

FACTORS INFLUENCING CONTINUATION INTENTION OF MOBILE BANKING USAGE: EXTENDING EXPECTANCY CONFIRMATION MODEL (ECM) AND ARTIFICIAL INTELLIGENCE (AI) WITH SECURITY AS MODERATION

Rokhimah^{1*}, Suhermin²

¹State Islamic Institute, Sorong, Indonesia

²Indonesian College of Economics, Surabaya, Indonesia

*Corresponding Author: rokhimah@iainsorong.ac.id

Abstract: This study aims to identify factors that influence continuance intention to use mobile banking by extending the Expectancy Confirmation Model (ECM) and integrating Artificial Intelligence (AI) and security as moderating variables. Data were collected from mobile banking users in Southwest Papua and analyzed using a Structural Equation Model (SEM) with the Partial Least Squares (PLS) approach. The results showed that confirmation, perceived usefulness, customer experience, and satisfaction significantly influenced continuance intention to use mobile banking. In addition, artificial intelligence that is considered intelligent and anthropomorphic also increases perceived usefulness and confirmation of expectations. The security aspect was found to moderate the relationship between perceived usefulness and satisfaction, thereby increasing user satisfaction. These findings provide important insights for mobile banking developers and policy makers to increase the adoption of digital banking services.

Keywords: Mobile Banking, (AI), (ECM), Customer Experience, Perceived Usefulness, Confirmation, Satisfaction

1. Introduction

Information and communication technology has developed rapidly in the last few decades, bringing significant changes in various sectors, including the banking sector. Today, the banking industry is a leading sector in providing and offering various Self-Service Technologies (SSTs), such as Automated Teller Machines (ATMs) online banking, and more recently mobile banking (m-banking) (Foroughi et al., 2019). In the era of disruptive technology, the emergence of artificial intelligence has fundamentally improved banking operations. The implementation of artificial intelligence is no longer an option for financial institutions and is now considered a critical tool to meet customer expectations (Koyluoglu & Acar, 2023).

Based on data on mobile banking application downloads in Indonesia throughout 2023 reported in The State of Mobile 2024 Report by Data.ai. Mobile banking application downloads are in third place, showing relatively stable numbers throughout 2023. The number of downloads per quarter ranges from 19.91 million to 21.3 million. Although the number of downloads is not as many as the loan application or digital wallet categories which are in first and second place, the number of mobile banking application downloads remains high (Databox, 2024).

The use of technology in banking services shows that mobile banking is increasingly popular, with an increase in users reaching 150% in the past year. Mobile banking is now the most dominant banking transaction channel compared to other channels (internet banking, SMS banking, ATMs and visiting branch offices). Most users choose mobile banking because of its ease of performing various services, such as transferring funds and purchasing credit. Surveys

show that 39% of Indonesians have opened digital bank accounts, and this number is predicted to increase to 100 million people by 2023 (Sharingvision, 2023).

Although AI-powered mobile banking is faster, more efficient and more effective, user acceptance of AI-driven digital banking is still in its early stages (Alnaser et al., 2023). In Indonesia, the use of mobile banking continues to grow rapidly, but the adoption and sustainability of its use in certain areas such as Southwest Papua still face special challenges that need to be considered. Based on a survey by the Indonesian Internet Service Providers Association (APJII), the internet penetration rate in 2024 will reach 79.5% of the total national population. The lowest internet penetration is on the island of Sulawesi, which is 68.35%, followed by Maluku and Papua at 69.91% (Databox, 2024). This indicates that limited internet access in underdeveloped areas, one of which is Southwest Papua, can be an obstacle to the adoption and intention to continue using mobile banking services. Thus, the intention to continue using mobile banking is very important for the success of developing mobile banking applications (Lee et al., 2023).

To understand the factors that influence the intention to continue using mobile banking, previous studies have analyzed various theoretical frameworks. Most researchers have used the TAM model (Bouhleb & Mzoughi, 2024; Jarad, 2022; Rahma & Sofyani, 2024; Setiawan & Dipa Mulia, 2023; Vaddhano, 2023), UTAUT (Abu-Taieh et al., 2022; Dhingra & Gupta, 2020; Moneim et al., 2024), TPB (Abu-Taieh et al., 2022; Rahma & Sofyani, 2024; Sasidharan & Venkatakrisnan, 2024), however, research on the adoption of continuous usage intentions using the Expectancy Confirmation Model (ECM) combined with the use of Artificial Intelligence (AI) in the banking context is still rare (Albashrawi, 2021; Foroughi et al., 2019; Lin & Lee, 2023; Tang et al., 2022) (Bhatnagr et al., 2024). And surprisingly, until now there has been no research conducted on mobile banking in the context of Indonesia that combines the ECM model with AI. On the other hand, security has been neglected in the mobile banking literature, even though the important role of security in various electronic platforms can provide more convenience and increase higher trust among customers as shown in the online environment (Moussawi et al., 2021), banking sector (Koyluoglu & Acar, 2023) and in online shopping (Balakrishnan & Dwivedi, 2024). Thus, security is considered as an antecedent or moderator of continuance intention in the banking context, as research conducted by (Albashrawi, 2021).

