through the use of survey queries. It's a theoretical concept that isn't directly observable but can be inferred from observable and measurable characteristics or behaviors (Battaglia et al., 2008), as follows:

1. **Trust in AI:** This construct represents the overall perception of trust that customers and stakeholders have toward adopting AI in the banking sector in Norway. It encompasses dimensions such as perceived reliability, integrity, benevolence, and competence of AI systems (Ramesh et al., 2020).
2. **Perceived Risks:** This construct refers to the potential risks or negative consequences of using AI in the banking sector. It includes data privacy, security, ethics, and transparency concerns (Noreen et al., 2023).
3. **Benefits of AI Adoption:** This construct represents the perceived benefits or advantages of using AI in the banking sector in Norway. It includes improved efficiency, cost savings, enhanced decision-making, and customer experience (Rahman et al., 2021).
4. **Trust in Banks:** This construct represents customers' and stakeholders' overall trust toward banks as financial institutions in Norway. It encompasses reliability, competence, integrity, and customer-oriented services banks provide (Zhang et al., 2018).
5. **AI Adoption Intention:** This construct refers to the intention of customers and stakeholders to adopt AI in the banking realm in Norway. It will be measured using a Likert scale (Matsepe & van der Lingen, 2022).

These constructs will be employed to answer this thesis's research question. These constructs represent the abstract ideas, underlying themes, or subject matters that will be measured using survey questions in the study (Fuchs & Diamantopoulos, 2009). The research can systematically investigate the relationships between these factors and their impact on AI adoption in the banking sector by measuring these constructs through survey questions.

4.3.1.1 First and Second-Order Constructs

In this thesis, first-order constructs refer to the specific dimensions or elements that have a direct impact on the higher-level construct, which in this case is trust in AI and the intention to adopt AI in the e-banking sector (Aldas-Manzano et al., 2011). These constructs are directly linked to the main outcome of interest, namely, the adoption of AI in banking. As described by Van Riel and colleagues (2017), these primary components exert direct influence on the overarching construct. These include:

1. Trust in AI
2. Perceived Risks
3. Benefits of AI Adoption
4. Trust in Banks

In the context of this research, the second-order construct, Demographic Variables, exerts an indirect impact on the outcome, which is the adoption of AI in banking. These variables function as a moderating factor, altering the relationship between the first-order constructs and the dependent variable. They potentially shape individuals' perceptions of risk, benefits, trust in banking institutions, and trust in AI, thereby influencing their willingness to embrace AI in e-banking (Sinha & Mukherjee, 2016). This study strives to offer a holistic view of the elements that drive trust in AI adoption within the banking sector, particularly focusing on how individual attributes might influence these dynamics (Huang et al., 2022).

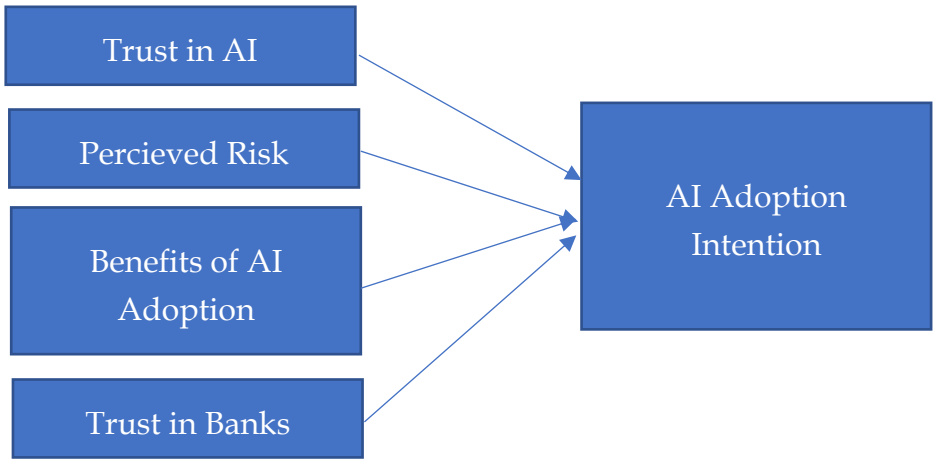

Figure 2. Conceptual framework

4.3.1.2 Construct Quality Assurance

To guarantee respondents' comprehension of the questionnaire, a considerable amount of time was invested in quality assurance. In an attempt to cater to a larger pool of potential respondents, the survey was made available in both Norwegian and English. It was crucial to ensure that the language used in the questionnaire was straightforward and that the meaning of each item was consistent across both languages.

4.3.2 Data Collection

Data will be collected using a structured questionnaire comprising multiple sections (Jones et al., 2013). The questionnaire will include items related to the key constructs of the research model (trust in AI, perceived risks, benefits of AI adoption, trust in banks, AI adoption intention, and demographic variables). Items will be measured on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture participants' perceptions and attitudes. The questionnaire will be pilot-tested for clarity, reliability, and validity before being administered to the primary sample. Data collection will be conducted online, using platforms such as Google Forms or SurveyMonkey, to reach a large and diverse sample of participants.
The questionnaire will be administered to customers and stakeholders in the banking sector in Norway, specifically targeting those with experience or knowledge of AI-powered e-banking services.

