

Faculty of Business Economics Master of Management

Master's thesis

Detection Mechanisms

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Al Integration in Financial Industry: Customer Perspectives on Chatbots and Fraud

Thesis presented in fulfillment of the requirements for the degree of Master of Management, specialization Data



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AI Integration in Financial Industry: Customer Perspectives on Chatbots and Fraud Detection Mechanisms

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Abstract. This thesis aims to investigate the implementation of AI technologies within financial institutions, particularly chatbots and AI-powered fraud detection mechanisms, as these technologies are widely used nowadays within financial organizations. Furthermore, consumer experiences with those technologies are to be navigated, as understanding these experiences will aid in revealing areas for improvement, resulting in improved AI leveraging for customers using AI technologies adopted by financial institutions. From a research perspective, consumer experiences with AI technologies within financial institutions are still underdeveloped. The findings from this work will help shed more light on this matter. A thorough literature review was first conducted and then followed by a qualitative study on the usage of chatbots and AI-driven fraud detection mechanisms within the financial industry from a customer point of view. The findings from both studies revealed various advantages of using these techniques but also challenges and concerns, both from a research and a customer's perspective. Advantages of using chatbots included instant and 24/7 availability, assistance in answering queries, or resolving confusions and issues. However, challenges concerning the accuracy of these systems and the privacy of users have risen. Concerning AI-driven fraud detection systems, literature, and survey participants have indicated that although they provide user protection, false flagging often occurs which was found to be disruptive for the consumers. The insights derived from this research will help developers further enhance the AI algorithms incorporated within the financial industry so that they align perfectly with customers' needs. This alignment will lead to improved company performance and higher customer satisfaction.

Keywords: Artificial Intelligence, Chatbot, Fraud detection.

1 Introduction

"Artificial" means made and developed by humans, and "Intelligence" stands for the capability to think and solve a certain dilemma. Therefore, the term "Artificial Intelligence" can be defined as the technology developed within the computer science field

where intelligent machines that mimic human thinking and provide solutions are invented [1].

Modern technological advancements along with the rise of big data have sparked a global interest in AI. Some even speculate that it will fundamentally disrupt the current business models resulting in the creation of completely novel markets [5]. Artificial intelligence has been gradually gaining more and more attention from businesses across various industries due to the power held within it that enables it to enhance and automate processes and operations [4]. The primary goal and function of AI technologies is thus, problem-solving [6].

In corporate and business atmospheres, firms often struggle with various issues that extend from operational inefficiencies to complicated decision-making processes. Solving these challenges is often required to foster growth and optimize productivity. Thus, AI has become a vital resource for businesses hunting for resolutions to enhance their performance and tackle various modern-day business challenges [2].

Applications of artificial intelligence can be roughly categorized into two groups based on their intended uses: artificial intelligence for automation and augmentation. Automation is the conduct of shifting from manual solutions conducted by humans to fully automated processes conducted using AI technologies. However, augmentation refers to only aiding and strengthening human intelligence by granting insights that help make more informed decisions [7].

In the arena of the digital revolution, artificial intelligence functions as a key partner in helping various industries step forward and thrive. From healthcare and finance to manufacturing and retail, artificial intelligence is transforming traditional systems by automating previously manually handled processes. Through enhancing machine learning algorithms and predictive analytics schemes, firms can now utilize the power of artificial intelligence to optimize operations, and resource utilization, and obtain insights into consumer behavior and market trends [2].

One crucial advantage of AI is that it bases its solutions on facts rather than emotions. Despite the measures undertaken, no one can change the fact that humans' emotions impact their decision-making adversely [8]. Furthermore, AI-enabled systems can complete stressful, complicated tasks more rapidly than humans could ever do. They also possess the ability to solve various inquiries at the same time with accuracy and high

success rates. It was also proven that machines and systems adopting AI-driven technologies make fewer errors, provide more efficiency over the long run, and take up less space compared to traditional methodologies [8].

