

# The Impact of ‘Nebula AI’ in the Banking Sector in Oman

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## Abstract

Nebula AI is the Oman’s first locally hosted Artificial intelligence (AI) platform, has accelerated digital transformation across the banking sector. Banks in Oman, used AI-driven tools such as chatbots, fraud detection systems, and personalized financial recommendations to advance Nebula AI. This study investigated the impact of Nebula AI on banking operations and customer experiences in Oman by examining perceived usefulness (PU), perceived trust (PT), and customer satisfaction (CS) as predictors of Nebula AI adoption. A mixed-method sequential explanatory design was applied. Quantitative data were collected from 300 banking clients using structured questionnaires and analyzed using correlations and regression. Qualitative insights were obtained through 15 semi-structured interviews and thematic analysis was used to explore risks, challenges, and prospects. Quantitative results show PU and CS as the strongest predictors of Nebula AI adoption ( $p = .000$ ), with PT also significant ( $p = .000$ ). From qualitative results, it proved that users valued efficiency, fraud detection, and chatbot responsiveness but expressed concerns about data privacy, limited awareness of features, and the need for human oversight. This study offered actionable guidance for Omani banks: enhance transparency, strengthen data protection, improve customer awareness, and design more personalized AI services. It highlights the need for balanced human–AI integration to improve trust, satisfaction, and long-term adoption.

**Keywords:** Nebula AI, Artificial Intelligence (AI), Banking Sector, Fraud Detection, Personalized Banking, Fintech, AI Implementation, Data Analytics, Risk Analysis.

## 1. Introduction

Artificial intelligence (AI) has made tremendous impacts in many industries across the globe, and the banking sector has not been left out in these technological improvements (Park, 2025). After becoming an NVIDIA Partner Network cloud service provider in November 2021, Oman Data Park (ODP) introduced Nebula AI, which is the first locally hosted AI platform in the country. The platform is driven by the NVIDIA DGX-A100 system which can handle up to 5 peta FLOPS of AI computations, is dependable and data sovereign to guarantee high-performance workloads (Park, 2025). Nebula AI, based on machine learning-led automation and analytics, boosts fraud detection, credit underwriting, customer-specific services, and custom financial planning, and the first areas of application include banking and other financial services (Li et al., 2024). Its adoption became a significant milestone of digital transformation in Oman in accordance

with Vision 2040 allowing banks to utilize modern AI solutions and ensuring the safety of data in the country (Milana, 2023).

The appearance of such platforms as Nebula AI means the beginning of the new stage of more intelligent and customer-centered financial services that meet the modern needs and demands of consumers with the help of higher efficiency, informed choices, elimination of fraud, and personalized solutions (Trizna et al., 2024). As a result, a growing desire to explore the deployment of AI-driven solutions and how they are received by customers as well as the implications of AI-driven solutions overall on the future of the banking industry in Oman can be seen as the solution continues to gain more and more usage (Shamsabadi et al., 2024).

The adoption of Nebula AI has been a revolutionary step in the banking industry in Oman for technological progress (Morrell et al., 2024). Nebula AI has helped banks transform their operations: through highly skilled machine

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learning and analytics, the system has helped banks to increase operational efficiency, detect fraud, and provide personalized financial services that meet specific customer demands (Morrell et al., 2024). A number of Oman banks have already adopted AI technologies as a way of enhancing service delivery and risk management (Nowara et al., 2024). An example is the Oman Arab Bank that introduced an AI-based biometric system to on-board new clients, which has cut the amount of time required to open an account to less than five minutes, yet has verified identity security. Bank Muscat has applied AI to detect frauds and anomalies in real-time to boost internal control and reduce financial risk (Brahimi & Sarirete, 2023). The National Bank of Oman has embraced AI in credit underwriting, investment advisory services, and document processing by using the natural language processing to improve decision-making and operational efficiency. Islamic banks, such as Bank Nizwa and Alizz Islamic Bank, have implemented AI-based chatbots and virtual assistants to address customer queries to enhance the level of engagement and response time (Basiddiq & Rana, 2024). Also, AI-ready infrastructure is available through Oman Data Park, where Nebula AI is located, ensuring data sovereignty, allowing banks to use advanced AI solutions without jeopardizing compliance with the regulation.

Trust is one of the most important aspects in the implementation of AI in Omani banking. The reliability, data security, and transparency in making decisions are factors that influence customers to develop confidence in AI systems (CS) factor (Basiddiq & Rana, 2024). Trust is especially essential within the context of financial services, where the information of personal and transactional character is sensitive (Byambaa et al., 2025). The locally hosted infrastructure at Nebula AI contributes to establishing a local residency of data and their adherence to the national regulations to gain customer and regulatory confidence. Nevertheless, there are still some issues, such as the necessity of human supervision to provide interpretation of multidimensional or high-stakes choices, lack of awareness and knowledge about AI among clients and bank workers, which can be a barrier to use and influence the level of trust in AI-based services (Chen et al., 2023).

