



EVALUATING THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE AUTOMATION OF THE BANKING SERVICES INDUSTRY: EVIDENCE FROM JORDAN

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ABSTRACT

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Due to the necessity of using technology in the most of banking and financial services, the adoption of artificial intelligence (AI) has become one of the key drivers for financial institutions' success. Financial institutions including banks implement AI based systems for the aim of meeting the needs of their clients. Although developing economies are bit slower in such adoption, however, they are still making their efforts. The current paper sheds the light on the role of AI in the enhancement of banking sector by exploring how AI based systems contribute in enhancing banking services and developing the trust of clients towards these services, so that developing economies could also adopt such advancements confidently. Consequently, after studying the Jordanian banking system through primary data, incorporating banking employees and clients, the study revealed that AI based systems conduct a central role in enhancing effective risk management, creating convenience, reducing costs and improving clients' trust towards banking services. Moreover, the study induced that developing countries like Jordan should adopt and implement AI based systems in banking operations and services so that their banking sectors could play a more constructive part of their economies.

Contribution/Originality: This research contributes redefining the role of Artificial Intelligence (AI) in the automation of the Jordanian banking services industry. Additionally, it contributes to enhancing the knowledge and awareness of bankers and clients about the adoption and benefits of the implementation of AI based systems. It also introduces various technologies and tools that have brought automation in the banking services industry.

1. INTRODUCTION

The implementation of Artificial Intelligence (AI) in different industries has proven the superiority of AI over human intelligence, which has given rise to the age of automation (Gallego-Gomez & De-Pablos-Heredero, 2020). Thus, due to its heavy reliance on human labor in order to accomplish its services; the implementation of AI systems in the banking industry sector has been taking place progressively when it is compared to other industry sectors (Boobier, 2020). Nevertheless, the rapid rate of technological innovation is bringing ways across various industries as competitive dynamics shift, and new business models emerge, which has made it essential for companies to scramble on the digital transformation bandwagon. However, there are several organizations

struggling to develop an effective approach to transform themselves digitally whereas, the success rates of such transformation efforts are consistently low with less than 30% succeed (Boobier, 2020).

Although advances in finance are not a new notion, the emphasis on technical advances, and its pace have increased substantially. Innovative FinTech solutions that rely on advanced applications in Artificial Intelligence (AI) are presently being introduced as well as applied at an extraordinary rate. Such solutions are altering the landscape of the entire financial industry through the formation of many opportunities, those are presenting a more comprehensive access to financial services (Kitsios & Kamariotou, 2021). There are several reasons behind the necessity for implementing artificial intelligence in banks and financial institutions. One of the most important factors that led to the applications of AI in the banking industry is the regulatory encouragement. For instance, in December 2018, US government agencies including Federal Reserve, Federal Deposit Insurance Corporation, Financial Crimes Enforcement Network, and National Credit Union joined in an effort to combat money laundering, and terrorist financing. As a result, banks were recommended to implement innovative AI tools and technologies.

The banking industry has undertaken substantial changes in recent years, due to the demand for more efficient and secure financial transactions and services. To meet such demands, the banking industry found itself face-to-face with the need for digitalization, which requires technologies that will impact virtually all banking operations. The concept of "FinTech" has increased swiftly worldwide, due to the prevailing and current financial business models that seem to have an increasing need for the popularization of new technologies. FinTech is short for Financial Technology that includes a vast range of electronic financial products and services. According to Zavolokina, Dolata, and Schwabe (2016) FinTech companies are characterized as financial companies, those are generating, adjusting as well as improving their current services based on innovative technological opportunities in an effort to enhance the quality of these services for their digitally inclined customers. FinTech brings about new business models that are changing the financial services industry.

According to Puschmann (2017), the role of (IT) traditionally was to cut business operating costs as well as elevating organizational efficiency through automating most of business processes. Consequently, the banking industry has always been considered as one of those industries that have a high demand for acquiring and applying different IT tools and solutions. This is due to the fact that the successful completion of all financial transactions is accomplished without any human intervention (Puschmann, 2017). IT has brought about a whole new way of doing business today thanks to a set of new prevalent digital tools and technologies (El Sawy & Pereira, 2013). Based on this new prevalent role of IT, organizations on the whole are forced to transform the way they do business by constructing and adopting new business models that are based on the adoption and implementation of IT's tools (Fichman, Santos, & Zheng, 2014; Plastino & Purdy, 2018).