In mobile banking applications, AI capabilities can demonstrate efficient and autonomous behavior to facilitate users in performing banking services or transactions. Anthropomorphism refers to AI mobile banking applications that behave like humans to help people complete services or tasks. The refore, it is important to explore and investigate whether AI features affect user adoption of AI-powered banking applications. However, there is still little research conducted (Alnaser et al., 2023; Koyluoglu & Acar, 2023; Lee et al., 2023; Tang et al., 2022). Seeing the gap in various literature on the intention to continue using mobile banking, this study attempts to develop ECM and AI. The Customer Experience variable is added to the ECM model previously conducted by (Bhatnagr et al., 2024), and adding security variables as a moderation. This study focuses on mobile banking users in Southwest Papua, because there has been no research conducted in this region, so it is expected to provide new insights into the factors that influence the intention to continue using mobile banking in Southwest Papua. This study can also be used by policy makers in formulating better strategies to increase access and use of digital financial services in disadvantaged areas such as lack of infrastructure or digital literacy.

2. Literature Review

Mobile Banking

Formal banks have successfully expanded services to previously underserved areas thanks to better regulation and technological advances, offering a range of financial products such as loans, savings accounts, and mobile banking (m-banking), which support investment, business, and economic growth (D'Andrea et al., 2024). M-banking has become a primary channel for customers to interact with banks via mobile devices, initially focused on basic functions such as bill payments and balance checks, and now becoming a key element in mobile commerce (Sulistiyani et al., 2024). M-banking and payment applications are the most popular services in mobile commerce, supporting financial activities by utilizing mobile phones to access payment services such as account inquiries, transfers, and bill payments (Pollari & Ruddenklau, 2019; PWC Global Fintech Report, 2019). M-banking also includes various terms such as mobile payments, which allow payments via applications on smartphones (Carandang, 2023; Rao et al., 2024; Shanmuganathan, 2020).

Expectation Confirmation Model

Expectation Confirmation Model (ECM) proposed by Bhattacherjee (2001) is a key theory in understanding how users' expectations prior to adopting a technology, such as mobile banking, influence their satisfaction and intention to continue using the technology. According to ECM, positive confirmation of expectations when a technology meets or exceeds users' expectations increases satisfaction and intention to continue using the technology, while negative confirmation decreases satisfaction (Chen, 2024; Nguyen & Dao, 2024). ECM, which is considered superior to other models such as TAM and UTAUT, has been shown to be relevant in the context of digital services, including mobile banking, as it highlights the role of perceived usefulness (PU) and confirmation as key predictors of user satisfaction (Susanto et al., 2023; Yao & Wang, 2024). Research shows that high perceived usefulness and confirmation of user expectations influence satisfaction, which in turn increases the intention to continue using mobile banking (Bhatnagr et al., 2024; Tang et al., 2022; Yan et al., 2023). Based on ECM and previous research results, this research hypothesis proposes that:

- H1 : Confirmation has a positive effect on perceived usefulness
- H2 : Confirmation has a positive effect on satisfaction
- H3 : Perceived usefulness has a positive effect on satisfaction
- H4 : Perceived usefulness increase continuous usage of mobile banking
- H5 : Satisfaction increase continuous usage of mobile banking

Research on customer experience in digital channels, including mobile banking, shows that satisfaction with digital services builds trust and loyalty, which is critical to retaining users in the competitive digital banking sector (Huseynli, 2022). Confirmation refers to how an individual's prior beliefs influence their perception of a service, by aligning technologies such as AI to enhance personalization, convenience, and speed of service, which in turn enriches the customer experience and increases loyalty (Bhatnagr et al., 2024; Kumar et al., 2023; Sumi, 2024). Sustainable intention, according to Bhattacherjee (2001), is a process that describes an individual's intention to continue using a technology based on previous experiences, where satisfaction plays a key role in forming long-term loyalty and retention (Bhatnagr et al., 2024; Rahi et al., 2023). In digital banking, creating a safe and seamless customer experience is a key factor in driving loyalty and continued usage amidst intense competition, in line with the

principles of the Expectation Confirmation Model (ECM) (Bhatnagr et al., 2024), which adds customer experience variables, This research hypothesis proposes that:

H6 : Confirmation influencing Customer Experience in digital banking services AI enabled.

H7 : Customer experience affects continuous usage of mobile banking in AI-based digital banking services

Artificial Intelligence (AI)

Artificial Intelligence (AI) is a field that focuses on developing systems that can mimic human intelligence, with approaches that include thinking and acting like humans as well as thinking and acting logically (McCarthy, 2007; Naik, 1994; Russell & Norvig, 2010). One of the major contributions in AI is the Turing Test proposed by Alan Turing in 1950 to assess the ability of a computer to imitate human interaction (Turing, 1950). AI has been widely adopted in the banking industry, including in mobile banking, which includes applications such as fraud detection, targeted marketing campaigns, and digital assistants, enabling banks to offer more efficient, personalized, and secure services (Koyluoglu & Acar, 2023; Lee et al., 2023). Mobile banking adoption is highly dependent on user comfort with the technology, with factors such as user interface, data security, and system reliability playing a significant role in building this comfort (Albashrawi, 2021; Alnaser et al., 2023).

AI in mobile banking can increase user convenience through features such as intelligence and anthropomorphism, which influences continued usage (Tang et al., 2022). Perceived anthropomorphism, or the user's perception of human characteristics in AI, strengthens trust and the perception of humanization of the technology, thereby increasing the impression of friendliness and reliability (Barrow, 2024; Lin & Lee, 2023). In mobile banking interactions, intelligent and anthropomorphic AI can provide a more humanistic experience, where users feel that AI can communicate and help like a human, strengthening user loyalty and retention (Payne et al., 2021). Therefore, we hypothesize that:

H8 : Perceived intelligence can increase perceived anthropomorphism.