AI has changed how banking was being conducted across the globe, but the impact of the use of platforms like Nebula AI in relation to the Omani sector had not been addressed in previous studies. Although, research exists on evidence across the globe that AI could improve efficiency,

personalization, and fraud detection, little was understood on how Omani banks and their clients are experiencing the technologies like Nebula AI, especially its impact, trust of Nebula AI and satisfaction rate in Omani banking sector (Basiddiq & Rana, 2024; Brahimi & Sarirete, 2023). To fulfil this gap, this study was conducted which explored the potential impact of Nebula AI on Omani banks both technologically and user-experienced by analysing the impact of Nebula AI on PU, PT and CS. This study also defined the difficulties of using AI-driven services, the benefits and future prospects which should be carefully managed.

This study is significant because it offered an in-depth insight about the effect of Nebula AI on Omani banking, both in qualitative and quantitative terms. Adopting a mixed-methods approach, it was able to record the ideas of banking employees and clients for customer satisfaction, perceived use, perceived trust, risk, challenges and future prospects. The analysis of the customer data and service trends of banking employees revealed that AI has the most significant opportunity to create the most significant effect in areas like customer satisfaction and allowed the researcher to point out potential obstacles like need for human oversights and lack of awareness, issue of trust and its benefits. The results added practical suggestions on how to improve AI adoption, strategic formulation, customer experience, and future policy development to take advantage from Nebula AI for the banking industry in Oman.

### ***1.1 Research Questions***

RQ1: How has the perceived usefulness of AI impacted the use of Nebula AI in banking sector of Oman?

RQ2: How has perceived trust in use of Nebula AI impacted to the banking sector of Oman?

RQ3: How has customer satisfaction impacted by the use of Nebula AI in banking sector of Oman?

RQ4: How does Nebula AI affect your daily banking?

RQ5: What are risks associated with the use of use of Nebula AI?

RQ6: How do banking employees and clients perceive the future prospects of using Nebula AI in banking sector of Oman?

### ***1.2 Conceptual Model***

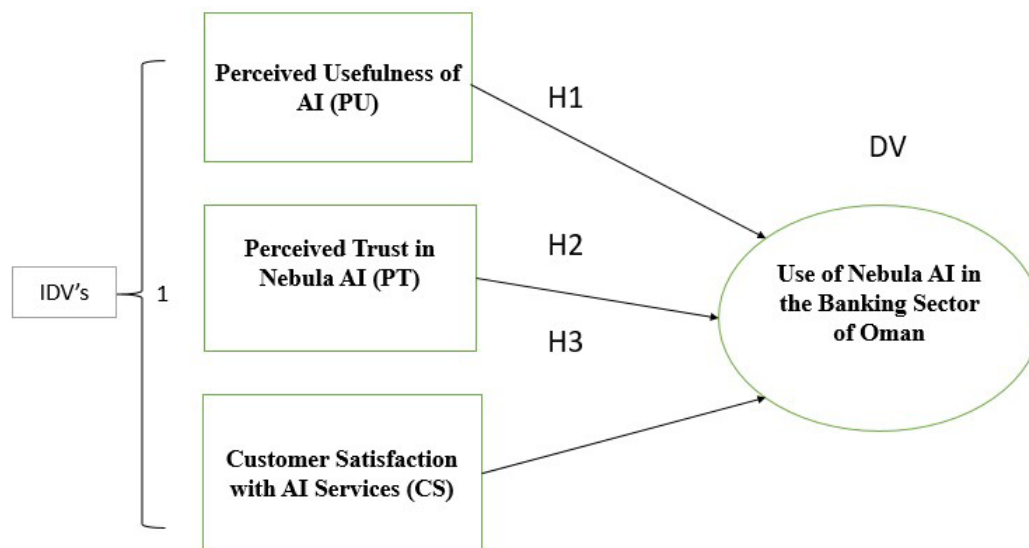
The conceptual framework of this study is based on the technology acceptance model (TAM) which established

that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the main determinants of technology adoption which eventually forms the intention to use and actual usage of nebula AI in banking sector of Oman. Independent variables include; Perceived Usefulness of AI (PU), the extent to which bank clients think that the use of Nebula AI helped by, chatbot responsiveness, accuracy of AI recommendations, fraud detection confidence and personalization of services. Perceived Trust in Nebula AI (PT), captured the belief of the client in reliability and security. However, trust variable in the presence of risk factor may influence the trust factor to impact the use of nebula AI as indicated from qualitative analysis of this study. Customer Satisfaction with AI Services (CS), captured positive experiences for customer satisfaction with

Nebula AI services in Omani bank sector (risk assessment, fraud detection and personalized customer services faster) has been measured. The dependent variable is the Use of Nebula AI in the Banking Sector of Oman that showed that the actual adoption and utilization of nebula AI relies on, PU, PT and CS.