Furthermore, the influence of such transformation can be observed throughout the entire business landscape, specifically in the financial services industry where FinTech has emerged as a new business model. Therefore, the implementation of AI brings about new compound challenges to businesses that go beyond the traditional management of the classical IT applications (Berente, Gu, Recker, & Santhanam, 2019). In this regard, Fichman et al. (2014) indicated that the intense competition between financial services companies, has forced these companies to adopt and implement a set of new predominant and ubiquitous technologies, such as big data analytics, social media, and cloud computing, which are the foundation of FinTech. Although, advancements in technological adoption has also led the attention of researchers to highlight the role and impact of such technological adoption on businesses, the current literature still lacks evidence regarding the various aspects of these technologies and their potential impact and role in different kinds of businesses.

In other words, although Artificial Intelligence (AI) has proven itself as an effective agent in the digital transformation of banking industries; the review of literature shows an absence of empirical research efforts in studying and evaluating the impact that AI has had in the digital transformation of banking services industry.

Thus, since there is a dearth of research studies on the role of AI in the enhancement of banking services, the current research was motivated to fill this gap through answering the role of different AI based banking systems tools like mobile banking, chat bots, transaction data enhancement and data collection. These tools have contributed in the enhancement of Jordanian banking services industry in terms of cost reduction, creating convenience, risk management, and building trust of clients. Moreover, this research not only contributes significantly to the literature by filling this gap, but also to knowledge and awareness of bankers and clients that how the adoption, the implementation and the use of AI based systems generate benefits at both ends.

2. LITERATURE REVIEW

As the popularity and interest in the FinTech phenomena continues to gain acceptance and interest among practitioners and researchers, many research efforts have been put through to explain such phenomena and recommend various approaches for their successful implementation. For instance, authors including (Zavolokina et al., 2016) recommended a theoretical framework that is based on three scopes including input, mechanisms, and output, which collectively utilize technology as an enabler of new innovative financial services and products. To that end, Frame and White (2014) confirmed that using technology as a digital innovator is indeed an enabler of financial innovation in the forms of novel services and products and novel organizational procedures and processes. A study by Ali, Ismail, and Swiety (2021) argued that the digital trading system as a product of technological advancements played a vital role to improve the stability of small and medium enterprises, which are listed on the Amman stock exchange by reducing the trading costs as well as facilitating trading processes for investors. According to Lerner and Tufano (2011) innovative financial services and products produce and promote new financial spectrum of know-hows, new organizations, and new market places. Such digital innovation, according to Fichman et al. (2014) can be manifested in the form of a new service, product, procedure, or business platform which necessitates major modifications by the business, and is facilitated and made possible by Information technology (IT).

According to Casares (2018), AI is being utilized in numerous applications in many different sectors. Chui and Malhotra (2018) observe that the utmost noteworthy AI capabilities are virtual agents, natural language text understanding, and machine learning. In general, AI is not utilized in segregation but frequently applied in aggregation with other technologies (Brock & Von Wangenheim, 2019). Such technologies include Application Programming Interfaces (APIs), Internet of Things, cloud computing, big data analytics, and open-source algorithms (Verweij, 2016). Since AI improves human intelligence rather than being an alternative for it Bibel (2014), it is acknowledged that AI requires the interactions with humans to be conducted and enable decision-making process to yield the best outcomes (Dhar, Holly, Ryan, & Galeaz, 2017).

Like all other sectors, financial institutions implement AI technology in different ways like identification of unusual transactions and frauds, customized services, decision making about creditworthiness, utilization of natural language processing on text documents, risk management and cyber security. The implementation of AI enables financial institutions and especially banking sector to improve their interaction with customers by tailoring modern technology to different aspects of operations (Abusalma, 2021). Some benefits of implementing AI in banking sector are elaborated in the following subsections.