Intelligence is a key attribute of AI that enables users to improve the efficiency of online transactions, solve operational problems, and provide personalized financial advice in mobile banking (Lin & Lee, 2023). Users' recognition of the potential of AI technology is known as perceived intelligence, which influences their perception of AI's ability to handle problems quickly and efficiently, as well as improve the availability of financial services (Gerlich, 2023). AI in mobile banking enables recommendations tailored to user profiles, such as replacing manual customer support, which reinforces user confirmation when AI meets their expectations (Tang et al., 2022). AI intelligence also makes financial services easier to use, increasing perceived usefulness and user satisfaction with mobile banking. Therefore, we hypothesize that:

H9 : Perceived intelligence can increase confirmation

H10 : Perceived intelligence can increase perceived usefulness

AI can reflect emotions in interactions with users, so that users develop anthropomorphic perceptions. These anthropomorphic features can instill positive emotions, change users' attitudes and cognitions towards products, and improve user experience (Gerlich, 2023). AI can understand needs, feel emotions, and provide attention through text or images, so that users feel warm and trusting, and are more interested in interacting more deeply with AI. In the context of mobile banking, the anthropomorphic elements of AI allow users to feel that they

are getting friendly service like from humans, increasing the use and confirmation of the service (Tang et al., 2022). Therefore, we hypothesize that:

H11 : Perceived anthropomorphism can increase confirmation

H12 : Perceived anthropomorphism can increase perceived usefulness

Security

Security is a crucial factor influencing customer satisfaction and loyalty in using mobile banking (MB), as users concerns about online threats such as hacking, personal data theft, and financial fraud can lead to distrust of the service (Algandi, 2020; Goronga et al., 2024). Although mobile banking offers convenience, the security aspect is often considered a major weakness that can influence the decision to use the application (Adepu, 2024). When service providers successfully improve security, customers feel more comfortable and protected, which leads to increased satisfaction and loyalty (Albashrawi, 2021). Therefore, adequate security not only improves the convenience and performance of services but also encourages wider adoption and creates a more positive user experience. Therefore, we hypothesize that:

H13 : The level of security can moderate the relationship between perceived usefulness and satisfaction

Based on the theoretical review above, the theoretical framework in this study is arranged in the following model:

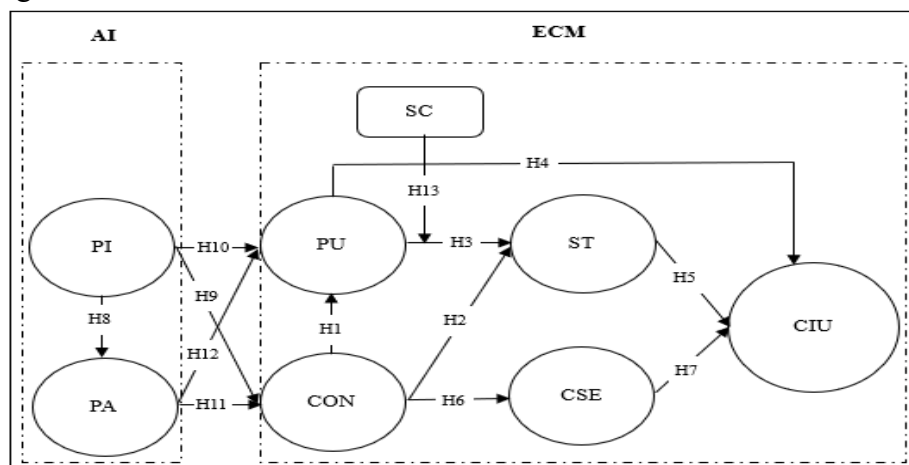


Figure 1: Theoretical Framework

3. Method

Population and Sample

The population in this study are users of financial services (customers) of banking who have experience in transacting using Mobile Banking (minimum use of 3 times). According to Hair (2006) states that to measure the sample size is calculated between (5-10) x the number of indicators. Based on these guidelines, the minimum number of samples for this study is = 5-10 x 35 indicators = 175-350 samples.

From the population, samples are selected by purposive sampling, which is sampling based on certain criteria that are adjusted to the research objectives. The criteria used in selecting samples are:

- a. Respondents domiciled in Southwest Papua Province.

- b. Respondents who have a Mobile Banking account.
- c. Respondents who are willing to fill out the questionnaire.
- d. Respondents who have used Mobile Banking at least 3 times.

The data source in this study uses primary data, with data collection techniques using questionnaire distribution. The questionnaire is divided into two components, namely general statements related to the demographics of respondents and the second questionnaire contains the perceptions of Mobile Banking users. Meanwhile, the data analysis technique used is Partial Least Square-Structural Equation Modeling (PLS-SEM) with the help of SmartPLS 3.0 software. PLS-SEM is a superior method in social science problems and is suitable for large and small samples (Hair et al., 2014).

