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ARTIFICIAL INTELLIGENCE (AI) IN THE BANKING INDUSTRY: A REVIEW OF SERVICE AREAS AND CUSTOMER SERVICE JOURNEYS IN DEVELOPING ECONOMIES

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Abstract

The banking industry's shift towards digitalization, particularly Web 2.0 banking, signifies a profound change in the bank-client relationship. This transformation integrates digital elements into consumers' lives, digitising everyday activities and highlighting the importance of online social platforms and digital business operations. AI's growing interest in academia and commerce underscores its significant role in customer service. The study examines AI strategies in the banking industry, focusing on service areas and adaptation to the evolving technological landscape, particularly in customer service in developing economies. By adopting an interpretivist philosophy emphasising practicality, a qualitative approach was employed through a systematic literature review of 90 articles using thematic analysis. The research highlights AI's growing use in process automation, customer experience, stock market trend prediction, credit risk management, online banking, marketing management, and auditing. It concludes AI's positive impact on banking operational efficiency and customer service by recommending ethical AI usage, stakeholder collaboration, trust in data handling, and robust internal control systems. Additionally, it suggests exploring the association between organisational culture, leadership, and AI integration in developing economies. The research contributes to the theoretical and empirical frameworks that explain how AI is optimally integrated into banking operations, guiding policymakers and practitioners in leveraging AI to foster financial inclusion and economic growth. Future researchers should include non-profit institutions and non-financial performance metrics to gain insights into AI's sustainability implications in banks beyond financial metrics.

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Key words:
AI, Banking Industry, Customer Service Journey, Digitalization, Developing Economies.

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1. Introduction

The rise of Web 2.0 has ushered in an era where Artificial Intelligence (AI) significantly impacts the financial sector, especially banking (Agarwal et al., 2024; Al-Baity, 2023). AI advancements are essential for financial institutions to meet evolving customer expectations and stay competitive. AI is transforming banking by enhancing customer services, like chatbots and voice recognition, and improving backend operations, such as credit underwriting and risk monitoring (Almatrafi et al., 2024). This integration is reshaping the industry, boosting customer interactions, and streamlining financial processes, with substantial cost savings anticipated, including over $447 billion in 2023 for banks in the UK and USA (Jameaba, 2022). Despite the benefits, AI adoption in banking presents challenges, such as developing efficient customer relationship management systems and automating processes like credit scoring and loan approval (Andoni et al., 2019; Borges et al., 2021). AI's expanding capabilities support various internal banking systems, particularly those related to consumer behaviour. However, the digital divide, limited access to advanced technologies, inadequate infrastructure, and low digital literacy hamper AI implementation. The World Bank reported that only 43% of the population in low-income countries had internet access, compared to 87% in high-income countries (Mpofu, 2024; Mhlanga, 2021), hindering banks' ability to implement AI solutions requiring robust connectivity and infrastructure. Consumer scepticism and mistrust towards AI-driven services in developing economies pose barriers, with a PwC study revealing 38% of consumers are hesitant due to data privacy and security concerns (Rabby, Chimhundu, & Hassan, 2022; Aiello et al., 2020; Abidin, Nawawi, & Salin, 2019). Regulatory frameworks also struggle to ensure ethical AI use and data protection. A 2020 McKinsey report noted that 60% of banks in sub-Saharan Africa operate on outdated systems, impeding AI integration (Jayadatta & Majeed, 2024; Amankwah-Amoah, & Lu, 2022). Although, 25% of banks in developing regions have implemented AI in customer service compared to 45% in developed regions (Sheth et al., 2022). Operational inefficiencies are prevalent, with 45% of banks in developing economies reporting high costs associated with manual processes and customer support (Zuhair et al., 2024; Charoenwong et al., 2024). These challenges highlight the need for a strategic approach to AI adoption in the banking sector of developing economies to unlock AI's full potential in revolutionizing customer service journeys and banking service areas.

AI's influence in banking, as outlined by research from Allied Market Research (AMR) and Grand View Research (GVR), is profound. In 2020, the market for AI in banking was valued at $12.9 billion, soaring to an impressive $196.63 billion in 2023, and is expected to continue rising, potentially reaching new heights by 2030. This growth is propelled by a compound annual growth rate (CAGR) of 37.3% from 2023 to 2030 (AMR, 2021; GVR, 2022). AI is a game-changer, empowering banks to stay competitive in the digital age against FinTech companies. According to a 2020 study by the National Business Research Institute and Narrative Science, approximately 32% of banks have embraced AI technologies, particularly through predictive analytics and voice recognition, to gain a competitive edge. The implementation of AI has the potential to significantly boost revenue in various banking segments, with corporate and retail banking anticipated to reap the most benefits. Successful AI implementations could add an estimated $321 billion and $306 billion in value to these sectors, respectively (Statista, 2024a). In investment banking, machine learning leads as the most prevalent AI application, with a usage rate of 60% to 80%, followed by predictive analytics and virtual assistant technologies (Statista, 2022). Reflecting on the banking sector's business landscape, Generative AI (GenAI) emerges as a significant player, potentially contributing $200 to $340 billion in value to the industry. This figure translates to 3% to 5% of total industry revenue, and successful GenAI deployment has been linked to a profit increase of 9% to 15% for the banking sector (Statista, 2024b).

Research on AI in the banking industry has undergone significant evolution (Calderon-Monge & Ribeiro-Soriano, 2024), particularly concerning service areas and customer service journeys in developing economies. Initially, studies focused on theoretical applications, highlighting benefits like cost reduction, efficiency improvement, and enhanced customer experiences (Di-Vaio et al., 2023). As AI technologies became more accessible, research shifted towards practical aspects, examining its actual impact on banking operations and customer interactions (Gupta & Ramachandran, 2021). Currently, its key evolution is the increasing emphasis on specific service areas that revolve customer complaints and satisfaction (Gurtu & Johny, 2019). Early research broadly discussed AI's potential across various banking functions, but recent studies delve deeper, exploring nuances of AI implementation (Debrah et al., 2022). Research now

distinguishes between different AI applications in customer service, such as chatbots for basic inquiries versus personalized AI assistants for complex interactions. Moreover, the focus has shifted towards understanding customer service journeys, particularly in developing economies. While initial research highlighted general benefits, current studies map out specific touchpoints and challenges faced by customers in these regions (Hasan, 2021; Herrmann & Masawi, 2022). This reflects a broader trend in AI research towards more context-specific and nuanced analyses, recognizing that the impact of AI can vary significantly depending on socio-economic and cultural factors. The relationship between banks and customers is undergoing a significant transformation, often referred to as "digital banking" or the "millennial generation" (Ashoka & Vinay, 2017; Soni et al., 2021). This transformation is driven by the recognition of customers as individuals with unique needs, leading to the provision of personalized digital services through digital channels. The integration of digital elements into various aspects of consumers' lives has shifted everyday activities to digital platforms (Hübenbecker, 2023), highlighting the importance of online social platforms and the digitalization of businesses. This trend has also increased the focus on AI technologies in both research and commercial sectors, particularly in enhancing relationship management, employee's efficiency and cost savings (Kumar et al., 2021). As banks strive to adapt and innovate to meet the evolving demands of digital-savvy consumers, the development of new financial products and services becomes crucial.

John McCarthy first introduced the term "AI" in 1956 by defining it, according to Rajaraman, (2014), as robotic systems designed to mimic human thought and behaviour. After the collapse of the dot-com bubble in 2000, AI research started to concentrate on Web 2.0 technologies around the year 2005, driven by a surge in data availability (Larson, 2021). This period marked significant advancements in AI, particularly in enhancing cognitive computing within businesses in developing economies. According to Tarafdar et al., (2019), by integrating algorithms into applications, organisations have been able to accelerate information analysis, enhance data accuracy, and free up employees to tackle more complex tasks. The effectiveness of AI technologies has become increasingly known in recent years. However, despite recognising the importance of AI for maintaining a competitive edge, many business leaders struggle to implement it strategically. According to Ransbotham et al., (2017), while 85% of executives acknowledged the significance of AI, only 39% had a strategic plan for its use, largely due to a lack of understanding. According to Bavaresco et al., (2020) and Loureiro et al., (2020), the impact of AI on business performance is becoming more tangible, as demonstrated by empirical studies. Grguric et al., (2020) highlighted AI's positive effects on operational efficiency but noted the absence of long-term studies on its impact on the customer service journey. Bavaresco et al., (2020) emphasised AI's role in enhancing decision-making processes, yet called for further research on its integration with human intuition in areas like consumer behaviour. Loureiro et al., (2020) examined AI's contribution to the customer experience but identified a gap in understanding its effects on the customer service journey. These studies underscore the potential of AI in improving business performance but also reveal the need for further investigation into its long-term implications and integration within the customer domain. This is particularly relevant in developing economies, where there is a notable scarcity of literature specifically addressing the consumer aspect of AI in the banking industry, despite the growing presence of AI in this sector. Moreover, past existing studies rely on quantitative research, which may lack depth and breadth. This is because their quantitative approach may not adequately reflect the perspectives of a diverse range of global literature (Loureiro et al., 2020; Petiwala et al., 2021), especially in areas where collecting survey data is challenging due to issues of banditry and killings, particularly in countries with high autocracy levels, despite AI awareness increasing globally. To address this gap, the study explores how the banking industry utilises informed AI strategies across its service areas and keeps pace with the fast-changing technology landscape, especially within the customer service journey. The specific goals of the study intend to:

I. Evaluate the service areas of the banking sector where AI is frequently utilised in 21st century business dynamics and explore their effect on marketing performance,

II. Analyse AI's role in the customer service journey in the banking industry.

The research is vital for several reasons. Banks in developing countries are adopting advanced technologies, like chatbots, to attract younger customers and enhance growth potential (Rajaobelina & Ricard, 2021). However, concerns are rising about issues such as unauthorized withdrawals and point-of-sale problems in 2023. This highlights the need to tackle unsustainable marketing practices, including the reliance on dubious tactics anchored on 'yahoo' and the occurrence of corporate scandals due to marketing ineffectiveness and lack

of patronage. The Consumer Financial Protection Bureau (CFPB) reported a 30% increase in complaints related to unauthorized withdrawals and point-of-sale issues in 2023 (CFPB, 2022). Additionally, a survey by the Marketing Standards Board (MSB) found that 40% of consumers believe unsustainable marketing practices contribute to corporate scandals and marketing ineffectiveness (MSB, 2023). Furthermore, a report by the Customer Service Institute (CSI) revealed that 60% of customers have experienced poor client relationship management, while 50% have encountered inadequate employee attendance practices in their interactions with banking businesses (CSI, 2023). Addressing common customer complaints about poor client relationship management and inadequate employee attendance practices in developing economies becomes necessary. Incorporating AI into the customer service process can enhance personalization and efficiency (Kusal et al., 2022). This can result in increased customer satisfaction and loyalty, while improving marketing outcomes. Consequently, the descriptive insights from this research could provide valuable guidance for the financial sector and policymakers. This would aid in the incorporation of AI into businesses and the formulation of action plans to safeguard data privacy and security in the context of AI-driven banking and consumer behaviour.

2. Literature Review and Theoretical Framework

2.1. Stakeholder and Agency Theory

According to Garcia et al. (2023), AI can help mitigate information asymmetries and ethical concerns in the banking industry. This capability is attributed to features such as transparency, precise dissemination of information, un-changeability, and computational reasoning, facilitated by technologies like smart contracts and automation. These are excellently fostered by the collaboration of the service areas offered by the manager and stakeholder. Consequently, theories from managerial or stakeholder perspectives provide insights into how AI shape the customer's service journey through provision of excellent service areas that has impact on their purchase decision cycle (Lakhchini et al., 2022; Leung et al., 2013).

According to the agency theory coined in 1976 by Meckling, Michael and Jensen, AI technology has the potential to improve the accuracy of accounting data through features anchored on smart contracts and meticulous record-keeping (Sidorova & Rafiee, 2019). AI enhances the verification of data by establishing agreement among multiple stakeholders, making it harder for managers to alter information. Additionally, AI simplifies tasks such as account reconciliation by using shared block-chain ledgers in triple-entry accounting (Agerfalk, 2020). The integration of block-chain technology and AI is expected to enhance the management and oversight of accounting data, making financial fraud more difficult to conceal. This synergy allows for the automation of various tasks such as bill payments, expense tracking, audit sampling, and compliance processes through the use of smart contracts. Additionally, AI's ability to detect anomalies, including the real-time identification of suspicious transactions, is anticipated to improve the detection of financial irregularities. However, it is important to note that while AI can reduce information asymmetries and address principal-agent problems, the system remains susceptible to manipulation if individuals tamper with the initial or raw data on the block-chain (Fritz et al., 2020). Even when the potential rewards are significant, companies may still be inclined to manipulate original data through deceitful actions. As a result, there is a risk that if managers acquire more than half of the computing power (51%), they might be able to manipulate a block-chain's ledger by adding incorrect information or modifying/deleting previous records (Han et al., 2023).

Rooted in R. Edward Freeman's stakeholder theory from the 1980s, AI is a powerful tool that is transforming the banking sector into a more open and inclusive environment (Mhlanga & Moloi, 2020). This technology allows various participants, including accountants, business partners, and investors, to actively engage in block-chain ecosystems. These participants work together to oversee, update, or verify transactions based on their specific access rights (Miller, 2022). This collaborative model enhances stakeholder involvement and opens up new business opportunities within block-chain networks. As a result, the adoption of an event-centric accounting model, where real-time data is captured on block-chains, caters to the diverse needs and goals of different accounting information users (Bitskkovskaya et al., 2022). AI-driven applications play a pivotal role in identifying patterns and predicting trends. Within the block-chain network, authorized users can monitor transaction data in real-time. The implementation of triple-entry accounting introduces a shared ledger, which acts as a single source of truth for authorized users (Gungor, 2022). Continuous auditing practices enhance assurance mechanisms, thereby increasing trust. However, it is crucial to address and

manage conflicts of interest among stakeholders. This necessitates companies to thoughtfully design their AI-enabled block-chain ecosystems to optimize collaboration while balancing the diverse interests of stakeholders in an equitable manner (Han et al., 2023).

3. Material and Methods

The interpretivist philosophy, emphasising the researcher's core beliefs regarding the creation of knowledge, is often hailed as a cornerstone of systematic literature review in behavioural research. According to Morgan, (2014), its value stems from its ability to integrate qualitative reasoning while highlighting the significance of grounding ideas and actions in practicality and real-world applicability as a measure of their validity and importance. Adopting an interpretivist approach prioritizes actions and strategies that lead to tangible and positive outcomes. It emphasizes the need for adaptability and flexibility in thinking, encouraging openness to experimental efforts that adjust strategies based on feedback and insights from trends in the banking industry (Simpson, 2018; Maarouf, 2019). Interpretivist reasoning allows banks to quickly adapt to unexpected challenges and seize new opportunities, enabling essential adjustments to their AI strategies. By focusing on concrete results, this philosophy can effectively reduce the risks associated with sticking to ineffective AI strategies, ensuring that banks remain grounded in market realities. This ensures that AI-driven decisions are based on solid data rather than vague assumptions, leading to enhanced performance in the banking sector. This research adopts the systematic literature survey methodology outlined by Zhai, (2023) and Wolfswinkel et al., (2013), which is structured into five distinct stages. Namely: scope of research inclusion and exclusion criteria, search query of literature survey, sample selection, thematic analysis and result presentation. These stages are necessary and designed to facilitate a thorough exploration and evaluation of the collected articles from various databases.

3.1 Scope of Systematic Literature Review

Inclusion Criteria	
Topic	Articles hinged on how artificial intelligence aids in banking operations Authors must be able to contextually place research articles through title and abstract review, that is, banking sector and artificial intelligence or related terminology must be mentioned in either article title, abstract or keywords
Document Type	Empirical and conceptual articles published in peer-reviewed journals Articles must be published in journals that are included on the 2022 ABDC list , as indicated by Paul and Criado (2020) and Paul et al. (2021b).
Language	All included articles are published in English
Exclusion Criteria	
Topic	Business-to-business (B2B) articles on topics including corporate insolvency and audits
Document Type	Books, book chapters and conference papers are excluded from the review
Language	Articles written in languages other than English

Fig. 1. Research Inclusion and Exclusion Criteria
Source: Author, (2024)

To adhere to the selection criteria framework suggested by Tran et al., (2018), this study adopts a purposive sampling method governed by specific inclusion and exclusion criteria. This approach is chosen for its ability to carefully select relevant literature that accurately reflects the key elements of this study, resulting in a focused and intentional analysis that provides meaningful insights. However, only studies that meet all of the specified inclusion criteria are incorporated into this research, while those that meet the outlined exclusion criteria are omitted, as depicted in the Figure 1. However, articles are excluded for several reasons. At first, according to Firmstone, (2019) and Siddaway et al., (2019), systematic reviews should be grounded in empirical studies that adhere to a clearly defined methodology and conform to established research norms. In contrast, conference papers, editorials, and opinion pieces often represent the subjective perspectives of their authors and lack the methodological rigor and detailed reporting of methods and results characteristic of research articles. This deficiency makes it challenging to evaluate their quality and relevance for the review. Firmstone, (2019) further contends that incorporating editorials, opinion pieces, and dissertations into a literature review could introduce bias and potentially distort the overall findings. Therefore, they are not included in this literature review study.