While AI technologies are widely spread and used in various industries, this research focuses solely on its adoption within the financial industry, and customers' perception on this topic. AI technologies are increasingly becoming more and more integrated within financial institutions, which is drastically upending the industry. Various financial organizations are making substantial investments dedicated to developing mastery in data science and machine learning, as AI's impact on banking and financial institutions is set to redefine operations, provide revolutionary products and services, and, most crucially, transform client experiences [3]. Artificial intelligence is a disruptive technology that, upon full adoption into the finance sector, will revolutionize its functionality and help the industry to function optimally [10].

Within the financial sector, AI technologies are widely implemented in fraud detection mechanisms. Various data sets are run through specialized systems that spot anomalies in transactions, thus helping minimize financial losses for consumers. Furthermore, AI solutions utilized by financial institutions, such as chatbots, were found to improve customer services, satisfaction, and loyalty rates [9]. These insights underscore the critical importance of studying AI adoption within the financial industry. However, how this adoption is perceived by the consumers of financial services is still an underexplored topic. To address this gap, this work tackles the following research question: "How do clients perceive the effectiveness of AI-driven chatbots and fraud detection systems implemented by financial institutions". This project uses qualitative methodologies to gain a profound understanding of how customers discern AI implementation within the financial industry, mainly chatbots and AI-driven fraud detection systems. This work provides a resourceful foundation for developers aiming to enhance AI systems within financial institutions to make them more tailored to customers' needs.

2 Methodology

To properly address and answer the research question for this thesis a multifaceted approach was adopted. First, an extensive exploratory examination of various literature articles, books, and research papers was conducted. This examination served as a foundational pillar, providing enriched insights on AI, and its adoption within the financial industry, mainly in chatbots and AI-driven fraud detection schemes. Through this analysis, a detailed, and thorough understanding of the topic was achieved, which offered the necessary context to explore and further analyze the integration of AI technologies within the financial sector from a customer point of view.

The main focus of the literature was to first understand AI in a general context, in which industries it is adopted, its advantages, why was it worth it to investigate its adoption within the financial industry and understand its usages within the industry, particularly chatbots for customer care service, and AI-driven fraud detection schemes.

Building upon the foundation established by the literature insights, a qualitative study was conducted to examine the consumer experience with AI technologies used within financial institutions they deal with in their daily life. A survey that included a set of open-ended and Likert-scale questions was designed, and it enabled the gathering of firsthand inputs and provided valuable assessments of how clients perceive the AI-driven technologies adopted by their financial institutions. The survey questions were designed to gauge customers' awareness of AI adoption within the financial industry and understand their comfort levels with its implementations. In addition, they aim to explore consumers' perceptions and experiences, whether positive or negative, with the implementation of AI in customer care services (particularly chatbots) and fraud detection mechanisms. Furthermore, the survey questions seek to identify the benefits customers have observed from AI adoption within their financial institutions. Finally, the survey questions aim to uncover what ethical concerns customers might have regarding AI adoption and their preferences for future AI implementations or enhancements.

This qualitative review assists in linking the theoretical with real-world insights and shedding light on a topic that remains relatively underexplored. The target population for this qualitative study are individuals who have a basic understanding of financial concepts and may be interested in a better understanding of the AI technologies used

by their financial institutions, this could include students, working professionals, or those with a passion for technology or finance. Another type of participants whose insights were valuable for this research are individuals with steady incomes who actively manage their finances online, as they are likely to have experience with AI technologies. For this research a total of 23 respondents took part in the survey, achieving data saturation. To source participants, I created a list of individuals from my network connections whom I found to be eligible to answer the survey, given their background and job occupations, and they were contacted either through emails, WhatsApp, or via direct phone communication. To proceed with the survey answers, I gathered and examined data manually extracting the interpretations necessary for my research based on the participants' inputs. In essence, the methodology adopted in this thesis seeks to reveal detailed aspects of AI integration within the financial sector and their impact on the clients using them. This will help AI developers further enhance the AI algorithms incorporated within the financial industry so that they align perfectly with customers' needs. This alignment will lead to improved company performance and higher customer satisfaction.

3 Literature Review:

3.1 Artificial Intelligence Adoption in Financial Industry

Financial institutions are functioning in a complex, rivalrous industry confronting major upgrade pressure to remain relevant in the current technological era. In these circumstances, maintaining clients' fidelity, which includes ensuring their continuous contentment, and trust is proven pivotal [11].