Research Instruments

Research variables are variations in the properties of an object or activity that are determined by researchers to determine their conclusions. The variables used in this study are divided into:

Table 1. Research Instruments

Variables	Code	Scale	Source
Perceived Usefulness	PU1	Likert 1-5	Nguyen, 2024
	PU2		
	PU3		
Confirmation	CON1	Likert 1-5	Alnaser, 2023
	CON2		
	CON3		
	CON4		
Customer Experience	CE1	Likert 1-5	Bhatnagr, et al 2024
	CE2		
	CE3		
Perceived Intelligence	PI1	Likert 1-5	Lee, 2023
	PI2		
	LI3		
	PI4		
	PI5		
Perceived Anthropomorphism	PA1	Likert 1-5	Lee, 2023
	PA2		
	PA3		
	PA4		
Security	SC1	Likert 1-5	Albashrawi, et al 2021
	SC2		
	SC3		
	SC4		
	SC5		
	SC6		
	SC7		
	SC8		
Continuous Usage Mobile Banking	CIU1	Likert 1-5	Nguyen, 2024
	CIU2		
	CIU3		
Satisfaction	ST1	Likert 1-5	Nguyen, 2024

Variables	Code	Scale	Source
	ST2		
	ST3		
	ST4		

Source: Primary Data, 2024

4. Result and Discussion

Respondent Demographics

Table 2. Demographic Profile of Respondents

Respondent Characteristics	F	%
Gender		
Man	82	30%
Woman	192	70%
Age		
17-22 Years	129	47,3%
23- 28 Years	57	20,9%
29- 34 Years	50	18,3%
>34 Years	37	13,6%
Region of Origin		
Sorong Regency	77	28,2%
Sorong City	82	30%
South Sorong Regency	28	10,3%
Maybrat Regency	28	10,3%
Tambrau Regency	25	9,2%
Raja Ampat Regency	33	12,1%
Type of work		
Students	132	48,4%
Businessman	21	7,7%
Civil Servants/TNI/POLRI	28	10,3%
Private sector employee	50	18,3%
Housewife	27	9,9%
Other	14	5,1%
Income		
Rp. 0- Rp. 2,000,000	142	52%
Rp. 2,000,000-Rp. 4,000,000	63	23,1%
Rp. 4,000,000-Rp. 6,000,000	38	13,9%
Rp. 6,000,000-Rp. 8,000,000	13	4,8%
>Rp. 8,000,000	17	6,2%
Types of Mobile Banking Used		
BRIMo	90	33%
Living Independently	61	22,3%
BCA Mobile	9	3,3%

Respondent Characteristics	F	%
BNI Mobile	14	5,1%
BSI Mobile	30	11%
Muamalat Mobile	66	24,2%
Other	3	1,1%
Length of Use		
Less than 6 months	11	4%
6 Months -1 year	45	16,5%
1 Year – 2 Years	88	32,2%
More than 2 Years	129	47,3%
Frequency of Use		
Faithful Day	50	18,3%
Once Every 2 Days	56	20,5%
Once a week	53	19,4%
1 Week 2 Times	85	31,1%
Once a Month	23	8,4%
Other	6	2,3%

Source: Primary Data, 2024

Evaluation of Measurement Model (Outer Model)

This study uses a structural equation model (SEM) Partial Least Square (PLS). The non-parametric method approach is based on total variance, using SmartPLS 3.0 software. The first step is to evaluate the measurement model (Outer Model) by looking at its validity and reliability. The Loading factor value shows the validity test, for all loading factors each indicator is above the threshold of 0.5. Cronbach's alpha and composite reliability (CR) are calculated to test the reliability of the factors. For Cronbach's alpha and CR, all item values are above the threshold of 0.6 (Hair et al., 2019) as shown in Table 3. The AVE value indicates the extent to which the items explain the variance of the construct, which is suggested to be more than 0.5 (Hair et al., 2019). Thus, table 3 shows that the model is good.

Table 3. Measurement Model

Variables	Indicator	Factor Loading	Alpha	CR	AVE
Perceived Useful	PE1	0.890	0.83	0.898	0.746
	PE2	0.859			
	PE3	0.843			
Confirmation	CON1	0.727	0.830	0.888	0.665
	CON2	0.837			
	CON3	0.843			
	CON4	0.849			
Customer Experience	CE1	0.825	0.747	0.854	0.661
	CE2	0.788			
	CE3	0.842			
Perceived Intelligence	PI1	0.632	0.804	0.865	0.564
	PI2	0.785			

Variables	Indicator	Factor Loading	Alpha	CR	AVE
	PI3	0.752	0.731	0.824	0.547
	PI4	0.815			
	PI5	0.760			
Perceived Anthropomorphism	PA1	0.579	0.731	0.824	0.547
	PA2	0.634			
	PA3	0.839			
	PA4	0.864			
Security	SC1	0.794	0.911	0.927	0.613
	SC2	0.732			
	SC3	0.788			
	SC4	0.794			
	SC5	0.754			
	SC6	0.787			
	SC7	0.793			
	SC8	0.820			
Continuous Usage Mobile	CUI1	0.856	0.786	0.875	0.661
	CUI2	0.857			
	CUI3	0.796			
Satisfaction	ST1	0.565	0.745	0.843	0.578
	ST2	0.797			
	ST3	0.816			
	ST4	0.832			

Source: Smart-PLS data processing results, 2024

The next measurement model involves discriminant validity analysis to ensure the latent variables differ from other constructs in the model (Hair Jr et al., 2017). The discriminant validity of the measurement model can be analyzed using the Fornell-Larcker criteria (Fornell & Larcker, 1981). Each construct must have a larger diagonal AVE square root with (off-diagonal) correlation for all constructs. The AVE root value of each variable is greater than the AVE value in table 4. These values confirm convergent validity, and this shows that all constructs in the research framework are empirically different.