4.3.2.1 Structure of the Questionnaire

1. Introductory page: An informative page with information about who I am, the study, the topic, who is supervising the study, and how I will treat the data collected.
2. Demographic Information: This section will collect primary demographic data.
3. Trust in AI: This section will include questions measuring various dimensions of trust in AI.
4. Perceived Risks: This section will include questions measuring the different dimensions of perceived risks associated with AI adoption.

5. Benefits of AI Adoption: This section will include questions measuring the different dimensions of benefits associated with AI adoption.
6. Trust in Banks: This section will include questions measuring the dimensions of trust in banks.
7. AI Adoption Intention: This section will include questions assessing the level of intention to adopt AI in the banking sector.

I kept the questionnaire anonymous to reach a broader population but added an option for respondents to add their email addresses if they were interested in the results (Jones et al., 2013).

4.3.2.2 Format of the Questionnaire

The questionnaire will be constructed using Likert scale items, multiple-choice questions, and open-ended inquiries to measure agreement or disagreement with assertions relevant to constructs (Malhotra, 2006).

4.3.2.1 Sampling Method

The target population for this study consists of customers and stakeholders in the banking sector in Norway. A random sampling technique will ensure that a representative population sample is obtained (Emerson, 2015). Participants will be recruited through online platforms, social media, and bank customer databases, with their consent.

This technique segments the population into distinct clusters (strata) based on particular demographic features, like age and gender, and then randomly selects members from each cluster. This stratified approach ensures the sample adequately mirrors the larger population, thereby helping to minimize sampling bias (Howell et al., 2020).

Demographic variable	
Gender	Female
	Male
	Prefer not to say

Age	18-25
	26-35
	35-45
	46-55
	56-65

Table 1. Descriptives Statistics of Survey Respondents

By following this data collection procedure, the thesis will gather relevant and reliable data to test the proposed research model and hypotheses, allowing for a comprehensive understanding of trust in AI adoption in the banking sector in Norway.

4.3.3 Data Analysis

The gathered data will undergo examination via descriptive and inferential statistics along with structural equation modelling (SEM) methodologies. Descriptive statistical tools, including means, standard deviations, and frequency distributions, will offer a summarized view of the data and delineate the traits of the sample. Inferential statistics, such as correlation and regression analyses, will investigate the interrelations among variables and evaluate the research hypotheses. SEM will be utilized to gauge the comprehensive fit of the research model and evaluate the immediate and mediated impacts of the constructs on AI adoption intent (Awang et al., 2016).

4.3.4 Validity and Reliability

To secure the legitimacy and consistency of the research conclusions, various measures will be implemented across the research progression. For example, the survey will undergo a pilot test to confirm its credibility and dependability. Additionally, the data analysis techniques, such as SEM, will be rigorously applied to confirm the robustness of the findings. Any potential limitations or biases in the research design will be acknowledged and addressed in discussing the results (Kimberlin & Winterstein, 2008).

4.3.5 Ethical Considerations

Throughout the research, I will adhere to ethical standards which include acquiring informed consent from all participants, safeguarding their anonymity and privacy, and proactively mitigating any potential distress or discomfort that may arise from their involvement in the research. Ethical approval will be sought from the relevant institutional review board before commencing the data collection process (Jones et al., 2013).

4.3.6 Evaluating the Measurement (outer) Model

In this study, the reflective measurement model is employed to evaluate the unseen variables, also referred to as latent variables or constructs. In a reflective measurement model, it's postulated that the latent variables are the cause of the observable variables, known as indicators. In other words, the variation in the latent variables leads to variations in the observed variables. This model is suitable for this thesis because it captures the multiple dimensions of each construct and allows for a comprehensive understanding of the relationships between the constructs (Bollen & Hoyle, 2012).

For each construct, several items (survey questions) will be developed to measure the different dimensions of the construct. The reflective measurement model is appropriate for this thesis because:

1. The constructs, such as trust in AI, perceived risks, and benefits of AI adoption, are multi-dimensional, and multiple items are needed to capture the various aspects of each construct.
2. The items are expected to be correlated because they are manifestations of the same underlying construct.
3. Any changes in the latent variable would lead to changes in the observed variables.

4.3.7 Evaluating the Structural (inner) Model

The Partial Least Squares Structural Equation Modelling (PLS-SEM) approach is used in this study to assess the internal structure of the model. This technique, which is variance-based, is apt for intricate models composed of multiple constructs and associations. PLS-SEM is

particularly useful when the aim is to predict and elucidate the relationships among constructs, assess the integrity of the research model, and provide sturdy results that can address the research question and corroborate the hypotheses (Hair Jr et al., 2017).

The PLS-SEM approach has several advantages, (Sarstedt et al., 2014), in the context of this thesis:

1. It can handle small sample sizes and non-normal data, which makes it suitable for the data collected through surveys in this study.
2. It is a flexible technique that can accommodate reflective and formative measurement models, allowing for using different types of constructs in the research model.
3. It is focused on predicting and explaining relationships between constructs, making it well-suited for testing hypotheses and understanding the causal relationships in the research model.
4. Using PLS-SEM, the thesis will be able to estimate and test the relationships between the constructs, assess the quality and explanatory power of the research model.