3.2 Keywords' Search Strategy

In January 2023, an extensive literature review was conducted using prominent academic databases such as ProQuest, IEEE, Scopus, Google Scholar, Sciendo, Scimago, Science Direct, and Web of Science to ensure a comprehensive examination of AI in behavioural science research. These databases were selected due to their relevance to the research topic, while providing a broad range of data and serving as a secondary source for additional materials (Boonstra & Laven, 2022). According to the search framework outlined by Zawacki-Richter et al., (2019), the search strategy employed specific keywords related to the study's focus, including "AI (AI)," "AI in organizational performance," "Consumer Behaviour," "Banking Industry," "Customer Service Journeys," "Service Areas," "Digital Banking in Developing Economy," "Customer Experience," "Banking's Applications of AI," "Technology Adoption in Banking," "Banking Sector in Developing Economy," "AI applications," "Performance enhancement through AI," "Adoption of technology in the banking sector," "Financial sector in Developing economy," "Thematic analysis of AI's usage," "Efficiency in organizations," and "Sustainability in business"," combined with Boolean operators "OR"; "BETWEEN" "NEXUS" and "AND" to refine the results. However, the snowball method was utilized to broaden the search scope and exclude irrelevant materials by meticulously reviewing reference lists in pertinent review papers and related studies. This ensures the inclusion of a diverse range of empirical research that fosters the accumulation of a comprehensive body of knowledge to support the methodological review (Wohlin, 2014). This approach was deemed ideal for providing effortless access to a wide range of information from multiple sources, such as industry analyses, financial statistics, and scholarly research.

3.3 Literature Sample Selection

By adopting the PRISMA flowchart as per Zhai, (2023), the literature review commenced with an extensive search, yielding 1,484 articles across various databases including Sciendo, Google Scholar and Web of Science. Further scrutiny, including the examination of reference lists and expert consultations, led to the removal of duplicates, reducing the count to 604 by excluding non-empirical studies, and then to 497 articles after initial screening owed to their non-compatibility with the empirically based research in behavioural science. Following a detailed review of titles and abstracts based on specific inclusion criteria, 318 studies were deemed suitable for data extraction. However, after excluding studies not directly related to the research focus, such as those on "AI in organizational contexts" and "AI in other industries," 90 studies were identified for comprehensive analysis according to the inclusion criteria and research objective. Figure 2 visually summarizes the literature search, screening, and inclusion processes. Each selected study was meticulously documented using a pre-defined template covering various aspects, including the research focus, authors, year of publication, research objectives/inquiries, size of the sample details, and research findings to identify the themes. This structured approach facilitated the systematic organization of essential information and allowed for easy reference during the review process (Mariani et al., 2023). While the initial categorization was based on the conceptual framework and existing reviews, it remained adaptable to incorporate new factors identified

in the reviewed literature that were not previously considered in the original data inventory (Zhai, 2023).

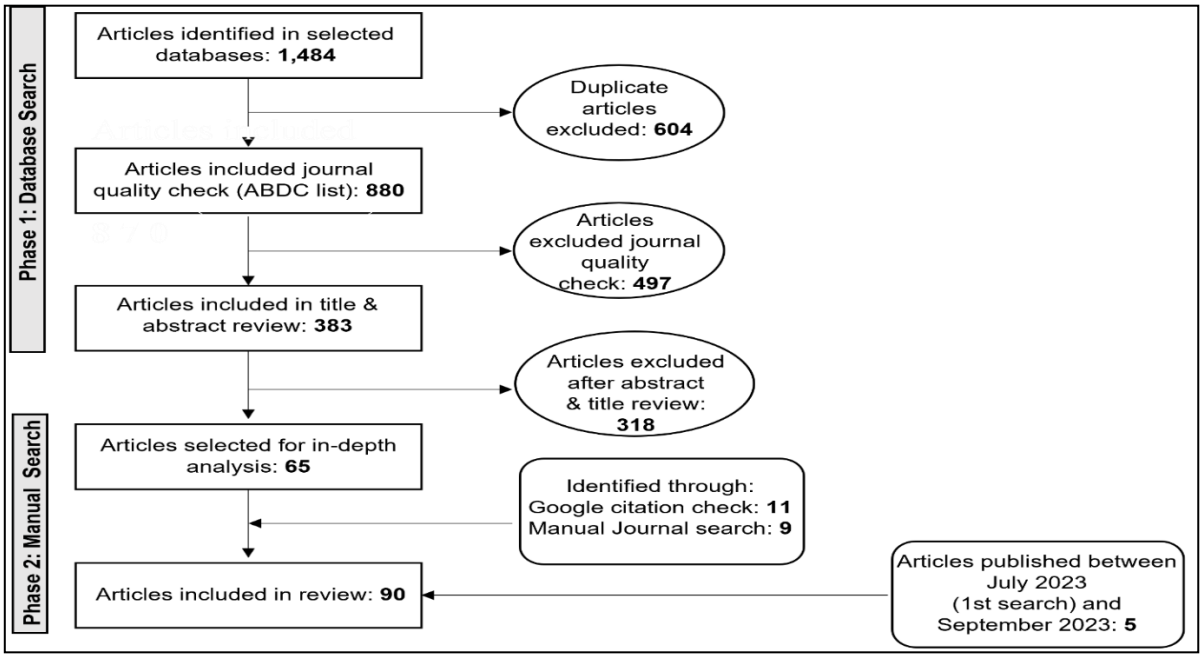


Fig. 2. Research PRISMA Flowchart
Source: Saunders et al., (2019)

3.4 Thematic Analysis

A thematic analysis was conducted using Nvivo version 11.0 and MS Excel to systematically identify and construct themes from the literature. This analytical method is ideal as it allows for a systematic examination and documentation of prevalent patterns within the data, providing deeper insights into various factors influencing AI's impact on consumer behaviour (Harper & Thompson, 2011; Fryer, 2014). Analysing the interplay between AI technology, customer service experiences, and financial management tactics provides a thorough examination of the challenges and opportunities that banks face in adopting AI in developing economies to enhance their operational efficiency and competitiveness. As Clarke and Braun, (2017) suggest, identifying key themes is appropriate for this research, as it allows for an in-depth examination of the complexities involved in integrating AI technologies into a highly regulated and competitive sector. Through a systematic review of various sources, including industry reports, academic research, and expert opinions, the researcher can gain valuable insights that can guide strategic decisions and enhance the performance of banks by effectively incorporating AI solutions in developing economies.

The research follows a six-step procedure outlined by Zhai, (2023) for thematic analysis namely: data familiarization, thematic coding, identifying and reviewing sub-dimensions of the themes, compiling recurring concepts, and analysing and interpretation of the data according to the study's objectives aim to maintain the quality and relevance of the literature. The PRISMA method, which includes a 90-item checklist and a four-phase flow diagram, was employed for screening in systematic reviews and meta-analyses to ensure this standard, as depicted in Figure 2. This technique guarantees a meticulous and methodical examination of the literature, leading to an in-depth comprehension of the impact of AI on the efficiency of banks, while conforming to a prescribed set of guidelines for reporting systematic reviews and meta-analyses (Zhai, 2023).

3.5 Research Ethical Consideration

In accordance with the ethical principles outlined by Tsamados et al., (2021), which emphasize the distinction between right and wrong actions, the study implements several measures to stay clue in ethical research. Firstly, the issue of informed consent is of paramount importance in the banking sector. To address this, researchers predominantly use publicly available market data and information, thereby bypassing the need for direct consent from individuals. Secondly, to uphold research integrity and avoid plagiarism, the study meticulously cites and acknowledges all sources used. This is crucial for maintaining academic integrity and combating plagiarism in scholarly work. Finally, as ensuring objectivity is vital to minimize potential biases, the researcher ensures that data collection is conducted impartially. This was achieved by relying on a systematic review of secondary data sources. By using validated data collection tools and applying appropriate statistical methods for data analysis, the study maintains its objectivity and integrity across the research areas.

