Ududeniye Gedara Dilusha & Wasala Nalinda

UNVEILING THE FUTURE:
HOW SRI LANKA'S BANKING SECTOR IS LEVERAGING AI-POWERED APPLICATIONS FOR ENHANCING CUSTOMER EXPERIENCE.

Master's in GBM
2024 Spring

KAMK • University of Applied Sciences

KAMK • University of Applied Sciences

ABSTRACT

Authors: Dilusha, Ududeniye Gedara; WasalaNalinda

Title of the Publication: Unveiling the Future: how Sri Lanka's banking sector is leveraging AI-Powered applications for enhancing customer experience.

Degree Tittle: Master's degree in Global Business Management

Key Words: Artificial Intelligence (AI), Banking, Customer Experience

This study is done with the purpose of identifying and improving the use of AI-Powered applications to enhance customer experience in the Sri Lankan banking sector. This study aims to make recommendations to improve the use of AI-powered applications to enhance customer experience in the Sri Lankan banking sector. A comprehensive literature review was done to identify the theoretical background related to the objectives of the study.

This study followed a qualitative method. The research approach used in this study was abductive method. The researcher used semi-structured interviews to collect primary data. Purposeful snowballing sampling technique was adapted. The sample size was six top level managers and 12 operational level managers in different banks in the Colombo district with over10 years of experience in the industry. Thematic analysis was done covering the themes of types of AI powered applications used, methods to enhance customer journey, challenges and opportunities related to AI-powered applications and methods to improve the use of AI-powered applications for customer experience management.

The findings revealed that Sri Lankan banks are increasingly using chat bots and fraud detection AIs. Sri Lankan banks believe that it is important to ensure security, and accuracy and efficiency in operations can be achieved through the adoption of Ais,which increases the customer experience. However, it incurs higher costs of implementation and maintenance, which is a great challenge. It was

recommended that it is important to invest in training, collaborating with Fintech innovators, and continuous investment in AI capabilities to improve the customer experience in banking.

TABLE OF CONTENTS

ABBREVIATIONS

AI – Artificial Intelligence

ATM - Automated Teller Machine

DL - Deep Learning

GDPR - General Data Protection Regulation

IoT - Internet of Things

ISO/IEC 27001 - Information Security Management

ML - Machine Learning

NLP - Natural Language Processing

PCI DSS - Payment Card Industry Data Security Standard

RPA - Robotic Process Automation

VTM - Virtual Teller Machine

INTRODUCTION

The introduction provides an overview of the study, detailing its background, research problems and research objectives. The chapter explains the significance and potential impact of the study and providesan outlineof the research.

1.1 Background of the Study

The rises of large data sets and recent technological advancements have created a global interest in artificial intelligence (AI). The fact that internet behemoths like Google, Amazon, Apple, and Facebook are spending millions on AI to offer AI-based services and applications highlights the importance of AI for a wide range of industries. The largest market for artificial intelligence (AI) technology adoption is now the banking sector. The industry's adoption of AI technology has particularly risen after the introduction of self-service branch networks and the Internet, or online banking. Among other use cases, natural language processing (NLP) and machine learning systems are being utilized to answer client inquiries, track spending and saving patterns, and issue payments automatically and dependably on behalf of customers. Repetitive and clerical duties are necessary for back-office operations in a bank. These tasks grow laborious and require a lot of time to finish (Verma & Bhattacharyya, 2017). On legacy systems, many linked processes are executed. It is common to have numerous staff members handling a single client request. These manual procedures can also be expensive and produce inconsistent or inaccurate results. Updating the procedures with the newest technology is crucial to overcoming such problems with time, money, and error. Therefore, AI for customer experience enhancements is increasingly discussed in the current banking context. AIs are popularly used to enhance the quality of banking services and provide customers with a better experience. Therefore, this study explores the use of AI in enhancing customer experience and provides recommendations to improve the use of AI-powered applications to enhance customer experience in the Sri Lankan banking sector.

Banking industry in Sri Lanka plays an important role in the Sri Lankan economy. The main types of financial institutions are Licensed Commercial Banks (LCBs) and Licensed Specialized banks (LSBs). The Central Bank of Sri Lanka is the regulator of the financial market in the country. Sri Lankan banks have been facing continuous economic and social challenges in the recent past. The COVID-19 pandemic was the most impactful and significant scenario which caused severe pressure on the whole financial system of the country. Devaluation of the currency during this period severely damaged the sustainability of the banks. However, due to the strategies implemented by CBSL, it was able to sustain in the long run (CBSL,

2024). The Sri Lankan banking sector is continuously introducing innovative banking services. Private-sector commercial banks are competing to attract more customers. These banks are highly focused on improving the customer experience in banking. This study analyses the use of AI to improve customer experience in Sri Lankan banks.

1.2 Research Problem

The use of AI in the banking industry is becoming increasingly popular around the world. However, there are several obstacles that banks face in adopting AI. Updating the systems based on technological trends is essential for banks to face the competition in the industry. Banks face technical difficulties in adopting AI, including compatibility with the AI requirements, which can be challenging. Banks must comply with regulatory frameworks related to cybersecurity. Other challenges include cybersecurity threats, which can be generated due to AI use. One of the biggest hurdles experienced by the banks is the lack of skilled employees for adopting AI (AL-Dosari et al., 2024). Employees must be skilled enough to handle AI effectively. Banks should invest heavily in employees' skill development. Further, financial burden is another challenge faced by banks when adopting AI. These challenges highlight the practical gap in the banking industry. Moreover, based on the authors' findings, none of the published studies have investigated the use of AI in the Sri Lankan banking industry, which reflects the theoretical and empirical gap. Therefore, this study answers the research problem of "How is the Sri Lankan banking sector leveraging AI-powered applications to enhance customer experience?"

1.3 Research Aim and Objectives

The main purpose of the research is to identify and improve the use of AI-Powered applications to enhance customer experience in the Sri Lankan banking sector. Therefore, the aim of the study is to make recommendations to improve the use of AI-powered applications to enhance customer experience in the Sri Lankan banking sector. Following this aim, this research includes other objectives, as follows:

- To identify the types of customer-centered AI-powered applications employed by the Sri Lanka's banking sector.
- To identify methods to enhance customer the journey in Sri Lankan banks using AI.
- To identify the challenges and potential opportunities relating to AI- powered applications for enhancing customer experience in the Sri Lankan Banking sector.

1.4 Research Questions

The main research question answered in this study is:

How to improve the use of AI-Powered applications to enhance the customer experience in the Sri Lankan banking sector?

To answer this main research questions, the study addresses three sub-questions as follows:

1. What types of AI-powered applications are employed by Sri Lanka's banking sector?
2. How does AI enhance the customer journey in Sri Lankan banks?
3. What are the challenges and potential opportunities relating to the use of AI- powered applications for enhancing customer experience in the Sri Lankan Banking sector?

1.5 Significance of the Study

The banking industry is one of the most important industries in the Sri Lankan economy. The stability and sustainability of this industry are highly important for the sustainability of the national economy. The current study aims to investigate how AI-powered applications are currently being used in the Sri Lankan banking sector to enhance customer experience and identify opportunities for improvement in this area. Therefore, this study identified AI's role in enhancing customer experience in banking and provided recommendations for optimizing the use of AI in this context. This delivers practical insights for banks to improve the adoption of AI in different aspects of their operations. These findings can guide the management of banks to develop strategies to enhance the use of AI to improve the customer experience and improve their competitive edge. Not only that, but this study also fills the existing theoretical gap pertaining to the use of AI in Sri Lankan banking.

1.6 Research Outline

This thesis report consists of five chapters, each dedicated to exploring distinctive aspects of the research journey. The layout of the study is briefly outlined and explained as follows:

Chapter 01 – Introduction

This chapter provides an overview of the research background and delves into the rationale behind conducting the study. Accordingly, the study identifies the background of the utilization of AI in the

banking industry in Sri Lanka. Further, this chapter discusses the research problem with research objectives and questions.

Chapter 02 – Literature Review /Theoretical Framework

This chapter discusses the latest literature related to AI usage and the use of AI to enhance the customer experience in the banking sector. Theoretical and empirical reviews of the literature are covered in this chapter.

Chapter 03 – Research Methodology

This chapter explains the main research methods employed by the researcher to achieve the objectives. Identification of the population and adapted sampling techniques, data collection method, and data analysis methods are rationally explained in this chapter.

Chapter 04 –Data Analysis and Findings

This chapter presents the data analysis findings. The analyses of data based on themes are presented comprehensively in this chapter.

Chapter 05 –Conclusion and Discussion

The analyses of qualitative data based on themes are discussed with literature in this chapter. The section presents the conclusions and managerial implications made based on the findings of the study. Further this chapter delivers the limitations and suggestions for future studies.

LITERATURE REVIEW

This chapter presents the theoretical framework of this study, aiming to identify and improve the use of AI-powered applications to enhance the customer experience in Sri Lankan banking sector. This gathers theoretical and empirical evidence to achieve the objectives of the study covering key topics such as banking industry in Sri Lanka, trust-commitment theory, Artificial Intelligence and AI applications in banking sector, customer experience and customer journey. These topics provide a comprehensive foundation of understanding how AI can be effectively leveraging to enhance customer experience.

2.1 Banking Industry in Sri Lanka

In Sri Lanka, the banking sector consists of Licensed Commercial Banks (LCBs) and Licensed Specialized Banks (LSBs) that control the financial system of the country and represent the largest portion of its total assets. In the country's financial system, the banking sector accounts for 61.9 percent of the total assets at the end of 2022(Central Bank of Sri Lanka [CBSL], n.d.). Currently, twenty-four commercial banks and six specialized banks operate in the country's banking system.(CBSL, n.d.). When compared with their importance in terms of intermediately role in the payment circle, LSBs' contribution is low as they have a minor impact on the country's financial system (CBSL, n.d.). In Sri Lanka's financial system, banks play a crucial role in supporting the economic growth and development by providing liquidity and modifying the riskiness of assets (CBSL, n.d.). With its higher influence on the financial system, LCBs significantly contribute to the economic stability in facilitating core banking functions including money deposit, credit provisions, payment services, international trades, foreign exchange services, financial intermediation, and risk management.

2.2 Trust-Commitment Theory

In 1994, Mogan Hunt published their theory on relationship marketing, evolving two key mediating variables, namely commitment and trust. Their Key Mediating Variable (KMV) model demonstrated how precursor variables impact relationship commitment and trust (Morgan & Hunt, 1994). In this theoretical model several precursor variables including relationship cost, benefits, shared values, communication, and opportunistic behavior were considered against relationship commitment and trust. Accordingly, trust-commitment theory highlights the significance of trust and commitment in shaping the dynamics of the relationship between buy and seller during the relationship development process, whichrefers to marketing (Morgan & Hunt, 1994). Trust and relationship commitment

areshown to play a pivotal role in moderating the connection between customers' evaluation of service convenience, individualization, and quality in AI- based customer experience (Senathirahah et al., 2024).

In their study, Ameen et al. (2021) developed a theoretical model integrating the trust-commitment theory with service quality to analyze how AI-powered applications in shopping lead to an improved customer experience. The findings indicated the role of trust and perceived sacrifice as factors mediating the effect of perceived convenience, personalization, and AI-enabled service quality (Ameen et al., 2021). The study further revealed that the effect of relationship commitment on AI-enabled customer experience quality (Ameen et al., 2021).

Another study conducted by Trawnihet al. (2022) investigated the impact of incorporating Artificial Intelligence in purchasing on the AI-powered customer experience, adapting the same conceptual model derived from service quality and trust commitment theory. The findings indicate a significant influence of relationship commitment on AI-powered customer experience(Trawnih et al.,2022). Additionally, the results highlighted the mediating role of perceived sacrifices and trust in shaping the impact of perceived convenience, personalization, and service quality of AI-powered services(Trawnih et al., 2022).

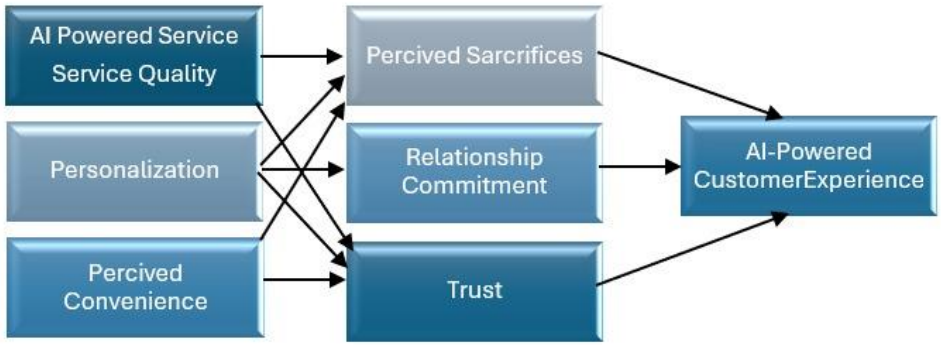
The findings from the studies by Morgan & Hunt (1994), Ameen et al. (2021), andTrawnih et al. (2022). examined the role of trust, commitment, and other factors in modifying AI-enabled customer experiences. Morgan & Hunt's (1994) trust commitment theory provides a foundational understanding of how these variables influence relationships. On the other hand, Ameen et al. (2021) and Trawnih et al. (2022) consider trust and perceived sacrifices as mediating factors in the context of AI-enabled services. Trawnih et al. (2022) proved the impact of relationship commitment on AI-powered customer experiences.

The trust commitment theory points out that trust and commitment are batteries for deepening the connection between buyers and sellers in the market (Wang et al., 2020).The theory has been extensively studied in various contexts, such as online retailing and group buying websites (X. Wang et al., 2020), brand relationships in online communities (Zhang et al., 2018), fan pages on social media (Akrout& Nagy, 2018), online shipping behavior (Rehman et al., 2019), and the role of trust in enhancing relationship commitment between customers and retailers in online settings and on social media (Wang et al., 2016). These studies note that a successful online retailer would admit that trust and relationship

commitment are the ultimate goals of effective communication between buyers and retailers.Figure 1 demonstrates the theoretical model developed by Ameen et al. (2021) to describe how trust and perceived sacrifices act as mediating factors between AI-Hedonic and AI-recognition customer experiences, along with four other factors including AI-enabled service quality, personalization, perceived convenience, and relationship commitment. Further, the framework shows how each factoralignwith the other in delivering a positive customer experience in an AI- enabled service environment.