5 RESULTS AND ANALYSIS

The following chapter has been developed with the motivation to provide comprehensive information regarding the results extracted from the data collected. Since the data has been collected using the survey in numerical form, and as mentioned in the methodology, the statistical analysis has been carried out. There are two main sections in which the overall analysis has been divided to evaluate about how the independent variables (Trust in Ai, Perceived Risk, Benefits of AI Adoption and Trust in Banks) have a relationship with the dependent variable (AI adoption intention). In that possibility the main influence has been related to the consideration of two different analysis techniques, one is the Correlational Analysis and the other is the Regression Analysis.

Both of These techniques serve two main options differently, but on the collective note the evaluative results have worked on the respective analysis regarding what influence the intention of people for utilizing the AI-based services within the banking sector. The findings from these two techniques have been provided below to provide an effective evaluation regarding the influence or relationship of independent variables with the dependent one respectively. The chapter also included an overall summary of the findings evaluated to provide a compressive overview regarding the results, so that the discussion in the next chapter should develop the effective understanding regarding the results achieving the research objectives and explaining about the research hypothesis.

5.1 Correlational Analysis

The initial segment of the analysis probes the connections between the independent variables and their respective dependent variables. This is achieved through the utilization of statistical tools that explore these relationships. In essence, this analytical tool is a robust framework that primarily measures the potency of the correlation between the variables in question. Correlational analysis is used to evaluate the relationship between independent and dependent variables. Finding the level of association between the independent and dependent variables is one of the main goals of correlational analysis. The dependent variable (AI adoption intention) and the independent variables (Trust in AI, Perceived Risk, Benefits of AI Adoption, and Trust in Banks) have been correlated and analysed.

To provide a more comprehensive evaluation, the current analysis has been refined to accurately depict the nuanced relationship between the dependent and independent variables. The assessment of magnitude typically employs suitable scales such as weak, moderate, and strong association, evaluated based on the value of the Pearson Coefficient. There are three potential relationships with a Pearson Coefficient value falling within the spectrum of 0 to 1. The scale for weak association ranges from 0-0.3, for moderate association, it ranges from 0.4-0.7, and for strong association, it spans from 0.7-1.0. The correlation table displayed below utilizes the Pearson Coefficient values to assess the structure, as further detailed in the corresponding research.

Table 02. Correlations

		Trust in AI	Perceived Risks	Benefits of AI Adoption	Trust in Banks	AI Adoption Intention
Trust in AI	Pearson Correlation	1	.811**	.805**	.779**	.717**
	Sig. (2-tailed)		0	0	0	0
	N	300	300	300	300	300
Perceived Risks	Pearson Correlation	.811**	1	.967**	.960**	.930**
	Sig. (2-tailed)	0		0	0	0
	N	300	300	300	300	300
Benefits of AI Adoption	Pearson Correlation	.805**	.967**	1	.966**	.916**
	Sig. (2-tailed)	0	0		0	0
	N	300	300	300	300	300
Trust in Banks	Pearson Correlation	.779**	.960**	.966**	1	.885**

	Sig. (2-tailed)	0	0	0		0
	N	300	300	300	300	300
AI Adoption Intention	Pearson Correlation	.717**	.930**	.916**	.885**	1
	Sig. (2-tailed)	0	0	0	0	
	N	300	300	300	300	300

The table offers an assessment of the relationship between independent variables and the intention to adopt AI, facilitating a more detailed understanding of potential impacts. In that consideration the basic association has been related with the factor Trust in AI which has the respective values of 0.717 in correlation with the AI adoption intention. Now as the value is in between the range of 0.7-1.0 which is the range for strong association. Thus, the evaluation set the respective evaluation that there is a strong association in between the two variables. There are three remaining variables, and these are the perceived risks, benefits of AI adoption and the trust in banks. The values of correlational for these are .930, .916 and .885. All of these are in the range of 0.7-1.0 which shows that the respective evaluation revolves around the consideration of association in between 0.7-1.0 securing the place of strong association. Now here is one thing which is important to consider in the following evaluation and that is the positive relationship between the independent and dependent variables as the values of Pearson Coefficient are positive. Moreover, the positive value means that the relationship between the variables is direct. It can be said that based on these considerations the respective evaluation regarding the impact is also positive respectively. The analysis has been carried out regarding the association in between the variables, along with the relationship and positive influence has been evaluated. But in order to evaluate regarding the significance of impact the regression analysis has been carried out.

5.2 Regression Analysis

In the present research, regression analysis was utilized to examine the relative significance of the relationship between dependent and independent variables. The correlational analysis indicated a strong association between all independent variables (Trust in AI, Perceived Risk,

Benefits of AI Adoption, and Trust in Banks) and the dependent variable, AI Adoption Intention. Although the impact of these variables on AI Adoption Intention has been identified as both direct and positive, regression analysis was conducted to determine the significance of each variable's impact.