4. RESULT PRESENTATION

4.1 Description of Article Profile

As AI becomes part of the banking sector daily routine, the study objective anchored on service areas and customer service journey as reflected in Figure 3 and Figure 4, focusing primarily on AI's application within the banking sector. Consequently, a thorough examination of the selected 90 articles revealed that 71% (64 articles) of the articles explored the various aspects of AI's usage in banking sector, including "Equity Markets and Investment, Risk and Credit Management, Retail Financing and Banking, Consumer Decision Making and Marketing Segmentation, Financial Management and Strategy, Financial Accounting and Auditing and Assurance, and Technology and Automation". However, 81% of these articles adopted a qualitative research approach, of which content research strategy becomes their most common data collection method. However, 10 articles followed a document analysis. Moreover, the research predominantly covered developing countries, with a particular emphasis on the Australia, USA, China, Japan, UK, and Saudi Arabia. Although, limited studies focus on Nigeria as a central realm, implying that research on AI's usage in consumer behaviour is at early stage of life in Nigeria. Kao et al., (2012) argue the performance of hedge funds during the financial crisis of 2008, by employing a comprehensive dataset of hedge fund returns and using various statistical techniques to analyse how several factors influencing hedge fund performance during the crisis. They suggest that AI play critical roles in hedge funds by facilitating higher liquidity and lower leverage through block-chain that adequately withstand the market turmoil. This highlights the importance of AI in helping fund managers' skills in navigating challenging market conditions. Furthermore, Han et al., (2023) argue that there is extensive use of AI in accounting and auditing for transparency and faithful reporting, specifically the application of block-chain technology for real-time audit trails in developing economy. This innovation is praised for its ability to increase audit efficiency and reduce human errors, leading to enhanced marketing performance by streamlining manual data extraction and audit preparation processes. Finally, Khandani et al., (2010) examine the role of AI in analysing the trading data of individual stocks showing that stocks with higher liquidity risk experienced larger price declines during the crash. This evidence that liquidity risk was a significant factor in the market downturn and emphasizes the need for investors to consider liquidity risk in their investment strategies. Therefore, the identified studies contribute to the understanding of AI's usage in financial market dynamics during periods of stress and offer valuable insights for investors and policymakers in managing risk and enhancing market stability.

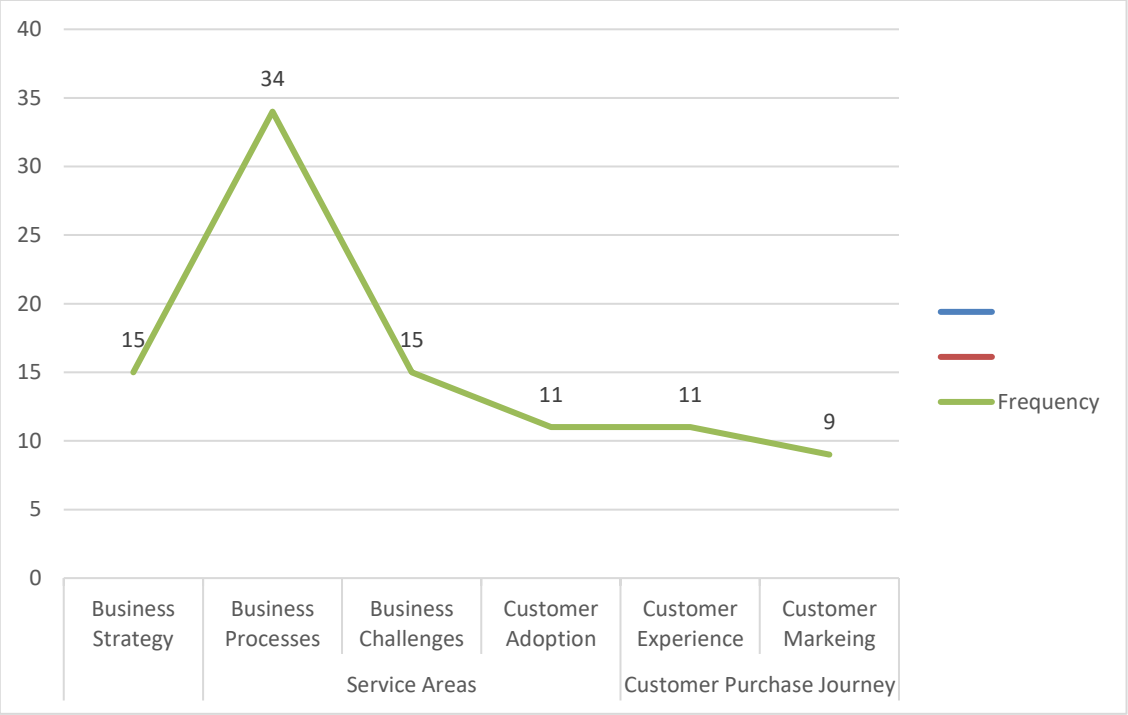


Fig. 3. Research Themes on AI's Usage in the Banking Sector
Source: Author, (2024)

In alignment with the second objective, a systematic review of 26 studies showcases how AI's banking usage impacts the consumer journey profiles in the decision process. Approximately 90% of the research focused on customer journey profiles, encompassing stages from acquiring clients to making credit decisions and post-decision activities, of which 95% utilized qualitative research methods to achieve their goals, with the rest employing mixed methodologies, including secondary data collection and qualitative designs. The research covered various regions, with a significant focus on developing countries, and notably included studies from the UK, USA, and Nigeria. The sizes of the samples in the studies ranged considerably, from single clients of banks to as many as 3,500 clients. Table 1 provides a brief overview of the main findings from research relevant to the study's goal. Schwartz et al., (2017) applied a targeting and need-based strategy in a significant retail banking environment to enhance customer acquisition, suggesting a technique that enables marketing professionals in banks to balance learning from advertising data with optimizing advertisement investments. Current technology advancement emphasizes incorporating AI as a tool for analysing customer adoption behaviours in banking, utilizing machine learning to assess and improve segmentation initiatives. Furthermore, Belanche et al., (2019) identified the factors that influence the adoption of AI-driven technologies in customer decisions regarding online banking usage, while Manser-Payne et al., (2018) explored the drivers of AI-enabled mobile banking service usage among millennial customers. These studies underscore the critical role of AI in simplifying the complexity of the customer service journey.

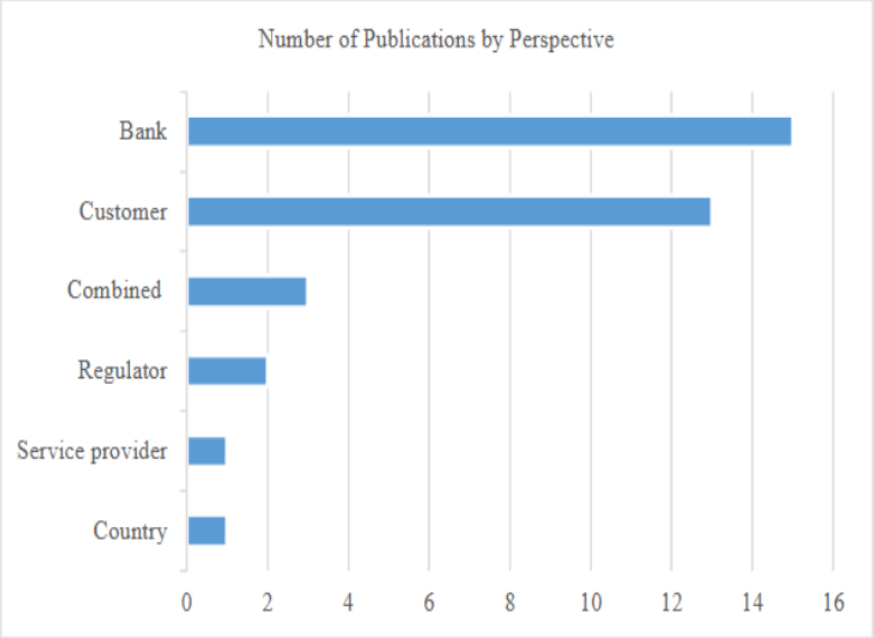


Fig. 4. AI's Literature Classification in 2023
Source: Lazo and Ebardo, (2023)

Adopting AI is anchored on the application of new ideas involving many individuals and groups with diverse perspectives, which are essential to understanding the adoption process (Häggman, 2009). Each stakeholder has unique goals that can either facilitate or hinder the spread of innovation. Research on AI adoption in banking has primarily focused on the perspectives of banks and customers, comprising 71% (64 papers) of the studies reviewed. Of the 90 studies examined, 43% (15 papers) focused on the bank's perspective, slightly more than the 37% (13 papers) that focused on the customer's perspective. Only 9% (3 papers) considered both perspectives. The heavily regulated banking industry presents challenges for AI adoption, yet few studies examine the regulatory viewpoint. Only two studies (Lui and Lamb, 2018; Truby et al., 2020) address the role of regulators in AI adoption. This aligns with the findings of Lazo and Ebardo, (2023) showcasing that AI's literature has gained consideration and attention among academia in recent years (Figure 6). Additionally, only one study investigated the impact of macroeconomic factors on AI use in banking at the national level. Service providers, crucial for supplying the necessary technology and services for AI adoption, are also underrepresented in research. Sanz and Zhu, (2021) highlight the importance of service providers in accelerating AI project scaling and transitioning from proof-of-concept to full-scale production implementation. However, in studying AI adoption in the banking sector, most research from the customer's perspective (26 out of 90 papers) is theoretically based. The Technology Acceptance Model (TAM) is the second most popular theoretical framework after the Technology Readiness Index, featuring seven studies. Moreover, over five studies combine multiple theories, such as the Stimulus-Organism-Response Theory with Task Technology Fit and the TAM with the Theory of Planned Behaviour. Individual theories like the Hedonic Motivation Adoption System and Service-Dominant Logic Theory also explain customer AI adoption. Conversely, numerous studies examine AI adoption from the bank's perspective, but none employs a theoretical framework. As a result, stakeholder theory and agency theories are under-explored forming the background of the research theoretical explanation. This is ideal as it combines both the customer's perspective and agency relationship in explaining AI's efficacy in banking industry.

