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Using Artificial Intelligence to Improve Customer Experience in the Banking Sector

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Abstract

The main objective of this study is to study the impact of using artificial intelligence to improve customer experience in the banking sector. The descriptive and analytical approach was used to achieve the study objectives and answer its questions. The study community consisted of all customers in the banking sector, where social media was used. The electronic questionnaire was sent on social media sites, and there was a response from community members. 530 responses were collected. The Statistical Package for the Social Sciences (SPSS) program was used. The findings indicate a positive effect of artificial intelligence on customer experience within the banking sector. The study recommends that banks aim to improve customer service by providing instant solutions and accurate analytics, which contributes to enhancing trust between customers and the bank. AI technologies can also provide new financial services, such as digital payment solutions or microfinance, which helps banks innovate and provide advanced solutions.

Keywords: *Artificial Intelligence, Customer Experience, Banking Sector, Jordan.*

1. Introduction

Generative AI is at the cusp of transforming productivity across a wide range of industries, and with special emphasis on financial services [1]. This technology is now remodeling bank operations in a number of ways, including the creation of advanced analytical models that drive better decision-making, automation of cumbersome manual processes, and transforming unstructured information into meaningful insights that help formulate more successful strategies. These applications are not only bringing operational efficiency but also enhancing risk management and compliance with relevant laws and regulations [2].

Due to the globalization of the economy, the banking industry has been facing severe competition, as a result of which the environment for the banking industry is unstable and fragile [3]. It is the banking industry that involves various stages, from processing loan applications that customers have submitted to ensuring secure banking transactions for customers until they continue maintaining their services with the banks. In demand is a better customer experience that customers require; they are seeking better service wherever they interact with the products and services [4]. That is to say, consumers want to have superior services. With the advent of technology in the last couple of decades, some industries have started using the latest technology, namely artificial intelligence, in order to give customers an unparalleled level of service [5].

These drivers include relentless margin pressures, strategy cycles, and rising customer expectations, prompting companies to increasingly embrace AI-powered technologies underpinned by data analytics [6]. This is changing the relationship between companies and

customers. It can positively influence customer-brand interactions. AI development can improve customer experiences since such innovations enhance an organization's ability to monitor customer preferences and spending behavior. According to Evans [7], the tactical use of AI technologies in appropriate customer touchpoints can therefore hand substantial dividends to companies and bring about improved customer satisfaction.

Therefore, the main objective of this study is to study the impact of using artificial intelligence to improve customer experience in the banking sector. The introduction of artificial intelligence (AI) to customer experience in the domain of banking generates a wide range of ethical concerns, such as bias and privacy, requiring careful consideration. There is the potential for biased results using AI algorithms, where the data used contains prior bias with detrimental effects for certain client populations. Therefore, it is also crucial to ensure data diversity and bias correction. In addition, the gathering and analysis of large amounts of personal data may violate privacy and therefore a high level of standards should be introduced in order to protect data and maintain transparency. Transparency on the working of smart technologies, in this sense, is of great importance because algorithmic obscurity can lead to a lowered trust of the customer. Maintaining good client relationships through continuous communication with the client and solving the client's problems on their behalf is equally important. Furthermore, banks need to acknowledge the legal risk issues related to the use of AI, which call for training and establishment of strong internal controls. The introduction of AI brings significant benefits; however, these challenges should be taken seriously in order to build trust and enhance the user experience.

2. Literature review

2.1 Artificial Intelligence

The term "artificial intelligence," abbreviated "AI," describes the process of imitating human intelligence in computers or computer systems [8]. It entails the creation of computer programs and algorithms that can carry out tasks that traditionally need human intelligence, such as reasoning, problem-solving, learning, perception, and decision-making [9]. Additionally, ethical problems like privacy, bias, responsibility, and job displacement are brought to the forefront as AI grows increasingly powerful and prevalent. Ongoing conversations and activities are centered on ensuring that AI systems' research, implementation, and regulation are done responsibly and ethically [10]. [11] included algorithms, expert systems, machine learning, and artificial neural networks as AI applications.