The regression analysis is comprised of three specific components: the Model Summary, the ANOVA (Analysis of Variance), and the Coefficients table. The Model Summary provides an overview of the influence that independent variables exert on the dependent variable, enabling an initial evaluation of the included models. The ANOVA table offers a detailed appraisal of the appropriateness of the research model in the context of the conducted regression analysis. Lastly, the Coefficients table discerns the magnitude of influence each variable holds; some may have a substantial impact, others may have a minimal one.

The first part of the regression analysis, the Model Summary, assesses how effectively the dependent variables are influenced by independent factors. This is done through the evaluation of the R-square value, which demonstrates the proportion of variance in the dependent variable that is predictable from the independent variables. The R-square value in the following table is 0.881, which translates into 88.1% when expressed as a percentage. This indicates that the independent variables account for 88.1% of the variation in AI Adoption Intention, the dependent variable. This percentage provides a precise measure of the extent to which the dependent variable's variation can be explained by the independent variables during the research.

Tabel 3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939[a]	.881	.880	.363009905405389

a. Predictors: (Constant), Trust in Banks, Trust in AI, Perceived Risks, Benefits of AI Adoption

The second part of the regression analysis, the ANOVA table, focuses on the statistical significance of the overall model by evaluating the p-value (also known as significance level). The threshold for the p-value is typically set at 0.05. A p-value less than or equal to this threshold indicates a statistically significant result. In this analysis, the p-value is 0.000, meaning it falls below the threshold, indicating that the regression model is statistically

significant for predicting AI Adoption Intention based on the independent variables (Trust in AI, Perceived Risk, Benefits of AI Adoption, and Trust in Banks). In simpler terms, the research model developed is found to be an effective tool for regression analysis, taking into account the given independent variables.

Tabel 04. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	288.241	4	72.060	546.839	.000[b]
	Residual	38.874	295	.132		
	Total	327.115	299			

a. Dependent Variable: AI Adoption Intention

b. Predictors: (Constant), Trust in Banks, Trust in AI, Perceived Risks, Benefits of AI Adoption

Table of Coefficients in this part, which considers regression analysis, is where the significance value is employed. The threshold value is 0.05, and the value of significance is evaluated for less than or equal to that number. There are four independent components: Trust in Ai, Perceived Risk, Benefits of AI Adoption and Trust in Banks. All of these variables have the Sig. values at 0.000 which enlightened about the concept that on the basic consideration all variables have the significant impact on the AI-Adoption Intention. These variable values have been identified significant as the values 0.000 is less than the Threshold value. It implies that within the banking sector these variables Trust in Ai, Perceived Risk, Benefits of AI Adoption and Trust in Banks have been influencing the AI-adoption intention among the people.

There are varieties of observations that can be included in this aspect, as the considered structured possibility can be orientated for the side of banking organisations as well. The Trust consideration for the AI-adoption intention is important, as the developments should be maintained for the increased awareness of the people regarding the benefits of AI and its reliability for trust ensuring. The perceived risk are also important in this approach, as the people should be aware of the aligned risks and organisations should work on the reducing the impact or chances for risks with which the enhanced operations can be maintained regarding the operational utilization for the Adoption intention respective. The Trust in banks is another

factor with positive and significant impact and it shows that banks themselves should have a better reputation in the society.

Tabel 5. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.204	.047		-4.381	.000
	Trust in AI	-.161	.040	-.138	-3.965	.000
	Perceived Risks	.938	.093	.891	10.085	.000
	Benefits of AI Adoption	.517	.099	.494	5.231	.000
	Trust in Banks	-.373	.093	-.340	-4.008	.000

a. Dependent Variable: AI Adoption Intention

5.3 Hypothesis Evaluation

H1: Perceived risks associated with AI adoption in the banking sector in Norway will harm trust in AI.

This hypothesis has been identified as positive in nature and implication, as from the correlational analysis it has been identified that there is a strong association in between the AI intention and the Perceived Risk Association. Moreover, the trust in AI is also strongly associated with the Perceived Risk as the value of Pearson Coefficient is 0.811. Thus, it can be said that the perceived risk associated with the AI adoption in banking sector has an influence on the trust of people in AI in Norway.

H2: Benefits of AI adoption in the banking sector in Norway will positively impact trust in AI.

This hypothesis has also been evaluated as positive, as the benefits of AI adoption has been evaluated as strongly associated with the AI adoption intention. In that the adoption intention

is strongly associated with the trust in AI, so it can be said that based on that respective evaluation the benefit of AI adoption in the banking sector of the Norway will influence positively on Trust in AI. This will be positive in nature, with respect to the regression analysis, as these variables have been identified as significant in impact in between the AI adoption intention and the Trust in AI.

H3: Trust in banks in Norway will positively impact trust in AI.

The trust in banks in Norway will positively impact trust in AI, as the following consideration has been evaluated as positive in nature. This is based on the consideration that the trust in banks has been strongly associated with the AI adoption intention with which the trust in AI has also been evaluated as strongly associated with positive and direct relationship. Afterwards, with the regression analysis it has been evaluated that the trust in AI and the Trust in Banks all have been identified to have a significant impact on the AI adoption intention. Moreover the trust in AI has been identified in strong association with the trust in banks ensuring that trust in Banks in Norway will impact the trust in AI.