Figure 1

AI-powered customer experience model developed by Ameen et al. (2021)



Trust is one of the most important elements in Morgan and Hunt's trust-commitment hypothesis, (Wang et al., 2020). Furthermore, autonomy plays a key role not only in the accomplishment of automated services but also in the connection of the space between people and automation (Hengstler et al., 2016). Discussing data privacy without addressing privacy itself is impossible, as it is a crucial element of customer trust. Consumers expect a certain level of autonomy in how retailers use their data, which makes privacy a fundamental concern. Moreover, Hengstler et al. (2016)indicated that trust is not an isolated factor; it can influence various elements related to AI utilization, such as service quality or convenience (Siau & Wang, 2018; World Economic Forum, 2021).Perceived sacrifice is treated as another mediating factors in this model that refers to what customers give up obtaining a product or services of a company(Ameen et al., 2021; Trawnih et al., 2022).These sacrifices can be monetary or

non-monetary factors (Ameen et al., 2021; Trawnih et al., 2022). In AI-integrated automated systems that have limited options, customers may experience loss of control, lack of privacy and personal interaction (Trawnih et al., 2022).

According to this framework, relationship commitment significantly determines the AI-enabled customer experience while being interconnected with the personalization of AI applications. Relationship commitment in the consumer-brand context refers to a sustained desire to maintain a valued connection between customers and the service provider (Ameen et al., 2021).Relationship commitment emerges because of sustained and satisfactory interaction over an extended period between customers and service providers (Wang et al, 2019).

In the settings of AI-enabled self-service technologies, customers evaluate service quality based on four dimensions such as security, reliability, customer services and interface design(Ameen et al., 2021). Multifaceted approaches to AI algorithms prudently aim to safeguard customer information, ensure security and reliability, and turn down perceived risk. Perceived privacy risk means customers'concernsthat their personal information could be used in unforeseen circumstances(Cheng & Jiang, 2020).Lower down of perceived risk was a key determinant of customer satisfaction and intention to continuous usage of Chatbot (Cheng & Jiang, 2020).Credit scoring models with AI algorithms provide better customer service in the bank's lending process (Vijai, 2019). Customer experience is positively influenced by chatbots well-designed advanced communication features, trustworthiness (El Bakkouri et al., 2022)as well as AI-powered self-service models with well-designed interfaces(Ameen et al., 2021).

Customer satisfaction depends on how AI-powered applications timely respond, function accurately, meet customer needs, understand, and respond to customer queries(Az Zahra et al., 2023).Modern chatbots that deliver company updates, customized offer product or service recommendations, and assist in purchasing decisions positively affect customer satisfaction, encourage ongoing service usage, and cultivate loyalty (Cheng & Jiang, 2020).In banking chatbot, perceived trust on data privacy, advanced support capabilities that enhance service quality, human-likeliness, user- friendliness, accurate and speed responsiveness make a great impact on the customer experience (Petersson et al., 2023).

How the service provider supplies a better service, it leads to an enhanced customer experience (Ameen et al., 2021 ; Trawnih et al., 2022). Because AIshas become more integral to banking service deliveries and invest in optimization of quality aspects is essential for positive customer experience.

In the study done by Ameen et al. (2021), customer convenience was shown to be a significant factor affecting the overall AI-enabled customer experience. In the AI-enabled service environment, perceived convenience relates to time savings and the ability to experience the service at the nearest convenient location (Ameen et al., 2021). The integration of AI into banking leads to a customer experience through increased convenience, which refers to the ease and efficiency which customers can interact with AI technologies to fulfill their needs and preferences.

The recent study conducted by Petersson et al. (2023)in the banking context using digitally native millennials, identified positive experiences with text-based chatbot attributes of easy usage, quick service, and human-like interaction. This study found that text-based chatbots are not totally competent at performing complex task and should be developed with advanced capabilities (Petersson et al.,2023).

In the modern banking environment, chatbots play a vital role in enhancing business process efficiency with a mix of technical and management expertise. Virtual service agents have evolved to perform sophisticated functionalities like real-time processing, natural language understanding and machine learning capabilities. They facilitate assertive, effective, and rapid customer interactions ensuring continuous availability and accessibility (Andrade &Tumelero, 2022). AI-powered chatbots automate repetitive tasks, deducing the need for manual intervention and providing instant responses to customer queries. Additionally, AI models can analyze vast amount of data quickly, enabling business to make informed decisions faster.

Complex banking procedures may be automated with the artificial intelligence, which will result in increased productivity and reduction in the amount of time required for processing (Frankenfeld, 1993). If the chatbot delivers convenience and efficient customer service, saving more time than a human agent, users are satisfied and have a greater intention to continue their relationship being loyal (Cheng & Jiang, 2020).Increasing demand for speed in various aspects of services and customer interaction goes beyond being a matter of convenience; it has transformed into fundamental principles of the modern customer experience (Binti et al., n.d.).

Customer preferences and behaviors have been rapidly evolving over last few decades. A recent market survey revealed significant changes in customer behavior with highest percentage scoring 76% of customization (Tilliette et al., 2021). Personalization has become the hallmark of an exceptional customer experience that delivers satisfaction. personalization is an individualized process that

providesusers with personalized information and interactions to address their unique interests and requirements.

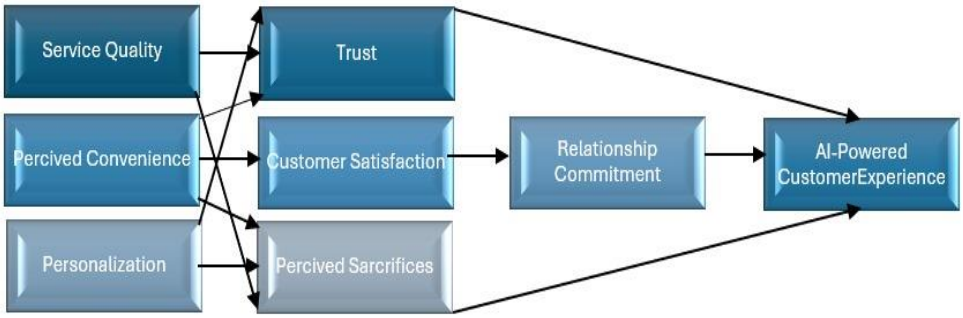
Banks benefitfrom leveraging advanced analytics and machine learning models for automated and personalized decisions throughout the customer life cycle (Agarwal et al., 2021).In an AI enabled service environment, personalization can be achieved with the user interface, content, and interaction process (Ameen et al., 2021).The personalization user interface adds values to customers by offering detailed screen layout and presentations, whiles content personalization delves into the customization of important information based on customer profile (Ameen et al., 2021). Applications that are powered by AI have the potential to revolutionize customer service by providing services that are not just individualized, but also proactive(Hughes, 2006).

According to Sheth et al. (2022) AI in banking can deliver personalized services by leveraging its capabilities to analyze vast amounts of data and customer interactions. AI can create detailed customer profiles based on customer preferences, interaction history, behavioral patterns, allowing banks to tailor their services and offerings to individual needs. By better understanding customers, bank can provide proactive customer support, giving target recommendations and service and product offerings. Fares et al. (2023)also demonstrates how AI may enabled individualized consumer interactions with AI- powered chatbot.

In summary, the reviewed literature underlies several key findings. AI applications are pivotal in delivering service quality, ensuring customer convenience, and offering personalization, all of which are crucial to the customer experience. These factors directly affect customer satisfaction, influencing their decision-making process. Relationship commitment emerges because of customer satisfaction, trust, and perceived sacrifices, which play an intermediate role between quality, convenience and personalization and their impact on the customer experience. based on the above motioned literature findings, this study develops a conceptualframeworkto explain how researchers understand each factor in banking sector align with other, as illustrated in Figure 2.

Figure 2

Conceptualframework for assessing AI-powered customer experience Developed by Dilusha &Nalinda (2023)



The conceptual framework incorporates following key factors:

- Service quality encompasses the development of domain security, reliability, customer support, and interactive design improvements.
- Perceived convenience refers to the extent to which customers find a service easy, comfortable, and convenient to use, reflecting the overall user experience.
- Personalization involves offering customized information and personalized interactions that align with their needs and preferences.
- Customer satisfaction refers to their level of delight with service quality, perceived convenience, and personalization service offerings.
- Relationship commitment refers to the intention to continue staying with a company or a brand.
- Customer experience is shaped by service quality, convenience and personalization and it is further nurtured by satisfaction and relationship commitment.
- Trust is the confidence customers have in a brand or company's reliability.
- Perceived sacrifice, wherein customers feel a loss in a transaction, can hinder the overall customer experience.

2.3 Artificial Intelligence (AI)

Evolution of AI began in the 1950s as a term in the academic discipline (Kaur et al., 2020). In the 1990s, the subject of AI came into practice and became increasingly popular among major tech companies. In the 2000s tech giants like IBM, Microsoft, Google, and Facebook started to employ AI and machine learning applications for their businesses. AI signifies a machine's ability to perform cognitive functions of the human mind(IBM, n.d.; McKinsey, 2023a). AI's capacity to perform cognitive functions includes perceiving, reasoning, learning, memorizing, interacting with an environment, problem-solving, analytical thinking, and creativity. Artificial Intelligence (AI) refers to the development and implementation of computer systems capable of performing tasks that typically require human intelligence, such as learning, reasoning, and self-correction (Kok et al., 2009).

Artificial Intelligence is a rapidly evolving field that continues to see significant development and advancement. According to Arend Hintze, an assistant professor of integrative biology, computer science and engineering Michigan State University, AI can be categorized into four types with its advancements beginning from task specific intelligence systems in widely use today to progressing sentient systems, that do not exist yet namely reactive machines, limited memory, theory of mind and self-awareness (Laskowski, 2023). Reactive machines are task specific and have no memory; limited memory category has memory that can use past data to make future decisions(Laskowski, 2023). Being a psychology term, the theory of mind describes AI's social intelligence capabilities to understand emotions and predict human behaviors, self-awareness category will posture self-consciousness and hopefully would come into the reality in the future (Laskowski, 2023).

The modern banking sector broadly employs various subfields of artificial intelligence in their daily operations (Vijai, 2019). Here we provide an overview of AI technologies including Neural Language Processing (NLP), Artificial Neural Network (ANN), Machine Learning (ML) and Deep Learning (DL).

Natural Language Processing (NLP)

Natural language processing is rootedin the1950s, with Alan Turing's introduction of the Turing test to assess the intelligence of computers by evaluating its ability to interpret and generate natural language (Lutkevich, n.d.). With the advancement in computer power, NLP has also gained significant growth in popularity as a term today with its modern applications. Natural Language Processing combines computer science and AI to facilitate effective communication between humans and machines through

natural language(Müller et al., 2020). NLP employs computational techniques to comprehensively examine, analyze and interpret human language. This involves equipping machines to understand, derive meaning from and extract information from textual data through algorithms and techniques. In real-world, NLP's advance capabilities of text and speech recognition is employed in mostly cited applications including machine translation, spam recognition, virtual agent and chatbot, social media sentiment analysis and text classification and extraction and medical sector (Khurana et al., 2023).

In the banking sector, NLP is utilized for various purposes such as customer support, process automation, enrichment of data, improvement in financial decision-making, compliance, and risk management processes (Banking and Finance, 2023). By employing NLP technology, banks automate various processes, boosting the accuracy, efficiency, and effectiveness(Laskowski, 2023).

Artificial Neural Network (ANN)

ANNs are a computational model that works like the functioning of human nervous systems(Islam et al., 2019). Neural network architecture comprises artificial neurons called units arranged in a series of layers. These layers are fully interconnected with each other, creating a pathway to information flow. Input units receive diverse information from an external environment that the network attempts to identify, understand, learn, or process. Output units are on the opposite side of the network, and the signal conveys how the network responds to the received information. In between input and output units, there are layers of hidden units that create an artificial brain. Accordingly, data enters the input layers, isthen transformed in the hidden layers, and produces an output layer based on weighted connections. The connection between units is represented by weights. A numerical value can be positive ifone-unit stimulatesanother orcan be negative if one unit suppresses or inhibits another(Islam et al., 2019).The magnitude of the weight determines the extent of the impact on others. Figure 3 illustrates how a neural network's layers are created with its interconnections. With its technical advantages, the artificial neural network is applied in various areas, such as medical diagnosis and health care, facial recognition, signature verification and forensics, social media, stock market predictions, aerospace and defense industry modules, weather forecasting, robotics and dynamics, electronic hardware, and accelerations(Goel et al., 2023).

In the banking industry, neural network AI is applied to advanced financial models to optimize risk profiling, credit scoring and trading(Boadu, 2018). It enhances customer service, personalization, compliance and fraud detection through advanced data analysis and pattern recognition(Boadu,

2018).ANNs, such as the Levenberg-Marquardt based Back Propagation (LMBP) algorithm, are employed to enhance the performance and accuracy of predicting cloud security levels. By analyzing data gathered using techniques like the cloud Delphi method, ANNs can identify patterns and trends in security issues. This helps banking developers and IT managers assess and improve the security of their cloud systems. Integrating ANNs with other optimal techniques can further enhance prediction and mitigation of security issues, ultimately increasing the success rate of cloud banking operations (Elzamly et al., 2017).

Figure 3

Structure of Neural Network adapted from (Yasar, n.d.)

Machine Learning (ML)

In 1959, Arthur Samuel has introduced the term 'machine learning' (ML) defining it as a field that gives computers the ability to learn without being explicitly programmed (Boutaba et al., 2018). ML is a subset of AI where practitioners develop AI models capable of learning from data patterns automatically without human direction. Machine learning models and their algorithms fall into four main categories: supervised learning, unsupervised learning, semi-supervised learning, and reinforcement learning (Boutaba et al., 2018).Accordingly, supervised learning involves data scientists giving algorithms labeled data with specified input and output variables The approach involves guiding the algorithm towards desired outcomes, allowing it to learn and establish correlations between input and output variables(Lawton, 2023). Unsupervised machine learning does not require labeled data, and these types of algorithms can use unlabeled data to discover patterns or data grouping(Lawton, 2023).Semi-supervised learning involves providing a limited set of labeled training data sets to grasp the underlying structure and learn allowing it to generalize and apply its knowledge to new unlabeled data(Lawton, 2023).Reinforcement learning involves teaching an algorithm to reach a goal by setting up roles and they

are programmed to seek rewards for positive performance, and avoid penalties for negative performance facilitating them to learn(Lawton, 2023).