Table 4. Discriminant Validity

	CE	CIU	CON	PA	PI	PU	SC	ST
CE	0.813							
CIU	0.664	0.837						
CON	0.715	0.614	0.816					
PA	0.666	0.637	0.708	0.740				
PI	0.695	0.69	0.772	0.717	0.751			
PU	0.618	0.557	0.761	0.597	0.683	0.864		
SC	0.732	0.774	0.621	0.711	0.693	0.527	0.783	
ST	0.537	0.584	0.602	0.552	0.616	0.556	0.597	0.760

Source: Smart-PLS data processing results, 2024

Anthropomorphism by 0.602 or 60.2%. And finally, satisfaction is influenced by perceived usefulness and confirmation by 0.474 or 47.4%.

Table 6. Path Coefficient (Direct Influence)

	Hypothesis	Original Sample	T Statistics	P Values	Information
H1	CON -> PU	0.562	7.177	0.000	Accepted
H2	CON ->ST	0.233	2,439	0.008	Accepted
H3	PU -> ST	0.092	1.214	0.113	Rejected
H4	PU-> CIU	0.137	0.779	0.038	Accepted
H5	ST-> CIU	0.277	3,846	0.000	Accepted
H6	CON->CE	0.715	19,563	0.000	Accepted
H7	CE -> CIU	0.431	6,614	0.000	Accepted
H8	PI -> PA	0.717	18,927	0.000	Accepted
H9	PI -> CON	0.545	10,443	0.000	Accepted
H10	PI -> PU	0.217	2,839	0.002	Accepted
H11	PA -> CON	0.308	6,495	0.000	Accepted
H12	PA -> PU	0.044	0.5360	0.296	Rejected

Source: Smart-PLS data processing results, 2024

Table 7. Path Coefficient (Moderation Influence)

	Hypothesis	Original Sample	T Statistics	P Values	Information
H13	SC -> ST	-0.076	2.248	0.013	Accepted

Source: Smart-PLS data processing results, 2024

Discussion

The use of artificial intelligence in digital banking services has great potential in improving customer experience. AI-based models can help banks better understand customer needs and behavior by leveraging data analysis and statistical methods, which in turn supports the development of customer-centric strategies (Nguyen & Dao, 2024). The research framework has integrated the expectation confirmation model (ECM) with artificial intelligence (AI) factors and investigated the continuance intention to use mobile banking towards AI-supported digital banking. This study integrates three main aspects of AI (perceived anthropomorphism and perceived intelligence) along with the components of the Expectancy Confirmation Model (ECM) including confirmation, perceived usefulness, satisfaction, customer experience and continuance intention to use (continuous usage) in the framework of mobile banking services. And security as a moderating variable.

This study shows empirical results that establish that H1, H2 and H6 are accepted. This means that confirmation is positively and significantly related to perceived usefulness, satisfaction and customer experience which is consistent with previous research by (Albashrawi, 2021; Bhatnagr et al., 2024; Foroughi et al., 2019). Confirmation as part of the Expectation

Confirmation Model (ECM) plays an important role in shaping user perceptions of perceived usefulness, satisfaction, and overall customer experience, thus strengthening the application of this theory in the context of digital services such as mobile banking. The findings also show that H7 is accepted, which means that perceived usefulness has an influence on increasing the intention to continue using (continuous usage). This indicates that the greater the benefits perceived by users, the higher the likelihood they will continue using the service. These results support previous studies that also show the importance of perceived usefulness in increasing loyalty and continued use of digital services (Tang et al., 2022).

The accepted H4 shows that customer experience plays an important role in influencing the continued intention to use mobile banking services. This is in line with research (Bhatnagr et al., 2024), which emphasizes that customers' positive experiences in using digital services can strengthen their intention to continue using the service in the future. H5, which is accepted, indicates that satisfaction has a positive and significant relationship with the intention to continue using mobile banking services. This result supports the research Tang et al. (2022) which states that satisfaction is a key factor that drives users to remain loyal to digital services. High satisfaction will increase customer loyalty and their desire to continue using the service, which is important for the sustainability of the digital banking business (Yan et al., 2023).

In the AI framework, the results of the study indicate that perceived intelligence has a significant effect on perceived anthropomorphism, confirmation, and perceived usefulness, as evidenced by the acceptance of hypotheses H8, H9, and H10. High perceived intelligence makes AI more perceived as having human characteristics (anthropomorphism), in accordance with the findings (Bhatnagr *et al.*, 2024), where intelligent AI is considered capable of imitating human behavior. In addition, AI that meets users' cognitive expectations strengthens confirmation, in line with research (Lee et al., 2023) which confirms that AI that is able to meet user expectations increases satisfaction and trust. Finally, AI that is considered intelligent also increases perceived usefulness, in line with the findings (Koyluoglu and Acar, 2023), where intelligent AI is perceived as more useful and relevant in solving user problems. These results together reinforce the understanding that perceived intelligence of AI plays a significant role in strengthening user acceptance and experience of the technology.