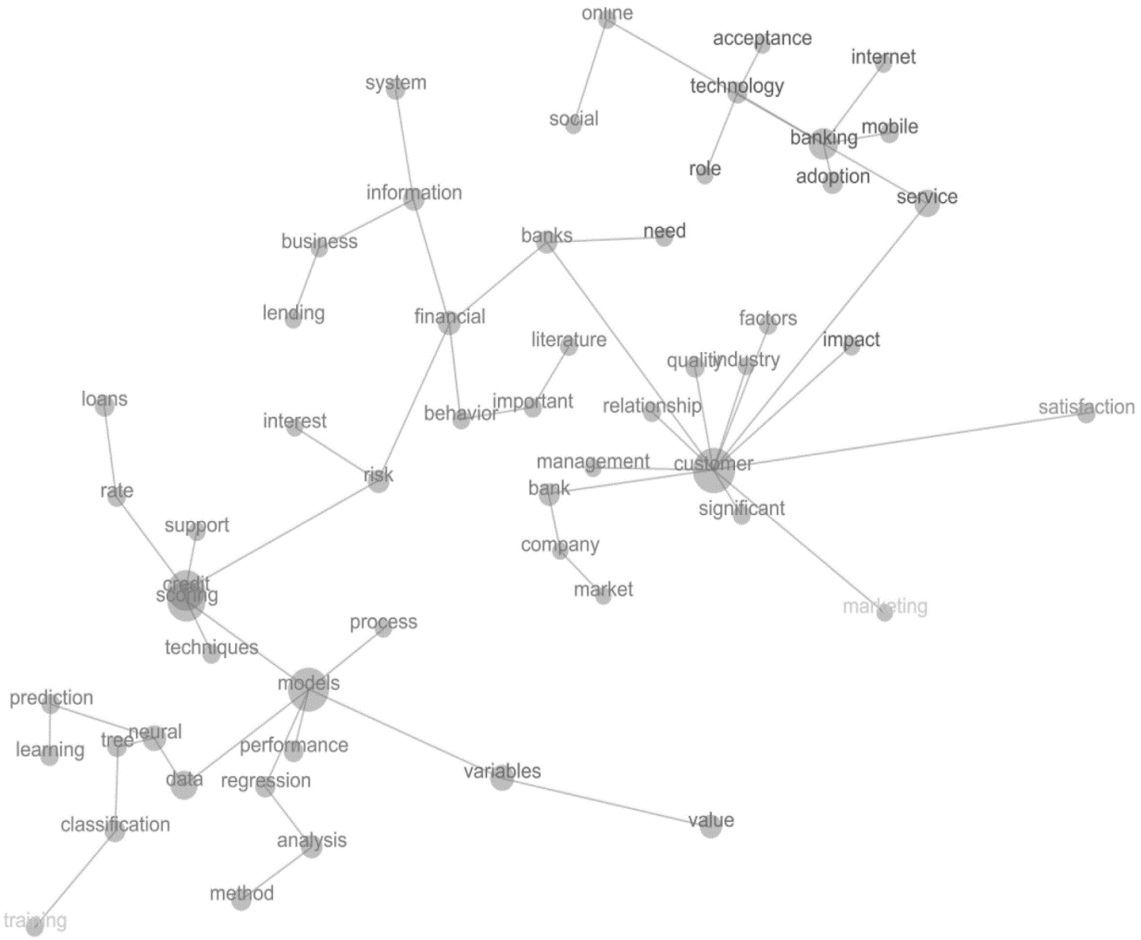


Fig. 5. Literature Cloud Map of Research Literature
Source: Author, (2024)

4.2 Presentation of Research Themes

To investigate the application of AI in the banking sector, the research approach began with a deductive method, organizing articles into predefined themes to identify key themes. An inductive method was then used to identify sub-themes and provide context to the main themes (see Figure 3). Borges et al., (2020), Bavaresco et al., (2020), Loureiro et al., (2020), and Verma et al., (2021) describe a methodological approach for identifying key themes that involve a comprehensive review of prior systematic literature reviews, the extraction of keywords, and the development of codes (themes) from selected articles. This process also entails a thorough examination of titles, abstracts, and full texts, as required, to ensure precise categorization within these identified themes. Through this process, four main themes were identified: Business Strategy, Business Process, Business Challenge, and Customer Service Blueprint, as shown in Figure 4.

4.2.1 Business Strategy

According to the business strategy theme that encompasses 15 articles, early research argues AI's efficacy amidst its potential applications and adoption from an organizational perspective (Smeureanu et al., 2013; Olson et al., 2012). According to Olson et al., (2012) and Akkoç, (2012), data mining has been used to forecast bankruptcy and improve risk models. The increasing adoption of AI tools in organizations presents substantial opportunities for enhancing business efficiency in financial institutions, surpassing traditional methods of strategic and risk model development. A synthesis of 15 articles revealed various sub-themes on the organizational use of AI, highlighting different current practices where banks employ AI to create organizational value. These applications include AI-driven strategies and internal business processes. According to Medhi and Mondal, (2016), the AI model is used to predict the success of outsourcing. Thus,

Fountain et al., (2019) argue that AI tools are effective in organizational strategies that are driven by AI technologies, yet challenges such as human resources and organizational culture pose obstacles to their implementation. However, Mohapatra, (2020) and Jakšič and Marinč, (2019) recent debates have highlighted the difficulties in implementing AI in banking institutions. Additionally, a sub-theme titled "Business Challenges with AI," comprising fifteen articles, explores various organizational hurdles, such as AI integration, investment decisions, financing decisions, AI knowledge barriers, and human-machine adaptation. Mohapatra, (2020) argued that challenges in human-machine interactions are crucial for the sustainable implementation of AI in banking. While technological advancements have been extensively studied, the real potential lies in embracing and integrating AI within the banking industry. Additionally, a subsection titled "AI and Adoption in Financial Institutions," covered by six articles, explores the incentives and obstacles faced by organizations in adopting AI technology. Fountain et al., (2019) conceptually identified barriers to organizational adoption, such as employee resistance due to fear of the unknown, company culture, and budget constraints. Overall, the strategy themes reveal that the organizational uses of AI were the most prominent discussion in today's business pyramids, indicating a consistent focus on technology development rather than implementation. However, discussions on the organizational challenges associated with AI implementation remain limited.

4.2.2 Business Process

AI became a reality and gained traction in the global banking sector after the dot com bubble and the advent of Web 2.0 in 2004, according to the Business Processes theme consisted of thirty-four (34) articles (Khandani et al., 2010). This interest was likely spurred by the proposed application of AI in predicting stock market trends and selecting stocks (Tseng, 2003; Kim & Lee, 2004). According to Baesens et al., (2005); Larson, (2021); Ince and Aktan, (2009); Kao et al., (2012), the initial focus of AI research in banking was on analysing credits and loans, aiming to establish a quick and reliable AI framework. Baesens et al., (2005) utilized neural networks to enhance predictions of loan defaults and early repayments. Ince and Aktan, (2009) employed data mining techniques in credit scoring analysis and discovered that AI-driven methods outperformed traditional ones. Khandani et al., (2010) demonstrated the effectiveness of machine learning models in assessing consumer credit risk. The sub-theme "AI and credit" was identified in fifteen articles that explored the use of AI technologies, such as data mining, chatbots, and machine learning, in improving credit scoring, analysis, and granting processes. Alborzi and Khanbabaei, (2016) investigated the application of neural network techniques in data mining to develop a customer credit scoring model. Since the Web 2.0 event in 2004, there has been progress in behavioural science research on how AI can enhance banking processes beyond credit analysis. Therefore, the sub-theme "AI and Services," which includes twenty articles, explores the role of AI in improving and optimizing processes. It focuses on how technology can enhance internal service processes in financial institutions. Soltani et al., (2019) explore the application of machine learning to optimize appointment scheduling and decrease service durations. The central idea underscores the capability of AI to improve banking procedures and functions. Nonetheless, there is a lack of empirical behavioural studies on the incorporation of technology into the banking infrastructure. Although there is a wealth of research on credit risk, the examination of additional financial products like cryptocurrency, block-chain, and black market currency is still restricted.