### 1.3 Hypothesis

H1: Higher perceived usefulness (PU) positively influences the use of Nebula AI in banking sector of Oman.  
H2: Greater perceived trust (PT) positively influences the use of Nebula AI in banking sector of Oman.  
H3: Higher customer satisfaction (CS) with AI services positively influences the use of Nebula AI in banking sector of Oman.



### 1.4 Theoretical Model

The theoretical framework of the proposed study is the Technology Acceptance Model (TAM) with the expansion of the qualitative research in order to identify the acceptance and a real difference of Nebula AI in the banking industry in Oman. In the quantitative part, the model hypothesizes that three defining variables, perceived usefulness, trust in AI, and customer satisfaction are the direct predictors of the overall usage of Nebula AI by the customers and the employees of the banking organization. Perceived usefulness represents the perception that AI improves the efficiency of the bank, trust encompasses the trust the customers have in the AI systems in order to perform secure and accurate tasks and customer satisfaction is a reflection of the pleasant experiences the consumers have had with the AI-driven banking services. The three

variables are independent predictors of the dependent variable, which is the actual use and acceptance of Nebula AI in the banking operations.

The qualitative expansion of the model examines the contribution of Nebula AI to the enhancement of fraud detection, risk assessment, and customer service in banks, which provides a more comprehensive understanding of the operational value of the system. Also, the model examines the possible risks of Nebula AI, including the issue of data privacy, reliability, and challenges related to implementation. The TAM-related factors of acceptance, combined with the qualitative themes, form an overall conceptual framework which can be used to explain not only why Nebula AI is adopted, but to also identify the practical effects of adopting AI on banking performance and what obstacles can be present in the implementation.

## 2. Literature Review

### 2.1 Perceived Usefulness (PU)

PU has always been among the most powerful indicators of the use of technology in the financial system, especially the AI-driven services (Byambaa et al., 2025). The (TAM) is based on the assumption that users will use new technologies when they think that the new system will greatly improve the performance of their tasks, efficiency, or accuracy of decision-making (Khalifa & Albadawy, 2024a). Applications of AI systems in the financial industry have proven to be effective in operation efficiency. An analysis of European banks reveals that the use of AI has had positive influences on the profitability and the return on assets (ROA) of banks. PWC estimates that 70 percent of the global economy will gain the most when AI is applied by China and North America by 2030 (Byambaa et al., 2025). The world is witnessing the development, development, and emerging countries formulate policies and regulations on the adoption and utilization of artificial intelligence (AI) in fast implementing AI-driven products like, Nebula AI (Khalifa & Albadawy, 2024b). The study also revealed that the customers would be more willing to utilize the AI systems which give a visible, tangible benefit. Even inside Oman, the digitalisation of the Central Bank providing AI-based services saw an incremental growth after the introduction of localized platforms and capabilities such as Nebula AI that contributed to the at-risk increase in usefulness perception.

H1: Higher perceived usefulness (PU) positively influences the use of Nebula AI in banking sector of Oman.

### 2.2 Greater perceived trust (PT)

High PT is the key determinant in the intention of customers to embrace Nebula AI-enabled banking services (Milana, 2023). The extent to which customers trusted the system went up significantly when they thought that Nebula AI worked properly, it secured their personal information, and was able to generate data that were true and free of bias (Nowara et al., 2024). With a higher level of trust, customers were more convinced that AI-based interactions were safe and valuable. Besides, users were more ready to implement AI features into their daily banking practices when they felt that Nebula AI contributed to the efficiency, accuracy, and individualization of banking services (Morrell et al., 2024). This feeling of high-quality, supportive functionality constituted a background force behind actual use behavior, establishing the notion that trust is a requirement for serious and sustainable interaction with AI technologies in

the banking sector. Thus, the market of AI technologies is enormous, and it will reach approximately 244 billion U.S. dollars in 2025 and will increase significantly to more than 800 billion U.S. dollars in 2030

(Department, 2025).

H2: Greater perceived trust (PT) positively influences the use of Nebula AI in banking sector of Oman.

### 2.3 Higher Customer Satisfaction (CS) with Nebula AI services

Nebula AI enables businesses to leverage AI, creating intelligent operations and potentially bringing concepts to life. Thus, business organizations in Oman are delivering a satisfaction rate of 99% through Nebula AI (Park, 2025). Nevertheless, customer satisfaction is also defined by the technical competence and particular use of technology. AI implementation enables banks to enhance the quality of customer service by automating repetitive processes, reducing costs, and providing real-time answers (Park, 2025). As far as fraud detection is concerned, studies have found out that AI algorithms can detect suspicious trends in real-time, thus reducing the number of fraudulent transactions and ensuring secure online banking environments (Reddy et al., 2024). Nebula AI impacts the customer perceptions on AI-driven services based on perceived usefulness and trust. This is especially relevant in the Omani setting, as banks are seeking to tap into younger and tech-savvy demographics by exploring AI-driven options, such as Nebula AI (Shamsabadi et al., 2024). Moreover, data analytics is necessary in observing trends in consumer behavior and opportunities of service improvement (Swaroop et al., 2024). Nonetheless, issues regarding algorithmic biases, privacy of data and excessive dependence on technology have also been addressed in research. Emphasizing the need to have robust regulatory frameworks and ethics.