2.2 Customer Experience

The customer experience represents the sum of all interactions between a customer and a retailer as perceived by and interpreted through the customers' assessment and evaluation processes. It has been regarded as a multidimensional concept. To this point, research identifies a number of components from the customer experience including: (a) cognitive, (b) Emotional, (c) physical and sensorial, and (d) social elements [12]. Cognitive elements are the high levels of mental processes such as perception, memory, language, problem-solving, and abstract thinking. According to the American Psychological Association [13], [14] the cognitive elements of customer experience involve the functionality, speed, and availability of the service. Previous literature has also pinpointed the complex emotional elements of customer service [12]. Emotions either flow as positive or negative, including delight, regret, anger, outrage, joy, or surprise, among others, as [14], [15] have shown.

3. Hypotheses development

Given the advancements in digital technology, banks must develop customer experiences that enhance loyalty and trust. To establish a robust digital banking foundation, it is essential for banks to enhance the efficiency and speed of their processes. Bhattacharya & Sinha [15] demonstrated

the integration of AI within banking features. Chatbot applications in banking platforms are evaluated according to customer experience. A positive correlation of 0.247 has been established between the two most prevalent use cases. This paper presents IT architecture and best practices for the digital banking sector. Chen et al. [16] demonstrated that chatbot usability positively influenced the extrinsic values of customer experience, while chatbot responsiveness positively affected the intrinsic values of customer experience. Additionally, the online customer experience positively correlated with customer satisfaction, while personality moderated the relationship between chatbot usability and the extrinsic values of customer experience.

[3] believe that AI has made it far easier to improve the banking experience of millions of customers and employees in several ways. AI has simplified many processes by reducing the workload of the employees by offering verification of credit score, system failure prediction, warning systems during emergency, fraud detection, phishing website detection, estimation about liquidity risks, determining loyal customers, and intelligence systems. Customer experience, on the other hand, is improved by utilizing various applications such as mobile banking, chatbots, and augmented reality. [17] investigated how such an AI-enabled customer experience can be enabled through integrating AI into the shopping experience. Indeed, their results confirm that trust and perceived sacrifice remain major factors acting as mediators in the effects of perceived convenience, personalization, and the quality of the AI-enabled service. Relationship commitment also had a significant effect on the AI-enabled customer experience.

[18] notes that customer experience is frequently a topic of discussion in the boardrooms of large corporations, a trend driven by consumer empowerment stemming from access to free social media and advancements in technologies like artificial intelligence. Whitepaper by CXPA outlined that application of AI along with a customer journey offers the following benefits to the organization: The subsequent figure depicts stages of a customer buying journey [19]: According to stage awareness, predictive analytics, subset of artificial intelligence identifies interesting features to the customer and suggests product or service recommendations. AI can help websites synthesize a huge amount of data for insights on the comparison of similar products during the consideration stage. AI checks the pattern of data to understand the customer's unique buying behavior and then suggests personalized recommendations at the time of buying. During the support phase, AI should study customer behavior to monitor signals of dissatisfaction and apply appropriate measures for the individual customer. These strategies provide extremely personalized customer service. • Finally, AI makes it possible for a two-way interaction to take place in order to be able to offer the relevant client support [20].

Because technology is necessary in most banking and financial services, [21] argued that the adoption of AI has every reason to be a key differentiator between financial institutions' performance. Financial institutions, such as banks, leverage AI to attend to customer's needs. LDC are taking longer, but they are getting there. Based on primary data of bank employees and customers, studying the casting system of the Jordanian banking system, this research has found out that, AI-based applications, not only increase risk management and the convenience, not only increase risk management and convenience, but also decrease costs, improve the trust among customers and banks. The research also recommended that developing nations like Jordan use AI-based financial systems to boost their economies. The statistical results of [22] offer compelling evidence on the significance of performance expectations, social influence, and perceived risk in shaping customer intentions. Marketers and decision-makers in the banking business can utilize these insights to formulate their long-term strategy for efficiently employing and optimizing AI technology in the sector. Moreover, by offering policymakers and practitioners of Jordanian commercial banks insights into the factors affecting consumer happiness, the findings will enhance the operational efficacy of these intricate organizations. [23]

According to the above, the following hypotheses can be reached:

H1: There is a positive impact of using artificial intelligence to improve customer experience in the banking sector.