2.1. Mobile Banking

Mobile banking facilitates the services of banks for customers as compare to their physical visits to branches; so it results in increasing banks' revenues. That's why banking sector is paying close attention to the adaptation and implementation of emerging technologies in an attempt to improve the quality of services and to be competitive in the market (Cavus, Mohammed, & Yakubu, 2021).

2.2. Data Collection and Analysis

Millions of transactions are recorded by banking sector every day so the collection and registration of huge volume of information becomes an overwhelming task for employees, hence creating vagueness about the relationship of collected data of thousands of clients (Yu & Song, 2020). Such data is collected and analyzed by AI based apps smoothly in order to improve the user's experience. The collected information is used in different operations like detecting fraud and granting loans, which results in enhancing revenues, while reducing the associated costs (Kaur, Sahdev, Sharma, & Siddiqui, 2020).

2.3. Chat Bots

AI based chat bots are among the most popular cases of implementing AI in banking sector that enable conversational interface between customers and banks without requiring huge expenses (Esther & John, 2020). Since the use of mobile apps is convenient for customers to make their transactions, chat bots services are embedded in these apps by banks which facilitate customers in different aspects like checking account balances, activation of cards, cash withdrawal, credit updates etc. while saving the communication time of financial institutions as well (Gentsch, 2019).

2.4. Risk Management

AI based systems also facilitate the risk management of loans issued by banks, because such systems have the ability to appraise credit histories of customers more appropriately. Mobile banking apps analyze users' data and can track financial transactions, facilitating banks in decision making and other multiple activities like detecting any threat of fraud or customers' insolvency in loan disbursements (Malali & Gopalakrishnan, 2020).

2.5. Data Security

Although online banking has facilitated customers in several ways, it has also brought cyber security challenges. For instance, credit card frauds have become the most common personal data theft and posed serious challenges for the banking sector (Paul & Madana, 2021). AI based monitoring and surveillance systems are quite effective against such security issues as they can analyze clients' behavior, financial habits, location and activate a security mechanism if any unusual activity is detected. Therefore, banks are rightly increasing their investments in AI and cyber security analytic programs (Yu & Song, 2020).

2.6. Transaction Data Enhancement

Transaction data enhancement is beneficial for both financial institutions and consumers. By using artificial intelligence and machine learning, it deciphers unfathomable strings of characters, containing information about the transactions and merchants, and converts it into readable text representing local merchant's name and address (Abusalma, 2021). Such conversion of complicated data into easily understandable information facilitates customers in understanding their transactions, which also eliminates the burden of customer service calls and costs of fraud research. Such understanding of data by customers not only eliminates banks' burden for unnecessary inquires calls about credit card bills, but also builds customers' trust on banking services because they are able to understand each of their transactions and relevant charges (Kaur et al., 2020).

2.7. Reduction in Operational Costs

Banks have to incur huge amounts in term of operational costs due to human based processes which are mostly based on heavy paper work, also incorporating the chances for human errors (Cavus et al., 2021). A few banks implement software like RPA (Robotic process automation) that imitates rules based digital tasks performed by humans. It is a very useful device for eliminating error prone and time intensive work in fields like data entry of

customers, filling up contract forms etc. Such software when coupled with AI technologies like natural language processing turn into intelligent process automation tools which are capable of handling mounting workflows of banks previously handled by humans (Indriasari, Gaol, & Matsuo, 2019).

2.8. Automated Investment Processes

AI has been implemented smartly by banks through their systems, which have facilitated making investment decisions and supporting investment banking research like hunting markets for unexploited investment opportunities and informing the algorithmic trading systems (Malali & Gopalakrishnan, 2020). Although humans are also involved in such investment decisions, AI based systems are unveiling additional opportunities through enhanced modeling and discovery. Moreover, such services like robot-advisers offered by many banks also facilitate customers in their portfolio management by providing higher quality assistance about investment decisions and accessibility according to the convenience of customers (Yu & Song, 2020).