ML applications are practically employed in various business disciplines, including business intelligence, customer relationship management, fraud detection, human resources information systems, supply chain management, manufacturing, pharmaceuticals, and financial modeling(Tucci, n.d.).These financial models include fraud detection tools, credit scoring models, risk management tools, trading, customer service instruments, compliance task automation, anti-money laundering and predictive analysis(DBS Bank, 2023).

ML algorithms like random forests and causal forests analyze consumer finance survey data to identify factors influencing customers' adoption of online banking services. These algorithms predict customer behavior, such as the sequence of actions leading to digitalization, and reveal causal relationships between variables (Carbo-Valverde et al., 2020). The study conducted by Munkhdalaiet al.(2019) compared machine learning (ML) approaches with the FICO credit scoring system using real consumer data. It was introduced by Fair Isaac Corporation to evaluate a person's creditworthiness. The results showed that using ML models for credit assessment could have led to lower expected credit losses and increased sustainability for lending institutions in the 2000s. Deep neural networks and XG Boost (as an analysis tool) trained on selected features achieved the highest accuracy and area under the curve (AUC), highlighting the potential of ML in improving credit risk assessment in banking.

Deep Learning (DL)

DL is a subset of machine learning that adapts a computational approach to employ models with multiple processing layers to learn complex data representation (Lecun et al., 2015). By utilizing multiple layers of processing, DL enables the extraction of hierarchical and abstract features from raw data. Accordingly, deep learning discovers intricate structure in large data sets by using the back propagation algorithm to adjust its internal settings in each layer, so it can figure out these representations based on what it learned in the previous steps (Lecun et al., 2015). Employing a complex neural network, deep learning mimics the way neurons interact in the human brain. The power and uniqueness of deep learning lie in its multilayered architecture coupled with diverse propagation, leading to enhanced accuracy in outcomes. This architectural approach is employed across a wide range of domains including the travel industry for price forecasting, banks to detect credit risk and fraudulent financial transactions and decision-making, and health care to diagnose decrease from medical scans (Wang et al., 2019).The

emergence of generative AI that contains the advanced capabilities of deep learning represents a significant leap in the AI landscape.

Generative AI is a subset of deep learning that generates new contents based on a learned probability distribution of existing data (Lawton, n.d.). Generative AI has undergone an astounding transformation in recent years, making it a hot topic, and businesses are racing to capture its values. McKinsey research found that generative is spreading across all business fields showing its potential to add US $4.4 trillion annually to the global economy(McKinsey, 2023b). Amongst other areas such as customer operations, marketing and sales, software engineering and research and development are frontiers those capturing values of generative artificial intelligence. Global Fintech report: 2023 reveals that industry is revolutionized by generative AI with the potential of improving automated financial task, customer services, enhancing security measures, facilitating to overcome technical constrains, enabling personalization services and boosting operational efficiency(Goyal et al., 2023).

2.4 Artificial Intelligence in Banking Industry

Amid the increased adaptation of AI technology by various industries, the banking and financial sector is also being the front runners. In the global scenario, functionality improvements in the banking system are increasingly achieved through adapted AI applications in various areas, including core banking functions, sales and risk management, fraud detection and prevention, internal auditing, asset management, customer engagement and relationship building(Umamaheswari et al., 2023). Within the banking context, AI-powered decision-making will be a greater priority in the future, not only to gain competitive advantage but to create values for the banking customers and stakeholders as well(Agarwal et al., 2021)

As stated by Sheth et al. (2022) optimal incorporation of Artificial Intelligence into banking services facilitate act as strategic entity, ensuring efficiency of banking operations enabling prompt and real time transaction. However, AI optimization should concern potential challenges and making balance with human intervention(Sheth et al., 2022) for delivering a better customer service. Over the last few years, natural language processing, machine learning and deep learning have emerged as a highly utilized subset of AI to ensure effective and efficient banking operations(Vijai, 2019).The following types of AI applications and AI integrated financial services are used in the banking industry**.**

Chatbot

Chatbot is an AI-powered virtual assistant available in 24/7 to provide prompt customer services. Chatbot uses natural language processing techniques to perform routine tasks such as understanding customer queries and generating automated responses, adding perceived values to customers(Petersson et al., 2023).

Robot bank

Banking robots are equipped with artificial intelligence to understand customers' requirement and perform accurate transactions, detecting customers and initiating conversations automatically in a very familiar way(Umamaheswari et al., 2023). Robot banks not only streamline banking processes but also aim to create an efficient and personalized customer experience(Umamaheswari et al., 2023).

Cash and Cheque Deposit Kiosks

Cash and Cheque deposit Kiosks are known as automated deposit machines powered by AI that allows banking customers to deposit both cash and cheque into their accounts more conveniently(VIRTECH, n.d.). These types of Kioskesare recognized as a hassle-free, useful adaptation in delivering core banking services(Sampath Bank PLC, n.d.).

Virtual Teller Machine (VTM)

VTM is an AI-powered application that provides convenient and efficient services to customers, such as customer onboarding, accounts opening, money deposits and withdrawals, funds transferring and other registration activities(Vijai, 2019). The integration of KYC (Know Your Customer) technology into virtual banking has allowed customers to experience banking core services remotely.

Digital Wallet and Virtual Cards

Digital wallets allow customers to make payment digitally, and virtual cards are used for online payments without using a mobile app enhancing overall experience (Umamaheswari et al., 2023; Vijai, 2019).

Personalization financial services

Automated financial systems, use AI and advance data analytics to analyze market conditions in relation to customer's financial goals and personal portfolios and offer customized recommendations on investment opportunities (Vijai, 2019).

Fraud detection and prevention systems

Fraud detection and prevention systems use machine-learning algorithms to identify unusual transaction patterns. These systems monitor transactions in real-time allowing them to detect and respond to potentially fraudulent activities as they occur (Umamaheswari et al., 2023).

An in-depth banking industry survey conducted by SAS in 2022 showed that digitalization and emerging technologies, including advanced data analytics, AI, and machine learning, blockchain, IoT/5G, and robotic process automation, stand out as a trend over the next decades(The Economist Group, 2022). Banking executives have identified the top strategies to stay ahead or take competitive advantage of the industry. investing in cyber security and data protection capabilities, improving customer experience through emerging technologies and data analytics,and improving data sharing between digital payment, fraud protection and anti-money laundering functions(The Economist Group, 2022). AI and machine learning are pivotalcapabilities needed for banks to exploit potential opportunities to maintain competitiveness in the evolving landscape of the finance industry.

2.5 Customer experience (CE)

Nowadays, customer experience management (CEM) is increasingly popular in the marketing paradigm, acknowledging its positive impact on businesses. Customer experience is defined as the individual interaction with a brand or with the company over time(Peppers, 2016, p.22). Customer experience explains how customers perceive a brand or a company based on their interactions throughout their journey. This interaction collectively shapes customer perceptions of the company, which can impact satisfaction, continued engagement with the company, and their loyalty. Scholars view CE as a multidimensional concept including customers' cognitive, emotional, behavioral/physical, sensorial, and social reactions to a company's product or service during their customer journey (Ameen et al., 2021; Lemon & Verhoef, 2016; Tulcanaza-Prieto et al., 2023)across all stages and touchpoints. The cognitive element of customer experience refers to functionality, speed, and service availability; the emotional aspect represents positive and negative feelings that affect consumer outcomes, including customer

satisfaction or dissatisfaction; behavioral and sensory factors describe how customers physically interact with and perceive company offering those relates to technology related features, user-friendly interfaces, and other sensory aspects. The social aspect emphasis human interaction, and social influence relates to how customer perceive and engage with the company or brand. These diverse aspects enable the company to strategically arrange its position in the marketing ecosystem to influence customer journeys, aligning company internal aspects with customer expectations and needs.

Customer experience management includes the process, tools and procedures required to affect individual customer experiences at a company (Peppers, 2016, p.40). Customer experience emphasize understanding customer requirements, fulfilling their expectations, maintaining positive relationships with them, gathering, analyzing, and positively responding to customer feedback and aligning business strategies, processes, and structures to deliver value for them and consequently make customers satisfied with the company. In customer experience management, measuring and monitoring customer reactions to product or service offerings, especially their attitudes and perceptions are key elements(Lemon & Verhoef, 2016).Individual perception factors include convenience in use, personalization, trust, customer loyalty and customer satisfaction(Tulcanaza-Prieto et al., 2023).In a study in the Ecuadorian Banking sector, Tulcanaza-Prieto et al. (2023) presented a theoretical framework for building relationships between these perception factors and the AI-enabled customer experience, including hedonic and recognition attributes. The investigation has measured factors such as convenience in usage, personalization, trust, customer loyalty and customer satisfaction effect on overall customer experience. The findings revealed that factors such as convenience in usage, personalization, trust, customer loyalty and customer satisfaction positively effecton AI-enabled customer experience including hedonic and recognition attributes (Tulcanaza-Prieto et al., 2023).

Self-service technologies (SSTs)are currently popular in-service industries, supplementing or replacing traditional interpersonal interaction with automated and technologically driven solutions. SSTs refer to technological interfaces that allow customers to access and utilize services without direct involvement from service provider(Meuter et al., 2000).These technologies are designed to enhance customer convenience by providing efficient and convenient service options (Meuter et al., 2000). In the banking sector, widely usedSSTs including online banking platforms, mobile banking apps, ATMs, and self-service kiosk play a considerable role in shaping customer experience facilitating efficient banking process.

In the banking environment AI- enabled customer experience refers to the adaptation and acceptance of digital banking services (Tulcanaza-Prieto et al., 2023). Researchers classified AI-enabled customer experience into two types of namely AI-Hedonic customer experience and AI recognition customer experience(Ameen et al., 2021; Tulcanaza-Prieto et al., 2023). Hedonic factors evolve arounds the acquisition of experience and refer to subjective factors of an individual including emotions, sensation, memories and imaginations, excitements, entertaining, educational, and novel experience (Ameen et al., 2021; Tulcanaza-Prieto et al., 2023). Hedonic consumption is often driven by subjective benefits, sothe rational aspect has a little impact on decision-making and consumption perception. Hedonic aspects cannot fully grasp human perception of an AI-enabled customer experience because AI algorithms lack gentle interaction which is provided by a human being (Tulcanaza-Prieto et al., 2023). As stated by Sheth et al. (2022), delivering human-AI-driven banking services is essential for enhancing the customer experience. AI-recognition aspect centers around respect and appreciation given to customers because of their consumption decision with the feeling of importance, respect, safety, relation, and a sense of beauty (Ameen et al., 2021; Tulcanaza-Prieto et al., 2023).

In AI-enabled context, customer experience is a complex and multifaceted phenomenon that adds values to the overall process, final outcomes and the situation experienced (Komulainen &Saraniemi, 2019). Komulainen &Saraniemi (2019) stated that customer experience creates utilitarian and hedonic values rather than social values; but utilitarian values make the real impact on banking customers' perception.

The study performed by Fares et al. (2023)revealed how AI has impacted customer journey in the banking sector. AI can automate and streamline various banking processes, such as credit applications and granting decisions, according to this study. This automation reduces the time and effort required from customers, making the journey more efficient enables banks to provide personalized interactions with customers.This finding aligns with the Cheng & Jiang(2020)view of AI applications in personalization. Chatbot powered by AI can offer tailored recommendations and assistance, enhancing the overall customer experience. Further, they revealed that AI can analyze vast amounts of customer data to provide valuable insights. Banks can use these insights to understand customer behavior better and tailor their services to meet individual needs. Security is an important aspect of banking. AI can help improve the security of banking services by detecting and preventing fraudulent activities. This enhances trust and confidence in the banking customer journey.

Several studies have investigated how AI-powered applications affect customer perception, satisfaction, and the overall customer experience. Going beyond general business adaptation, AI applications have the potential to create personalized services, deliver effective business procedures and support for financial inclusions (Vijai, 2019).In the banking industry, leveraging AI applications facilitates customer attraction, enhance the customer experience, and consequently support the business expansion (Kaur et al., 2020). AI makes seamless and spontaneous transactions while facilitating new dimensions in the industry to boost customer engagement in banking sector (Umamaheswari et al., 2023). AI technologies create value both for bank and its customers and results in efficient and personalized services to meet changing customer expectations(Blumberg et al., 2021). The studies highlight the potential of AI technologies to transform the banking sector through streamlining tasks, operational efficiency, personalized services, and better customer engagement, enabling organizations to build a customer centric ecosystem(Blumberg et al., 2021).

The integration of AI-driven tools brings considerable challenges and potential opportunities. Challenges encompass the need to ensure the quality of data, address biases within the algorithmic process and maintaining transparency and safeguard customer privacy(Sheth et al., 2022). Finding a right balance between automation and preserving human interaction also presents a notable obstacle(Sheth et al., 2022). However, AI facilitates service customization by leveraging extensive data to tailor offerings to meet customer preferences(Goyal et al., 2023). Automation streamlines process, leading to quicker responses (Goyal et al., 2023; Sheth et al., 2022)and allowing human agents to focus on intricate customer needs.Predictive analysis empowers businesses to anticipate customer behavior, while natural language processing facilitates more fluid and intuitive interaction. Through these capabilities, businesses can continually enhance the customer experience, fostering deeper connections and driving sustainable growth. The rapid advancement of AI presents both challenges and opportunities for enhancing the customer experience. Assurance if ethical AI employment, protecting customer data privacy, managing the complexity of integration, and addressing the skills gap in AI development are considered barriers to exploit. According to Chong et al. (2021), designing chatbots to effectively interpret and respond to customer emotions is crucial. Ensuring chatbots accurately represent the brand and provide satisfactory service without human intervention is another hurdle.