As the literature states, despite all the potential, the implementation of AI in the banking sector of Oman is possible only in the long run, and a moderate approach must be applied, and probably both the technology possibility and client demands should be taken into account.

H3: Higher customer satisfaction (CS) with AI services positively influences the usage of Nebula AI in banking sector of Oman.

## 3. Methodology

### 3.1 Research Design

A sequential explanatory design was employed

to investigate the implications of Nebula AI in the Omani banking sector. An analysis was carried out quantitatively to ascertain perceived usefulness of AI to influence the use of Nebula AI on the Omani banking sector, perceived trust in use of Nebula AI in the banking sector of Oman and customer satisfaction influence as a result of use of Nebula AI in banking sector of Oman. Nevertheless, the qualitative design evaluated Nebula AI enhanced fraud detection, risk assessment and customer service, risks related to the use of Nebula AI and future prospects of using Nebula AI in banking industry of Oman. Quantitative design was more reliable and valid because of practical insights but qualitative insights gave deeper insight on nebula AI impact and challenges.

### **3.2 Data Collection**

The mixed-approach method was used to collect the data to ensure that both quantitative and qualitative information has been gathered regarding the application of Nebula AI within the banking industry in Oman. Primary data were collected through surveys and interviews with clients and banking professionals, whereas secondary data were obtained from financial reports, academic journals, and industry publications. To complete the quantitative aspect, a structured survey questionnaire was conducted on major banks clients based in Oman like Bank Muscat, bank Dhofar and the national bank of Oman. The questionnaire contained Likert-scale scales that quantified perceived usefulness, trust, customer satisfaction and ease of use. On the qualitative aspect, 15 semi-structured interviews were held with chosen employees and clients of the banking sector who have heard about Nebula AI, delving into the use of AI, risks involved, challenges and future opportunities. Additionally, both groups were addressed through focus group discussions to ensure a common understanding of expectations, concerns, and perceptions regarding AI-driven banking services.

### **3.3 Population and Sampling**

The targeted group consisted of banking clients and employees who have knowledge/experience of Nebula AI in Omani banks. In the case of the survey, a stratified random sample of 300 banking clients was selected to represent the demographics of the clients and ensure the reliability of the statistics and generalizability. In the qualitative part, 15 participants, including banking workers and customers, were purposefully chosen to undergo semi-structured interviews and focus group discussions, thereby

providing comprehensive information on the use of Nebula AI, risks, challenges, and prospects.

### **3.4 Data Analysis**

Qualitative data were analysed using a thematic analysis to define the recurrent themes, patterns, and attitudes from the semi-structured interviews. The analysis was informed by five themes, which are; data privacy concerns, need for human oversight, efficiency and time-saving, lack of awareness about features and expectations for customization. Quantitative analysis was done using SPSS to determine; the impact of Nebula AI on Daily Banking (e.g., How does Nebula AI affect your daily banking?), 2) Challenges/Risks (e.g., What concerns do you have about data protection or the need for human personnel?), and 3) Future Prospects (e.g., What enhancements would you personally desire in personalization?).

These questions allowed exploring experiences of participants and context-specific peculiarities of AI implementation in the Omani banking industry.

## **4. Result and Discussion**

### **1. Quantitative Results**

The demographics in Table 1, shows a heterogeneous sample of banking clients in Oman. The most significant number of participants fell within the 26-35 years range, at 32.7%, and the second range, at 24.7%, demonstrates that many Nebula AI users are middle-aged and young clients. There was equal gender distribution between 51.7% male and 48.3% female clients, that provided a wide representation. Clients were also highly familiar with technology, with 44 and 41% indicating moderate and high familiarity respectively, indicating high willingness to use AI-enabled banking services. Familiarity was the lowest at only 15%, which means that the majority of clients were not afraid of using digital and AI-based banking options.

### **4.1 Usefulness, Trust and Customer Satisfaction to Impact the Use of Nebula AI in the Banking Sector of Oman**

Table 2 shows the average mean scores show that client perceptions of Nebula AI in Omani banking remain relatively positive. The level of AI recommendation accuracy according to usefulness is highest with mean of 3.88. Chatbot responsiveness was rated moderately high at 3.20, indicating great satisfaction with AI-assisted interactions. The fraud detection rating was 3.57,

*Table 1: Demographic Profile of Participants (Quantitative Survey)*

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age	18–25	65	21.7%
	26–35	98	32.7%
	36–45	74	24.7%
	46 and above	63	21.0%
Gender	Male	155	51.7%
	Female	145	48.3%
Tech Familiarity Level	Low	45	15.0%
	Moderate	132	44.0%
	High	123	41.0%

suggesting that clients have a high level of trust in the security of Nebula AI. The overall experience with AI in banking was positive, with a mean score of 3.48, indicating that clients value the integration of AI. Personalization has

score of 3.74, which shows that there is a moderate level of satisfaction and it is an area that clients want to see better efforts in terms of personalizing the services to suit their individual preferences.