H1.1: There is a positive impact of using expert systems to improve customer experience in the banking sector.

H1.2: There is a positive impact of using artificial neural Networks to improve customer experience in the banking sector.

H1.3: There is a positive impact of using algorithms to improve customer experience in the banking sector.

H1.4: There is a positive impact of using machine learning to improve customer experience in the banking sector.

4. Research Methodology

The descriptive and analytical approach was used to achieve the study objectives and answer its questions. The descriptive approach was used based on studying the research topic based on an appropriate tool used to collect data and information, with the aim of studying the relationship between the study dimensions and its variables. The analytical approach was used to process the data collected, analyze it, and test hypotheses to reach the study results and provide appropriate recommendations for those results.

The study community consisted of all customers in the banking sector, where social media was used. The electronic questionnaire was sent on social media sites, and there was a response from community members. 530 responses were collected, of which 12 questionnaires were not valid for statistical analysis, leaving 528 questionnaires valid for statistical analysis. The Statistical Package for the Social Sciences (SPSS) program was used, as this study aims to identify the use of artificial intelligence to improve customer experience in the banking sector.

5. Data Collection

Two different sources were used to acquire the information needed to complete the study's objectives. The use of secondary sources began with the use of theoretical and scientific literature. These sources played a crucial role in helping researchers gather the information they needed to build the study's theoretical framework, refine its goals, and review key findings. Additionally, they were extremely important in developing the study's hypotheses and enhancing the conversation. Books, university theses, scholarly research articles, peer-reviewed magazines, and academic works published.

5.1 Reliability Test

To ensure that the questionnaire's items were adequate and consistent, the Cronbach's Alpha value was determined. The value is statistically acceptable if the result is more than 0.70, and the closer it is to one (or 100%), the more reliable the search tool will be (Sekaran and Bougie, 2016). Cronbach Alpha ranges from 0.876 to 0.927, as seen in Table (1). To put it another way, the study tool is reliable, and the data it generates is accurate and trustworthy for assessing variables. Since all independent and validated variable dimensions are greater than 70%, reliability has been taken into account.

Table 1: Cronbach's Alpha Coefficient

	Number of items	alpha Cronbach
Expert Systems	5	0.969
Artificial Neural Networks	5	0.780
Algorithms	5	0.869
Machine Learning	5	0.758
Artificial Intelligence	20	0.915
Customer Experience	10	0.906

6. Hypothesis Testing

6.1 The First Main Hypothesis

To test the first main hypothesis, Multi linear regression analysis was performed.

The first main hypothesis of the study was as follows: "There is a statistically significant impact at the level of ($\alpha \leq 0.05$) of using artificial intelligence to improve customer experience in the banking sector".

Table 2: Results of Testing the Impact main hypothesis

I.V	Model Summery		ANOVA		Coefficients				
	R	R ²	F	Sig F*	variable	B	standard error	T	Sig T*
customer experience in the banking sector	0.850	0.722	146.501	0.000	Expert Systems	0.180	0.047	3.434	0.001
					Artificial Neural Networks	0.474	0.049	9.605	0.000
					Algorithms	0.160	0.061	2.609	0.010
					Machine Learning	0.268	0.050	5.350	0.000

*The effect is statistically significant at the level ($\alpha \leq 0.05$)