2.9. The Role of Artificial Intelligence Technology in Jordanian Banking System Enhancement

Although technology is developing rapidly in Jordanian banking industry, but it has still not placed its position in the Jordanian banks including the Central Bank of Jordan. However, the banks are in the process of adopting and implementing advanced technologies like AI intelligence so that they can cope with the challenges of recent era. The implementation of AI based systems has become the dire need for banking systems (MoDEE, 2020). In this regard, the Central Bank of Jordan in collaboration with Microsoft has focused on the digital transformation of Jordan's Financial Services Industry by providing cloud computing guidelines. These guidelines are projected to provide recommendations to various institutions like exchange companies, banks, Islamic banks, microfinance companies, credit information companies and other financial institutions about digital transformation, governance and cyber security. By following these guidelines and recommendations, the Jordanian financial industry including banks will move towards digital transformation and anticipate tremendous growth (Microsoft News Center, 2019).

The present paper aimed at exploring the role of Artificial Intelligence (AI) in such digital transformation of Jordanian banking system and examine how the implementation of AI affected the banking sector and how it contributed in the enhancement of banking services industry. Jordan has started its journey for going digital like other developing economies, so a need was felt to explore different aspects of digitalization and its effect on economy and different sectors. The current study is expected to provide a great contribution to literature, by highlighting the fact that the adoption and implementation of AI contributes in the digital transformation of the banking sector, enhancement of its services and operations and ultimately enabling the financial development of the banking services industry.

3. METHODOLOGY AND HYPOTHESES DEVELOPMENT

3.1. Research Methodology

The current research focuses on collecting primary data from employees and clients of the Jordanian banks, which are listed on the Amman stock exchange through structured questionnaires, following the study of Abusalma (2021), who also used a questionnaire to study the effect of AI on job performance. The study incorporated two questionnaires: one for employees incorporating questions regarding how the implementation of AI in different aspects contributes in enhancing the banking services; while the second questionnaire was designed for clients in order to explore their perception about banks going digital through the implementation of AI and how it could affect their level of trust towards banking services. The responses were collected on a five-point Likert scale from strongly disagree to strongly agree. Initially, the questionnaire was tested by five participants from different banks to ensure the validity and a pilot feedback was collected to ensure the clear understanding of the questions by

participants. The final sample included 100 employees and 100 clients of different Jordanian listed banks. However, 88 employees and 91 clients responded successfully, making the sample size of 179 in this study.

To achieve the study aims and objectives, the collected responses were analyzed through arithmetic means of the responses. This was helpful in interpreting the perception of employees and clients towards the adoption of AI in enhancing banking services, so that the impact of AI on banking sector could be highlighted. In addition, the one sample t-test was also utilized in order to check the role of AI in the enhancement of Jordanian banking system.

3.2. Hypotheses Development

There are numerous studies conducted to explore the role of artificial intelligence in the enhancement of banking system. For instance, Puschmann (2017) argued that information technology exerts a significant role through cutting business operating costs and elevating organizational efficiency via the automation of many of the business processes. Similarly, Fichman et al. (2014) indicated that based on the new prevalent role of IT, organizations on the whole are forced to transform the way they do business by constructing and adopting new business models that are based on the adoption and implementation of IT tools. In the same vein, Esther and John (2020) proved that AI based chat bots are among the most popular cases of implementing AI in banking sector that enable conversational interface between customers and banks without requiring huge expenses. In addition, Malali and Gopalakrishnan (2020) stated that AI based systems facilitates the risk management of loans issued by banks, because such systems have the ability to appraise credit histories of customers more appropriately. Mobile banking apps analyze users' data and can track financial transactions, which in turn facilitate banks regarding loan issuance decisions in terms of any threat of fraud or the insolvency of the customers. However, since the aforementioned as well as the critical appraisal of previous related work revealed a gap regarding the role of AI in the enhancement of Jordanian banking system; the current study aimed at filling this gap in literature through testing the following main hypotheses, which are extracted by relying upon the gap in the available literature:

H₀₁: The Artificial Intelligence significantly contributes to the enhancement of Jordanian banking services industry.

H₀₂: There are no significant differences between the perspectives of employees and clients' perspectives regarding the role of AI in the enhancement of Jordanian banking services industry.