*Table 2: Mean of PU, PT and CS with Nebula AI in banking Sector of Oman*

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Q1 (PU): The AI system provides recommendations that are helpful for completing my financial tasks.	300	1	5	3.88	1.307
Q2 (PU) :Using the AI-based services through Chatbot responsiveness improves the efficiency of my banking/financial activities.	300	1	5	3.42	1.420
Q4 (PT) : I believe the Nebula AI system reliably detects and prevents fraudulent activities.	300	1	5	3.75	1.269
Q5 (CS) : I am satisfied with the overall performance of the Nebula AI-based services offered.	300	1	5	3.48	1.418
Q6 (CS): Nebula AI has improved the speed and efficiency of the personal banking services I use.	300	1	5	3.74	1.274
Valid N (listwise)	300				

#### 4.2 Correlations

Table 3 shows the results of correlation analysis, indicate that all variables have strong and significant correlations with each other. The overall effect of Nebula AI on the Omani banking industry are positively correlated (PU, PT and CS) with correlation values, (.917, .607,

.605), offering a very strong positive relation and making the perception that usefulness positively influences the satisfaction level and the overall impact of the Nebula AI on the banking industry in Oman. There is also a moderate to strong relationship between Perceived Trust (PT) and PU, CS, and overall impact (all  $r = .674$ ) which indicates

that trust adds a considerable but not as significant contribution as usefulness. In general, it is possible to

state that usefulness and satisfaction are the most powerful predictors of the perceived impact of Nebula AI.

*Table 3: Correlations of (PU, PT and CS)*

Correlations		PU	PT	CS	Impact of Nebula AI on banking sector of Oman
PU	Pearson Correlation	1	.548**	.552**	.917**
	Sig. (2-tailed)		.000	.000	.000
	N	300	300	300	300
PT	Pearson Correlation	.548**	1	.998**	.607**
	Sig. (2-tailed)	.000		.000	.000
	N	300	300	300	300
CS	Pearson Correlation	.552**	.998**	1	.605**
	Sig. (2-tailed)	.000	.000		.000
	N	300	300	300	300
Impact of Nebula AI on banking sector of Oman	Pearson Correlation	.917**	.607**	.605**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	300	300	300	300

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**4.3 Regression**

**4.4 Model Summary**

According to the Model Summary in Table 4, the predictors, which are Perceived Usefulness (PU), Perceived Trust (PT), and Customer Satisfaction (CS), accounted Perceived Impact of Nebula AI on the Omani banking industry with R2 value of .864. This outstanding high level of explanatory power is an indication that the model is statistically solid and very dependable. The standard error of .113 is relatively small, and it implies that actual values are far near the estimated values. The highest value of R is an indicator of a near-perfect relationship between the

predictors and the dependent variable, indicating that PU, PT, and CS are a combined strong factor with regard to the adoption of Nebula AI.

**4.5 ANOVA**

The results of the ANOVA Table 5 indicate that there is statistical significance of the regression model. The significance level of .000, indicates that the combination of predictors (PU, PT, CS) plays a significant role in predicting the difference in the perceived impact of Nebula AI in the banking sector. The substantial regression sum of squares relative to its residual implies that most of the

*Table 4: Model Summary*

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.929a	.864	.863	.3204

a. Predictors: (Constant), CS, PU, PT

variation in the dependent variable is explained by the model as opposed to random error. The outcomes of the research confirm the idea that the model fits exceptionally

and that PU, PT, and CS have a significant role to play in the prediction of the perceived impact of Nebula AI in Oman.

*Table 5: ANOVA*

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	192.960	3	64.320	626.554	.000b
	Residual	30.386	296	.103		
	Total	223.347	299			
a. Dependent Variable: Impact of Nebula AI on banking sector of Oman						
b. Predictors: (Constant), CS, PU, PT						

#### 4.6 Coefficients

The results of Table 6 shows that all the three predictors have a significant effect on the perceived impact of Nebula AI. The influence of Perceived Usefulness (PU), ( $p = .000$ ) is the greatest, (PT) is ( $p = 0.00$ ) which supports

the idea that trust and usefulness is the strongest factor affecting adoption of AI. Customer Satisfaction (CS) also positively affects the embrace of Nebula AI ( $p = .000$ ) meaning that clients who are satisfied selected to choose to adopt Nebula AI.