AI technologies use advanced science to analyze unstructured data and transform it into interpretable insights, which helped in making previously challenging financial processes more achievable. The adoption of AI within financial institutions has been proven to optimize internal operations and processes [16].

Major technological and data-reliant businesses have shown that by focusing on consumers and implementing cutting-edge technologies, financial services are set to be

revolutionized. Nevertheless, classic financial institutions commonly fail to provide sufficient flexibility and creativity to their customers. Technological advancements are hence embraced as a breakthrough to revolutionize customer care within the financial industry [12].

By embracing and implementing modern technologies, modern financial businesses are now capable of creating higher customer satisfaction rates, reducing costs, and fastening development. In addition to realizing significant advancements in various operations such as financial planning and borrowing processes [12]. Artificial intelligence and machine learning adoption within financial institutions were thus highly encouraged [13].

FinTech institutions, which can be defined as businesses that depend on technological advancements and cloud services to offer financial solutions to their customers, rather than the traditional methods [14], are heavily client-oriented which has set the bar high for the other traditional financial institutions, drove them to adjust, and inspired them to provide better services, products, and also foster AI-enabled practices. Moreover, technological advancements and AI adoption in the financial industry have evolved communication means between financial institutions and their customers, as those communication means have become more conversation-based, permitting customers to write their concerns or even talk, which is greatly beneficial, as it feels more natural and less formal [15].

Chatbots, also known as virtual advisors, are one of the implementations of artificial intelligence in the financial sector and are utilized massively within banking institutions and insurance firms to assist in customer care [3]. The adoption of this artificial intelligence tool holds promise for higher efficiency in the financial industry due to the automation of operations and customer services. Consequently, it opens avenues for improved customer interactions and satisfaction, by offering quicker response times and personalized services, potentially resulting in enhanced sales and revenue growth.

The adoption of artificial intelligence technologies within financial institutions has benefited both the firms and their customers, and this benefit can be observed in various areas. Artificial intelligence plays a huge role in forecasting systems as it helps in forecasting market trends, and stock prices, and it does that by examining previous data and providing useful insights from it. This can help customers obtain more precise investment recommendations and tailor-made portfolio suggestions [17]. Furthermore, AI technologies aid in identifying fraudulent activities, and suspicious transactions. Artificial intelligence algorithms examine transaction patterns to uncover anomalies, which consequently make clients experience increased security and a sense of tranquility and offer them protection against fraudulent transactions [17].

Traditional financial institutions are highly encouraged to adopt and utilize artificial intelligence technologies, as it is the key to staying on top of the game and maintaining customers' trust [5].

Chatbots usage in the financial industry:

As technology advances to meet current needs and demands, communication schemes are also evolving, fostering novel developments such as AI and machine learning [20]. The invention of AI-enhanced chatbots to provide financial assistance is a major leap forward in the junction of AI and the financial sector. These chatbots, also known as virtual assistants or catboats, are IT-powered systems that mimic human-like interactions to convey assistance, respond to questions, and provide customized suggestions. The financial industry has quickly embraced artificial intelligence within its systems to improve clients' experiences, optimize processes, and enhance decision-making. AIdriven chatbots have become essential in this industry, providing 24/7 availability and the capability to manage massive volumes of data in real-time [3].

Chatbot technologies can offer customer services similar to those an expert would give, and they also provide valuable recommendations to clients at a reduced cost [18]. Moreover, they are capable of interacting with customers through diverse channels, such as instant messaging, visual interfaces, or auditory communication. Messaging-based chatbots are readily accessible on businesses' websites, and customers can use these tools to seek answers to frequently asked questions or to receive documents [22]. The advent of this novel technology would transform the process of conducting business, as well as non-commercial operations [18].

The instantaneous availability of chatbots has altered customer care methodologies into more interactive exchanges, significantly influencing customer loyalty, satisfaction,

and repurchase rates [19]. Chatbots offer 24/7 customer care service, which gives clients the freedom to access information regarding their financial queries whenever they please. This reduces the constraints of typical business conduct allowing clients to access support and responses to their issues at any moment, which enhances the efficiency of financial services [3].