H4: Trust in AI will positively impact AI adoption intention in the banking sector in Norway.

The following hypothesis has been identified as positive, as form the evaluations of regression analysis it has been observed that trust in AI has been identified to have a strong influence and significant impact in the AI adoption intention. Based on these possibilities the main identification has been associated with the consideration of increased, positive and significance influence on the AI adoption intention.

6 DISCUSSION

The discussion chapter is designed to comprehensively interpret the findings, relating them back to the original research objectives and hypotheses. Its navigation through each independent variable - Trust in AI, Perceived Risk, Benefits of AI Adoption, and Trust in Banks - commences, discussing their respective influence on the dependent variable, AI adoption intention, in the context of the Norwegian banking sector. The discussion on these variables involves carefully exploring their associations and implications derived from the results and comparing them to existing literature and studies. Each hypothesis is revisited, dissecting the validation or contradiction found in the results. The practical implications of these findings, particularly for banking institutions in Norway, become the subsequent point of discussion.

6.1 AI Adoption Intention

My findings related to AI adoption intention were quite revealing. The dependent variable, AI adoption intention, represented the inclination of banking customers in Norway to use AI-assisted services in banking operations. The study found that this intention is notably influenced by four significant independent variables: Trust in AI, Perceived Risk, Benefits of AI Adoption, and Trust in Banks.

Trust in AI emerged as a significant factor influencing AI adoption intention, as established by a Pearson Coefficient value of 0.717. This underlines a positive correlation, emphasizing that the higher the trust in AI, the higher the adoption intention. This finding aligns well with existing literature, such as the work of (Lu et al., 2018), where trust was determined to be a critical factor influencing the acceptance of AI.

Perceived risk, with a Pearson Coefficient value of 0.930, indicated a strong correlation with AI adoption intention. This factor's high value signifies the substantial role of perceived risk in determining whether customers are ready to adopt AI in banking. This is consistent with studies such as (Moqbel & Bartelt 2015), which also found a perceived risk to influence the acceptance of new technologies significantly.

Next, the Benefits of AI Adoption showcased a strong correlation with a Pearson Coefficient value of 0.916. This asserts that the perception of AI's benefits plays a significant role in encouraging AI adoption intention. When perceived as enhancing banking efficiency or value,

the benefits stimulate adoption. This finding echoes the studies of (Bagozzi et al., 1999), where the perceived benefits significantly determined AI adoption in retail banking.

Finally, Hypothesis 4 posits that trust in AI will positively impact AI adoption intention in the banking sector in Norway. The strong association between trust in AI and AI adoption intention validates this hypothesis. Thus, Hypothesis 4 is confirmed, stressing the importance of fostering trust in AI for its widespread adoption in the banking sector.

All four hypotheses were validated, suggesting that perceived risk, perceived benefits, trust in banks, and trust in AI are all significant variables in influencing AI adoption intention in the banking sector. These findings have important implications for banks, suggesting that addressing perceived risks, highlighting AI benefits, and fostering trust in banks and AI can encourage greater AI adoption.

Lastly, Trust in Banks is also strongly associated with AI adoption intention, exhibiting a Pearson Coefficient value of 0.885. Thus, highlighting how customer trust in their banks directly affects their willingness to adopt AI-based banking services. These findings inform banks, policymakers, and researchers about the key factors influencing AI adoption in banking and can inform strategic decisions to promote AI adoption.

6.2 Trust in AI

In the results, the role of Trust in AI was significant in influencing the AI adoption intention in banking. With a strong Pearson Coefficient value of 0.717, the relationship between these variables was direct and robust. This suggests that the greater the trust in AI among the bank's clientele, the higher the intention to adopt AI-based services.

In this context, trust in AI can be understood as the user's belief in the reliability, integrity, and competence of the AI system being used. When customers trust AI, they are more inclined to use banks' AI-driven services. This trust can be shaped by various elements, including the user's understanding of AI, previous experiences with AI services, and their perception of the AI's transparency and fairness.

Evaluating the hypotheses formulated for this study gives us comprehensive insights into the variables influencing AI adoption intention in the banking sector. Hypothesis 1, which posits that perceived risks associated with AI adoption in the banking sector in Norway will harm trust in AI, I find a strong correlation of 0.811 between perceived risks and trust in AI. This suggests that as perceived risks increase, trust in AI decreases, and vice versa. Thus, Hypothesis

1 is validated, indicating that mitigating perceived risks can enhance trust in AI, leading to a higher likelihood of AI adoption.

This finding is consistent with the existing literature on the topic. For instance, in a Venkatesh et al. (2012) study, trust was identified as a critical enabler of AI adoption across various sectors, including banking. My study reinforces this understanding by demonstrating the same trend within the banking industry in Norway.

My study's findings contribute to the growing body of evidence that suggests that trust in AI is an essential determinant of AI adoption. By illustrating this connection in the context of Norwegian banking, it offers valuable insights for stakeholders in this sector. The implication is that building customer trust in AI technology should be a priority in the strategies developed to promote the adoption of AI services in banking. Banks could achieve this by ensuring transparency in AI operations, maintaining data handling integrity, and enhancing AI-driven services' overall reliability.