*Table 6: Coefficients*

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.429	.078		5.484	.000
	PU	.803	.024	.845	32.825	.000
	PT	.973	.228	1.412	4.274	.000
	CS	-.876	.229	-1.270	-3.834	.000
a. Dependent Variable: Impact of Nebula AI on banking sector of Oman						

## 2. Qualitative Results

The qualitative results draw attention to important user views and gaps in Oman’s experience with AI-driven banking services:

### 1. Data Privacy Concerns

The issue of personal and financial data security when participating in the daily banking activities with Nebula AI was a significant concern among 12 out of 15 participants. A large number of clients admitted that AI was a good idea but were still worried about the security of their personal data. According to one interviewee, the convenience is good, yet they always fear that their data might be stolen once all things are put in the hands of AI. one participant said;

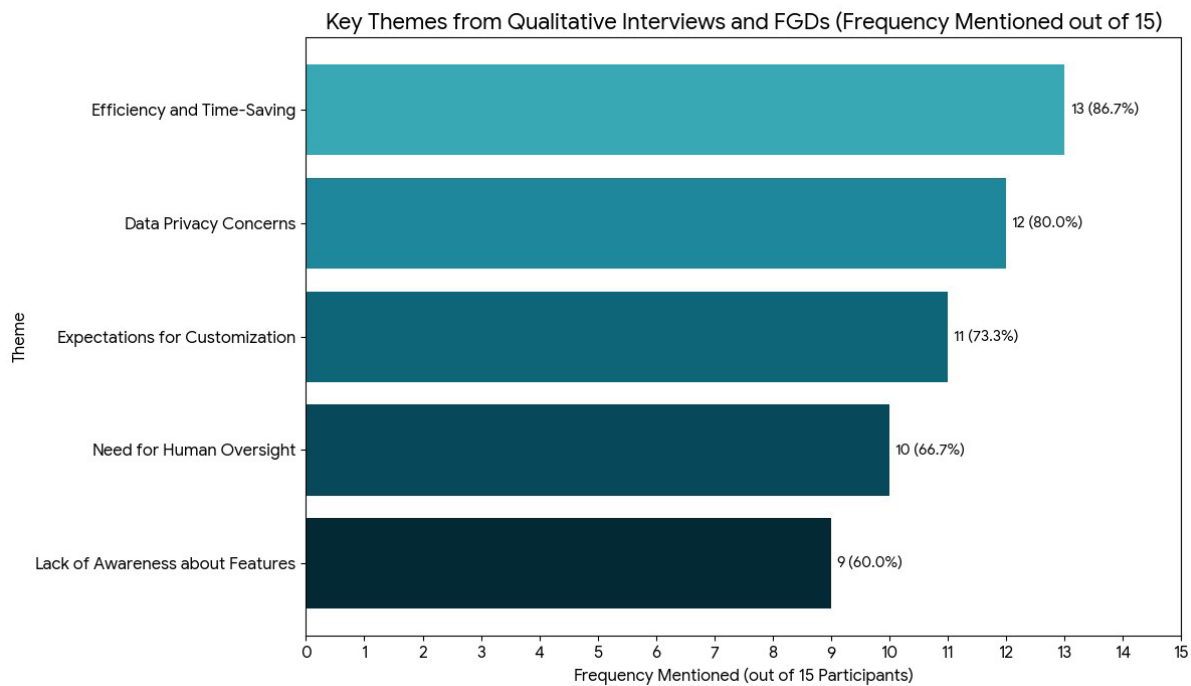
“AI is quick, but I am not sure of the destination of my

information and who accesses it”.

These issues show that the issue of trust is paramount in terms of AI adoption which is directly related to H2, which states that perceived trust has a positive impact on AI use. These findings are also supported by the previous research. According to Yanamala and Suryadevara. (2023), one of the biggest limitations to the use of AI in banking is data privacy. Studies emphasized that AI is a black-box, which may lead to less trust, especially when the user is not informed about how the data is processed (Jurewicz et al., 2024; Muneer et al., 2024). Though these are some of the concerns, participants admitted that they would feel more secure when using the AI services, in case they had adequate safeguards. This is an indication that strengthening trust mechanisms in Nebula AI may either support H2 directly and indirectly H1 and H3 as trust and perceived security

*Table 4: Key Themes from Qualitative Interviews*

Themes	Description	Frequency Mentioned
Data Privacy Concerns (Nebula AI affect your daily banking)	Concerns about security of personal and financial data	12 out of 15
Need for Human Oversight (risks associated with the use of use of Nebula AI)	Customers still prefer human interaction for complex tasks	10 out of 15
Efficiency and Time-Saving (affect your daily banking)	AI helps reduce waiting time, especially in query handling	13 out of 15
Lack of Awareness about Features (risks associated with the use of use of Nebula AI)	Customers unaware of full capabilities of AI tools	9 out of 15
Expectations for Customization (clients and employees perceive the future prospects and Nebula AI )	Users expect more tailored and intuitive services	11 out of 15



correlate with perceived usefulness and satisfaction.

## 2. Need for Human Oversight

It was noted that human control is necessary in most cases, as stated by 10 out of 15 participants, particularly during complex transactions or unfamiliar banking scenarios. Although Nebula AI was valued to do routine jobs, clients said that AI could not be used as a substitute to human judgment. One participant noted; “AI works well on fundamental questions, but in the case of serious events, they would prefer having a real person to lead them”.