3.3. Conceptual Framework

Figure 1 indicates the study's conceptual framework. The framework indicates that the study explores the contribution of AI towards the enhancement of banking services industry, while the implementation of AI is captured through different aspects, such as mobile banking, chat bots, data collection and transaction data enhancement. On the other hand, the enhancement of banking services industry is captured in terms of risk management, cost reduction, client's trust enhancement and convenience.

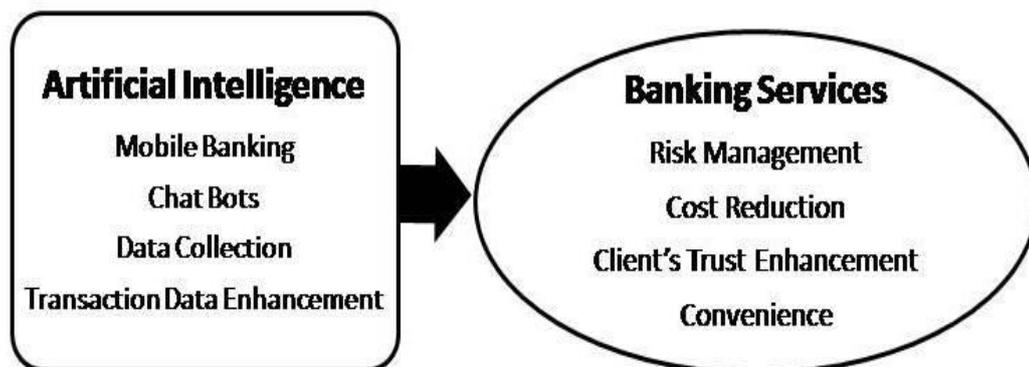


Figure 1. The study's conceptual framework.

3.4. Empirical Model

This research work focuses on evaluating the role of artificial intelligence in the enhancement of Jordanian banking system. For this purpose, the following model was tested:

$$EJBSI = \beta_0 + \beta_1 MB + \beta_2 CBs + \beta_3 DC + \beta_4 TDE + e_t$$

Where, β_0 is the constant term, the EJBSI is the independent variable that refers to the enhancement of Jordanian banking services industry as captured by banking services like risk management, costs reduction, client's trust enhancement and convenience. The MB relates to the mobile banking, CBs is the chat bots, DC is the data collection and the TDE refers to the transaction data enhancement as main measures for Artificial Intelligence. $\beta_1: \beta_4$ are the regression coefficients to be tested, and the e_t relates to the error term.

4. FINDINGS AND DISCUSSION

The responses, which are collected from respondents (employees/clients) are organized into different sections i.e. indicating the role of different aspects of AI implementation on banking services in different ways according to employees' and clients' perspectives. The results are presented in the following sub sections.

4.1. Descriptive Tests

This section demonstrates the arithmetic means and standard deviations for the responses of banks' employees and clients regarding the role of AI's measures in the enhancement of banking services industry.

Table 1. Mobile banking.

Viewpoint	Statement	AM	SD
Employees' Perspective	Mobile banking services are cheaper than traditional banking services	3.98	0.16
	Mobile banking services have shed the load of customers from physical branches.	4.67	0.27
	Mobile banking services have shed the load of customers, which helps cost reduction as well.	4.13	0.16
Clients' Perspective	Mobile banking services are more convenient than traditional banking services	4.57	0.23
	Mobile banking services are cheaper than traditional banking services, because it saves time and expense.	4.68	0.11
	Mobile banking services have enhanced my trust on banking services.	4.23	0.31
	I feel more reliable while making transactions through mobile banking services.	4.28	0.29

AM= Arithmetic Mean, SD= Standard Deviation

Table 1 indicates the role of mobile banking services in enhancing traditional banking services through employees' and clients' services. As the arithmetic means of almost all the statements are around 4 so it seems there exists a level of agreement for statements between employees and clients. According to bank employees, mobile banking services are cheaper than the traditional banking services as well as they help reducing the load of customer visits to physical branches and eliminating cost as well. Likewise, the bank clients believed that mobile banking services are convenient as they save time and expense of customers that was spent by physically visiting the bank branches for making transactions, but now they not only feel easy but also find these services as reliable ones. Mobile banking also enhanced the level of trust of customers towards banking services offered by their banks. The findings thus overall indicated that mobile banking services contributed to enhancing traditional banking services through convenience, cost reduction and enhancing clients' trust.