The empirical results also show that perceived anthropomorphism has a significant influence on increasing confirmation, as evidenced by the acceptance of hypothesis H11. Perceived anthropomorphism increases confirmation, where AI that is perceived as more human-like is considered capable of meeting user expectations, in line with the findings Gerlich (2023) which shows that anthropomorphic AI is more trusted to perform tasks effectively. Furthermore, perceived anthropomorphism was shown to have no influence on perceived utility, hence H12 was discarded. Shi et al. (2022) in (So et al., 2024) discovered that perceived anthropomorphism did not always have a substantial effect on perceived usefulness. Anthropomorphism has a greater impact on emotional or social relationships with users but does not always increase the perception of the practical usefulness of technology in completing certain tasks. Zhang and Wang's (2023) investigation revealed that the amount of AI intelligence had no significant impact on perceived utility.

The results of this study indicate that perceived usefulness does not have a significant effect on satisfaction, so hypothesis 3 is rejected. This can be seen from the demographic analysis of respondents, where the majority are students. This means that this group may have different expectations regarding the usefulness of technology in increasing their satisfaction. Students often focus more on other aspects such as ease of use, convenience, or accessibility than practical usefulness in daily activities. In addition, they may also prioritize security and privacy

features, which are more relevant to their digital experience, rather than just the function of the usefulness of technology. However, the security variable was found to moderate the relationship between the two, thereby increasing the relationship between perceived usefulness and satisfaction. This means that when the security aspect is more considered, users tend to feel more satisfied even though the perceived usefulness does not directly affect satisfaction. These results are in line with research Al-Bashrawi (2021), which shows that security plays an important role in increasing user trust and satisfaction, especially in the use of technology involving personal or financial data.

Overall, these results confirm that user perceptions of human characteristics in AI play a significant role in enhancing user satisfaction through the conformity of expectations and the perception of the usefulness of the technology. Overall, these findings strengthen the role of factors such as perceived usefulness, customer experience, and satisfaction in shaping the continuance intention to use mobile banking services. Thus, the empirical findings have confirmed that digital banking led by artificial intelligence meets customer expectations and enhances satisfaction.

5. Conclusions

This study examines the factors influencing the continuance intention to use mobile banking extended by the Expectancy Confirmation Model (ECM) and artificial intelligence (AI) and moderated by security. The main findings show that confirmation, perceived usefulness, customer experience, and satisfaction play a significant role in driving continuance intention to use mobile banking. Intelligent and anthropomorphic artificial intelligence also play an important role in increasing user satisfaction. This study suggests that mobile banking application developers and policy makers should pay attention to the security and customer experience aspects to increase the adoption and continuous use of digital financial services, especially in regions such as Papua Barat Daya.

References

- Abu-Taieh, E. M., AlHadid, I., Abu-Tayeh, S., Masa'deh, R., Alkhaldeh, R. S., Khwaldeh, S., & Alrowwad, A. (2022). Continued Intention to Use of M-Banking in Jordan by Integrating UTAUT, TPB, TAM and Service Quality with ML. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(3), 120. <https://doi.org/10.3390/joitmc8030120>
- Adepu, A. (2024). Security Risks and Mitigation Strategies in Mobile. *International Journal of Research in Information Security*, 10(05), 654–659.
- Albashrawi, M. A. (2021). Mobile Banking Continuance Intention. *Journal of Information Technology Research*, 14(1), 55–69. <https://doi.org/10.4018/jitr.2021010104>
- Algamdi, A. (2020). Milev Journal of Research and Studies. *Milev Journal of Research and Studies*, 6(2), 506–523.
- Alnaser, F. M., Rahi, S., Alghizzawi, M., & Ngah, A. H. (2023). Does Artificial Intelligence (AI) Boost Digital Banking User Satisfaction? Integration of Expectation Confirmation Model and Antecedents of Artificial Intelligence Enabled Digital Banking. *Elsevier*, 2(8), 1–13.
- Balakrishnan, J., & Dwivedi, Y. K. (2024). Conversational commerce: entering the next stage of AI-powered digital assistants. In *Annals of Operations Research* (Vol. 333, Issues 2–