The other one added;

“AI does not see emotional or complex situations in the entirety- sometimes we need human judgment on certain things”.

These points underscore the fact that AI is helpful (confirmed H1), but trust and satisfaction could improve when automation is supplemented with human control hence, confirming H2 and H3.

Previous studies support this point of view. have discovered that customers are more willing to use AI provided that human support can be provided when needed to verify the information (Chen et al., 2023; Zhu et al., 2023). Another

study highlighted augmented banking, in which AI and human knowledge coexist and do not supplant each other (Reddy et al., 2024). The perceptions by the participants are that the perceived usefulness and customer satisfaction of Nebula AI get better with the human control over the risks and assurance to the clients and this directly supports all the three hypotheses.

### **3. Efficiency and Time-Saving**

Thirteen out of fifteen clients have reported that Nebula AI significantly reduced their time waiting. Participants commended AI in answering banal questions, tracking transactions, and detecting fraud. One of the participant told;

“Prior to the evolution of Nebula AI, I used to spend long queues and now can solve simple problems within few seconds.”

Another told;

“The Chatbots with Nebula AI are extremely quick. It responds immediately even in the dark.”

Client satisfaction is also attributed to efficiency (H3). As an illustration, one participant;

“AI alerted him of a suspicious transaction within seconds, where human employees at the company would have taken longer to do so, which makes me feel safe.”

Previous studies support these findings. Studies stated that AI automates repetitive functions and saves time, as well as it makes customers more satisfied (Khalifa & Albadawy, 2024a; Swaroop et al., 2024). The efficiency of AI in Gulf banking, with technologies like Nebula AI, has enhanced trust and adoption. Thus, the experimentally measured improvements in speed and accuracy demonstrate that PU and CS play a significant role in the usage of Nebula AI, supporting all three hypotheses.

### **4. Lack of Awareness About Features**

9 out of 15 clients and banking employees' complaints that they did not know the full capabilities of Nebula AI and it influenced the usage and satisfaction. One of an employee said;

“I like to tale help with Nebula AI but i was not aware that it could assist clients in services.”

Another one added;

“Banks never told me about what is the Nebula AI is.”

This gap in knowledge lowers the perceived trust and satisfaction, resulting in the possibility that more awareness might enhance awareness about its usage and benefits, this supporting the low significant p value for PT.

According to the previous literature, AI adoption is enhanced by awareness campaigns (Rawas, 2024). The study defined that informed users have more confidence in AI and interact more with the functions (De Filippis & Al Foysal, 2024; Jiang et al., 2023). Another study showed that AI capability knowledge increases the level of satisfaction and perceived usefulness (Khalifa & Albadawy, 2024b). Omani banking clients and employees also demonstrated the same patterns: at the point of comprehending AI functions, more confident and satisfied participant said they were. Therefore, the perceived usefulness can be reinforced to create trust and customer satisfaction because of the awareness gap filling, and all three hypotheses are proven to be empirically supported.

### **5. Expectations for Customization**

11 out of 15 participants had a great desire to have more customized AI services. The clients expected Nebula AI to give personalized suggestions and predict personal needs. According to one client;

“AI should be made aware of my habits and suggest something based on them, rather than general recommendations.”

As illustrated by Chen et al. (2023), personalization is an excellent way to enhance satisfaction and engagement. Specifically, AI solutions with a cultural background increase trust and value perceptions in the Middle East banking environment. Based on the responses given by the participant (Bhuiyan, 2024). They become more satisfied and willing to use Nebula AI when it meets personalization expectations (Chen et al., 2023). Thus, perceived usefulness is supported by customization in direct way, whereas trust is funded in an indirect way that strengthens the three hypotheses (H1, H2, H3).

### **5. Discussion**

The findings of this study has proved that the role of Nebula AI in the Omani banking sector is quite positive, and Perceived Usefulness (PU), Perceived Trust (PT), and Customer Satisfaction (CS) were revealed as the main determinants of adoption. The quantitative data indicate that the perception of accuracy in AI recommendations is moderate (mean = 3.92); however, the AI recommendations are the most responsible (mean = 3.8), which proves that the clientele attaches importance to the speed, quality, and accessibility of AI-mediated communication. The likelihood of detecting fraud was and the degree of trust in the security capabilities of Nebula AI was high.