Table 2 incorporates the statements asked from bank employees regarding the implementation of AI in data collection of employees and how it contributes in enhancing banking services. The arithmetic means of the statements are around (4) so according to the bank employees the AI based data collection system is more accurate and reliable as compared to the traditional data collection systems. The data also revealed that the new system

helped eliminating the manual tasks performed by employees at different levels so it also helped eliminating the associated costs. Moreover, the AI based data collection system, by providing extensive information about clients, helped making effective credit and loan decisions so it contributed in risk management of the banks. The findings therefore indicate that AI based data collection systems contribute to enhancing traditional banking services through cost reduction and risk management.

Table 2. Data collection.

Viewpoint	Statement	AM	SD
Employees' Perspective	AI based data collection system is more accurate and reliable	3.97	0.19
	AI based data collection system helps making effective decisions about loans and credit allocation to clients.	4.58	0.27
	AI based data collection system contributes in risk management of banking operations.	4.17	0.29
	AI based data collection system eliminates extensive manual works so helps eliminating relevant costs as well.	4.25	0.32
AM= Arithmetic Mean, SD= Standard Deviation			

Table 3. Transaction data enhancement.

Viewpoint	Statement	AM	SD
Employees' Perspective	Transaction Data Enhancement has shed the load of customers from physical branches.	3.79	0.36
	Transaction Data Enhancement has shed the load of customers, which helps cost reduction as well.	3.93	0.32
	Transaction Data Enhancement contributes in risk management of banking transactions.	4.37	0.27
Clients' Perspective	Transaction Data Enhancement has made the understanding of banking services quite easier.	4.28	0.29
	Transaction Data Enhancement has eliminated my visits to the bank branches.	4.19	0.18
	Transaction Data Enhancement has enhanced my trust on banking services as I am able to understand my transactions easily.	4.53	0.24
AM= Arithmetic Mean, SD= Standard Deviation			

Table 3 indicates the contribution of AI based transaction data enhancement and its contribution in enhancing banking services through employees' and clients' perspective. Arithmetic means for employees' perspective are around 4 while for clients' responses are more than 4. According to the bank employees, transaction data enhancement enabled clients to understand their transaction related information by themselves so it not only eliminated the burden from physical branches but also contributed to eliminating associated costs and risk management. Similarly, clients agreed that transaction data enhancement not only enabled them to understand their transactions but also eliminated their visits to the physical branches. It also helped them enhancing their trust towards banking services as they were now able to understand banking transactions quite easily. The findings therefore indicate that transaction data enhancement contributes towards banking services' convenience, cost reduction, risk management and enhancing clients' trust.

Table 4. Chat bots.

Viewpoint	Statement	AM	SD
Employees' Perspective	Chat bots have shed the load of customers from physical branches.	3.84	0.37
	Chat bots have shed the load of customers, which helps cost reduction as well.	3.98	0.32
Clients' Perspective	Chat bots are the convenient way to get in touch with my bank	4.82	0.15
	Chat bots are the convenient way to get my questions answered whenever I need it.	4.74	0.19
	Chat bots have eliminated my visits to the bank branches.	3.95	0.35
AM= Arithmetic Mean, SD= Standard Deviation			

Table 4 indicates the contribution of chat bots towards enhancing banking services and shows that bank employees believe that the chat bots have eliminated the burden of clients' physical visits to branches, as a result associated cost has also been eliminated. While, clients indicate that they get most of their questions answered through chat bots which has also eliminated their frequent visits to the physical branches. Hence, these chat bots contribute in eliminating cost reduction for bank, while providing convenience to the clients. The findings of the study also indicate that the implementation of artificial intelligence in different aspects in banking services contributes well in enhancing traditional banking services offered by the banks. Therefore, banks should focus on adoption, implementation and up gradation of their operations and services through artificial intelligence.