In order to offer precise and personalized recommendations, chatbots use machine and deep learning technologies to retrieve data regarding clients' personal information, purchase history, and geographic details [23]. Chatbots develop a self-learning algorithm using programming tools and mathematical equations that help offer clients valuable insights and answers to their queries in real time [20]. This way, customers benefit from customized recommendations, rapidly and efficiently [23].

Developing chatbots relies on using a set of codes and algorithms that prepare them to detect similar patterns in consumer requests and address them correctly. It was shown that the majority of businesses nowadays contemplate chatbots as first-line workers due to their ability to seamlessly communicate with clients, collect and save massive volumes of data, and be cost-efficient [21]. Chatbots are well-appointed with innate and vicarious skills that aided them in substituting human jobs, predominantly those found in customer service sectors. Nevertheless, it is also debated that chatbots can only ease workload but not entirely replace human involvement, as these tools still have limitations that need to be further addressed such as the probability of misinterpreting customer queries, in addition to sustainment, assembly, and training costs, which can be relatively high [21].

AI-powered chatbots adopted within financial institutions provide various advantages and show the potential for exciting possibilities within the sector. While there exist obstacles and restrictions to this technology, for example, accuracy, misinterpretation, and confidentiality concerns, they are however addressed and attempted to be resolved [3].

Furthermore, financial firms will need to further explore ethical aspects, ensure alignment with regulations, and strengthen customer trust to completely leverage the power of chatbots. Through meticulous development, continuous refinement, and a focus on user-centric practices, virtual chatbots are capable of becoming vital instruments for customers looking for customized and structured financial assistance [3].

Fraud detection

Financial fraud is a dilemma faced within the financial sector, affecting both businesses and consumers of financial services. Classic fraud detection techniques that encompass manual detection are not only laborious, costly, and unreliable, but in this era of big data, they are also found to be unhandy. Thus, financial organizations have switched to automated processes fostering the implementation of AI-driven fraud detection tools [24].

Fraudulent crimes are considered a serious issue within financial organizations, as these institutions constantly deal with large deposits and payments and need to be extra careful when handling them. AI technologies can help mitigate these dangers [13].

AI technologies are equipped with advanced security and fraud detection techniques that for example can be utilized to examine past spending habits and behaviors of consumers, and that can help identify any unusual transactions made. For instance, using a bank card to make payments from different geographical locations in a short matter of time is often a security and fraud concern [13].

Artificial Intelligence has been proven to be a significantly efficient tool in fraud detection within the financial industry. The adoption of AI techniques in fraud detection methodologies has shown notable success in decreasing false fraud flagging and detecting actual fraud, offering enhanced user protection, and meaningful insights for institutions using these cutting-edge technologies [25].

When employed for fraud detection, artificial intelligence can identify different types of fraud conduct and it does that by leveraging modern and innovative techniques, such as machine learning and pattern recognition, to examine large volumes of data at an accelerated speed. This, consequently, assists financial institutions in detecting warnings of probable fraudulent activity [25]. For instance, artificial intelligence technologies can identify anomalies in customer behaviors, detecting probable fraudulent acts such as identity theft, or scam transactions.

The capability to adjust and gain knowledge from previous and new patterns offers financial organizations a handy weapon to fight against advanced fraud techniques [26].

There have been various instances where AI-driven fraud detection techniques have been proven to thwart major financial losses within financial institutions. These instances showcase the power AI techniques uphold in detecting fraudulent acts that might have not been observed if only classic fraud detection methodologies were implemented. This therefore guarantees the financial integrity of organizations and the satisfaction of their clients [25].

Sometimes, authentic transactions can be mistakenly flagged as fraudulent, or the other way around. This is a major hurdle faced in fraud detection, as it can cause major processing limitations, dissatisfaction of customers, higher operational costs, or even more atrociously, concealed fraudulent activities that succeeded in passing through. AI technological advancements, aim to solve this hurdle by improving the precision of fraud detection processes and trying to prevent its occurrence as much as possible by consistently improving the analysis of past data and refining its algorithms to reduce mistakes [25]. Furthermore, machine learning techniques use advanced methodologies that help in precisely differentiating between authentic and fraudulent activities. Consequently, financial organizations fostering AI-powered fraud detection tools experience a major decrease in false reporting, assuring that authentic transactions run efficiently [27].