Integrating AI into the service environment offers significant opportunities such as improved customer insights, enhanced personalization, efficiency gains, and competitive advantage (Dwivedi et al., 2021). AI can analyze vast amounts of data to provide deeper insights, tailor experiences for customers, automate

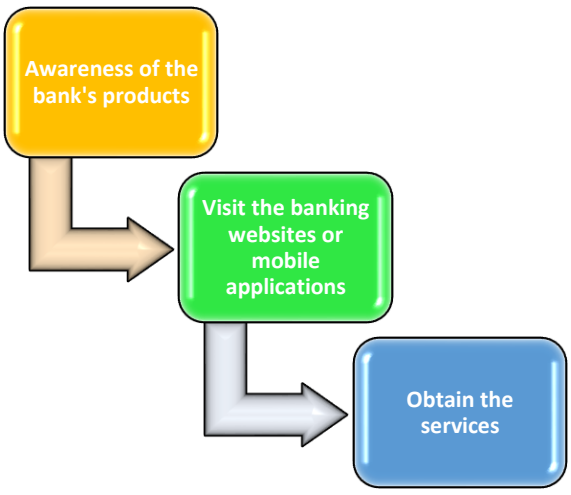
tasks for efficiency, and provide a competitive edge through early adoption.AI-chatbots offer innovative service offerings, improved customer service with 24/7 support, cost efficiency through automation, and personalized interactions based on customer data.Creating operational systems that enable collaboration between chatbot and human agents or other integrated systems is essential.

2.6 Customer Journey

Customer journey refers to the entire lifecycle of interactions and experiences that a customer has with a company. The customer journey starts within initial awareness and engagement and continuous through to purchase. Customers use product or service and then they get post-purchase support from service provider. Customer journeys have become more complex due to the adoption of touchpoints and channels available for customers to interact with companies. These touchpoints can include websites, social media, mobile apps, physicalstores,etc.(Brynjolfsson et al., 2013).Figure 4 demonstrates how the customer experience journey in banking is spared across touchpoints from the awareness stage to experience the service.

Figure 4

Customer experience journey in the banking adapted from (Lemon & Verhoef, 2016).



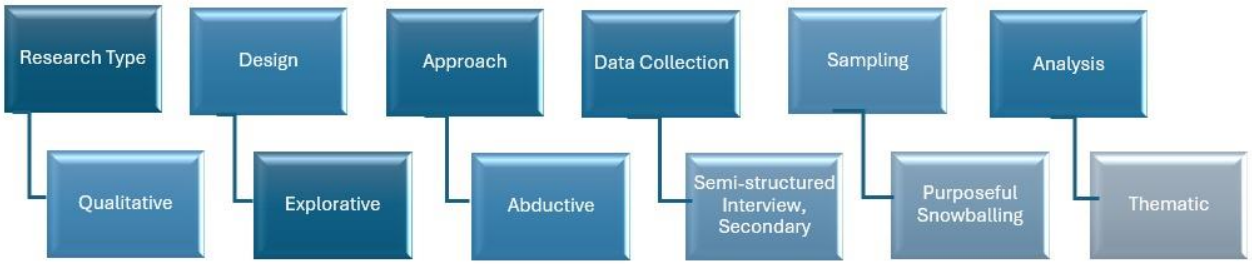
It starts with the awareness of the bank's products or services through advertising, word-of-mouth, or online research. The customers can then visit the banking websites or mobile applications to engage with the service or experience. Then, the customers can open accounts or apply for services online or in person at a branch. Customers interact with the bank through various touchpoints, such as ATM transactions, online banking, mobile banking, customer service calls, and branch visits. Each of these touchpoints contributes to the overall customer experience and satisfaction (Lemon & Verhoef, 2016).

RESEARCH METHODOLOGY

This chapter explains the study's research methodology, including a discussion of the research type, research design and research approach, data collection method sampling and data analysis and coversethical consideration of the study. Figure 5 is the outline of the research methodology of this study which demonstrates as follows:

Figure 5

Outline of the research methodology



3.1 Research Design

Research philosophy is referred to as the beliefs, values, and assumptions that guide the researcher's approach to their study. According to Saunders et al. (2016), there are two main research philosophies, namely, positivism and interpretivism. The pisitivism philosophy is based on scientific information, and studies involving the scientific approach often use the positivism approach. The positivism philosophy emphasizes the importance of empirical observation and sensory experience as the basis for knowledge. Researchers employ scientific methods in doing these types of research, such as hypothesis testing. These studies are objective, and the outcomes are based on existing facts and knowledge rather than the independent views of the researcher (Park et al., 2020). This study does not involve any hypothesis testing, and therefore, positivism is not applicable.

In the interpretivism philosophy, subjective experiences, and meanings that individuals or groups attribute to their social world are considered (Saunders et al., 2016). Interpretivists prioritize understanding the meanings that individuals attach to their actions and interactions. In this approach, researchers often follow qualitative approaches such as interviews, and observations. This philosophy

provides a deeper analysis of the context or phenomena of the study. The current study uses qualitative methods and interviews as major data collection methods. Therefore, researchers can obtain a clear idea of how artificial intelligence is used in the Sri Lankan banking industry. Therefore, it can be argued that this study should use the interpretivism philosophy.

The research approach can be identified as the plan for doing the research. Research approach depends on the method of data collection and analysis, theoretical perspectives, and the research design. The main research approaches used by the researchers are inductive, deductive, and abductive approaches. The deductive approach is used for studies that start with general theories. These studies then develop specific hypotheses to achieve the objectives of the study (Fazidah Elias, 2012). The deductive approach is often used with quantitative research studies. This is a top-down approach. The deductive approach starts with analyzing existing theories related to the topic of the study. It then focuses on specific observations through the collection of empirical data. The deductive approach is commonly used in the natural and social sciences. On the other hand, the inductive approach begins with empirical observations and data collection to develop a theory or hypothesis (Liu, 2016). In this approach, the studies are dependent on the themes developed by the researcher. Qualitative research studies are frequently using an inductive approach.

The abductive approach is a combination of deductive and inductive approaches. The abductive approach starts with an observation or set of observations (Awuzie& McDermott, 2017). Further, it follows an iterative aspect where the researcher evaluates both the literature and then the analysis findings. Then the researcher finds the explanation for those observations. The current study evaluates how the Sri Lankan banking sector is leveraging AI-powered applications to enhance the customer experience. Therefore, the abductive approach is suitable for this research since it helps explore complex phenomena and generates new insights based on observed patterns or data. The current study evaluates the responses from banking industry experts to identify the usage of AI in the banking industry in Sri Lanka. This needs a comprehensive analysis of themes aligned with the objectives of this study. Therefore, anabductive approach can be used to analyze these patterns and themes more effectively.

Research strategy refers to the plan that a researcher uses to conduct their study (Wedawatta&Amaratunga, 2011). In its intrinsic nature, the methodological choice of this research aligns with qualitative strategy. Qualitative research explores complex phenomena by prioritizing non-numeric data to get deeper insights(Saunders et al., 2016, p.168)The researcher aims to analyze the current use of AI in banking, the use of AI for improving customer experience, and any challenges

associated with it. This should be comprehensive and should be analyzed in-depth. Therefore, the qualitative strategy is the most suitable strategy since it can be used for more in-depth and comprehensive analysis of data.

3.2 Sampling, Data collection and Data Analysis

The population of this study is the banking industry professionals in Sri Lanka. Due to convenience and accessibility, the study was limited to the banks in Colombo district, the Capital of Sri Lanka. To gain insight into the AI applications used by three prominent banks in the Colombo district of Sri Lanka, semi-structured interviews are performed with senior personnel. The sampling technique was purposeful snowballing, in which the researchers contacted one or two cases in the population and asked these cases to identify others for the study (Saunders et al., 2016, p.303). Accordingly, six top-level managers and twelve operational-level managers at six banks in Colombo were interviewed. Semi-structured interviews were done over the telephone because researchers were out of the Country. The whole conversation was recorded and transcribed. The purposive sampling method helps the researcher get target individuals who possess the specific knowledge and expertise needed to provide relevant and insightful information on this topic (Campbelletal., 2020).

Primary data is collected through semi-structured interviews. Semi-structured interviews are a qualitative data collection method that combines a predetermined set of open-ended questions, but it allows the researcher the flexibility to make new questions based on the flow of the discussion (Saunders et al., 2016, p.391). Given prominence to research objectives to conduct an in-depth exploration regarding the utilization of AI in the Sri Lanakan banking sector, it created twelve significant semi-structured interview questions. All the interviewees were informed about the study purpose and their rights. Participants were informed about data privacy and data protection and ensured that their anonymity was assured throughout the process. They were given the right to withdraw their response at any time. Secondary data is gathered through a comprehensive literature review. Literature was developed based on international journal articles that were accessed through online platforms, namely Google Scholar, Research Gate, Emerald Insights, etc. In addition to those published books and industry reports were reviewed.

In qualitative data analysis, it systematically analyses non-numerical data (St. Pierre& Jackson., 2014). In this study, the thematic analysis method was used where the researcher identified themes based on the 4 objectives. The respondents were coded based on their position at the bank (Ex: Manager 01,

Manager 02, etc.). Therefore, this analysis was able to achieve the objectives through a comprehensive and in-depth analysis of interview data. The interview data was recorded and transcribed before the analysis, and the researcher had to read the transcriptions multiple times to get familiar with the collected data. The researcher used quotes from the respondents in analyzing the data based on themes. This helped to offer a more insightful and practical understanding of the context.

3.3 Ethical Considerations

Research ethics refers to the standard of behavior that guide how researchers should conduct themselves concerning the rights of those who participate or are affected by the research (Saunders et al., 2016, p.239). The ability to reflect on the whole research process from an ethical perspective and meet those standards is a prerequisite.

In this study, researchers undertook ethical practices making the interviewees aware of the research background, and rational of the data collection process. The anonymity of participants will be assured, data privacy and data protection were top priorities. Data collection as well as analysis done in an unbiased manner to ensure the quality of the study.

DATA ANALYSIS AND FINDINGS

This chapter analyse the primary data collected through semi-structured interviews. Six top-level manager and twelve operational-level managers atsix banks in Colombo district, Sri Lanka were interviewed. Top level managers had more than twenty-fiveyears' experience in banking sector whereas operational-level managers had ten to twenty-five years of experience in banking. The interviews were transcribed and used for the thematic analysis. The analysis was separated into themes based on the objectives of the study. A detailed list of participants (code bank name, position of the management hierarchy, and code name for interviewees) are presented follows.

Table 1

The List of Interview Participants

Code Bank Name	**Banker's position of the management hierarchy**	**Name Code**
ABC Bank	TopLevel Manager 01	A
	Operational Level Manager 01	B
	Operational Level Manager 02	C
XYZ Bank	Top Level Manager 02	D
	Operational Level Manager 01	E
	Operational Level Manager 02	F
LKR Bank	Top Level Manager 03	G
	Operational Level Manager 01	H
	Operational Level Manager 02	I
MNO Bank	Top Level Manager 04	J
	Operational Level Manager 01	K
	Operational Level Manager 02	L
PQR Bank	Top Level Manager 05	M

	Operational Level Manager 01	N
	Operational Level Manager 02	O
STU Bank	Top Level Manager 06	P
	OperationalLevel Manager 01	Q
	Operational Level Manager 02	R

4.1 AI-powered applications in Sri Lankan Banking Sector

Chatbots and virtual assistants powered by artificial intelligence are used to answer client inquiries and provide support in automated customer care and support systems(Petersson et al., 2023).This type of conversational technology efficiently addresses common customer queries, guides customers through procedures, ensuring assistant in 24/7. Customers do not want to need traditional business hours to get these kinds of banking services. Most of the respondents expressedthat the chatbot offers automated customer service and supports them to do frequently needed tasks, cutting down human involvement. However, these are supported by the respondent N as follows:

"Our AI-powered chatbot deduces customers time consumption by giving answers to repetitive queries that customers normally asked. It mainly focuses on providingbetter support 24/7 to satisfy them". (N)

Massive amounts of transaction data are analyzed in real-time by fraud detection systems employing artificial intelligence(Umamaheswari et al., 2023). By identifying suspicious trends that could point to fraud, these systems can alert authorities to investigate deeper and stop fraud before it harms consumers. Respondent D brought forward the use of artificial intelligence to analyze consumer behavior and transaction patterns to detect suspicious transactions as a means of detecting fraud and managing risk. Manager Q highlighted the use of artificial intelligence for behavioral analytics in fraud detection.

"...this system monitors and analyzes client behavior to spot irregularities that could suggest fraud. This system watches and analyzes client behavior to spot irregularities that could suggest fraud..." (Q)

During these computations, several data items, such as methods of money management and exchange history, are investigated. Through the usage of AI-driven algorithmic calculations, administrativemanagers, H, and Q had the ability to improve the accuracy of risk assessment calculations. Respondent M shared their thoughts on the application of artificial intelligence in the process of determining the credit risk of consumers.

"AI has improved our ability to access credit risks accurately, allowing us to make more informed lending decisions. This helps efficiency in the lending process as well as our higher financial performance" (M).

Personalized financial advice systems may be able to gather and evaluate data from many customer connections and financial transactions using artificial intelligence. Using this information, individuals will get customized financial advice and help(Sheth et al., 2022).According to respondents, the utilization of artificial intelligence enables the analysis of customers' previous actions, preferences, and purchases. Data collected and analyzed from the activities carried out by consumers of digital products (e.g., websites or apps) is known as behavioral analytics. To enhance customer satisfaction and commitment, this data is dissected to identify patterns and instances. As a result of the findings of this data analysis, specific promotional initiatives and correspondences are organized. According to employee L of the MNO bank, they implemented behavioral analytics to facilitate targeted marketing initiatives, resulting in increased customer loyalty via the delivery of personalized offers. Determines the kind and level of engagement with a brand's digital assets (website, mobile app, etc.).

"Integration of behavioral analytics into the marketing department takes a more strategic approach, delivering customized offers and driving customer loyalty. Specially, this works for corporate customers." (L).

