A Study: How AI is Incorporated in the Middle East Banking

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ABSTRACT

The banking sector has undergone significant transformation due to the swift advancements in Artificial Intelligence (AI). The present study elucidates the benefits of aforementioned technology and their influence on both individuals and communities. The paper discusses a novel cohort of banking institutions that have reaped the rewards of advancements in AI-powered electronic gadgets and internet-based applications. For example, mobile devices are increasingly utilized to conduct transactions via economic institutions' accounts. author has discussed in the paper that advancements in AI have brought significant benefits to the banking sector. The adoption of AI-powered electronic gadgets and internet-based applications has revolutionized the way banking services are delivered, providing convenience, personalized experiences, and enhanced customer service. AI technologies have also contributed to fraud detection and prevention, improved operational efficiency, and facilitated financial inclusion. As the banking sector continues to evolve, the integration of AI is likely to play an increasingly vital role in shaping the future of banking services.

Keywords- Artificial Intelligence (AI) in Banking, Middle East Banking, AI-powered Banking Devices, Future of AI in Middle East Banking.

I. INTRODUCTION

Technological adoption in the banking sector has been slower compared to other industries due to its high dependence on human involvement and manual operations. However, as time has passed, banks have gradually incorporated technological inventions into their day-to-day operations, resulting in improved performance. The implementation of artificial intelligence in the banking segment has the potential to enhance operations and make them more efficient and convenient. Bank Technology pertains to the utilization of technology, specifically artificial intelligence and information technology, to revolutionize the manner in which banking and financial services are conducted. Alternatively, it can be described as the convergence of the fields of finance and technology[1]. The utilization of technology facilitates the accessibility of diverse financial services to a wider population, allowing for the payment of bills, money transfers, and account opening, thereby promoting financial inclusivity. Fintech has

emerged as a crucial component in enhancing the financial industry, with a majority of consumers opting to conduct their financial transactions through mobile applications and advanced solutions. The process of digitizing finance has been underway for several years, with its origins dating back to "1967 when Barclays Bank in the UK introduced the first Automated Teller Machine (ATM)". The aforementioned apparatus constituted a novel development that facilitated a substantial metamorphosis in the expeditious acquisition of monetary funds by individuals.

During the 1970s, financial institutions implemented payment systems based on cards. Subsequently, online banking gained widespread acceptance around the year 2000. In the 2010s, mobile-based "on-the-go banking" gained popularity. The integration of financial technology and artificial intelligence is a promising solution aimed at addressing the disparity between the services provided by financial institutions and the demands of their clientele. This represents a highly stimulating advancement in the realm

of financial technology at present[2]. In addition, financial services that are technology-based facilitate the attainment of financial inclusion, which endeavours to offer financial products and services at a reasonable price to all sectors of society, including women, youth, and SMEs, to fulfill their fundamental requirements, irrespective of their income. This is accomplished by providing them with various financial services, such as savings, payments, loans, as well as insurance.

One significant area where AI has made a notable impact is the adoption of AI-powered electronic gadgets and internet-based applications in banking. Mobile devices, such as smartphones and tablets, have become increasingly prevalent and are now extensively used for various banking activities. Customers can conveniently access their bank accounts, check balances, make payments, transfer funds, and perform other transactions through dedicated banking applications[3]. This accessibility and convenience have revolutionized the way banking services are delivered, making it more convenient for customers to manage their finances anytime and anywhere.

The utilization of AI in mobile banking applications has brought forth numerous benefits. Firstly, AI algorithms can analyze customer data, transaction patterns, and spending behaviors to provide personalized recommendations and financial insights. This helps customers make informed decisions about their finances and plan for their future effectively. AI-powered chatbots and virtual assistants have also been implemented in banking applications to provide instant customer support and answer queries promptly, enhancing customer service.

Detection and prevention of fraudulent activity in the financial industry have also benefited significantly from the use of AI technology. Algorithms powered by artificial intelligence are able to process massive volumes of data, recognize patterns within that information, and spot abnormalities that may point to fraudulent activity[4]. This preventative method assists financial institutions in thwarting fraudulent activity and protecting their clients' accounts and other financial holdings from harm.