4.2.3 Business Challenge

According to Business Challenges theme consolidated by fifteen (15) articles, AI adoption has been gaining momentum due to widespread concern about net present outcome of investment, financing, and dividend decisions. As a result, efforts are instigated towards AI integration, knowledge barriers, and human-machine adaptation. This makes AI-driven tools, like chat-bots, to be increasingly utilized to enhance banking's operational efficiency and decision-making processes. Feuerriegel et al., (2020) argue that AI technologies like machine learning algorithms analyse vast amounts of data to identify investment opportunities and manage portfolio risks. This has led to more informed and data-driven investment strategies, contributing to the overall financial performance of banks. Similarly, Dwivedi et al., (2021) motioning AI's crucial role in credit scoring and loan approval processes. By leveraging predictive analytics and data mining techniques, banks assess the creditworthiness of borrowers more accurately and swiftly, thereby reducing the

risk of default and improving the efficiency of lending operations. Finally, according to Schlögl et al., (2019), dividend decisions are influenced by AI, as predictive models help in forecasting future earnings and determining optimal dividend pay-out ratios. This ensures that banks maintain a balance between rewarding shareholders and retaining earnings for future growth. Despite its efficacy, AI integration into banking operations is not without challenges. Toniolo et al., (2020) noted the lack of AI knowledge among staff, which hampers the effective implementation of AI technologies. Cao (2022) coined that human-machine adaptation remains a critical issue, as there is a need for seamless collaboration between AI systems and human employees to achieve optimal results. Overall, while AI offers significant opportunities for enhancing business decisions and operational efficiency in the banking sector, greater attention is needed in areas such as AI knowledge development, effective integration of AI technologies, and fostering human-machine collaboration. This is because addressing these challenges will foster full leverage of the AI's potential, while banks maintain a competitive edge in the rapidly evolving financial landscape.

4.2.4 Customer Service Blueprint Model

According to customer- centric theme titled "customer service blueprint" coined by twenty-six (26) articles, the focus on utilizing AI to gain deeper insights into customer adoption of digital banking services is increasing. In the domain of AI and Customer Adoption, which encompasses 11 articles, the focus is on utilizing AI to investigate the challenges and incentives that influence the adoption of digital banking technologies by customers. Arif et al. (2020) utilized a neural network approach to identify barriers to the adoption of Internet banking by customers. Belanche et al. (2019) examined factors associated with the adoption of AI-driven technologies in the banking sector, while Payne et al. (2018) investigated the motivators for using AI-enabled mobile banking services. Additionally, bank marketers have recognized the potential of AI in improving the segmentation, targeting, and positioning of their banking products and services. However, the AI and Marketing sub-theme, covering nine articles, examines AI's use in marketing tasks like customer segmentation, product development models, and marketing campaign execution. Smeureanu et al., (2013) introduced a machine-learning approach for banking customer segmentation, while Schwartz et al. (2017) applied AI to analyse resource allocation in targeted ads. Recently, there's been a growing interest in AI's impact on customer experience, as shown by Soltani et al. (2019) and Trivedi (2019). The AI and Customer Experience sub-theme, with eleven articles, delves into AI's role in enhancing customer experience in banking services. Trivedi (2019) showcases the effect of chat-bots in banking on customer experiences. Despite significant progress in understanding AI's role in digital banking adoption, marketing, and customer experience, the ethical implications of AI in banking are still largely unexplored. Investigating this area could reveal the long-term effects of AI on customer trust and loyalty and how AI can be integrated with new technologies to create more personalized and seamless banking experiences.

5. DISCUSSION OF FINDINGS

The study's findings are systematically discussed according to the research objective that guides the subject area.

Service Areas of AI's usage and their impact on banking marketing performance

The use of AI in the banking sector has brought significant advancements in banking operational efficiency and customer decision-making process, as demonstrated by various studies, including those by Tseng (2003) and Kim and Lee (2004), which investigated AI's role in forecasting stock market movements and making investment choices. Machine learning algorithms, in particular, analyse large datasets and market patterns to deliver more precise forecasts, aiding in portfolio selection and optimizing resource distribution for targeted advertising, according to Schwartz et al. (2017). This echoed the argument, coined by Kao et al., (2012) and Baesens et al. (2005), that the significance of AI in credit and risk management. AI-powered credit scoring models improve the accuracy of credit risk assessments, leading to more informed decisions on credit issuance. This aligns with the perspectives of Ala'raj and Abbod (2016), who stress the role of AI in effective credit risk management. Consequently, by streamlining and enhancing credit processes, banks can reduce the risk of defaults and improve the overall performance of their loan portfolios.

The integration of AI in consumer banking has indeed revolutionized the sector from a consumer perspective. Studies like those by Soltani et al., (2019) and Arif et al., (2020) have shown that AI-powered tools such as scheduling systems and online banking platforms have streamlined operations, making the banking experience more convenient for consumers. This aligns with Trivedi's (2019) assertion that AI enhances the consumer experience and fosters brand loyalty, leading to increased customer satisfaction and retention, which in turn positively affects the operational efficiency of banks. Belanche et al., (2019) also highlight the effective use of AI in robotic systems at the customer interface, which demonstrates AI's capability to automate routine tasks and enhance operational efficiency. The practical implementation of AI in banking operations, such as through the automation of processes, not only reduces operational costs but also improves accuracy and speed, leading to overall improvements in efficiency. This transformation brought about by AI in consumer banking is a clear indication of the positive impact that technology can have on both the consumer experience and the operational aspects of the banking industry.

According to societal marketing philosophy, AI has transformed how personalized customer decisions are made, as observed by Belanche et al., (2019). Banks now use AI algorithms to understand customer behaviour and preferences, leading to more targeted marketing approaches. Ashoka, (2017) also points out AI's role in enhancing customer service acceptance, improving banks' ability to meet individual needs. Additionally, Muñoz-Izquierdo et al., (2019), along with Han et al. (2023), highlight AI's importance in the fields of auditing and accounting. AI methods simplify financial reporting, reduce errors, and increase precision, ensuring adherence to regulations and operational effectiveness. The adoption of AI tools in financial institutions promotes business efficiency, outperforming traditional strategies in risk management. AI has become essential in various banking areas, including stock market predictions, credit risk evaluation, customer banking, and auditing, providing innovative solutions. As the banking sector continues to embrace technological progress, AI's role is anticipated to grow, further revolutionizing the financial services industry in developing economies.

The role of AI in the banking sector's customer service journey

Fares et al., (2022) presented the notion of a "service blueprint" in Figure 5 to tackle the absence of universally established criteria for comprehending consumer banking purchase decisions. This framework visually maps the customer experience, detailing both front-end interactions and back-end processes, along with support mechanisms. According to Bitner et al., (2008), the effectiveness of a service blueprint hinges on customer prioritization and the strategic design of steps based on data and expertise. This model equips banking experts, marketers, and researchers with a deep understanding of the customer journey, highlights AI's impact, identifies research areas, and uncovers growth opportunities in the industry. It consists of four key components: the customer journey, front-stage, back-stage, and support processes (Figure 6). The customer journey maps out the steps customers take when seeking credit solutions, forming the blueprint's base. The front-stage encompasses interactions with banking touchpoints, such as AI-driven interfaces like chat-bots. Back-stage activities support the customer-facing front-stage operations, while support processes facilitate smooth internal organizational interactions and back-stage functionality. Importantly, AI enhances bank users' decision-making by improving their navigation through various stages of their journey.