However, while artificial intelligence provides valuable schemes for fraud detection techniques, added human supervision remains recommended. Achieving a collaborative approach that gathers the advancements of artificial intelligence with human knowledge improves the efficiency of fraud detection methodologies [28].

On another note, the success of artificial intelligence in fraud prevention significantly depends on the quality and variety of data provided. Making sure that the data used is thorough, bias-free, and timely updated improves the model's capability to identify fraudulent acts more accurately [29].

In summary, the practical applications of artificial intelligence in fraud detection highlight its ability to effectively prevent fraudulent activities, minimize false reporting, and offer valuable insights for financial institutions. However, even with the constant improvement of AI-powered fraud detection schemes, human involvement remains vital in sustaining reliable prevention against fraud attempts [25].

4 Qualitative Exploration of AI Adoption in the Financial Industry: Survey-Based Insights:

A survey was conducted in order to assess how consumers of financial services perceive AI implementations within the institutions they deal with. This research mainly focused on the implementation of chatbots as an AI tool that helps enhance customer service interactions, in addition to examining how AI techniques can help in leveraging better fraud detection schemes that will provide better protection to consumers. The respondents, who are consumers and users of these AI-driven techniques within the financial industry, were thus asked to assess their experiences and provide insights, which will help shed more light on the topic of AI adoption within the financial industry, but from a customer's point of view. The survey addressed different aspects extending from awareness and comfort levels with AI implementations, to personal experiences with chatbots and fraud detection systems. This thorough analysis offers valuable insights into customer experiences with AI in finance, providing a profound analysis of its impact and perceptions.

Demographics and Awareness:

The pool of respondents was composed of individuals who were mainly customers of banking institutions and insurance firms. A significant majority of them stated that they were well aware of AI implementations within the financial sector, which established the profound integration of artificial intelligence technologies in modern financial services and showcased consumers' growing familiarity with AI-powered solutions.

Comfort with AI:

Furthermore, the survey revealed that over half of the participants were somewhat comfortable with the adoption of artificial intelligence techniques within the financial institutions they deal with. This finding suggests that financial services customers are nowadays more appreciative of AI-powered solutions, and they perceive them as a valuable tool that improves their interactions with financial institutions.

AI in Customer Service:

Moreover, the survey findings indicated that approximately 90% of respondents have previously used chatbots for their inquiries or complaints. Most participants have stated that they found the tool useful and helpful, supporting their claims by citing instances where chatbots helped them answer certain queries, guided them to resolve a certain issue they faced, or to find features that were not so easy to locate. Furthermore, they appreciated its instancy and fastness in providing guidance, compared with traditional customer care services. However, other respondents indicated that they were not fully satisfied with chatbots, as they couldn't answer their inquiries accurately, sometimes provided wrong misleading answers, or just did not give the full guidance needed. Those participants indicated that chatbots need further enhancements to fully be able to support clients in their customer service inquiries. Furthermore, 30% of respondents have indicated that they have previously encountered issues related to AI applications in financial services, providing instances of when chatbots did not provide the required assistance or made them repeat a transaction multiple times as the AI system did not let it get through. Participants found these instances disruptive. In addition, 11% have encountered situations where AI-driven systems used by financial institutions have misunderstood or misinterpreted their financial inquiries and preferences. These findings stress the need for continuous improvement in chatbot algorithms to ensure that they can effectively resolve a wide range of customer queries and issues.

Fraud Detection and Security:

Another significant finding from the survey is related to AI-driven fraud detection schemes implemented by financial institutions. Around 30% of the participants have reported that a transaction they have previously made was flagged by AI systems as a potential fraud. Some participants appreciated the accuracy and protection the system provided them, as the activity that was flagged was indeed fraudulent, however, others indicated that the flagging was a false warning, but they seemed to understand why it happened as they have indeed conducted a suspicious activity. For example, tempting to withdraw an unusual amount of money, or order online to a new geographic location without informing the bank that they have moved out. Others have stated that they believe the accuracy of these fraud detection systems is not elevated enough because the algorithms used are not quite complex and are only based on simple parameters like time, location, or transaction frequency. A portion of the respondents have also shown discontentment with instances where AI technologies used by financial institutions have led to unintended consequences or negative outcomes for them, as they had to pay extra fees, or their personal accounts were closed because of false flagging. These findings underscore the importance of implementing fraud detection algorithms that minimize false reporting yet effectively detect actual fraudulent activities.