According to manger D of XYZbank, they have developed a customer-centric system utilizing behavioral analytics to enhance constant customer engagement. Fares et al. (2023) also demonstrated how AI may enable individualized consumer interactions with chat bots that provide recommendations and help that are specifically tuned to each user.

A feature of automated telephone systems known as interactive voice response (IVR) allows users to submit requests, receive information, or both via the use of speech or menu inputs, rather than by interacting with a live agent. Computer-based AI-enhanced IVR systems can listen to and to respond to customers' voiced requests by utilizing conventional language processing. The consumer contacts the support staff via phone. These frameworks simplify the process for customers by managing inquiries,

providing information, and concluding transactions. The interactive voice response system may handle basic inquiries, direct the call to the right person, or let the user choose to switch channels or request a callback. To improve client support, ABCbank has introduced robot banks with advanced interactive features. Thanks to these advanced interactive features, the robot banks streamlines banking processes(Umamaheswari et al., 2023).

"In 2017, we introduced the first AI banking robot, a humanoid teller. This robot uses AI to understand customer requests, initiate conversation upon detecting a customer presence, and perform core functions such as providing account balance, exchange rates, interest rates, loan and credit card details, cash withdrawals, and guidance on opening accounts, etc." (A).

The goal of predictive analytics is to foretell future results by analyzing historical data. Predictive analytics software combines past data with machine learning algorithms. These tools enable banking institutions to anticipate market trends, client demands, and risk considerations, enabling them to provide proactive and individualized services. The approach finds patterns and correlations in past data using statistical modeling, data mining, machine learning, and AI techniques to predict how things will turn out in the future. The algorithms employed by PQR Bank's Artificial Intelligence enhance portfolio management in response to fluctuating market conditions and individual client risk profiles. A forward-thinking kind of business intelligence, predictive analytics may aid organizations in seeing potential dangers and possibilities. Manager H stated that *"we employ predictive analytics to anticipate market trends and offers investment advice"*. This aligns with the literature findings of Agarwal et al. (2021)on personalization.

A wide variety of applications may benefit from robotic process automation's ability to automate routine, repetitive, and rule-based processes. The implementation of these robots significantly improves operational efficiency and reduces expenses due to their ability to operate consistently with minimal errors. RPA bots may learn new instructions by observing people use digital material. Most of the bankers emphasized the importance of implementing RPA to automate redundant duties to increase productivity in areas such as exchange processing. Robot banks streamlines the banking process and enhance customer support(Umamaheswari et al., 2023).The XYZ bank's new digitalized banking concept gives priority to automation and operational efficiency.

"...according to this concept, we offer customers a unique, convenient experience tailored to today's fast-moving, digital lifestyle. Robotic automation is a key component that we offer to customers with advanced AI technologies. This is a good example of process automation and operational efficiency" (D).

New users are seamlessly integrated into a product or service during customer onboarding, which lays the groundwork for a great customer experience. AI-powered queue management systems can anticipate customer flow and allocate resources effectively, resulting in reduced wait times and increased productivity. By automating processes such as verifying recognizable evidence and managing archives, AI further enhances the enrollment system, resulting in a more streamlined and accurate workflow. A manager at LKR Bank proposed the incorporation of computer-based intelligence (CBI) into line executive frameworks to enhance the ability to anticipate and address client administration requests. The use of artificial intelligence (AI) to automate document verification and streamline client onboarding was discussed by the manager R.

4.2 Methods to enhance customer journey Using AI- Applications

Both the top-level managers and operational-level managers at banks confirmed that AI can improve the customer journey. However, they have different perspectives on the methods of enhancing customer journey using AI. One of the most common methods of improving customer journey by AI according to managerP,is that *"AI significantly reduces the time taken for loan approvals and account management, improving overall customer satisfaction"*. The study done by Cheng & Jiang, (2020)proved that AI applications can reduce the time taken for banking activities.

Previously, banks had analyzed the creditworthiness of their customers through a separate system. It has taken a longer time to analyze the applicant's financial history, credit scores, employment status, etc. AI integrated systems has reduced the time taken for the analysis of credit worthiness and improved the efficiency in loan arrangements. This has benefited clients by saving them time. AI has automated routine tasks such as balance inquiries, transaction categorization, fraud detection, etc. which has reduced delays in banking services.

As stated by bankers, AI ensures accuracy in operations and hence enhance the reliability of services which is aligned with the findings of Petersson et al. (2023).Due to the efficiency, loan approvals have become easy and timesaving. The operational-level managers,namely F, K, and M have given similar responses to the question of how these AI-powered applications contribute to improve the customer

journey and interaction with the bank. For example, the F stated that "*These applications streamline operations and improve customer satisfaction by offering quicker and more accurate services*.". This finding agrees with the findings of Tulcanaza-Prieto et al. (2023).

All of them have confirmed that the use of AI has helped them offer personalized banking experiences for their customers. They responded that, nowadays, AI chat bots assist with account balance inquiries, transaction history, etc. Therefore, customers can receive accurate and quick service without visiting the banks. This has reduced their waiting time at banks, which improves their journey in obtaining customer service. Findings agree with the study of Tulcanaza-Prieto et al., (2023).

These managers further revealed that AI algorithms can quickly analyze customer data to make quick decisions. This automation speeds up the banking service processes. AI systems can process transactions and update account information in real time. This reduces the delays that customers experience with traditional batch processing methods.

When referring to the aspect of personalized banking services, the managers confirmed that, AI analyzes customer data to provide personalized financial advice and product recommendations. Further, AI uses predictive analytics to forecast customer needs and preferences. Therefore, it can effectively forecast future actions and tailor services accordingly. The manager E responded,"AI *reduces wait times and provides a seamless transition between different banking services, enhancing the overall customer experience*" that was affirmed by Cheng & Jiang, (2020).

According to managers B and Cat ABC Bank, an AI tool used by them enhances accessibility and streamlines operations. According to their responses, AI-powered chatbots and virtual assistants offer consistent service for customers. These managers further explained that AI solutions are integrated across mobile apps, websites, and social media at banks. This ensures that customers can access banking services through their preferred channel. Most of managers revealed that process automation offers timely service for customers and increases customer satisfaction. The respondents revealed that AI utilizes NLP to understand and respond to voice commands. This enabled customers to interact with their bank using voice-activated assistants. According to managers C, the ABC bank used Robotic Process Automation to streamline its operations. This reduces the workload on human employees, and hence, it helps for faster service delivery, which enhances the customer journey.

The researcher analyzed how banks use AI for the security and privacy of their banking services. These are the determinants of service quality in AI-powered applications and directly affect customer

experience (Ameen et al., 2021). All the responses supported those views of security and privacy in service deliveries are assures in number of ways. These identified factors are discussed here.

Bankers revealed that AI systems use anomaly detection techniques to identify unusual patterns or behaviors that can indicate a security threat. This is done quickly, allowing for immediate action. He further emphasized that if an AI system detects an unusual login pattern from multiple locations within a short period of time, it can flag this as a potential threat and activates security protocols. Respondent B in ABC Bank revealed that AI helps to maintain data encryption and strict access controls. Data encryption and strict access controls are important for cyber security in the banking sector. According to him, AI can facilitate real-time encryption of data as it is created and transmitted. This ensures that personal and financial data is always protected. AI models are constantly undated with the latest protocols to prevent frauds and unauthorized access and to protect customer data. According to PQR bank, adapting the latest security features like biometric checks and end-to-end encryption can significantly improve the customer journey.

"We implemented layered security protocols and real-time monitoring to secure customer data" (B).

We use encrypted AI models that operate within a secure environment to analyze data without exposing it. Regular audit and compliance with international data protection standards are mandatory" (D).

They both explained that AI systems continuously monitor access patterns and can detect anomalies that may indicate unauthorized access attempts. These systems can automatically provide alerts or lock down unauthorized access preventing breaches. Therefore, it enhances the customer journey in banking. All bankers highlighted that they ensure the highest levels of data protection and privacy in compliance with global standards. Compliance with these standards enhances the reliability of banking services, reducing the likelihood of disruptions due to security incidents.

"Banks strictly adhere to global data security standards and regular updates to AI algorithms ensure robust security. Some standards are GDPR (General Data Protection Regulation), PCI DSS (Payment Card Industry Data Security Standard), and ISO/IEC 27001 (Information Security Management" (G).

The researcher was able to identify examples for the methods of AI-powered applications that have personalized services for customers based on the experience of the managers. Manager A responded that, *"By analyzing spending patterns, AI offers customized budgeting tips and alerts customers about potentially beneficial financial opportunities".* He further revealed that AI can analyze a customer's

spending habits and financial goals to provide tailored advice. This personalization makes the tips more relevant and useful to the customer's specific situation. According to them, AI can alert customers about potentially beneficial financial opportunities, such as better savings or investment options. These alerts can help customers make informed decisions and take advantage of opportunities that they may have otherwise missed. The managers at ABC Bank revealed that they use AI for customizing investment recommendations and notifications based on individual profiles and preferences. This can increase customer engagement with the bank's investment services. Customers are more likely to interact with the bank's apps or website to receive these updates. Therefore, it can be a positive overall experience.

Offering personalized financial management and advice was the example provided by the employee I for how AI-powered applications have personalized services. The managers highlighted that AI could assess the risk tolerance of customers and recommend suitable investment options by analyzing historical data and market trends. They further revealed that AI can help customers create personalized financial plans based on their goals. It can provide guidance on how to achieve their financial objectives. Accordingly, banks benefits from leveraging advanced analytics and machine leaning models to automated and personalized decisions throughout the customer life cycle (Agarwal et al., 2021)because it is the key to enhancing the customer experience (Ameen et al., 2021).Respondent Q revealed that they provide personalized loan options and banking experiences based on individual customer data. Further, interviewee F revealed that they dynamically adjust credit limits and tailor marketing efforts based on customer behavior. These initiatives have improved customer satisfaction and loyalty according to them. Personalization of banking services using AI has helped the banks to provide more satisfactory services to the customers.

The responses from managers proved that AI has enabled banks to offer personalized banking experiences to customers. Findings reveals that Sri Lankan banks provide tailored financial advice, product recommendations, and customized budgeting tips through AI-powered chatbots and algorithms; this personalization enhances the overall customer experience and increases engagement with banking services., it can be concluded that this has increased customer trust in the security measures implemented by banks.

4.3 Challenges and potential opportunities related to AI- powered applications

The following are some of the difficulties and possibilities associated with AI-powered apps that aim to improve the customer experience, based on interview data collected from senior and operational managers at different Sri Lankan banks.

The integration of artificial intelligence with the legacy technologies that many financial institutions now use has proven to be highly challenging. In many earlier systems, artificial intelligence technologies that are now accessible were not developed to support them. There is a possibility that this may result in compatibility issues as well as technical issues (Bostrom & Yudkowsky, 2014). To facilitate the process of integration and overcoming these challenges, Manager B have worked together with information technology professionals to make gradual improvements to their systems. It was also suggested by Manager G that the most effective method for overcoming these issues was to implement the modifications gradually and to continuously enhance the backend architecture.

According to respondents' expressions, it feels that the cultural resistance that exists inside the company is yet another key impediment that occurs with the introduction of artificial intelligence. Whether they are fearful about losing their employment or do not completely understand the technology behind artificial intelligence, workers may be reluctant to adapt. As a reaction, Manager D planned a series of lectures and seminars to emphasize the benefits of artificial intelligence and to make their transition easier. When it comes to the operational level, Manager B highlighted how they addressed customer hesitation by progressively integrating AI and giving continual feedback. Manager P had overcome early skepticism by offering comprehensive training and proving the advantages of AI.

In the context of Sri Lanka, one of the challenges that arise is the training of artificial intelligence systems to grasp the local languages and dialects. Training artificial intelligence models to accurately analyze linguistic nuances is necessary to achieve this goal. As a means of drawing attention to this challenge, Manager J said that the AI models' knowledge of local languages has significantly improved because of continual training, which has, in turn, led to enhanced interactions with consumers.

There is a possibility that cutting-edge artificial intelligence systems may be prohibitively costly (Russell & Norvig, 2010). Manager P acknowledged that the high expense posed a difficult impediment; nonetheless, essential relationships with technology providers were able to effectively minimize this hindrance due to their successful implementation. Business leaders and governmental authorities should be urged to embrace and utilize artificial intelligence owing to the potential benefits that the

technology may provide to enterprises and the economy, as well as its capacity to address certain societal challenges.

According to XYZ Bank Manager D, significant challenges at the operational level included specialist issues and customer hesitation; nevertheless, these challenges were successfully resolved via the use of staggered arrangements and progressive input. As stated by D, *"we cannot ignore the likelihood that there may be barriers to adoption, such as concerns over the workforce and other problems that are prevalent in society"*. Further, he explains that critical preparation and planning were very important, as they contributed to the management of expenditures and the guarantee of alignment with corporate goals.

There are issues and concerns about privacy that arise because artificial intelligence systems are data-hungry. The incorporation of artificial intelligence (AI) into the financial sector raises substantial problems with respect to the protection of sensitive information. It is of the utmost importance to maintain the trust of customers and to comply with legislation regarding information security. When it comes to the data that is gathered by AI systems, users have very little to no say. In response to these concerns, the M banker made certain that the financial institution complied with international information security requirements in a stringent manner. An outstanding instance of this is the development of network intrusion detection systems that are driven by artificial intelligence and continuously monitor the behavior of users. It is possible that this will lead to an excessive amount of surveillance. As an additional point of interest, he expressed the need for compliance with information security standards to reduce the effect of data privacy concerns.

There was a suggestion made by Manager A that artificial intelligence might be used to automate the processing of mortgages, which would cut approval times in half, from weeks to days. It was noted by A thatartificial intelligence has the capacity to manage complex customer relations, such as providing mortgage assistance. It is possible that this may result in higher productivity and satisfied consumers. Complex banking procedures may be automated with the assistance of artificial intelligence, which will result in increased productivity and a reduction in the amount of time required for processing (Frankenfeld, 1993).