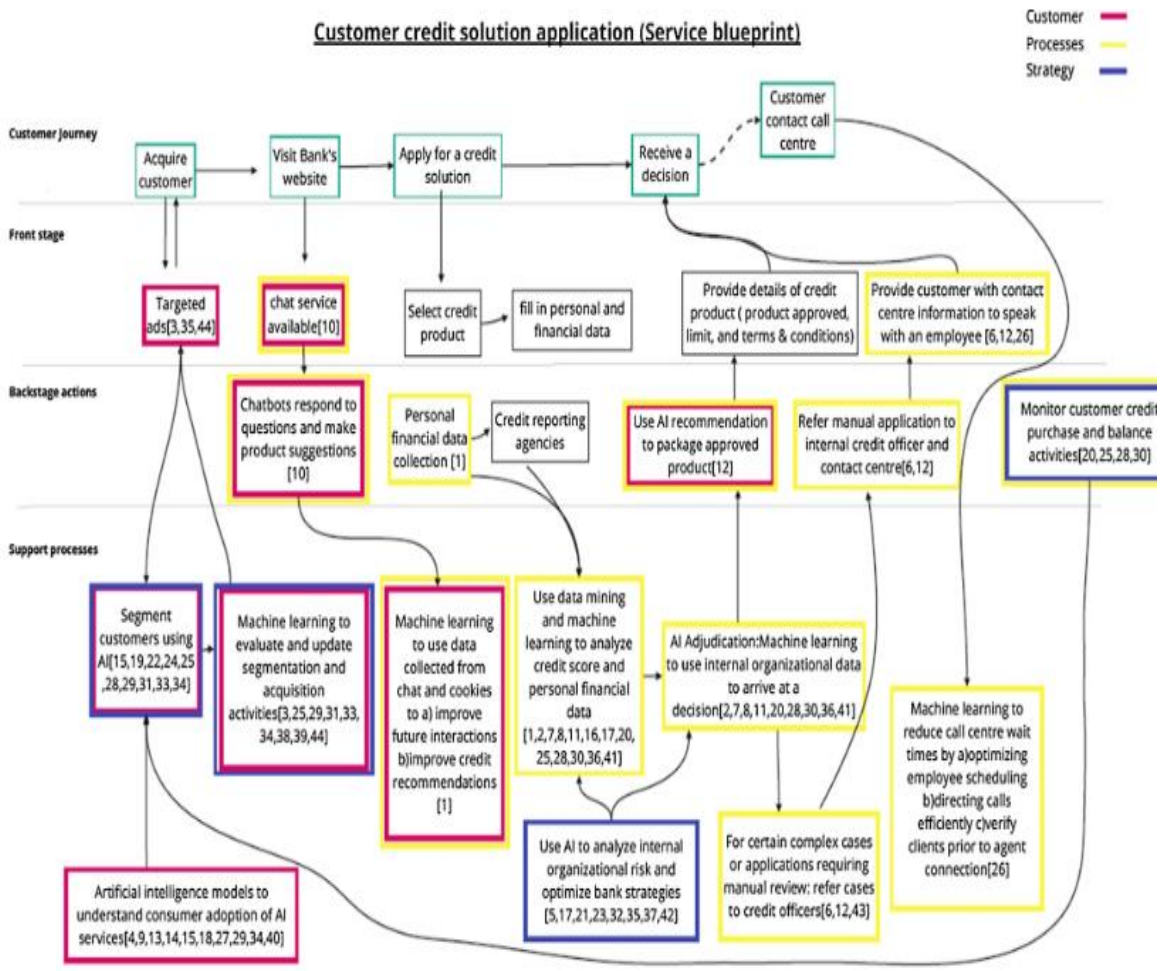


Fig. 6. Literature Cloud Map of Customer Service Journey
Source: Adapted from Fares et al., (2023)

According to Broby, (2021), the customer journey in the banking sector begins with the acquisition phase, followed by credit decision-making and post-decision activities. The primary goal of the acquisition phase is to attract visitors to the bank's website and convert them into active users. This is achieved through front-stage activities such as personalized targeted advertising. Supporting this approach, Schwartz et al. (2017) suggested a multi-dimensional strategy for retail banks to enhance customer acquisition by balancing the learning from advertising data with the optimization of advertising expenditures. During this stage, AI plays a crucial role in understanding customer adoption behaviours in banking. Machine learning techniques are used to improve segmentation efforts by identifying factors that influence online adoption. Sharma et al. (2017) employed a neural network approach to analyse factors affecting mobile banking adoption. Similarly, Payne et al. (2018) examined the comfort and attitudes of digital natives towards AI-enabled mobile banking services. This aligns with the perspective of Markinos and Daskalaki, (2017), who argued that machine learning allows banks to categorize customers based on their reactions to advertisements.

During the credit application phase on a bank's website, the main goal is to turn visitors into applicants. The use of robot-advisors plays a vital role in helping customers choose a credit option that fits their needs and qualifications (Hasan, 2021; Herrmann & Masawi, 2022). These advisors gather basic personal financial information, quickly confirm it with credit bureaus, and enhance service offerings while directing customers to suitable options. Trivedi, (2019) highlights the significance of information, system, and service quality in providing a smooth customer experience with chat-bots, with personalization serving as a moderating factor. This is because robot-advisors offer both task-oriented functions, such as checking bank accounts, and problem-solving functions, like processing credit applications. The collected data is analysed using machine

learning to continuously improve offerings and enhance the overall customer experience. Following the research of Jagtiani and Lemieux, (2019), machine learning is used to optimize data from various sources, enabling the creation of well-informed and comprehensive credit recommendations. While this proposed process offers significant benefits to customers and banks, it is important to note that many customers are hesitant to share their information. Therefore, building trust in the banking institution is crucial for improving the customer experience.

At the stage of service decision-making after gathering data from online sources, the employment of data mining and machine learning is essential for analysing data and making informed credit decisions. Now, with the aid of a robot-advisor, customers can receive credit decisions swiftly, moving away from traditional methods that could take up to two weeks due to advisory and underwriting processes. The integration of AI into credit decision-making processes offers a rapid and well-informed approach, streamlining what was traditionally a lengthy journey involving advisory networks and underwriting. This not only accelerates decision-making but also enhances the customer's sense of empowerment. It is essential to strike a balance between managing organizational risk, maximizing profits, and promoting financial inclusion. Khandani et al., (2010) leveraged machine learning to create a model for assessing customer credit risk. Koutanaei et al., (2015) developed a data mining model to bolster confidence in credit scoring systems. To mitigate organizational risk, Mall (2018) utilized a neural network approach to analyse the behaviour of customers at risk of default, with the aim of reducing credit risk and boosting profitability for credit institutions.

At the post stage decision, Xu et al., (2020) observed that in the final phase known as customer service centres, people generally prefer human help for complicated tasks. Human intervention is deemed essential, especially for tasks that require, according to Baiden, (2011), manual assessment which is pivotal in credit evaluations, as AI systems may be prone to errors or mis-judgments. While AI offers numerous benefits to both customers and organizations, Jakšič and Marinč, (2019) argue that maintaining relationship banking is essential for financial institutions to remain competitive. To incorporate AI effectively, it is suggested that banks optimize their channels. Soltani et al., (2019) propose that financial institutions can enhance efficiency by using machine learning to streamline appointment scheduling and shorten service times. As the customer decision process involves a journey from information gathering to decision queue and finally to post-service behaviour, AI positively influences consumers' decision-making in their banking journey.

5.1 Research Implication, Limitation and Gap for Further Enquiries

The research findings reveal practical implications for the banking sector in these regions. These implications span across operational efficiency, customer experience, financial inclusion, and regulatory challenges. Firstly, AI's integration into banking operations significantly enhances operational efficiency (Hübenbecker, 2023; Milian et al., 2019). By automating routine tasks such as transaction processing, fraud detection, and customer service inquiries, banks can reduce costs and minimize human error. This leads to improved accuracy and faster processing times, which are crucial for customer satisfaction and competitive advantage. The adoption of AI-driven predictive analytics allows banks to better manage risk, optimize their credit scoring processes, and offer personalized financial products (Kumar et al., 2021; Kusal et al., 2022). Consequently, banks can operate more efficiently and allocate resources to more strategic initiatives, fostering growth and innovation in the sector. Secondly, the findings underscore the transformative impact of AI on customer experience. AI-powered chatbots and virtual assistants provide 24/7 customer support, addressing queries and resolving issues promptly (Lakhchini et al., 2022). This not only enhances customer satisfaction but also frees up human agents to focus on more complex tasks. AI's ability to analyse customer data and behaviour enables banks to offer personalized services and targeted marketing campaigns, thus deepening customer relationships and loyalty. In developing economies, where access to traditional banking services may be limited (Mariani et al., 2023), AI-driven mobile banking solutions can bridge the gap, offering convenient and accessible financial services to underserved populations. Furthermore, the research highlights AI's potential to promote financial inclusion in developing economies. By leveraging AI, banks can reach unbanked and underbanked populations with tailored financial products and services. AI algorithms can assess creditworthiness using alternative data sources, such as mobile phone usage and social media activity (Mhlanga, 2020, 2021), enabling banks to extend credit to individuals without traditional credit histories. This can stimulate economic growth by providing financial opportunities to those previously excluded from the

formal financial system. However, the implementation of AI in the banking industry also presents significant regulatory and ethical challenges (Leung et al., 2013). The research emphasizes the need for robust regulatory frameworks to govern the use of AI, ensuring transparency, accountability, and data privacy. Banks must navigate the complexities of data protection regulations and address concerns related to algorithmic bias and discrimination (Nazar et al., 2021). Additionally, there is a need for continuous investment in cybersecurity to safeguard against potential AI-driven cyber threats. Finally, the research is crucial both empirically and theoretically. Empirically, it provides valuable insights into the practical applications of AI in improving service areas such as fraud detection, personalized banking, and efficient transaction processes. It also highlights the transformative impact on customer service journeys, enhancing satisfaction and engagement. Theoretically, this research contributes to the development of frameworks and models that explain how AI can be optimally integrated into banking operations. It offers a basis for future studies, guiding policymakers and practitioners in leveraging AI to foster financial inclusion and economic growth.