The correlation coefficient ($R = 0.850$) shows that using artificial intelligence has an impact on improving customer experience in the banking sector. Table No. (2) shows the effect of the independent variable (artificial intelligence) on improving customer experience in the banking sector, with a calculated value of F (146.501) and a level of significance ($\text{sig} = 0.000$) less than 0.05. The coefficient of determination ($R^2 = 0.722$) shows that variation in quantitative methods can account for 53.4% of the variation in (improving customer experience in the banking sector). The values of the regression coefficients for the sub-dimensions variable (using artificial intelligence) on (customer experience in the banking sector) are displayed in Table 2. The table makes it evident that the Expert Systems dimension B value was (0.180) and that its computed T value was (3.434) at a significant level (0.001). It is less than 0.05, meaning that at the significance level ($\alpha \leq 0.05$), there is a substantial positive effect. The table shows that the value of the Artificial Neural Networks dimension of T was calculated in this dimension (9.605) at a significance level (0.010), that is, less than 0.05, indicating a substantial positive effect at ($\alpha \leq 0.05$). The value of B was (0.474). The table makes it evident that there was a substantial positive influence in the algorithm dimension, with the B value being (0.160) and the T value being (2.609) at a significance level of (0.010), less than 0.05. where ($\alpha \leq 0.05$). and the table makes it evident that there was a substantial positive influence in the machine learning dimension, with the B value being (0.268) and the T value being (5.350) at a significance level of (0.000), less than 0.05. where ($\alpha \leq 0.05$).

To test the sub-hypotheses, simple linear regression analysis was performed.

H1.1: "There is a statistically significant impact at the level of ($\alpha \leq 0.05$) of using Expert Systems to improve customer experience in the banking sector".

H1.2: "There is a statistically significant impact at the level of ($\alpha \leq 0.05$) of using Artificial Neural Networks to improve customer experience in the banking sector".

H1.3: "There is a statistically significant impact at the level of ($\alpha \leq 0.05$) of using Algorithms to improve customer experience in the banking sector".

H1.4: "There is a statistically significant impact at the level of ($\alpha \leq 0.05$) of using Machine Learning to improve customer experience in the banking sector".

Table 3: Impact test results H1.1, H1.2, H1.3 and H1.4

D.V	Model Summary	ANOVA	Coefficients
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	R	R²	F	Sig F*	B	standard error	T	Sig T*
Expert Systems	0.529	0.280	88.849	0.000	0.575	0.048	9.426	0.000
Artificial Neural Networks	0.775	0.600	344.065	0.000	0.790	0.052	18.549	0.000
Algorithms	0.626	0.392	147.921	0.000	0.762	0.059	12.162	0.000
Machine Learning	0.712	0.508	236.077	0.000	0.676	0.058	15.365	0.000

*The effect is statistically significant at the level ($\alpha \leq 0.05$)

A positive association was found between the first dimension (Expert Systems) and the second dimension (improve customer experience in the banking sector), as indicated by Table (3) R-value of (0.529). When all other factors stay constant, the coefficient of determination results shows that ($R^2 = 0.280$), which indicates that, when it comes to the Expert Systems dimension, the (improve customer experience in the banking sector) domain accounted for (28%) of the variation. At the significance level ($\alpha \leq 0.05$), it was demonstrated that the regression's significance was supported by the value of (F) reaching 88.849 at the confidence level (sig = 0.000).

There is a positive association between Artificial Neural Networks and improved customer experience in the banking sector, as indicated by the second dimension's R-value of 0.775. After adjusting for all other factors, the coefficient of determination results in ($R^2 = 0.600$), which indicates that the (Artificial Neural Networks) domain accounted for (60%) of the variance in (improve customer experience in the banking sector). Furthermore, the value of (F) reached (344.065) at the level of confidence (sig = 0.000), demonstrating the significance of the regression at the level of significance ($\alpha \leq 0.05$), was demonstrated.

There is a positive association between Algorithms and improved customer experience in the banking sector, as indicated by the second dimension's R-value of 0.626. After adjusting for all other factors, the coefficient of determination results in ($R^2 = 0.392$), which indicates that the (Algorithms) domain accounted for (39.2%) of the variance in (improve customer experience in the banking sector). Furthermore, the value of (F) reached (147.921) at the level of confidence (sig = 0.000), demonstrating the significance of the regression at the level of significance ($\alpha \leq 0.05$), was demonstrated.

There is a positive association between the Machine Learning on the improved customer experience in the banking sector, as indicated by the second dimension's R-value of 0.712. After adjusting for all other factors, the coefficient of determination results in ($R^2 = 0.508$), which indicates that the (Machine Learning) domain accounted for (50.8%) of the variance in (improve customer experience in the banking sector). Furthermore, the value of (F) reached (236.077) at the level of confidence (sig = 0.000), demonstrating the significance of the regression at the level of significance ($\alpha \leq 0.05$), was demonstrated.