Applications that are powered by artificial intelligence have the potential to revolutionize customer service by providing services that are not just individualized, but also proactive (Hughes, 2006). The second manager brought up the possibility that artificial intelligence may entirely revolutionize the

customer service sector by using advanced natural language processing to generate interactions that seem to be indistinguishable from those that are carried out by humans. Employee E emphasized the significance of artificial intelligence's capacity to transform customer relations by delivering services that are more specifically customized to the client's needs. The manager L of MNO Bank brought attention to the possibilities of providing client service that is even more customized and effective.

AI has the potential to revolutionize predictive banking by giving users proactive tools for managing their finances (Yong & Zhou, 2010). On the topic of proactive financial management solutions, Manager J brought up the possibility of AI. Also, Manager M brought up the enormous possibility of AI to automate wealth management and investing strategies. Manager M of PQR Bank seen that AI has the potential to completely transform financial advice services by providing more accurate and up-to-the-minute financial planning. A manager of the PQR Bank also highlighted the potential of AI in predictive analytics, saying that *"it would improve the bank's capacity to anticipate and proactively address customers' financial demands (0).*

Bank branches that are fully automated may be one day appearing, offering customers a more streamlined and efficient banking experience. Manager P highlighted the subject of entirely automated branches as a possible outcome of future advancements in AI. Manager I of LKR Bank brought up the possibility of AI fully automating branch operations, which would streamline services and cut operating expenses, from an operational standpoint.

AI opens a world of possibilities for more tailored services to customers, which in turn increases customer engagement and happiness. AI can improve client engagement through the provision of more precise financial advice. As pointed out by Manager G of LKR Bank, AI has the potential to make banking more accessible and user-friendly, increase client satisfaction through personalized and efficient services, supported by STU Bank's Manager R.

The researcher analyzed how AI-powered applications help in predicting and meeting customer needs. The responses from managers at ABC BANK and XYZ BANK are similar in that they all emphasized the analysis of behavior patterns to predict and offer relevant financial products or services. These responses focus on leveraging AI for understanding customer behavior and tailoring recommendations based on those insights. AI can analyze spending and income data, as mentioned by ABC Bank:

"*AI analyzes spending and income data to proactively offer relevant financial products and services. This approach can help customers find products that better fit their needs and financial goals, leading to a more customized and satisfying banking experience" (B).*

On the other hand, as mentioned by XYZ BANK, AI can analyze behavior patterns to predict and address customer financial needs. Manager E said, *"AI tools help identify up-sell and cross-sell opportunities by understanding customer preferences and life stages."*.Therefore, banks can proactively offer relevant products and services, improving customer satisfaction and loyalty by understanding customer behavior. Similarly, the responses from the STU Bank managers and MNO Bank managers emphasized proactive customer service. Both banks mention using AI to anticipate customer needs based on behavioral data, indicating a customer-centric approach to service delivery. Accordingly, *"AI anticipates and prevents potential fraud scenarios, which can enhance proactive customer protection"* (0).

On the other hand, most of the managers highlighted that AI tools are used for data mining techniques to predict customer needs and suggest relevant banking products for their customers. These respondents confirmed that banks are using AI to improve customer engagement. According to them, AI systems analyze transaction data to predict when customers might need additional financial support or services. Employee O explained that this can help them provide proactive assistance before customers even realize they require it. He gave an example:*"if the AI system detects a pattern of declining balances or missed payments, it can alert the customer and offer financial counseling or customized loan products"*. The predictions made by banking AI can help banks intervene at critical moments when customers are most in need of support according to him.

Measurement of the effectiveness of AI-powered applications in enhancing the customer experience is important. Therefore, the researcher questioned this among the banking professionals. Managers at ABC Bank prove that they measure effectiveness through customer satisfaction scores. According to them, *"We measure effectiveness through customer satisfaction scores and reduced service time*" (B).

ABC Bank places a high value on ensuring that their AI-powered applications positively impact customer satisfaction. Managers at ABC Bank believe that higher customer retention rates suggest that the bank's AI-powered applications are contributing to a positive customer experience. This leads to increased loyalty and continued business from existing customers. The top-level manager at the bank also reveals that that effectiveness of AI-powered applications measured by the uptake of AI-driven services and improvements in customer loyalty and satisfaction metrics.

Manager D in XYZ Bank replied that *"We track reductions in operational costs and improvements in customer feedback as metrics of success.".* He explained that reducing operational costs through AI-powered applications indicates that the bank is operating more efficiently. These cost savings can help improved customer services and enhance the overall customer experience. Another manager at the same bank revealed that they measure customer loyalty and the uptake of AI-enhanced services. According to the managers in LKR Bank, process efficiency and customer feedback are used to measure AI effectiveness. These applications can automate repetitive tasks and optimize decision-making processes.

Manager G explained that AI algorithms are used to automate loan approval processes. Therefore, the bank can measure the time taken for loan processing before and after AI implementation. Reduction in processing time indicates improved efficiency. Customer feedback is an important indicator of how well AI-powered applications are meeting customer needs and expectations. LKR Bank gathers feedback through surveys, social media, and direct interactions with customers. This gives an idea of the customer experience with the banking services they provide. Employee I at the LKR Bank revealed that, they use customer service resolution rates and efficiency metrics to measure effectiveness of AI-powered applications. He argues that AI-driven chatbots successfully resolve a higher percentage of customer inquiries. When these chatbots resolve a higher number of queries, then higher efficiency. It contributes to a positive customer experience.

Operational level manager K revealed that they *"tracks engagement rates and user feedback to assess AI impact.".*According to him when customers frequently use AI-driven chatbots to inquire about products or services, it proves that the chatbot is meeting their needs effectively and contributing to a positive customer experience. On the other hand, employee K at MNO Bank, revealed that effectiveness is measured by reduced fraud incidents and enhanced risk detection. Minimized fraud means that customers' funds are safe and secure within the bank. According to him, it demonstrates an effective AI powered banking service. They measure AI's effectiveness by improving customer retention rates and growth in managed assets.

In this study, the researcher investigated how banking professionals see the future of AI-powered applications in the banking sector in Sri Lanka. According to the responses, all the managers believe an increase in AI-driven platforms in banking is essential. Managers E from XYZ Bank and R from STU Bank expect AI-driven automation to play a significant role in enhancing customer experiences. On the other hand, manager E from XYZ Bank emphasizes that AI can reduce human errors through automation.

Manager R from STU Bank focuses on creating more user-driven banking experiences. Managers M from PQR Bank and R from STU Bank expect a future increase in AI-driven automated services. The manager M expects this trend to spread all islands. On the other hand, Manager N emphasizes AI's role in creating user-driven banking experiences. Manager H from LKR Bank responded that *"We focus an increase in AI-driven automated services in branches".* According to him, AI can handle more complex financial decision-making processes, which indicates a shift towards using AI for more complex tasks.

The researcher believed that ensuring that customers trust the AI-powered applications is important in enhancing the customer experience in banking (Ameen et al., 2021). According to an operational-level managers at ABC Bank, transparency about AI operations and robust security measures build customer trust. When banks are transparent about their AI operations, they provide customers with insight into how AI is being used to enhance services and improve their banking experience. They revealed that they do regular security audits and have clear communication about data use. El Bakkouri et al.(2022)also argues that AI facilitates effective communication.

Managers emphasized that clear communication about how customer data is collected, stored, processed, and used is essential for building transparency and trust. D manager in XYZ Bank replied that, *"Ensuring the security of AI systems and transparently handling customer data are vital for maintaining trust".* This proactive approach to security helps build confidence among customers while assuring them that their data is being handled securely and responsibly. Manager D revealed that frequent audits and clear data usage policies help ensure that customers trust in their AI applications.

According to respondents, XYZ Bank is conducting frequent audits of AI applications and data handling practices. This proves their commitment to maintain the highest standards of security and compliance. According to H manager at LKR bank, they educate customers on AI benefits to build trust. They believe that educating customers on AI benefits can lead to increased engagement and participation in AI-driven banking activities. Further, LKR Bank empowers customers to better understand how AI-powered services can enhance their banking experience. Further, the bank implements strict data control and transparent AI policies. They are maintaining customer trust through consistent performance and security transparency. They ensure compliance with international standards for AI in banking to build trust. Compliance with international standards helps banks to mitigate risks and ensures trust associated with AI deployment in banking operations.

As stated by Ameen et al. (2021), ensuring convenience is important tothe customer experience in AI-powered environment. Respondents revealed that they simplify the banking process customers using multiple devices. The manager B at ABC Bank explained that they introduce AI-driven mobile banking apps to enhance convenience. These apps allow customers to operate their banking activities remotely. AI simplifies banking operations which helps for easier and faster customer transactions. ABC employees further explain that AI-driven chatbots and virtual assistants can provide personalized support and guidance to customers seeking complex financial products. Like this response, a manager H at LKR Bank revealed that *"AI facilitates convenient and more accurate banking services, enhancing convenience ".*

According to manager E, AI enables banks to handle complex requests efficiently, automating processes and reducing the need for manual intervention. This aligns with the findings of Blumberg et al. (2021). This streamlines operations, speeds up response times, and minimizes errors, according to this manager. The manager L at MNO Bank revealed thatAI minimizes the need for physical banking interactions which increases convenience. Customers can log in to their accounts at home or anywhere they are convenient and do their transactions without visiting the bank. Manager K at the same bank confirmed that they are using AI-driven systems to enable faster and safer banking transactions. AIs are used for authentication of transactions and other security measures. This improves customer convenience in banking. They confirm that AI has reduced the need for in-person consultations. AI Chatbots is helping with the communication, and it enhances convenience for their customers. They further reveal that using AI can enhance convenience through mobile apps and digital banking. AI is providing accurate information for the banking operations. Therefore, the reliability of the services enhances while improving customer convenience.

4.4 Recommendations to improve the AI- applications to enhance customer experience.

The researcher asked for recommendations to improve the use of AI-powered applications for enhancing customer experience in the Sri Lankan banking sector. All the top-level managers including A, C, G, J, M and P recommended that continued investment in AI research and a focus on developing modified AI solutions for the local market are important. They further explained that Sri Lankan banks can effectively customize banking services based on the needs of the customers using AI. Investing in AI training for staff and educating customers on AI benefits are recommended by an operational level manager C at ABC Bank. The manager D suggested that bank should invest on improving the existing AI capabilities. This can enhance the predicting of financial trends to offer even more personalized services.

The manager D recommended saying *"my recommendations include enhancing AI-driven customer insights and expanding AI use in back-end operations for greater efficiency".* Most of the managers highlighted that enhancing AI-driven customer insights and expanding AI use in back-end operations are important. Similarly, the manager C at ABC Bank, a manager I at LKR Bank suggested that the bank should invest in more effective training on AI systems for the staff. Important strategic choices include tackling the skills gap in AI development and controlling the complexity of integration, as noted by Dwivedi et al. (2021).Employee K recommended that *"fostering innovation to keep AI solutions at the forefront of technology is a prerequisite*". The new financial products can improve the customer experience in banking as argued by him. On the other hand, another manager at the same bank suggested that banks should invest in security using AI which can improve the security of transactions. Manager N suggested that *"To improve AI use, I would focus on continuous learning systems that adapt more dynamically to changing market conditions and client needs".* On the other hand, the two managers namely Q and R also recommended that banks should continuously invest in AI to improve the quality of the banking service to provide a competitive banking experience for customers.

According to the above analysis, it can be concluded that building trust and transparency is important for the successful adoption of AI-powered applications in banking. AI is used to simplify banking operations, streamline processes, and enhance convenience for customers in Sri Lanka. Sri Lankan banks recognize the importance of continued investment in AI research and development to stay competitive and meet evolving customer expectations. Banks are committed to continuous innovation and improvement in AI-driven solutions to provide a competitive banking experience for customers.

CONCLUSION AND DISCUSSION

This study was done with the purpose of identifying and improving the use of AI-Powered applications to enhance customer experience in the Sri Lankan banking sector. The aim of this study was the to make recommendations to improve the use of AI-powered applications to enhance customer experience in Sri Lankan banking sector. The main research question answered in this study is "How to improve the use of AI-Powered applications to enhance customer experience in the Sri Lankan banking sector?". The Table 2 provides answers to the research questions addressed in this research.

Table 2

Answers to research questions

Research Question	Answers from research findings
How to improve the use of AI-Powered applications to enhance customer experience in the Sri Lankan banking sector?	• Invest in continued ai research and development • Enhance AI-driven customer insights • Improve data analytics capabilities • Focus on customer education and transparency • Enhance AI training for staff • Improve security measures • Focus on continuous innovation
What types of AI-powered applications are employed by the Sri Lanka's banking sector?	• Automated customer service and support • Fraud detection and risk management • Personalized financial services • Operational efficiency and automation
How does AI enhance customer journey in Sri Lankan banks?	• Improving efficiency • Automating routine tasks • Providing personalization • Enhancing security • Ensuring accessibility • Increasing customer trust
What are the challenges and potential opportunities relating to the use of AI-powered application for enhancing customer experience in Sri Lankan Banking	Challenges: • Cultural Resistance • Data Integration

sector?	• High Costs • Privacy and Security Concerns Opportunities: • Automated Processes • Personalized and Proactive Customer Service • Enhanced Mobile Banking • Fully Automated Bank Branches • Increased Customer Engagement and Satisfaction

The current study identified that security concerns are important in improving customer experience in AI-powered banking. Therefore, this research offers practical guidelines for banks to implement layered security protocols and real-time monitoring systems. The findings of this study help Sri Lankan banks identifying methods to enhance customer experience using AI. This can help them build effective strategies to enhance the customer journey and customer experience in banking. The current study identified the challenges and opportunities in AI-enabled customer experience. This helps the management identify potential challenges in banking operations related AI adoption. Therefore, bank managersgain insights to build risk management strategies related to those challenges. Further, this study provides methods to improve the use of AI powered applications to improve customer experience in banking. Sri Lankan banks therefore can identify the most suitable methods to improve the banking experience for their customers.

According to the findings, the most popular type of AI used by banks in Sri Lanka is the AI chatbots. AI applications for risk assessment were the other type of AI in banking. The literature review proves that there are chatbots, virtual teller machines, robot banks, digital wallets, etc. as AI tools. The study done by (Vijai, 2019) also highlights the use of chatbots in banking. Therefore, in Sri Lanka, banks are more focused on chatbots and virtual assistants as AI tools. Fares et al. (2023) highlights that transformative impact of AI on the banking customer journey. This researcher revealed that AI automates and streamlines banking processes, such as credit applications and granting decisions, reducing the time and effort required from customers. Top-Level Manager emphasized that AI has significantly reduced the time for loan approvals and account management. Further, it improves overall customer satisfaction.