Additionally, AI has facilitated the automation of routine tasks and processes in banking operations. This automation has improved operational efficiency, reduced costs, and minimized the chances of human error. AI-powered systems can handle tasks such as document processing, customer onboarding, credit scoring, and risk assessment, enabling faster and more accurate decision-making processes[5].

The influence of AI in banking extends beyond individual customers to the broader community. AI technologies have enabled financial inclusion by providing access to banking services for underserved populations. Mobile banking apps have made it simpler for people to take part in financial transactions as well as engage in the traditional economy, particularly those who live in distant locations or who do not have easy access to conventional bank offices[6].

Artificial Intelligence (AI) is making significant inroads into the banking sector in the Middle East, transforming the way financial institutions operate and provide services. Here are some key aspects of AI adoption in Middle Eastern banking:

• Customer Experience Enhancement: Banks in the Middle East are leveraging AI technologies to enhance customer experiences. AI-powered chatbots and virtual assistants are deployed to provide 24/7 customer support, answer queries, and assist with basic transactions. These intelligent systems can understand natural language, interpret customer requests, and offer personalized recommendations, thereby improving customer satisfaction.

• Fraud Detection and Security: AI plays a crucial role in fraud detection and security in Middle Eastern banks. Advanced AI algorithms analyze vast amounts of data, including transaction histories, customer behavior patterns, and external factors, to identify potential fraud and security risks. By detecting anomalies and patterns indicative of fraudulent activities, AI systems help banks proactively prevent fraud and safeguard customer accounts.

• Anti-Money Laundering (AML): AML compliance is a significant concern for banks in the Middle East due to regional regulations and the global fight against financial crime. AI solutions are utilized to analyze vast quantities of financial data, monitor businesses, and recognize doubtful actions that may sign the money laundering or terrorist funding. AI-powered systems assist banks in meeting regulatory requirements and strengthening their AML measures.

• Risk Assessment and Credit Scoring: AI algorithms are employed to assess creditworthiness and calculate credit scores for individuals and businesses. By analyzing a broad range of data, including credit histories, financial statements, and market trends, Artificial intelligence technology deliver more precise and efficient risk assessment, allowing banks to make conversant loaning choices. This helps improve access to credit and supports economic growth in the region.

• Automation and Operational Efficiency: Middle Eastern banks are embracing AI-driven automation to streamline operations and enhance efficiency. Routine manual tasks, such as document verification, data entry, and compliance checks, can be automated using AI technologies[7]. This reduces the processing time, minimizes errors, and allows bank employees to focus on more value-added activities, such as customer relationship management and strategic decision-making.

• Personalized Financial Services: AI enables Middle Eastern banks to deliver personalized financial services to their customers. By analyzing customer data, AI algorithms can generate insights into individual financial behaviors, preferences, and goals. This enables banks to offer tailored product recommendations, personalized

investment advice, and customized financial planning, enhancing the overall customer experience and strengthening customer loyalty.

• Arabic Language Processing: AI technologies are being developed and deployed to handle Arabic language processing, enabling banks to provide AI-powered services and support in the local language. Natural Language Processing (NLP) models are trained to comprehend and retort accurately to Arabic customer queries and requests, further enhancing customer engagement and accessibility.

The adoption of artificial intelligence in Middle Eastern banking is driven by the region's focus on technological innovation, customer-centricity, and regulatory compliance. As artificial intelligence endures to early payment, it is likely to play an progressively important role in reshaping the banking landscape, driving operational efficiency, and delivering enhanced financial services to customers in the Middle East[8]. It emphasizes that AI aims to replicate human-like complex competences such as cognitive, learning, and self-correction in computer systems. Recent developments in hardware and software technologies have enabled artificial intelligence (AI) systems to exhibit enhanced features. Applications of artificial intelligence may be found in a wide variety of industries, including optical interaction, network planning, transportation systems, programming, and medical research, to name a few.