*Table 7: Perceived Benefits and Risks of Nebula AI (Mixed Insights based on participant' answers)*

Aspect	Benefits Example	Risk Example
Fraud Detection	Real-time flagging of suspicious transactions	False positives can delay legitimate actions
Chatbot Interactions	24/7 service availability	Lack of empathy in complex issues
Personal Banking Services	Tailored offers and product suggestions	Over-reliance may limit human discretion
Operational Efficiency	Reduced time for approvals and queries	System errors can affect customer trust
Data Analytics	Better trend identification for future service design	Concerns around misuse of customer data

Correlation analysis can be used to lend further support to these conclusions. PU shows a very good positive correlation with CS and the perceived overall impact of Nebula AI, which means that clients who perceive AI to be useful are more satisfied and feel that they gain more benefits. PT correlates positively as, PU and CS, which proves but the factor of trust is an enabling factor during adoption. In regression analysis, it has confirmed that the all variables are the strongest predictors; PU ( $p = 0.000$ ), CS ( $p = 0.000$ ) and PT which is significant also with ( $p = .000$ ). This numerical data can be compared with the prior research that stressed the usefulness and satisfaction as the most influential factors behind the adoption of AI in banking environments (Khalifa & Albadawy, 2024a; Swaroop et al., 2024)

Qualitative results provided more understanding of these connections. The privacy issues of the data were mentioned by 12 out of 15 participants and this indicated that trust is a determinant in the adoption of AI critically (H2). Customers noted their concern with information safety and stated that information disclosure and protection would boost their trust, which aligns with Yanamala and Suryadevara (2023), Jurewicz et al. (2024), and Muneer et al. (2024), indicating that one of the key obstacles to the adoption of AI is data privacy.

10 participants have highlighted the necessity of human control over transactions that are either complex or sensitive. Clients also admitted that AI can be used to complete routine tasks, yet they felt trusted and more satisfied when human judgment is applied to automation, which is also in line with the results of previous research on the idea of augmented banking by Reddy et al. (2024) and Chen et al. (2023). This highlights the fact that PU, PT, and CS have a compounding effect in the adoption of AI.

Time-saving and efficiency were significant advantages reported by 13 participants. Nebula AI capability to automate routine activities, respond in time, and detect fraudulent activity raises the perceived usefulness and satisfaction, which confirms H1 and H3. Past studies have proven that efficiency and speed have a positive impact on customer satisfaction and trust in AI-enabled banking services (Rawas, 2024; Swaroop et al., 2024). On the other hand, awareness gaps (9 participants) and expectations on personalization; 11 participants are an indication of areas that need to be improved. Perceived usefulness, trust, and satisfaction can be enhanced through awareness campaigns and specific AI solutions, which align with the findings of Almohaimed (2023), Chen et al. (2023), and Gupta (2022).

Lastly, there are mixed perceptions as seen among the participants, which depict a balance between the risks and benefits. Nebula AI is more effective in fraud detection, operational productivity, and personalization, yet the risks include system malfunctions, false alarms, excessive dependency, and absence of empathy in complicated interactions, according to the clients. These observations align with earlier research on the limitations of AI adoption, suggesting that adoption strategies, such as user training and human-AI interaction, can make the process both advantageous and harmless (Bhuiyan, 2024; Jiang et al., 2023)

Overall, quantitative and qualitative data indicate that Perceived Usefulness, Trust, and Customer Satisfaction have a positive effect on the adoption of Nebula AI in Omani banking, thus empirically proving all three hypotheses (H1, H2, H3). Although usefulness and satisfaction are the most influential ones, trust and human control cannot be overlooked in managing risks, improving security, and

*Table 8: Hypothesis Testing Results*

Hypothesis	Statement	Result	Evidence ( $\beta$ , p-value)
H1	Higher perceived usefulness (PU) positively influences the use of Nebula AI.	Supported	p = 0.000
H2	Greater perceived trust (PT) positively influences the use of Nebula AI.	Supported	p = 0.000
H3	Higher customer satisfaction (CS) positively influences the usage of Nebula AI.	Supported	p = 0.000

positive user experiences. Table shows the hypothesis results;

## 6. Conclusion

Nebula AI has recognized as a successful technological move in Oman towards the success of banking sector. This study provided a complex image of the transformation of banking experiences by using AI by integrating survey numbers, interviews, and focus group discussions into a mixed-method research design. Noteworthy findings indicate that AI applications such as personalised recommendation engines, chatbots, and fraud detection systems are popular in most cases, especially among younger, technologically-oriented consumers. It serves as an indication of the significance of effective, helpful AI services in improving client relationships. However, there were a few concerns raised through qualitative themes (Table 4) that encompassed the necessity of human supervision, data safety, and insufficient knowledge on AI characteristics. Even though the increase in productivity and convenience is promised by Nebula AI, customers expect greater transparency, enhanced personalisation, and the ease of AI-human communication.

### 5.1 Strengths and Limitations

The mixed-method design, the quantitative survey with the qualitative interview and focus groups, allowed gaining a holistic picture of the perception of the clients towards Nebula AI in the Omani banking industry. This study has certain limitation, it mainly considers major banks in Oman, which might not bring an adequate generalization of the findings to other countries or banking settings with varying technological maturity or cultural backgrounds.

### 5.2 Future Considerations

Future studies should provide some comparative

insights in comparison with Gulf and other countries with banking organizations about the use of Nebula AI. Moreover, discussing the ways of growing the level of trust, e.g., data processing transparency and collaboration between humans and AI, might suggest some practical advice to the banks in order to optimize the use and the satisfaction of AI-based services.

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