Benefits of AI in Financial Services:

Despite the challenges and concerns, the overwhelming majority of respondents with a 95% rate believed that AI technologies have significantly improved the efficiency and accuracy of financial services. They cited various benefits of AI integration acknowl-edging the benefit of moving from manual to automated processes which has increased banks' productivity and consequently customer satisfaction, in addition to forecasting systems that use historical data to make valuable predictions that benefit both the firm and its clients. Furthermore, survey participants expressed their contentment with the efficiency modern AI-powered systems provide such as the 24/7 availability, time savings, and making payment processes remotely feasible. Moreover, it was stated that AI systems enable faster processing of transactions, more accurate risk assessment, better fraud prevention, and personalized customer experiences. According to the survey respondents, some customer inquiries would make unnecessary traffic for customer service agents but using an AI bot might help and remove the simple quarries from the queue. AI also helps in freeing up human resources to focus on more complex and strategic aspects of financial management.

Ethical Considerations:

65% of the survey participants indicated that financial institutions are somewhat transparent about the AI algorithms they use, while 30% believed that they are not transparent at all. In addition, a significant percentage of respondents have stated that they are indeed concerned about the potential biases that AI algorithms might introduce into financial processes. For example, the potential abuse of AI systems to control users or the occurrence of prejudices formed from historical data might lead to unfair decisions

and privacy concerns. The respondents emphasized the need for human oversight to ensure accountability and ethical conduct. 40% of participants stated that when it comes to handling requests and tasks related to their finances, they prefer solely human involvement, while 60% did not mind the involvement of both humans and AI systems, and 0% trusted that AI systems alone could handle their inquiries effectively. Moreover, the ethical concern that was mainly raised by most respondents related to data privacy and security. The developers of AI algorithms used within financial institutions should thus prioritize incorporating advanced data security practices and uphold transparency and accountability in AI-powered financial services.

Future Outlook:

80% of participants agreed that there is a need for greater education and awareness among consumers about AI technologies in finance, and they have shed light on various areas where AI technologies can impact the future of the financial industry. Respondents believed that artificial intelligence would play a significant role in improving efficiency within financial organizations by streamlining operations, automating routine tasks, and minimizing miscalculations.

While emphasizing the importance of adopting advanced security and data protection measurement, survey participants also highlighted the potential to make financial services and customer care practices more beneficial through the use of more advanced chatbots and virtual assistants. Survey participants have indicated that they would like to see in the future more personalized financial planning services, enhanced forecasting systems, AI-driven investment tools, and improved fraud detection schemes. Overall, the respondents believe that there is still room for improvements within AI-driven financial services to fully appeal to the users.

In summary, the survey findings provided valuable insights into the ways financial services customers perceive AI technologies incorporated within the institutions they deal with, with a focus on chatbots and fraud detection techniques implementations. By addressing the concerns and taking into consideration how customers perceive those technologies, financial institutions can fully harness the transformative power of AI to deliver enhanced services and products to their consumers and build trust in AI-powered financial services.

5 Comparison of findings from the literature review Vs findings from the Survey:

The findings from the literature review and the survey both highlight the crucial role of artificial intelligence implementations within the financial industry. With a focus on the integration of chatbots and fraud detection techniques, measures to optimize customer care practices, and increase security were navigated.

The literature review analyzed how chatbot tools adopted within financial institutions can be a powerful tool to improve customer care practices as they offer real-time assistance and instant customer care support and guidance. Furthermore, it was emphasized that chatbots help make financial institutions more cost-efficient, and aid in enhancing processes by automating traditional customer care services and providing 24/7 availability. These findings aligned with what was reported by the survey respondents, as they have indicated that they often utilize chatbot tools in their financial inquiries, and they appreciate the constant availability and the fast response times. However, survey participants also expressed their dissatisfaction with certain chatbot flaws, such as not being able to always provide the complete required assistance, and they suggested that further enhancements should be applied to chatbot algorithms so they can fully meet customer expectations.