Despite the insightful findings of the research, several perceived limitations were acknowledged. Firstly, the scope of the research might be inherently limited by its geographical focus. Developing economies are diverse, with varying levels of technological adoption, regulatory environments, and customer behaviour patterns (Pandl et al., 2020). The findings from this region might not be applicable to another, leading to a potential lack of generalizability. This diversity can create inconsistencies and difficulties in drawing comprehensive conclusions applicable across all emerging markets. Secondly, the rapid pace of technological advancement poses another challenge. AI technologies and their applications in the banking sector are evolving swiftly (Nazar et al., 2021; Pandl et al., 2020), which means that any review or analysis could quickly become outdated. This temporal limitation means that the research findings might not capture the latest developments or the future trajectory of AI integration in banking services in the next generation and century. Moreover, access to data and the quality of available data in developing economies can be problematic. Many banks in these regions do not have sophisticated data collection and management systems (Rahman et al., 2022; Ren et al., 2023), leading to gaps in the data required for thorough analysis. This data limitation can hinder the ability to perform in-depth and accurate assessments of AI's impact on customer service journeys from a stakeholder perspective. Also, there is perceived bias in the reviewed literature. Scoping reviews rely on existing studies, which have their own methodological limitations and biases (Sezer et al., 2020; Singh et al., 2023). Since the existing research predominantly focuses on positive outcomes or specific aspects of AI implementation (Sousa et al., 2023; Sunny et al., 2022), the literature review may present a skewed perspective, overlooking challenges, failures, and negative impacts. This can lead to an overly optimistic portrayal of AI in banking without adequately addressing potential risks and drawbacks. Moreover, the ethical and societal implications of this research on AI in banking, especially in the context of developing economies, are often underexplored (Tan & Taeihagh, 2020; Trivedi et al., 2021), since the research does not focus on those core areas. Issues such as data privacy, algorithmic bias, and the potential for job displacement need more attention. Research that does not critically engage with these aspects may miss out on discussing significant challenges that could impact the acceptance and effectiveness of AI solutions in these regions. Lastly, the interdisciplinary nature of AI integration in banking requires a comprehensive approach that considers technological, economic, and social dimensions. Research focuses primarily on technological advancements by perceivably neglecting the human and cultural factors essential for successful AI implementation (Verma et al., 2021). Without this holistic overview, the research may offer an incomplete picture of the complexities involved in adopting AI in the banking sector of developing economies.

Consequently, several significant research gaps demanding further inquiries were emerged and discovered. At first, most studies on AI utilization in banks focus on a few specific areas including developing countries (Wahyudi et al., 2023). Thus, there is a scarcity of research examining the overall impact of AI on the specific functional areas of the banking sector and individual banking organizations. Since AI adoption does not occur in isolation; therefore, more research is needed on how banks manage the adoption of AI as a new technology and how this adoption transforms banking organizations and the banking business as a whole. Additionally, given the critical role of regulators in the banking industry (Wandmacher et al., 2022), further research is necessary on how regulators influence AI usage and its mediating role in shaping and re-shaping firm's performance While much of the attention is on regulatory requirements and concerns in today's business landscape (Weber et al., 2024), studies should also explore the role (both direct and indirect) regulators play

in promoting AI adoption within the banking industry. Additional research is necessary to fully comprehend how service providers can expedite the integration of AI within the banking sector. Although prominent tech giants and global consulting firms are prominent players, emerging tech start-ups and local businesses might offer more accessible services and a deeper understanding of the local landscape. Collaborating with fintech companies could also accelerate the adoption of AI by traditional banks. Moreover, the shortage of skilled professionals poses a significant challenge to AI adoption (Yang et al., 2023). Further investigation is warranted to explore how institutions can facilitate the training of individuals to work with AI-powered technologies. This could involve identifying the requisite skills for AI development and implementation, determining optimal training methods, identifying suitable educational institutions, and assessing the feasibility of an outsourced workforce. Additionally, addressing concerns regarding the trustworthiness of AI technologies is crucial (Hübenbecker, 2023; Kumar et al., 2021). While current efforts are primarily focused on enhancing the effectiveness of AI programs (Herrmann & Masawi, 2022), a more comprehensive approach is needed to ensure that AI solutions are fair, accurate, and transparent. Finally, the adoption of AI involves several stakeholder groups, yet most studies focus on single perspectives, such as the customer's or the bank's AI effect in developing countries (Calderon-Monge & Ribeiro-Soriano, 2024; Debrah et al., 2022). Multi-perspective studies, however, delve into how different parties can collaborate more effectively to overcome key obstacles to AI adoption. The banking industry has a history of embracing new ideas and technological changes (Di-Vaio et al., 2023; Gupta & Ramachandran, 2021). With the introduction of AI, the industry faces another technological challenge due obsolescence of existing ideas owed to its limited scope and adaptation (Gurtu & Johny, 2019; Hasan, 2021). It is essential for all parties to participate and collaborate for the successful integration of AI into banking, enabling the industry to fully leverage its potential.

6. CONCLUSION AND RECOMMENDATION

The role of AI in the banking sector is crucial, as it significantly influences consumer decisions, operational efficiency, and overall firm performance. Although there has been a recent decline in short-term investments in AI technologies by banks in developing economies, banks still continue to recognize the importance of leveraging AI for both financial and non-financial services. Consistent with the findings of Wu and Olson (2020), this study emphasizes the necessity of continuous investment in AI to mitigate potential risks and improve the integration of online and offline banking channels. The study firmly believes in the inherent advantages of AI, particularly its positive impact on customer journey metrics such as loyalty and transaction ease. This underscores the crucial role of AI in improving client interactions in the banking sector. Moreover, the research recognizes the contribution of AI to enhancing the operational effectiveness of banking services, which ultimately results in superior organizational performance. By effectively utilizing AI in areas such as consumer behaviour analysis, financial reporting, auditing, stock market forecasting, and credit risk assessment, banks can improve service quality and achieve commercial success. Therefore, AI is increasingly becoming an essential part of banking operations, and in today's business environment, adopting AI is crucial for enhancing organizational efficiency and ensuring long-term growth. This statement emphasizes the importance of AI as a fundamental factor in achieving success within the dynamic banking industry. Therefore, the below action plans are recommended:

I. **Ethics in AI's usage of consumer behaviour**: Financial institutions should develop and adhere to ethical guidelines for AI usage, focusing on data privacy, information integrity, and security. Transparent communication about AI processes is essential to foster customer trust. Thus, implementing robust security measures will protect customer data, ensuring compliance with regulatory standards and fostering long-term customer relationships.

II. **Internal control system**: As unethical withdrawal of customer funds becomes widespread, internal control accountants should establish continuous monitoring and improvement mechanisms for AI applications. This includes implementing AI-driven continuous auditing to detect financial anomalies and regularly updating AI models to meet changing business needs. Such practices will optimize AI systems, reduce error risks, and ensure adaptability to market shifts.

III. **Collaborative AI Ecosystems**: Banks should promote collaboration within AI networks, involving various stakeholders. This might involve designing AI systems that consider diverse interests which will

enhance coordination and information sharing, leading to improved organizational effectiveness through collective insights.

IV. **AI's Research Orientation**: Financial institutions should establish an independent research-based team to investigate how stakeholders perceive the value of AI integration in their firms. Its focus can explore how leadership roles and factors influence AI adoption. Through this approach, they can delve into the impact of organisational challenges related to AI incorporation, such as cultural barriers, on their firm. They can then broaden the scope of AI to include non-profit organizations and non-financial performance indicators. Through this, firms will have a holistic understanding of AI adoption outside the financial realm as a basis for corporate sustainability.

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