- 3). Springer US. <https://doi.org/10.1007/s10479-021-04049-5>
- Barrow, N. (2024). Anthropomorphism and AI hype. *AI and Ethics*, 4(3), 707–711. <https://doi.org/10.1007/s43681-024-00454-1>
- Bhatnagr, P., Rajesh, A., & Misra, R. (2024). Continuous intention usage of artificial intelligence enabled digital banks: a review of expectation confirmation model. *Journal of Enterprise Information Management*. <https://doi.org/10.1108/JEIM-11-2023-0617>
- Bhattacharjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly*, 25(3), 351–370.
- Bouhleb, O., & Mzoughi, M. N. (2024). An Investigation of Users' Continuance Intention toward Mobile Banking Applications. *International Journal of Business*, 29(1), 109–134. [https://doi.org/10.55802/IJB.029\(1\).005](https://doi.org/10.55802/IJB.029(1).005)
- Carandang, G. M. A. (2023). Enhancing Perceptions and Behavior: Exploring Factors Influencing Mobile Banking Services and Artificial Intelligence Adoption in Lipa City, Batangas. *International Journal of Research Publications*, 132(1), 58–76. <https://doi.org/10.47119/ijrp1001321920235454>
- Chen, H.-J. (2024). Assessing the Influence of Optimism on Users' Continuance Use Intention of ChatGPT: An Expectation-Confirmation Model Perspective. *International Journal of Management Studies and Social Science Research*, 06(01), 347–353. <https://doi.org/10.56293/ijmsssr.2024.4831>
- D'Andrea, A., Hitayezu, P., Kpodar, K., Limodio, N., & Presbitero, A. F. (2024). Mobile Internet, Collateral, and Banking. *International Monetary Fund*, 1–69.
- Databoks. (2024a). *Aplikasi Keuangan Terbanyak Diunduh di Indonesia 2023, Pinjaman Teratas*. Databoks. <https://databoks.katadata.co.id/datapublish/2024/01/22/aplikasi-keuangan-terbanyak-diunduh-di-indonesia-2023-pinjaman-teratas>
- Databoks. (2024b). *Penetrasi Internet Indonesia Belum Merata, Terendah di Sulawesi*. Databoks. <https://databoks.katadata.co.id/datapublish/2024/02/01/penetrasi-internet-indonesia-belum-merata-terendah-di-sulawesi>
- Dhingra, S., & Gupta, S. (2020). Behavioural intention to use mobile banking: An extension of UTAUT2 model. *International Journal of Mobile Human Computer Interaction*, 12(3), 1–20. <https://doi.org/10.4018/IJMHCI.2020070101>
- Foroughi, B., Iranmanesh, M., & Hyun, S. S. (2019). Understanding the determinants of mobile banking continuance usage intention. *Journal of Enterprise Information Management*, 32(6), 1015–1033. <https://doi.org/10.1108/JEIM-10-2018-0237>
- Gerlich, M. (2023). Perceptions and Acceptance of Artificial Intelligence: A Multi-Dimensional Study. *Social Sciences*, 12(9). <https://doi.org/10.3390/socsci12090502>
- Goronga, R., DV, A., & Lotriet, H. (2024). Mobile Banking Application Security Factors Model for Aged Users. *Ssrn*.
- Hair, J. F. (2006). *Multivariate Data Analysis* (5th ed.). Gramedia Pustaka Utama.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24.
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. (2014). Partial Least Squares Structural Equation Modeling (PLS-SEM) An Emerging Tool in Business Research. *European Business Review*, 2(26), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
- Huseynli, B. (2022). Digital transformation for improving customer experience. *Handbook of Research on Interdisciplinary Reflections of Contemporary Experiential Marketing Practices*, July, 78–100. <https://doi.org/10.4018/978-1-6684-4380-4.ch005>
- Jarad, A. L. G. A. (2022). Continuous Intention to Use Mobile Banking Apps: Empirical Study

- in Iraq. *Theory, Methodology, Practice*, 18(1), 61–74. <https://doi.org/10.18096/tmp.2022.01.05>
- Koyluoglu, A. S., & Acar, O. E. (2023). A Study on Adoption of Artificial Intelligence Use in Mobile Banking. *Casopis Za Ekonomiju I Trzisne Komunikacije*, 13(2), 344–361. <https://doi.org/10.7251/EMC2302344K>
- Kumar, R., Singh, R., Kumar, K., Khan, S., & Corvello, V. (2023). How Does Perceived Risk and Trust Affect Mobile Banking Adoption? Empirical Evidence from India. *Sustainability (Switzerland)*, 15(5), 1–21. <https://doi.org/10.3390/su15054053>
- Lee, J. C., Tang, Y., & Jiang, S. Q. (2023). Understanding Continuance Intention of Artificial Intelligence (AI)-enabled Mobile Banking Applications: an Extension of AI Characteristics to an Expectation Confirmation Model. *Humanities and Social Sciences Communications*, 10(1), 1–12. <https://doi.org/10.1057/s41599-023-01845-1>
- Lin, R. R., & Lee, J. C. (2023). The supports provided by artificial intelligence to continuous usage intention of mobile banking: evidence from China. *Aslib Journal of Information Management*. <https://doi.org/10.1108/AJIM-07-2022-0337>
- McCarthy, J. (2007). What is Artificial Intelligence? *Stanford University*, 1–12. <https://doi.org/10.1016/B978-0-323-95068-8.00001-7>
- Moneim, Y. F. A., Farid, S., Abdelkader, M., & Ragheb, M. A. (2024). The Impact of UTAUT, trust perspective and bank's reputation on actual use of mobile banking with mediating role of behavioral intention: An empirical study on commercial banks in Egypt. *Journal of Electrical Systems*, 20(4s), 1553–1562. <https://doi.org/10.52783/jes.2197>
- Moussawi, S., Koufaris, M., & Benbunan-Fich, R. (2021). How perceptions of intelligence and anthropomorphism affect adoption of personal intelligent agents. *Electronic Markets*, 31(2), 343–364. <https://doi.org/10.1007/s12525-020-00411-w>
- Naik, B. (1994). Artificial Intelligence. *Artificial Intelligence*. <https://doi.org/10.1017/9781009258227>
- Nguyen, G. Do, & Dao, T. H. T. (2024). Factors influencing continuance intention to use mobile banking: an extended expectation-confirmation model with moderating role of trust. *Humanities and Social Sciences Communications*, 11(1). <https://doi.org/10.1057/s41599-024-02778-z>
- Payne, E. H. M., Peltier, J., & Barger, V. A. (2021). Enhancing the value co-creation process: artificial intelligence and mobile banking service platforms. *Journal of Research in Interactive Marketing*, 15(1), 68–85. <https://doi.org/10.1108/JRIM-10-2020-0214>
- Pollari, I., & Ruddenklau, A. (2019). The Pulse of Fintech 2018. *KPMG, February*, 1–75. <https://assets.kpmg/content/dam/kpmg/xx/pdf/2019/02/the-pulse-of-fintech-2018.pdf>
- PWC Global Fintech Report. (2019). Global Fintech 2019. In *PwC Global Fintech Report*. <https://www.pwc.com/gx/en/industries/financial-services/assets/pwc-global-fintech-report-2019.pdf>
- Rahi, S., Alghizzawi, M., & Ngah, A. H. (2023). Factors influence user's intention to continue use of e-banking during COVID-19 pandemic: the nexus between self-determination and expectation confirmation model. *EuroMed Journal of Business*, 18(3), 380–396. <https://doi.org/10.1108/EMJB-12-2021-0194>
- Rahma, N., & Sofyani, H. (2024). The influence of islamic banking digital service quality on intention to continue using islamic banking: a case of Indonesia. *Journal of Accounting and Investment*, 25(1), 269–288. <https://doi.org/10.18196/jai.v25i1.18841>
- Rao, D. M., Nayak, P. N., Roshni, M., & Aayushi, P. (2024). The Study on Perception of Youngsters towards Mobile Payments in Financial Services. *International Journal of*