AI based systems depend on intricate algorithms, which allow for quick connectivity and improved decision-making. The view that artificial intelligence (AI) systems in technology are often more effective and superior than human specialists in some fields. Although the current applications of AI are relatively narrow, they have been well-tested in many areas. These applications have shown promising results, leading to a decrease in road accidents and improved accuracy in medical diagnostics[8]. The passage concludes by noting that the widespread use of AI has opened up global opportunities. Further optimization of relevant algorithms holds the potential to develop superhuman intelligence in various automatic processes in the near future. It is important to note that the passage presents a general overview of AI and its applications, without referencing specific studies or providing in-depth analysis. Additionally, the claims about AI systems being more efficient and superior to human experts should be interpreted with caution, as the performance and limitations of AI systems can vary depending on the specific task and context.

The current era of business and technology has sparked significant interest in artificial intelligence (AI) and behavioral studies for various reasons. There has been a discernible rise in the use of modern technology in Pakistan's financial services sector, particularly in the country's banking sector. This expansion is evident in

the 12.2 percent growth rate reported in the country's financial and banking business as well as the 7% expansion rate recorded in the Kingdom of Saudi Arabia's banking sector[9]. The provision of banking and financial services has increasingly been centered on the application of technological advances in order to cater to the ever-shifting tastes of clients.

In this research, the theory of planned behavior, often known as TPB, is used in order to examine the impact that AI-based financial services have on client uptake. The evaluation of behavioral patterns that lead to the acceptance of banking services takes into account a number of aspects, including awareness, attitude toward artificial intelligence (AI), personal standards, perceived danger, perceived value, understanding of artificial intelligence technology, and plans to embrace AI in banking. There is a strong correlation between the amount of customer knowledge of digital financial services supplied by banks and the customers' intentions to utilize these services[10-11]. Higher customer awareness and understanding of the benefits and usage of AI digital services directly contribute to positive adoption intentions. Studies have shown that trust, social norms, apparent worth, and information of using applications influence the implementation of artificial intelligence in banking.

Attitude towards AI banking plays a significant role in adoption. Positive attitudes towards innovative AI-based financial services are found to influence the acceptance of internet banking services. Incorporating customer information and creating a positive image of banking services are crucial for increasing adoption intentions. Subjective norms, which reflect the behavior and opinions of influential individuals or groups, have been found to impact the implementation of artificial intelligence in banking services.

Perceived risk, associated with the cost and uncertainty of using AI-based financial aids, influences adoption purposes. Higher perceived risk leads to lower adoption intentions. Building customer trust and ensuring consistent outcomes of financial transactions are essential in mitigating perceived risk. The degree to which the application of AI within financial institutions improves overall performance is referred to as its perceived utility[12]. AI improves transaction speed and working performance, providing more accurate information. Banking has become more independent as a result of the involvement of technology as well as the internet of things (IoT), which has led to an increase in client trust and the widespread use of AI banking.

Knowledge of AI technology is a crucial factor in determining customer adoption intentions. Knowledge increases customer trust and has an encouraging consequence on the implementation of artificial intelligence-based financial services. "Knowledge of financial services and their operations also contributes to customer adoption tendencies[13]. In summary, the adoption of AI-based banking services is influenced by

factors such as customer awareness, attitudes, subjective norms, perceived risk, perceived usefulness, knowledge of AI technology, and adoption intentions". These factors play a significant role in shaping customer behavior and decisions regarding AI adoption in the banking sector.

II. THE PURPOSE OF THE INVESTIGATION

The primary purpose of the investigation is to inspect the implementation of Artificial Intelligence within the banking sector of the Middle East region. The present study offers a thorough examination of the utilization of AI methodologies in the banking sector, with the aim of enhancing the overall performance of banking systems and networks.

III. THE MAIN QUESTION THAT LIES AT THE CORE OF THE STUDY

The primary inquiry of this investigation, in accordance with its objective, is formulated as follows: What are the potential opportunities that arise from the implementation of AI within the banking industry of the Middle Eastern region?