4.2. Results from One-Sample T-Test

This test was mainly implemented to evaluate the impact of AI in the enhancement of Jordanian banking system. Table 5 exhibits statistics regarding the role of AI's measures including MB, CB, DC and TDE in the enhancement of banking services industry from the perspectives of banks' employees as well as clients.

Table 5. Banks' employees and clients.

Employees' Perspective					
AI's Aspects	t	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
MB	7.57	0.01	2.17	1.56	2.78
CB	8.29	0.03	2.35	1.75	2.95
DC	10.7	0.02	1.94	1.55	2.32
TDE	7.03	0.02	2.00	1.39	2.60
Clients' Perspective					
MB	11.0	0.02	2.17	1.76	2.59
CB	8.09	0.04	2.41	1.78	3.04
DC	8.92	0.01	2.23	1.70	2.76
TDE	9.52	0.03	2.00	1.55	2.44

Note: MB: Mobile Banking, CB: Chat Bots, DC: Data Collection, TDE: Transaction Data Enhancement.

This research ran one sample t-test with the aim to evaluate the role of artificial intelligence in the automation of Jordanian banking services industry from the perspectives of banks' employees and clients. Consequently, through testing the first main hypothesis, which signifies that AI significantly contributes in the enhancement of Jordanian banking services industry; statistics from the Table 5 proves that from the viewpoint of employees the measures of artificial intelligence significantly contribute in enhancing the banking services, which are provided by Jordanian banks, and those which are listed on the Amman stock exchange. Similarly, from the perspective of banks' clients, measures like mobile banking, chat bots, data collection, and transaction data enhancement are found to be significantly impacting the services of Jordanian banking system.

5. CONCLUSION

Digitalization has become the dire need of the era for almost all businesses and same is the case with the banking sector. Banking services are becoming more diverse with the passage of time, incorporating mounting number of transactions that are becoming out of the scope of human capacity. Since going digital and performing services through AI based means is the most effective solution, the current research sheds light to show how the implementation of AI based systems contributes in enhancing banking services and leads to upgrade the banking sector. Four different aspects of AI implementation were studied i.e. mobile banking services, data collection, transaction data enhancement and chat bots, and their contribution towards the enhancement of banking services in different ways like cost reduction, creating convenience, risk management, and enhancing clients' trust were studied through the perspectives of banks' employees and clients. Consequently, from the perspective of clients, the study revealed that the use of AI based banking services contributes in creating convenience, and enhancing their trust

towards banking services, while for banks, the implementation of AI based systems is beneficial in having effective risk management, cost reduction and enhancing their clients' trust towards offered banking services. In this regard, studies including (Abusalma, 2021; Kaur et al., 2020; Malali & Gopalakrishnan, 2020) indicated that the adoption of AI contributes in facilitating the process of risk management, reducing costs, improving the level of communication between banks and their clients, and subsequently it will lead to build customers' trust on banking services, because they are able to understand each of their transactions and the relevant charges. Therefore, it is evident that the implementation of AI based systems contributes successfully in the enhancement and up gradation of banking services, which would ultimately improve the quality of banking services as well as generate financial benefits for the banking industry. Studies including (Cavus et al., 2021; Kaur et al., 2020; Yu & Song, 2020) stated that the adoption and implementation of new technologies, such as AI helps bank in improving the quality of their services, reducing their costs and ultimately, improving revenues. Furthermore, by relying on the aforementioned findings, the study concludes that employees as well as clients of Jordanian banks have similar perspectives regarding the central role of AI in the enhancement of Jordanian banking system. Since these two parties appraise the implementation, as well as the adoption of the AI, it can be induced that the four different aspects of AI analyzed in this study, i.e. mobile banking services, data collection, transaction data enhancement and chat bots are similarly found to exert significant impacts in the perspectives of employees and clients of Jordanian banks. Moreover, there is still a huge gap in literature to highlight the potential pros and cons of such technological adoptions in businesses and different sectors of economies, so future researches could capture these areas. The outcomes of such implementations could be estimated quantitatively with the passage of time.

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