In the banking environment, AI has reduced waiting times for customers through chatbots for balance inquiries and transaction history, which enhances the customer journey by providing quick and accurate service. Fares et al. (2023) further revealed that AI can provide personalized interactions with customers, offering tailored recommendations and assistance via chatbots. According to the data analysis, top-level manager revealed that AI is used for personalizing dashboards and providing tailored financial advice for a better customer journey. On the other hand, operational-level managers highlighted that AI helps in offering personalized banking experiences by analyzing customer data to provide tailored financial services.

Enhancing security is another method of ensuring better customer journey according to Fares et al. (2023). Accordingly, AI continuously learns and adapts to new security threats. On the other hand, AI helps maintain data encryption and strict access controls according to the analysis. Therefore, it can argue that the current study findings align with the literature related to customer journey in banking.

According to the data analysis findings, challenges in implementing AI-powered applications were identified as data integration challenges, higher costs, data privacy and accuracy, resistance to change, etc. The challenge of data integration was consistent with Sheth et al. (2022). Those researchers emphasized the need to ensure data quality and address biases within algorithmic processes. The current study also proved that the quality of data and integrating it effectively into AI systems are crucial for accurate outcomes. The analysis of the current study noted customer resistance as a significant challenge, as stated by Sheth et al. (2022).

The current study highlights the importance of maintaining transparency and safeguarding customer privacy. As identified earlier, addressing the costs, and aligning AI with business goals was a challenge faced by banks in Sri Lanka. Dwivedi et al. (2021) also mentioned that managing the complexity of integration and addressing the skills gap in AI development are important strategic decisions. The managers revealed that AI can automate complex processes such as mortgage approval, significantly reducing the time required from weeks to days.

Another major opportunity in using AI for banking is automating complex procedures through AI leads to increased productivity and reduced processing times. AI-powered banking applications can revolutionize customer service by providing personalized and proactive interactions. The respondents further revealed that AIs are increasingly used to develop mobile banking applications which are a potential

opportunity. According to the bank managers, AI can significantly enhance mobile banking applications by creating more user-friendly and engaging interfaces.

Customization and responsiveness are another major opportunity for using AI in banking. They further confirmed that predictive banking and financial management another opportunity created by AI. Future advancements in AI can lead to fully automated bank branches, streamlining services, cutting operating costs, and offering a more efficient banking experience for customers, according to the analysis.

AI can predict customer needs by analyzing behavior patterns. Tulcanaza-Prieto et al. (2023), also reveal that AI can enhance the customer experience through personalization and trust, which are critical for predicting and meeting customer needs. Banks measure effectiveness through reduced service times and operational costs, according to the data analysis findings. Umamaheswari et al. (2023) also highlight that AI facilitates convenient transactions. Managers expect an increase in AI-driven platforms in the banking sector for automation and user-driven experiences, supporting the findings from the study Blumberg et al. (2021).

According to the data analysis, managers from different banks highlighted how AI simplifies banking processes and enhances convenience through mobile apps and online services. These findings align with those of Blumberg et al. (2021). This study revealed that AI can streamline tasks and improve operational efficiency for the improvement of the customer experience. The data analysis revealed that it is important to invest in AI research, training staff, and collaborate with Fintech innovators to improve the use of AI for better customer experience. The studies done by Vijai, (2019) and Kaur et al.(2020) also highlighted that AI can offer personalized and efficient services, thereby enhancing customer satisfaction and loyalty.

In Sri Lanka, banks enabled service quality, customer convenience, personalization and customer trust to satisfy them, enhance their commitment to stay with them and consequently enhance the customer experience employing AI-powered applications.

The current study was based on a qualitative research method that analyzes non-numeric data. Therefore, it can be argued that the researcher interferes in the data collection process, which can lead to biased answers. Further, in this study, a limited sample size is covered, and the purposeful snowballing technique is applied. Therefore, the generalizability of the results to the entire banking sector is limited. Hence, it can be suggested that a combination of qualitative and quantitative methods

will be used for future studies. This can present a deeper understanding of AI usage in the banking industry, and this can guide the researcher to identify effective improvements.

The study uses both primary and secondary data, ensuring a comprehensive understanding of the research topic. Primary data is collected from interviews with senior personnel from multiple banks, while secondary data is sourced from reputable journals and articles. Participants in this study are informed about the purpose of the study and their rights. This transparency helps ensure that the responses are accurate and truthful. This ensures the credibility of the study. The study uses a semi-structured interview question. This ensures that all participants are asked the same questions similarly, which helps in maintaining the reliability of the data collection method. However, this supports getting a quality data with further conversations. Further, the data is analyzed based on themes aligned with the objectives of this study. This ensures that the findings are directly related to the research questions and objectives, enhancing the validity of the study.

REFERENCE

Agarwal, A., Singhal, C., & Thomas, R. (2021). Global Banking & Securities: AI-powered decision making for the bank of the future.

Akrout, H., & Nagy, G. (2018). Trust and commitment within a virtual brand community: The mediating role of brand relationship quality. Information and Management, 55(8), 939–955. https://doi.org/10.1016/j.im.2018.04.009

AL-Dosari, K., Fetais, N., &Kucukvar, M. (2024). Artificial Intelligence and Cyber Defense System for Banking Industry: A Qualitative Study of AI Applications and Challenges. Cybernetics and Systems, 55(2), 302–330. https://doi.org/10.1080/01969722.2022.2112539

Ameen, N., Tarhini, A., Reppel, A., & Anand, A. (2021). Customer experiences in the age of artificial intelligence. Computers in Human Behavior, 114. https://doi.org/10.1016/j.chb.2020.106548

Andrade, I. M. De, &Tumelero, C. (2022). Increasing customer service efficiency through artificial intelligence chatbot. Revista de Gestao, 29(3), 238–251. https://doi.org/10.1108/REGE-07-2021-0120

Awuzie, B., &McDermott, P. (2017). An abductive approach to qualitative built environment research: A viable system methodological exposé. Qualitative Research Journal, 17(4), 356–372. https://doi.org/10.1108/QRJ-08-2016-0048

Az Zahra, A. ,R, Jonas, D., Erliyani, I., Rosdiana, & Yusuf, N. ,A. (2023). Assessing Customer Satisfaction in AI-Powered Services: An Empirical Study with SmartPLS. International Transactions on Artificial Intelligence (ITALIC), 2(1), 81–89. https://doi.org/https://doi.org/10.33050/italic.v2i1.432

Benartzi, S., & Payne, J. W. (2017). Systems and Methods for Providing Customized Financial Advice Using Loss Aversion Assessments to Determine Investment Fund Ratings. Retrieved 5 22, 2024, from http://freepatentsonline.com/y2017/0365130.html

Binti, F. A., Roslan, M., & Ahmad, N. B. (n.d.). The Rise of AI-Powered Voice Assistants: Analyzing Their Transformative Impact on Modern Customer Service Paradigms and Consumer Expectations. In Quarterly Journal of Emerging Technologies and Innovations Research Article: Quarterly Journal of Emerging Technologies and Innovations.

Blumberg, S., Isenberg, R., Kerr, D., Mitra, M., & Thomas, R. (2021). Global Banking & Securities: Beyond digital transformations: Modernizing core technology for the AI bank of the future.

Boadu, E. (2018). 4 ways AI neural networks will disrupt banking. Infinite Intelligence. https://infinite-intelligence.net/directory-articles/4-ways-ai-neural-networks-will-disrupt-banking

Bostrom, N., & Yudkowsky, E. (2014). The Cambridge Handbook of Artificial Intelligence: The ethics of artificial intelligence. Retrieved 5 22, 2024, from https://intelligence.org/files/ethicsofai.pdf

Boutaba, R., Salahuddin, M. A., Limam, N., Ayoubi, S., Shahriar, N., Estrada-Solano, F., &Caicedo, O. M. (2018). A comprehensive survey on machine learning for networking: evolution, applications and research opportunities. Journal of Internet Services and Applications, 9(1). https://doi.org/10.1186/s13174-018-0087-2

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D. and Walker, K., 2020. Purposive sampling: complex or simple? Research case examples. Journal of research in Nursing, 25(8), pp.652-661 doi: 10.1177/1744987120927206

CBSL. (2024). Banking Industry. https://www.cbsl.gov.lk/en/financial-system/financial-system-stability/banking-sector

Central Bank of Sri Lanka [CBSL]. (n.d.). Banking Sector | Central Bank of Sri Lanka. Retrieved December 3, 2023, from https://www.cbsl.gov.lk/en/financial-system/financial-system-stability/banking-sector

Cheng, Y., & Jiang, H. (2020). How Do AI-driven Chatbots Impact User Experience? Examining Gratifications, Perceived Privacy Risk, Satisfaction, Loyalty, and Continued Use. Journal of Broadcasting and Electronic Media, 64(4), 592–614. https://doi.org/10.1080/08838151.2020.1834296

David, B., Chalon, R., Zhang, B., & Yin, C. (2019). Design of a Collaborative Learning Environment integrating Emotions and Virtual Assistants (Chatbots). Retrieved 5 22, 2024, from https://ieeexplore.ieee.org/document/8791893

DBS Bank. (2023, October 25). Use cases of machine learning in banking & finance. https://www.dbs.com/artificial-intelligence-machine-learning/machine-learning/use-cases-of-machine-learning-in-banking-and-finance.html

Dilek, S., Çakir, H., & Aydin, M. (2015). APPLICATIONS OF ARTIFICIAL INTELLIGENCE TECHNIQUES TO COMBATING CYBER CRIMES: A REVIEW. International Journal of Artificial Intelligence & Applications, 6(1), 21-39. Retrieved 5 22, 2024, from https://arxiv.org/abs/1502.03552

Dwivedi, Y. K., Wade, M. R., & Schneberger, S. L. (2012). Informations Systems Theory: Vol.2. Springer, 28(May), 461. https://doi.org/10.1007/978-1-4419-6108-2

El Bakkouri, B., Raki, S., &Belgnaoui, T. (2022). The Role of Chatbots in Enhancing Customer Experience: Literature Review. Procedia Computer Science, 203, 432–437. https://doi.org/10.1016/j.procs.2022.07.057

elets-the Banking and Finance. (2023). Empowering Banking with Natural Language Processing (NLP). https://bfsi.eletsonline.com/empowering-banking-with-natural-language-processing-nlp/

Fares, O. H., Butt, I., & Lee, S. H. M. (2023). Utilization of artificial intelligence in the banking sector: a systematic literature review. Journal of Financial Services Marketing, 28(4), 835–852. https://doi.org/10.1057/s41264-022-00176-7

Fazidah Elias, N. (2012). Using a deductive approach in validating a measurement model. Article in AUSTRALIAN JOURNAL OF BASIC AND APPLIED SCIENCES, 6(8), 329–336. https://www.researchgate.net/publication/283368168

Frankenfeld, F. M. (1993). Trends in Computer Hardware and Software. American Journal of Health-system Pharmacy, 50(4), 707-711. Retrieved 5 22, 2024, from https://ncbi.nlm.nih.gov/pubmed/8470690

Frankenfeld, F. M. (1993). Trends in Computer Hardware and Software. American Journal of Health-system Pharmacy, 50(4), 707-711. Retrieved 5 22, 2024, from https://ncbi.nlm.nih.gov/pubmed/8470690

Goel, A., Goel, A. K., & Kumar, A. (2023). The role of artificial neural network and machine learning in utilizing spatial information. Spatial Information Research, 31(3), 275–285. https://doi.org/10.1007/s41324-022-00494-x

Goyal, D., Varma, R., Rada, F., Pande, A., Jauregui, J., Corelli, P., Tripathi, S., Sénant, Y., Dab, S., Erande, Y., Choi, J., Kosersk, J., Carrubba, J., Morris, N., Rotman, F., Risley, M., & Suri, S. (2023). Global Fintech 2023: Reimagining the Future of Finance. https://www.bcg.com/publications/2023/future-of-fintech-and-banking

Hengstler, M., Enkel, E., &Duelli, S. (2016). Applied artificial intelligence and trust-The case of autonomous vehicles and medical assistance devices. Technological Forecasting and Social Change, 105, 105–120. https://doi.org/10.1016/j.techfore.2015.12.014

IBM. (n.d.). What is artificial intelligence (AI)? IBM. Retrieved January 5, 2024, from https://www.ibm.com/topics/artificial-intelligence

Islam, M., Chen, G., &Jin, S. (2019). An Overview of Neural Network. American Journal of Neural Networks and Applications, 5(1), 7. https://doi.org/10.11648/j.ajnna.20190501.12

KAUR, N., SAHDEV, S. L., SHARMA, M., & SIDDIQUI, L. (2020). BANKING 4.0: “THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE BANKING INDUSTRY & HOW AI IS CHANGING THE FACE OF MODERN DAY BANKS.” INTERNATIONAL JOURNAL OF MANAGEMENT, 11(6). https://doi.org/10.34218/ijm.11.6.2020.049

Khurana, D., Koli, A., Khatter, K., & Singh, S. (2023). Natural language processing: state of the art, current trends and challenges. Multimedia Tools and Applications, 82(3), 3713–3744. https://doi.org/10.1007/s11042-022-13428-4

Komulainen, H., &Saraniemi, S. (2019). Customer centricity in mobile banking: a customer experience perspective. International Journal of Bank Marketing, 37(5), 1082–1102. https://doi.org/10.1108/IJBM-11-2017-0245

Laskowski, N. (2023). artificial intelligence (AI). TechTarget.Com. https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence

Lawton, G. (2023). 4 types of learning in machine learning explained. Techtarget.Com.