IV. RESEARCH METHODOLOGY

According to Kothari (2004), the term "research methodology" refers to a methodical and stringent academic technique that is used to gather vital data for an investigation, with the end goal of successfully attaining all of the goals and targets that the study has set for itself. The selection of an appropriate research methodology is instrumental in addressing the research problem at hand. The present investigation applied both explanatory and descriptive methodologies, given its quantitative nature. These approaches facilitated the gathering of quantitative data to enhance understanding of the interrelationships among the research variables[14-15]. The explanatory research method has been chosen for its adaptable and informal approach to comprehending the study's context.

The study employed the descriptive research method to analyze the demographic distribution and overall perception of the participants regarding the matter under investigation. For the purpose of this investigation, the technique of research that has been selected is a combination of methods, which makes use of inductive as well as deductive reasoning. The implementation of an investigation method serves as a framework for leading a study and enhances the reliability of the research. The present study has opted for a mixed-methods approach to augment the precision of the research outcomes. The study's research methodology involved the utilization of a survey instrument to gather primary measurable data from the participants. The survey technique was employed in this study to collect data from a broad geographic region and a sizable sample population of two hundred bank employees from nominated banks in the "Middle Eastern region". The data collection method employed in this study to gather quantitative data was an organized and "close-ended questionnaire". The participants were solicited and subjected to a survey in order to comprehend the domains of artificial intelligence (AI) application and its effects on the banking industry's performance in the Middle East.

V. ANALYSIS OF DATA

In this research, a quantitative analysis was performed on primary data gathered from a survey of two hundred bank employees from a selection of banks located in the Middle Eastern area. The participating institutions were all located in that region. Replies from participants who gave full responses were the only ones considered for inclusion in this research; responses that were either partially given or not given at all were disregarded. Everyone who was going to take part in the survey was given enough information on the goals of the research before it was carried out. After acquiring the required approvals and information from the appropriate banks, the survey was carried out using electronic mail as the primary mode of communication. The present investigation employs descriptive analysis to convey the demographic analyzing of those who took the survey and provide an overview of the context of the study that is being carried out.

The demographic features of the people who participated in the research are outlined in the tables that follow. When analyzing the demographic profile of everyone who participated in the survey, the distribution of ages was the first factor that was taken into consideration (table 1). According to the findings of the research, a sizeable percentage of the people who took part in the survey—specifically, 33 percent—were in the age range of 41 to 50 years old. According to the findings of the survey, participants aged over 50 made up 18% of the overall population, while those aged between 21 and 30 and between 31 and 40 made up an equal number of 24.5% of the total participants.

Table 1: Age wise distribution

Age Group	Percentage
21-30 years	24.5%
31-40 years	24.5%
41-50 years	33%
Above 50 years	18%

The next factor that will be looked at is the gender makeup of the population (table 2), which will be

examined. According to the demographic information that was collected, it was discovered that 82% of the respondents were male staff members from a variety of financial institutions, while just 18% of the respondents were female employees. As a result, it is possible to draw the conclusion that male workers participated in the survey at a higher rate than their female counterparts did. This finding is consistent with the social norms that predominate in countries of the Middle East, where the percentage of women who are employed is lower than in other parts of the globe.

Table 2: Gender wise distribution

Gender	Percentage
Male	82%
Female	18%

The level of expertise in the banking business was one of the characteristics that was analyzed throughout the demographic profiling process. According to the findings, the majority of subjects, who comprised 39% of the total, had been employed in the sector for a period of less than five years. Additionally, twenty-six percent of those surveyed had between 5 and 10 years of experience, 27.5 percent had between 10 and 15 years of experience, while the rest of the 7.5 percent had more than 15 years of work experience.

Table 3: Experience in banking wise distribution

Experience in Banking	Percentage
Less than 5 years	39%
5-10 years	26%
10-15 years	27.5%
More than 15 years	7.5%

One of the parameters considered in the study was the country of residence. The results indicate that the majority of participants, specifically 59%, were from the United Arab Emirates, followed by 32% from Saudi Arabia, 15% from Oman, and 12% from Qatar, Bahrain, and Kuwait each.