6.3 Perceived Risk

The analysis revealed a significant and powerful link between Perceived Risk and the intent to adopt AI in the banking sector, as evidenced by a high Pearson Coefficient value of 0.930. According to the correlation analysis, there is a strong and direct correlation between the Perceived Risk and the inclination towards AI adoption. Surprisingly, this suggests that as perceived risk escalates, so does the propensity to embrace AI-driven services in banking. However, this might be explained by the understanding that as the perceived risks increase, people tend to rely more on sophisticated technology like AI to manage these risks.

In this context, perceived risk refers to potentially adverse outcomes. This might include risks related to AI systems' privacy, security, or reliability. Despite these concerns, the high correlation suggests that users are willing to adopt AI due to its numerous benefits that outweigh the perceived risks.

Comparing these findings with the existing literature resonates with previous research but presents a different perspective. Previous studies, such as Lu et al. (2018), have generally argued that high perceived risk can be a barrier to the adoption of new technology, including AI. However, my study offers a different view, suggesting that in certain circumstances, such as in the banking sector, perceived risks can drive the adoption of AI.

This indicates that the influence of perceived risks on AI adoption is multifaceted and can vary based on the context. In a high-stakes environment like banking, where security and financial risks are paramount, the perceived risks associated with AI adoption could potentially spur its adoption rather than hinder it, given that users see AI as a solution to manage these risks.

6.4 Benefits of AI Adoption

The results indicated a strong association between the benefits of AI adoption and AI adoption intention, as suggested by a high Pearson Coefficient value of 0.916. This strong correlation signifies that as the perceived benefits of AI adoption in the banking sector increase, the intention to adopt AI services in the same sector also increases. This is quite intuitive, as users are likelier to adopt a technology that offers significant benefits. The benefits of AI adoption could include improved customer service, personalized banking solutions, better financial advice, risk management, and enhanced operational efficiency.

Hypothesis 2 proposes that the benefits of AI adoption in the banking sector in Norway will positively impact trust in AI. The data support this hypothesis, showing a strong correlation between the perceived benefits of AI adoption and trust in AI. Therefore, Hypothesis 2 is confirmed, emphasizing the need for banks to communicate the potential benefits of AI effectively to increase trust and encourage AI adoption.

The findings align with existing literature, supporting the commonly found link between perceived benefits and technology adoption intention. Several studies, such as Venkatesh et al. (2012), have found that the perceived benefits significantly influence the intention to adopt technology in various sectors, including banking. However, my study adds more value to this body of literature by demonstrating that this relationship holds for AI adoption in banking, a less-explored context in existing studies.

Overall, my findings highlight the importance of effectively communicating the benefits of AI to potential users in the banking sector to promote its adoption. As users become more aware of the potential benefits of AI, they are more likely to express a willingness to adopt AI-based services. Hence, this insight could inform the development of strategies to increase AI adoption in the banking sector.

6.5 Trust in Banks

In my research, the strong positive correlation between trust in banks and AI adoption intention is noteworthy, as highlighted by a Pearson Coefficient of 0.885. This suggests that the higher the trust in banking institutions, the higher the intention to adopt AI technologies within these settings. Trust in banks emerges as a significant factor influencing users' willingness to adopt AI, indicating the fundamental role of trust in the banking sector.

Hypothesis 3, which suggests that trust in banks in Norway will positively impact trust in AI, is also supported by my findings. A potent positive correlation was identified between trust in banks and trust in AI, whereby trust in banks fosters acceptance of new technologies. This verifies Hypothesis 3, emphasizing the instrumental role that trust in banks plays in steering the intention to adopt AI.

Aspects such as the bank's dependability, the security protocols it adopts, its repute, and the quality of customer service it offers could shape trust in banks. When customers hold a bank in high regard, they are more likely to embrace novel services, including those powered by AI. Consequently, bolstering trust within the banking industry can dramatically sway the acceptance of AI-driven technologies.

My findings echo previous research highlighting the role of trust in financial institutions in promoting adopting new technologies. My study contributes to the existing body of knowledge by extending this relationship to AI adoption in the banking sector, a comparatively less investigated domain.

The results from my study underline the importance of fostering trust in banks to encourage the adoption of AI. Thus, banking institutions aiming to improve AI adoption should prioritize strategies to build and maintain customer trust. These strategies could include transparent communication, excellent customer service, and robust security measures to reassure customers about their data safety.

6.6 Practical Implications

The insights gleaned from my research findings carry profound practical implications for Norway's banking sector and possibly other regions globally. My study showed that perceived risks, perceived benefits, trust in banks, and trust in AI are significant determinants of AI

adoption intention in banking. Each factor offers actionable directions for banking institutions to navigate AI implementation effectively.

Firstly, My results underscored the negative relationship between perceived risks and AI adoption intention. This suggests that banks should carefully manage and mitigate perceived risks related to AI. They might consider instituting comprehensive customer education programs to demystify AI technologies, elucidate their working principles, and clarify any misconceptions. Demonstrating a robust data security and privacy framework can also help alleviate customer apprehensions.