Lawton, G. (n.d.). What is Generative AI? Everything You Need to Know. Techtarget.Com. Retrieved February 13, 2024, from https://www.techtarget.com/searchenterpriseai/definition/generative-AI

Lecun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. Nature, 521(7553), 436–444. https://doi.org/10.1038/nature14539

Lemon, K. N., &Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. Journal of Marketing, 80(6), 69–96. https://doi.org/10.1509/jm.15.0420

Liu, L. (2016). Using Generic Inductive Approach in Qualitative Educational Research: A Case Study Analysis. Journal of Education and Learning, 5(2), 129. https://doi.org/10.5539/jel.v5n2p129

Lutkevich, B. (n.d.). natural language processing (NLP). TechTarget.Com. Retrieved January 6, 2024, from https://www.techtarget.com/searchenterpriseai/definition/natural-language-processing-NLP

McCoy, A., Ward, T. E., McLoone, S., & Delaney, D. (2007). Multistep-ahead neural-network predictors for network traffic reduction in distributed interactive applications. ACM Transactions on Modeling and Computer Simulation, 17(4), 16. Retrieved 5 22, 2024, from https://dl.acm.org/citation.cfm?id=1276929

McKinsey. (2023a). What is AI (Artificial Intelligence)? McKinsey . https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-ai

McKinsey. (2023b). What is the future of Generative AI? McKinsey. https://www.mckinsey.com/featured-insights/mckinsey-explainers/whats-the-future-of-generative-ai-an-early-view-in-15-charts

Morgan, R. M., &Hunt, S. D. (1994). The Commitment-Trust Theory of Relationship Marketing. Journal of Marketing, 58(3), 20. https://doi.org/10.2307/1252308

Müller, M., Alexandi, E., & Metternich, J. (2020). Digital shop floor management enhanced by natural language processing. Procedia CIRP, 96, 21–26. https://doi.org/10.1016/j.procir.2021.01.046

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1994). Reassessment of Expectations as a Comparison Standard in Measuring Service Quality: Implications for Further Research. Journal of Marketing, 58(1), 111. https://doi.org/10.2307/1252255

Park, Y. S., Konge, L., & Artino Jr, A. R. (2020). The positivism paradigm of research. Academic Medicine, 95(5), 690–694.

Peppers, D. (2016). Managing customer experience and relationships : A strategic framework. John Wiley & Sons.

Petersson, A. H., Pawar, S., & Fagerstrøm, A. (2023a). Investigating the factors of customer experiences using real-life text-based banking chatbot: A qualitative study in Norway. Procedia Computer Science, 219, 697–704. https://doi.org/10.1016/j.procs.2023.01.341

Petersson, A. H., Pawar, S., & Fagerstrøm, A. (2023b). Investigating the factors of customer experiences using real-life text-based banking chatbot: A qualitative study in Norway. Procedia Computer Science, 219, 697–704. https://doi.org/10.1016/j.procs.2023.01.341

RAMAGUNDAM, S., 2023. Improving Service Quality With Artificial Intelligence In Broadband Networks. International Neurourology Journal, 27(4), pp.1406-1414. https://www.researchgate.net/profile/Shashishekhar-Ramagundam/publication/377109172_Improving_Service_Quality_With_Artificial_Intelligence_In_Broadband_Networks/links/6596d6a53c472d2e8eb4b0d5/Improving-Service-Quality-With-Artificial-Intelligence-In-Broadband-Networks.pdf

Rehman, S. U., Bhatti, A., Mohamed, R., &Ayoup, H. (2019). The moderating role of trust and commitment between consumer purchase intention and online shopping behavior in the context of Pakistan. Journal of Global Entrepreneurship Research, 9(1). https://doi.org/10.1186/s40497-019-0166-2

Russell, S. J., & Norvig, P. (2010). Artificial Intelligence: A Modern Approach. Pearson Education, Inc. Retrieved 5 22, 2024, from http://aima.cs.berkeley.edu/

Sampath Bank PLC. (n.d.). Sampath Bank PLC | Online Banking. Retrieved February 13, 2024, from https://www.sampath.lk/

Saunders, M., Lewis, P., & Thornhill, A. (2016). Research methods for business students www.pearson.com/uk.

Senathirahah, A. R. B. S., Alainati, S., Haque, R., Ahmed, S., Ibrahim, MD. K., &Chowdhur, B. (2024). Antecedents and Consequence of Trust-Commitment Towards Artificial Based Customer Experience. UCJC BUSINESS AND SOCIETY REVIEW (Formerly Known as Universia Business Review)), 21(80). https://doi.org/10.3232/UBR.2024.V21.N1.16

Sheth, J. N., Jain, V., Roy, G., & Chakraborty, A. (2022). AI-driven banking services: the next frontier for a personalised experience in the emerging market. International Journal of Bank Marketing, 40(6), 1248–1271. https://doi.org/10.1108/IJBM-09-2021-0449

Shi, C., Satake, S., Kanda, T., & Ishiguro, H. (2016). How Would Store Managers Employ Social Robots. Retrieved 5 22, 2024, from https://dl.acm.org/citation.cfm?id=2906956

Siau, K., & Wang, W. (2018). Building trust in artificial intelligence, machine learning, and robotics. Cutter Business Technology Journal, 31(2), 47–53.

The Economist Group. (2022). Banking in 2035: global banking survey report. https://impact.economist.com/.

Tilliette, M., Humphrey, B., Bose, A., &Gopikumar, S. (2021). Servitization as a product strategy. .

Trawnih, A., Al-Masaeed, S., Alsoud, M., &Alkufahy, A. M. (2022). Understanding artificial intelligence experience: A customer perspective. International Journal of Data and Network Science, 6(4), 1471–1484. https://doi.org/10.5267/j.ijdns.2022.5.004

Tucci, L. (n.d.). What is Machine Learning and How Does It Work? In-Depth Guide. Techtarget.Com. Retrieved January 6, 2024, from https://www.techtarget.com/searchenterpriseai/definition/machine-learning-ML

Tulcanaza-Prieto, A. B., Cortez-Ordoñez, A., & Lee, C. W. (2023). Influence of Customer Perception Factors on AI-Enabled Customer Experience in the Ecuadorian Banking Environment. Sustainability (Switzerland), 15(16). https://doi.org/10.3390/su151612441

Umamaheswari, S., Valarmathi, A., & Lakshmi, R. (2023). Role Of Artificial Intelligence in The Banking Sector. Journal of Survey in Fisheries Sciences, 10(4S), 2841–2849. https://www.pymnts.com

Verma, S., &Bhattacharyya, S. S. (2017). Perceived strategic value-based adoption of Big Data Analytics in emerging economy: A qualitative approach for Indian firms. Journal of Enterprise Information Management, 30(3), 354–382. https://doi.org/10.1108/JEIM-10-2015-0099

Vijai, C. (2019). ARTIFICIAL INTELLIGENCE IN INDIAN BANKING SECTOR: CHALLENGES AND OPPORTUNITIES. International Journal of Advanced Research, 7(4), 1581–1587. https://doi.org/10.21474/IJAR01/8987

VIRTECH. (n.d.). INTELLIGENT CHEQUE PROCESSING.

Wang, H., Huang, J., & Zhang, Z. (n.d.). Association for Information Systems Association for Information Systems The Impact of Deep Learning on Organizational Agility The Impact of Deep Learning on Organizational Agility. https://aisel.aisnet.org/icis2019

Wang, W. T., Wang, Y. S., & Liu, E. R. (2016). The stickiness intention of group-buying websites: The integration of the commitment–trust theory and e-commerce success model. Information and Management, 53(5), 625–642. https://doi.org/10.1016/j.im.2016.01.006

Wang, X., Tajvidi, M., Lin, X., &Hajli, N. (2020). Towards an Ethical and Trustworthy Social Commerce Community for Brand Value Co-creation: A trust-Commitment Perspective. Journal of Business Ethics, 167(1), 137–152. https://doi.org/10.1007/s10551-019-04182-z

Wedawatta, G., &Amaratunga, D. (2011). Case study as a research strategy: Investigating extreme weather resilience of construction SMEs in the UK. 7th Annual International Conference of International Institute for Infrastructure, Renewal and Reconstruction. https://publications.aston.ac.uk/id/eprint/23751/1/Investigating_extreme_weather_resilience_of_construction_SMEs_in_the_UK.pdf

World Economic Forum. (2021). World Economic Forum. In Encyclopedia of Governance.

Yasar, K. (n.d.). What is a Neural Network? Definition, Types and How It Works. TechTarget.Com. Retrieved January 6, 2024, from https://www.techtarget.com/searchenterpriseai/definition/neural-network

Yong, G., & Zhou, L. (2010). Risk Evaluation Model Construction for Commercial Bank Logistics Finance. Retrieved 5 22, 2024, from http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.ieee-000005661346

Yong, G., & Zhou, L. (2010). Risk Evaluation Model Construction for Commercial Bank Logistics Finance. Retrieved 5 22, 2024, from http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.ieee-000005661346

Zhang, T., Bilgihan, A., Kandampully, J., &Lu, C. (2018). Building stronger hospitality brands through online communities. Journal of Hospitality and Tourism Technology, 9(2), 158–171. https://doi.org/10.1108/JHTT-04-2017-0032

Zörgő, S. and Peters, G.J.Y., 2019. Epistemic network analysis for semi-structured interviews and other continuous narratives: challenges and insights. In Advances in Quantitative Ethnography: First International Conference, ICQE 2019, Madison, WI, USA, October 20–22, 2019, Proceedings 1 (pp. 267-277). Springer International Publishing

LIST OF FIGURES

APPENDICES

Annexure 1: The list of semi-structured interview questions.

Unveiling the Future: how Sri Lanka's banking sector is leveraging AI-Powered applications for enhancing customer experience.

Thank you very much for your valuable time. We are conducting research on Unveiling the Future: how Sri Lanka's banking sector is leveraging AI-Powered applications for enhancing customer experience in Sri Lanka. The main purpose of our research is to identify and improve the use of AI-Powered applications to enhance customer experience in Sri Lankan banking sector. We highly appreciate your contribution towards this task and ensure the anonymity of your responses. For confidentiality, your name or other personal information will not be mentioned in thisresearch.Your contribution is highly appreciated giving your thoughts and insights sharing experience and you can withdraw your response at any time.

Part 01

In which bank you are working and what services are provided by your bank?

Give us a brief introduction of yourself including your position, and working experience in the banking sector?

What is your perspective about using AI for banking?

Part 02

Objectives/themes	Literature Section	Interview Questions
Types of customer-centered AI-powered applications employed by Sri Lanka's banking sector	AI application Typologies	Can you describe the types of AI-powered applications currently employed by your bank to enhance customer experience?
Methods to enhance	Customer Journey	How do these AI-powered applications

customer journey in Sri Lankan banks using AI		contribute to improving customer journey and interaction with your bank? How do you ensure the security and privacy of customer data while using AI-powered applications? Can you provide examples of how AI-powered applications have personalized services for your customers?
Challenges and potential opportunities relates to AI- powered application for enhancing customer experience in Sri Lankan Banking sector	Customer experience challenges and potential opportunities	What challenges have you encountered in implementing AI-powered applications for enhancing customer experience, and how have you addressed them? What are the potential opportunities you expect in leveraging AI-powered applications to further enhance customer experience?
improve the use of AI-Powered applications to enhance customer experience in Sri Lankan banking sector.	Customer experience (CE)	How do AI-powered applications help in predicting and meeting customer needs? How do you measure the effectiveness of AI-powered applications in enhancing customer experience? How do you see the future of AI-powered applications in the banking sector in Sri Lanka?
	Trust Commitment theory	How do you ensure that customers trust the AI-powered applications used by your bank? How do you ensure that convenience of the customers is achieved through the use of AI for the banking services?
Recommendations to improve the use of AI-	Customer Journey	What recommendations would you make to improve the use of AI-powered applications

powered applications to enhance customer experience in Sri Lankan banking sector		for enhancing customer experience in the Sri Lankan banking sector?

Annexure 2: Data Management Plan

1. General description of the material

The research primarily relies on semi-structured interviews with key employees of major commercial banks in Sri Lanka. Secondary data is obtained from academic sources, industry reports and websites of selected banks to provide additional insights relates to the phenomenon that was investigated.

2. Documentation and quality of the material

Interviews with bankers will be conducted virtually, through online communication platforms and all the interviews are recorded and transcribed in fulfilling documentation requirement. Ensuring the anonymity of participants other identification information are recorded in detail. Secondary data is collected from latest academic sources, industry reports and websites of selected banks to ensure the quality and reliability of the sources used.

3. Storage and backup

Interview recordings and transcribers will be stored in the personal computer system, and electronically in cloud-based platform as a backup file. All the files are saved as word documents and audio file format. Mendeley reference management tool is used to organized and store academic sources and other reliable documents. Additionally, secondary data documents are stored in the personal computer storage. The accessibility is only available for the researcher.

4. Ethical and legal issues related to storage

The consent from interview participants is obtaining before collecting data and explaining how data is stored as well as presented. Anonymity and confidentiality of participant is ensued in storing data in the way that it prevents the identification of participants through engaging a coding system for each participant. All the security measured are taken to prevent unauthorized access to stored data. Further the research is adhered to legal and ethical regulations relates to data storage and privacy protection.

5. Opening the material and long-term storage

Participants in the research study were provided information about purpose of usage their data including the possibility of future research, ensuring transparency and ethical consideration. However, data protection and management measured are taken to prevent the possibility of authorized access.

Annexure 3: Timetable and task distribution

Task	Contribution	Time duration
Research topic formulation	Dilusha & Nalinda	1 Week (1st week , December 2023)
Literature review	Dilusha	5 Weeks
Prepare research proposal	Dilusha & Nalinda	2 Weeks
Supervisor review and improvements	Dilusha & Nalinda	3 Weeks
Presentation of research proposal	Dilusha & Nalinda	1 Week
Supervisor review and implements	Dilusha & Nalinda	2 Weeks
Primary data collection	Dilusha & Nalinda	3 Weeks
Data analysis and interpretations	Nalinda	2 Weeks
Presenting empirical result	Dilusha & Nalinda	1 Week
Progress Review	Dilusha & Nalinda	1 Week
Discussion & managerial implications	Dilusha & Nalinda	1 Week
Supervisor review and improvements	Dilusha & Nalinda	1 Week
Final Research presentation	Dilusha & Nalinda	1 Week (4th week, May 2024)