Table 4: country of residence wise distribution

Country of Residence	Percentage
UAE	59%
Saudi Arabia	32%
Oman	15%
Qatar	12%
Bahrain	12%
Kuwait	11%

The findings connected to the adaptation of AI in the banking segment and its specific applications can be summarized as follows:
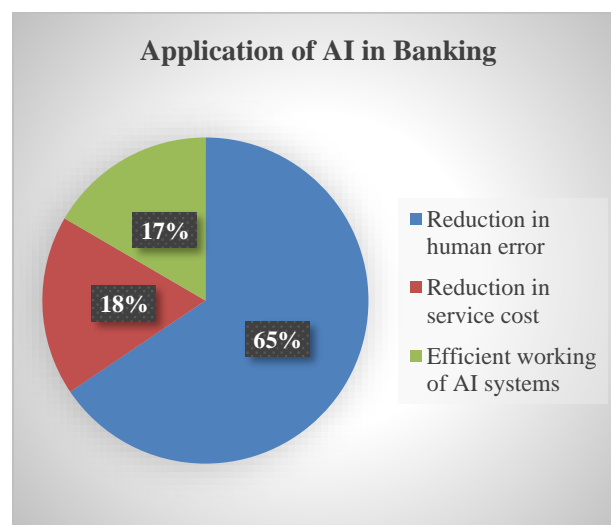
1. Adoption of AI in Banks:

• 64% of the 200 participants admitted that their banks had not adopted artificial intelligence systems.

• Artificial intelligence (AI) was recognised as being used in the financial institutions of 33 percent of the participants.

• 3% of the participants were undecided about the presence of AI systems in their banks.
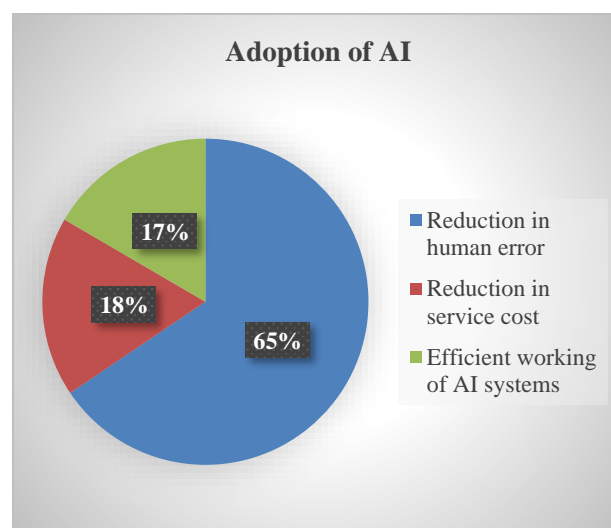
Figure 1: Adoption of AI

2. Specific Applications of AI in Banking:

• 72% of the participants believed that AI is primarily useful for automation of procedures.

• Approximately 17.5 percent of the participants stated that artificial intelligence is used for reducing human mistake.

• Around 17% of the participants expressed that AI is applied for personalization of services.


Figure 2: Application of AI in Banking

These findings align with the majority opinion of the participants, indicating that AI in the banking segment is primarily utilized for procedure automation, reducing human error, and providing personalized services. These findings are consistent with existing studies conducted in the field, which also emphasize the role of AI in automating processes, minimizing manual labor, reducing errors, and offering personalized services to customers in the banking sector.

On the basis of the information provided, the following is a condensed version of the distribution of frequency graphs for the effect of AI in the banking industry, as well as a summary of the driving forces behind the implementation of AI in the banking industry:

*1.* *Impact of AI in the Banking Segment:*

- 68.5 percent of the two hundred participants thought that the performance of banks would be significantly improved by the use of artificial intelligence technologies.

- Among those who took part in the study, 21.5 percent of people thought that artificial intelligence systems will not have a big influence on banks.