Secondly, the positive correlation between the perceived benefits of AI adoption and AI adoption intention highlights the need for banks to communicate the potential advantages of AI effectively. These benefits might include increased convenience, personalized banking services, and improved security. By amplifying these benefits through marketing and communication strategies, banks can enhance customer understanding and acceptance of AI technologies.

Trust in banks was also a critical factor influencing AI adoption intention. To cultivate and maintain this trust, banks should uphold high levels of transparency, especially regarding AI applications. Furthermore, providing exceptional customer service and maintaining a track record of reliable and secure operations can significantly boost customer trust in banking institutions.

Lastly, trust in AI itself is a crucial determinant of AI adoption intention. Therefore, banks should aim to foster trust in AI technologies among customers. This could be achieved by ensuring the transparency of AI systems, exhibiting their accuracy and reliability, and showing their ability to enhance customer experiences.

This research calls for banking institutions to manage perceived risks attentively, highlight the benefits of AI adoption, cultivate trust in banks, and foster trust in AI. These steps could significantly aid in improving customer acceptance and encouraging the adoption of AI technologies in the banking sector. By considering these findings, banks can potentially smooth their transition towards more AI-integrated services and operations.

7 CONCLUSION

7.1 Limitations and Future Research

In the spirit of academic rigour, it is imperative to acknowledge certain limitations inherent in this study. Firstly, the research was geographically confined to the banking sector in Norway, which might limit the generalizability of the results. Cultural, economic, and technological differences across regions can significantly influence consumer perceptions and behaviours related to AI adoption. Secondly, the study relied on self-reported measures, which might be subject to bias. Respondents might have overestimated or underestimated their intention to adopt AI in banking due to social desirability bias or a lack of self-awareness.

Also, the variables included in my model were guided by the extant literature, and although they cover significant aspects of AI adoption intention, other potential variables may have been overlooked. These could include factors such as privacy concerns, perceived ease of use, and subjective norms, which are proven to affect technology acceptance in various studies.

Future research could address these limitations by expanding the geographical scope of the study, perhaps considering multiple regions or countries to provide a more globally representative perspective on AI adoption in banking. Future research could also apply a mixed-methods approach, combining qualitative methods, such as interviews or focus groups, with the quantitative methods employed in this study to yield more nuanced insights.

Further, exploring additional variables that might influence AI adoption intention in banking would be insightful. Understanding the influence of privacy concerns, perceived ease of use, and subjective norms could deepen my understanding of consumers' intentions to adopt AI in banking. Longitudinal studies could also be carried out to examine how AI adoption intention evolves, particularly as consumers' familiarity and comfort with AI technologies increase.

7.2 Summary and key findings

The current research delved into the elements driving the intention to adopt AI within Norway's banking industry. This investigation was steered by a theoretical framework alongside four propositions, seeking to comprehend the impact of trust in AI, perceived risk, benefits derived from AI adoption, and trust in banking institutions on the inclination to embrace AI.

Through statistical analysis of survey data, the study provided several key findings. Firstly, it was established that trust in AI significantly influences AI adoption intention, underscoring the importance of building customer trust in the AI systems used by banks. Secondly, the study confirmed a strong correlation between perceived risk and AI adoption intention, suggesting that customers' assessment of potential risks can significantly influence their willingness to adopt AI in banking.

Moreover, the findings highlighted a positive correlation between the perceived advantages of adopting AI and the intention to embrace AI, underscoring the importance for banks to effectively convey the potential benefits of AI to their clientele. Lastly, the study affirmed a significant association between trust in banks and AI adoption intention, demonstrating the importance of maintaining customer trust at the institutional level to foster AI adoption.

The four hypotheses were validated, providing a comprehensive understanding of the variables influencing AI adoption intention in the Norwegian banking sector. In light of these findings, banks must address these factors to enhance AI adoption strategically. These could involve building customer trust in AI, managing perceived risks associated with AI, highlighting the benefits of AI adoption, and maintaining overall trust in banking institutions.

Despite its limitations, the study contributes to the emerging literature on AI adoption in banking, offering valuable insights for academia and industry. Future research is recommended to explore this phenomenon further, encompassing diverse geographical regions and additional influential variables. Also, this study underscored the complex interplay of trust, perceived risk, and perceived benefits in shaping customers' intention to adopt AI in the banking sector. Its findings hold important implications for the banking sector's strategy in effectively promoting AI adoption among its customer base.

7.3 Final thoughts

To summarize, this research has been crucial in identifying the variables that sway the incorporation of AI in the banking sector, particularly within Norway. The empirical results indicate that factors such as confidence in AI, perceived risk, perceived advantages of adopting AI, and trust in banking institutions significantly shape customers' intentions to adopt AI technologies in banking services. These four factors, independently and collectively, shape the user's outlook towards AI adoption, shedding light on the multifaceted dynamics within this rapidly evolving landscape. As a result, this study contributes to the academic discourse on AI

adoption, expanding the understanding of the role and importance of trust, perception of risks, and benefits in this sphere.