AI-driven fraud detection mechanisms adopted within financial institutions are another theme that was thoroughly analyzed throughout the literature review. This latter examined how AI algorithms enhanced fraud detection schemes by analyzing transaction patterns and the ability to detect anomalies within those patterns. Survey findings did align with those statements, as the participants have indeed confirmed that fraud detection mechanisms are helpful and do provide a certain level of user protection. However, these systems can also sometimes provide false detections resulting in inconvenient consequences for the customer. Respondents called for more enhancement of AI-

powered fraud detection techniques to reduce erroneous reports and enhance the overall reliability of these systems.

Furthermore, both the literature review and survey findings emphasized the importance of enforcing strong and reliable security and data privacy measures, and fixing biases that could be found in AI algorithms. Survey findings highlighted the importance of involving human expertise and not only relying on AI systems for ensured accountability and ethical AI use, which aligns with the literature's suggestions for addressing these issues to build consumer trust.

In summary, the literature review and survey findings both explore the impact of AI advancements on the financial sector, particularly in chatbot implementations and fraud detection mechanisms. The survey adds a more consumer-focused perspective, where their concerns and expectations are brought up. Survey participants, who are direct consumers of the financial services where chatbot and AI fraud detection techniques are deployed stressed the importance of addressing data security issues, improving AI algorithms to provide enhanced services to the clients, and maintaining transparency to build trust and fully harness the benefits of those AI implementations. The findings from this study offer a ground for algorithm developers to address what customers want and need, this way AI implementations within the financial industry will enhance customer satisfaction rates and consequently firms' profits.

6 Recommendations for Further Advancements in AI Adoption within Financial Institutions:

Based on this study, various recommendations could be proposed to ensure a continuous innovative trajectory for AI applications within the financial industry, which would be of great value to the customers using those applications. Firstly, financial institutions should dedicate an important budget for AI research and development within their IT departments to ensure staying on top of the game and keeping pace with the ongoing technological advancements. Additionally, institutions should provide continuous supervision and testing to their models, to ensure ultimate data security practices, and mitigate algorithm biases. These issues are found to be the main concerns of financial services customers, and by working towards eliminating or minimizing them, financial institutions can enhance customer satisfaction greatly. Finally, adhering to the use of ethical conduct, and promoting clear communication practices is deemed essential to gaining customers' trust, as they are highly perceptive when firms lack transparency and that makes them less likely to trust the organization and might lead them to potentially leaving its customer base.

7 Research Limitations:

Sample Bias: The sample included participants from diverse backgrounds and age categories who at least had a basic knowledge of AI implementations within the financial industry. However, the study findings might not be generalizable to the whole population, as they do not address how individuals, who do not acquire sufficient knowledge about AI, perceive AI-driven techniques within the financial industry.

Rapid Technological Change: AI-driven technologies within the financial industry are in constant development, especially in this age of big data. This might cause the findings from this study to become quickly outdated as new advancements occur.

Contextual Factors: The study approach might have not fully taken into consideration the various contextual factors that are established in today's economy such as the perpetuating economic conditions, which could have impacted survey participants' perspectives on financial technologies.

8 Conclusion

This thesis focused on exploring the implementation of AI techniques within the financial industry, mainly the usage of chatbots and AI-driven fraud detection techniques, and understanding customer experiences with these techniques, how they perceive them, and what are their expectations and concerns.

After establishing a thorough understanding of how chatbots and fraud detection techniques are employed within financial institutions, a qualitative study was conducted to highlight customer experiences with these techniques.

The surveying methodology that was implemented included 23 individuals, who were direct consumers of financial services and provided valuable insights on how they perceive chatbot and fraud detection techniques.

Indeed, it was found that chatbots are frequently utilized by financial services consumers, and are appreciated for the instant assistance they provide, their 24/7 availability, and their ability to assist and solve various customer care-related problems. However, challenges concerning privacy issues, transparency measurements, and accuracy were raised.

Furthermore, survey findings highlighted that fraud detection mechanisms adopted by financial industries have proven beneficial for customers. However, they are not always accurate and can cause inconvenience for the customers when false flagging occurs.