- 10% of the participants were undecided about the influence of AI systems in the banking segment.
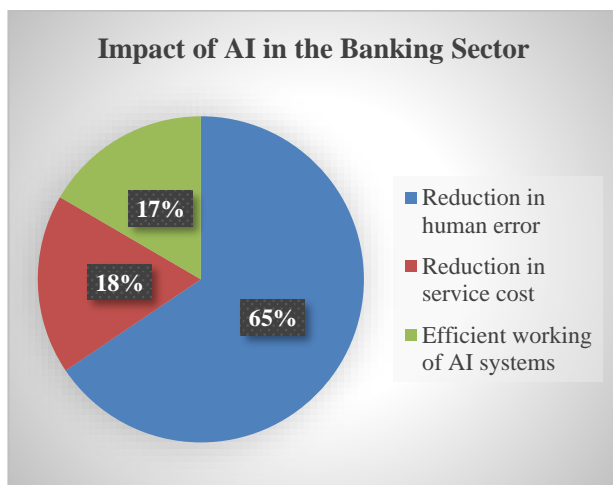
Figure 3: Impact of artificial intelligence in the Banking Sector

2. *The Motivating Factors Behind the Implementation of AI in Financial Institutions:*

- 79% of those who took part in the study cited the decrease in errors made by humans as the key motivating reason for the use of AI in financial institutions.

- A decrease in the overall cost of providing the service was cited as the key motivating reason by 21.5% of those who participated.

- The effective operation of AI systems was highlighted by twenty percent of those surveyed as a primary motivation for the adoption of AI.

- 19% of those who took part pointed to the capacity of AI systems to make decisions in an effective manner as an essential factor driving the industry.
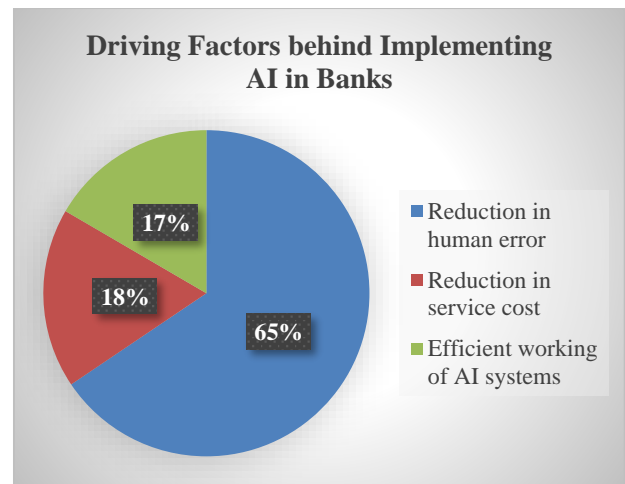
Figure 4: Driving Factors behind Implementing AI in Banks

These findings align with the participants' opinions, indicating that the reduction in human error is considered a significant driving force behind the implementation of artificial intelligence in the banking segment. Additionally, the secondary research findings also support this view, emphasizing the importance of reducing manual errors in the banking and finance industry.

VI. CONCLUSION

The integration of AI and analytics has brought about a significant transformation in conventional banking methods, resulting in more resilient, interconnected, and adaptable ecosystems that cater to the increasingly complex demands of customers. This presents a significant potential for leveraging future prospects and is a crucial aspect for the banking industry to establish robustness in anticipation of forthcoming challenges within the sector.

The banking and financial industry prioritizes the implementation of sophisticated techniques to cater to the requirements of customers and enhance their productivity. The implementation of artificial intelligence technology provides banks with valuable strategic insights into potential areas of opportunity, enabling them to more efficiently and effectively address the needs of stakeholders. Kasisto has provided artificial intelligence assistants for various banking institutions, such as Liv., a digital bank based in the UAE, DBS Bank, Standard Chartered Bank, and TD. The KAI-powered chatbot of the bank provides assistance to customers in executing cross-border fund transfers, preventing unauthorized credit card charges, and seamlessly transitioning them to human customer support as required.

The implementation of artificial intelligence-powered virtual assistants in the banking sector, utilizing machine learning technologies, has resulted in a

significant reduction in response time and the ability to address customer inquiries promptly. Artificial intelligence (AI) is utilized in the risk management process, and machine learning algorithms enable banks to analyze data from diverse sources, including the market, credit reports, and historical data. This analysis aids in comprehending various risks, including reputation risk, default risk, concentration risk, price risk, and others.

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