7. Discussion

The findings indicate a positive effect of artificial intelligence on customer experience within the banking sector. This hypothesis suggests that the implementation of artificial intelligence technologies can enhance customer experience by improving efficiency, offering personalized services, and boosting customer satisfaction. The findings indicated a beneficial effect of employing expert systems on enhancing customer experience within the banking sector. Expert systems are software applications that utilize defined rules and knowledge to offer guidance or solutions for particular issues. In the banking sector, these systems facilitate personalized financial advice, enable rapid data analysis, and deliver precise recommendations to customers, thereby improving their experience. The findings indicated a beneficial effect of artificial neural networks on enhancing customer experience within the banking sector. These networks, modeled after the human brain, are employed for pattern recognition and predictive analysis. In banking institutions,

these tools facilitate the analysis of customer behavior, enable the prediction of needs, and support the provision of personalized services, thereby enhancing customer satisfaction. The utilization of algorithms in the banking sector positively influences customer experience, as algorithms serve as systematic instructions for problem-solving and task execution. Algorithms in the banking sector enhance internal processes by facilitating rapid and efficient transaction processing and enabling the analysis of large datasets to yield valuable insights, thereby improving customer experience. The application of machine learning in the banking sector positively influences customer experience. Machine learning, a subset of artificial intelligence, emphasizes the creation of systems capable of learning from data and making informed decisions. Machine learning in banks facilitates the analysis of customer data, identification of patterns, provision of personalized recommendations, and enhancement of security via fraud detection, thereby significantly improving customer experience.

In the matter of AI enhancing CX in the banking industry, there are several ethical issues that need discussion. In terms of bias, AI algorithms may result in biased results if the training data contains a priori biases. All this could have a discriminatory effect on some customer segments, making them discriminated against in the provision of services or offers. So, it is also crucial to check whether the data used is representative and whether bias correction tools can be applied. The data mining of vast amounts of personal data also has a tendency to cause customer privacy to be violated. Customers can feel vulnerable to the way their data is being used. It is of primary importance to apply stringent data protection policies, as well as to provide transparency on the purpose for which it is used. Moreover, the opacity of algorithms may result in a collapse of customer trust in transparency. If there is no transparency, customers can become worried about what decisions are made. Thus, intuitive instructions on how intelligent systems work need to be made easily understandable. If customers do not perceive a fair treatment, this may lead to erosion in trust towards the bank. Close bonding with the customers is of primary importance by means of consistent communication and addressing customer grievances. Institutions can be challenged to handle legislation and rules on data and in the application of AI. That is why compliance training and creation of robust internal policies are important to invest in. The potential for AI in banking is tremendous, but ethical issues cannot be dismissed. Banks can maximize user experience and trust in the emerging technology by increasing the transparency, privacy protection and reducing bias.

8. Conclusion

The banking sector is undergoing a radical transformation due to rapid technological advancements. The bank is no longer just a place to exchange money, but has become a digital partner in the lives of customers. Artificial intelligence plays a very important role in the banking sector, as this AI technology helps to increase customer service and enhances the efficiency of internal operations. It can be used to analyze data of customers to make personal recommendations. This further helps in enhancing risk management and combating fraud. This is considered an enrichment in customer engagement, driven by chatbots. Artificial Intelligence is driving digital transformation in the banking industry, thus helping banks offer smart and more personalized services that meet the needs of customers.

The study recommends that banks aim to improve customer service by providing instant solutions and accurate analytics, which contributes to enhancing trust between customers and the bank. AI technologies can also provide new financial services, such as digital payment solutions or microfinance, which helps banks innovate and provide advanced solutions. In addition, banks can use AI to enhance cybersecurity, which is a critical aspect in light of the increasing threats of cybercrime, which increases customers' sense of satisfaction and belonging. Modern banks rely heavily on technology to protect their data and the data of their customers; therefore, AI technologies can help monitor suspicious activities and detect any hacking attempts early, which enhances the level of security and improves the customer experience.

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