To conclude, by taking into consideration customer insights derived from the qualitative study conducted, chatbot and fraud detection systems developers can use these insights to further enhance the algorithms used so that they align perfectly with customers' needs. This alignment will enhance company performance and result in increased customer satisfaction.

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Appendix:

AI Applications in the Financial Industry Survey- Customer Insights

My name is Najat Mkass, and this survey is being conducted as part of my research for my master's thesis dissertation at Hasselt University, focusing on "AI Integration in Financial Industry: Customer Perspectives on Chatbots and Fraud Detection Mechanisms" for the award of a master's degree in Management with a specialization in Data Science.

In the arena of digital revolution, artificial intelligence functions as a key partner in helping various industries step forward and thrive. As a consumer and client of a financial institution (Bank, insurance company, etc...), you are interacting with AI technologies, whether consciously or not. Whether you're utilizing online financial services, or finance mobile apps, ever addressed a question to a chatbot, or have ever been shielded from fraudulent transactions, these experiences are often facilitated by AI algorithms operating behind the scenes.

This survey aims to understand your experiences as a consumer with these AI technologies used within financial institutions. Your valuable insights will play a vital role in advancing our understanding of AI's impact on financial services from a customer's point of view.

Please note that your participation is voluntary, and you may decline to answer any questions that you do not feel comfortable with.

Additionally, individual findings will remain confidential. To protect your anonymity, we will not share any details with anyone outside the immediate people working on this research.

Thank you in advance.

Najat Mkass

To take part in this survey, you need to agree to the following statements indicating that you have been informed about the study and that your participation is voluntary.

I have read and understood the study information.

I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time without having to give a reason.

I understand that the information I provide will be used for the student's master's thesis.

I understand that personal information collected about me that can identify me, (such as name and email address), will not be shared beyond the study team.

Q1 What type of financial institutions do you primarily deal with? (Select all that apply)

	Banks
	Investment Firms
	Insurance Companies
	Other
Q2 How aware are you of the AI applications currently used by the financial industry? Not Aware Somewhat Aware Very Aware 	
Q3 How comfortable are you with the use of AI and machine learning technologies by financial institutions?	
Oe	xtremely uncomfortable
\bigcirc s	omewhat uncomfortable
ON	leither comfortable nor uncomfortable
\bigcirc s	omewhat comfortable
OE	xtremely comfortable

Q4 Have you ever interacted with a chatbot for customer service inquiries or complaints?

○ Yes
○ No
Q5 If yes, how helpful was it, please share your experience?
Q6 Has a transaction ever been declined by your financial institution because of AI flagging it as potentially fraudu- lent?
○ Yes
ONO
Q7 If yes, could you please share your thoughts on the accuracy and effectiveness of the AI system in detecting po- tentially fraudulent transactions?
Q8 Are you aware of any instances where AI technologies used by financial institutions have led to unintended con- sequences or negative outcomes for customers?
○ Yes
○ No
Q9 If yes, please describe.

Q10 Do you believe AI technologies have improved the efficiency and accuracy of financial services?

O Yes

○ No

Q11 If yes, please elaborate.

Q12 How transparent do you feel financial institutions are about the AI algorithms used?

O Very transparent

O Somewhat transparent

O Not transparent

Q13 Are you concerned about the potential biases that AI algorithms might introduce into financial processes or operations?

OYes

 \bigcirc No

Q14 If yes, please elaborate.

Q15 When it comes to handling requests and tasks related to your finances, do you prefer more human involvement or do you trust AI systems to handle these tasks effectively?

Human
AI
Both

Q16 Have you ever encountered any issues or concerns related to AI applications in the financial services you've used?

O Yes

O No

Q17 If yes, please elaborate.

Q18 Have you ever encountered situations where AI-driven systems used by financial institutions have led to misunderstandings or misinterpretations of your financial needs or preferences?

OYes

 \bigcirc No

Q19 What are the most significant ethical considerations financial institutions should take into account when deploying AI technologies?

Q20 Do you believe there is a need for greater education and awareness among consumers about AI technologies in finance?

OYes

Maybe

 \bigcirc No

Q21 How do you think AI technologies will impact the future of the financial industry?

Q22 Are there any specific AI applications or features you would like to see implemented by financial institutions in the future?