Furthermore, the implications of this study transcend academia, offering tangible insights for practitioners in the banking industry. The results guide banks seeking to facilitate a smoother transition towards AI-centric services, emphasizing the importance of building customer trust, managing perceived risk, and accentuating the benefits of AI integration. With this knowledge, banks can devise more effective strategies to promote AI adoption among their customer base, ultimately enhancing the quality and efficiency of their service offerings.

Lastly, while this study has focused on the Norwegian banking sector, the findings resonate with a global narrative of increasing AI adoption across various sectors. As such, the insights gleaned from this study could have broader relevance and applicability, extending to other countries and industries undergoing similar digital transformations. In essence, the significance of this research is multi-dimensional - it not only fills a gap in the existing literature but also charts a practical path for banks and stakeholders navigating the complexities of AI adoption.

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9 APPENDICES

Appendix 1. Questionnaire

	English	Norsk
Demographic Information/ Demografisk informasjon		
	Age (in years): 18-24 25-34 35-44 45-54 55-64 65 or above	Alder (i år): 18-24 25-34 35-44 45-54 55-64 65 or above
	Gender: Male Female Non-binary Prefer not to say	Kjønn: Mann Hunn Ikke-binær Foretrekker å ikke si
	Experience with technology (in years): Less than 1 1-5 6-10 11-15 16-20 More than 20	Erfaring med teknologi (i år): Mindre enn 1 1-5 6-10 11-15 16-20 Mer enn 20
Please rate your agreement with the following statements on a scale of 1-5 (1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree) /		

Vennligst ranger din enighet med følgende påstander på en skala fra 1-5 (1 = helt uenig, 2 = uenig, 3 = uenig, 4 = enig, 5 = helt enig)			
Constructs/ Konstruerer 1	**Trust in AI**	**Stol på AI**	**Source**
1.1	I believe AI systems in the banking sector are reliable	Jeg tror AI-systemer i banksektoren er pålitelige	(Ramesh et al., 2020)
1.2	I trust the competence of AI systems in the banking sector	Jeg stoler på kompetansen til AI-systemer i banksektoren	(Ramesh et al., 2020)
1.3	I think AI systems in the banking sector demonstrate integrity	Jeg tror AI-systemer i banksektoren viser integritet	(Ramesh et al., 2020)
Constructs/ Konstruerer 2	**Perceived Risks**	**Oppfattede risikoer**	**Source**
2.1	I am concerned about data privacy when using AI in the banking sector	Jeg er bekymret for personvern når jeg bruker kunstig intelligens i banksektoren	(Noreen et al., 2023)
2.2	I have ethical concerns regarding the use of AI in the banking sector	Jeg har etiske bekymringer angående bruken av kunstig intelligens i banksektoren	(Noreen et al., 2023)
2.3	I am concerned about the transparency of AI	Jeg er bekymret for åpenheten til AI-	(Noreen et al., 2023)

	systems in the banking sector	systemer i banksektoren	
Constructs/ Konstruerer 3	**Benefits of AI Adoption**	**Fordeler med AI-adopsjon**	**Source**
3.1	AI adoption in the banking sector improves efficiency influencing customer experience	AI-adopsjon i banksektoren forbedrer effektiviteten	(Rahman et al., 2021)
3.2	AI adoption in the banking sector leads to cost savings	AI-adopsjon i banksektoren fører til kostnadsbesparelser	(Rahman et al., 2021)
3.3	AI adoption in the banking sector enhances decision-making	AI-adopsjon i banksektoren forbedrer beslutningstaking	(Rahman et al., 2021)
Constructs/ Konstruerer 4	**Trust in Banks**	**Tillit til bankene**	**Source**
4.1	I trust the banks in Norway to act with integrity	Jeg stoler på at bankene i Norge opptrer med integritet	(Zhang et al., 2018)
4.2	I believe banks in Norway are competent in their operations	Jeg mener bankene i Norge er kompetente i sin virksomhet	(Zhang et al., 2018)
4.3	I trust banks in Norway to prioritize customer-oriented services	Jeg stoler på at bankene i Norge prioriterer kunderettede tjenester	(Zhang et al., 2018)
Constructs/ Konstruerer 5	**AI Adoption Intention**	**AI-adopsjonsintensjon**	**Source**

5.1	I intend to use AI-based services offered by banks in Norway	Jeg har tenkt å bruke AI-baserte tjenester som tilbys av banker i Norge	(Matsepe & van der Lingen, 2022)
5.2	I would recommend AI-based banking services to others	Jeg vil anbefale AI-baserte banktjenester til andre	(Matsepe & van der Lingen, 2022)
5.3	I believe AI-based banking services have a positive impact on the industry	Jeg tror AI-baserte banktjenester har en positiv innvirkning på bransjen	(Matsepe & van der Lingen, 2022)
Thank you for participating in this survey! Your responses will help us better understand the trust and adoption of AI in the e-banking sector in Norway / Takk for at du deltar i denne undersøkelsen! Svarene dine vil hjelpe oss å bedre forstå tilliten og bruken av AI i e-banksektoren i Norge			