- Research Publication and Reviews*, 5(4), 4740–4752.
<https://doi.org/10.55248/gengpi.5.0424.1051>
- Russell, S. J., & Norvig, P. (2010). Artificial Intelligence. In *2010 The 2nd International Conference on Computer and Automation Engineering, ICCAE 2010* (Vol. 4).
<https://doi.org/10.1109/ICCAE.2010.5451578>
- Sasidharan, A., & Venkatakrishnan, S. (2024). Intension to Use Mobile Banking: An Integration of Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM). *KSII Transactions on Internet and Information Systems*, 18(4), 1059–1074.
<https://doi.org/10.3837/tiis.2024.04.013>
- Setiawan, S. O., & Dipa Mulia. (2023). Factors that Influence Intention to use Mobile Banking. *Dinasti International Journal of Digital Business Management*, 4(5), 969–979.
<https://doi.org/10.31933/dijdbm.v4i5.2017>
- Shanmuganathan, M. (2020). Behavioural finance in an era of artificial intelligence: Longitudinal case study of robo-advisors in investment decisions. *Journal of Behavioral and Experimental Finance*, 27, 100297. <https://doi.org/10.1016/j.jbef.2020.100297>
- Sharingvision. (2023). *Survey Business IT Outlook 2023 Sharing Vision: Mobile Banking menjadi Primadona*. Sharingvision. <https://sharingvision.com/insight/survey-2022-sharing-vision-mobile-banking-menjadi-primadona/>
- So, K. K. F., Kim, H., Liu, S. Q., Fang, X., & Wirtz, J. (2024). Service robots: the dynamic effects of anthropomorphism and functional perceptions on consumers' responses. *European Journal of Marketing*, 58(1), 1–32. <https://doi.org/10.1108/EJM-03-2022-0176>
- Sulistiyani, Nurchayati, Nurchayati, & Handani, N. D. (2024). User Experience of Mobile Banking Application in Indonesia: New Technology of Banking. *Global Business and Finance Review*, 2(March), 127–141.
- Sumi, R. S. (2024). E-learner's continuance usage behavior of online learning: integration of ECM and TAM. *International Journal of Research in Business and Social Science* (2147-4478), 13(2), 382–393. <https://doi.org/10.20525/ijrbs.v13i2.3171>
- Susanto, P., Hoque, M. E., Nisaa, V., Islam, M. A., & Kamarulzaman, Y. (2023). Predicting m-Commerce Continuance Intention and Price Sensitivity in Indonesia by Integrating of Expectation-Confirmation and Post-acceptance Model. *Sage Open*, 13(3), 1–22.
<https://doi.org/10.1177/21582440231188019>
- Tang, Y., Jiang, S., & Lee, J. C. (2022). *Continuous Usage Intention of Artificial Intelligence (AI)-Enabled Mobile Banking: A Preliminary Study*. 135–139.
https://doi.org/10.2991/978-94-6463-036-7_20
- Turing, A. M. (1950). Computing Machinery and Intelligence Author (s): A . M . Turing Source : Mind , New Series , Vol . 59 , No . 236 (Oct . , 1950), pp . 433-460 Published by : Oxford University Press on behalf of the Mind Association Stable URL : [http://www.jstor.org/sta. Mind, 59\(236\), 433–460](http://www.jstor.org/sta. Mind, 59(236), 433–460).
- Vaddhano, N. (2023). Continuance Intention of Mobile Banking Applications in Indonesia: Integrated TAM-Delone and Mclean Model. *International Journal of Economics, Business and Management Research*, 07(12), 01–22.
<https://doi.org/10.51505/ijebmr.2023.71201>
- Yan, M., Filieri, R., & Gorton, M. (2023). Continuance Intention With Online Technology: A systematic Literature Review. *International Journal of Phytoremediation*, 21(1), 1.
- Yao, N., & Wang, Q. (2024). Factors influencing pre-service special education teachers' intention toward AI in education: Digital literacy, teacher self-efficacy, perceived ease

of use, and perceived usefulness. *Heliyon*, 10(14), e34894.
<https://doi.org/10.1016/j.heliyon.2024.e34894>

Zhang, Y., & Wang, S. (2023). The influence of anthropomorphic appearance of artificial intelligence products on consumer behavior and brand evaluation under different product types. *Journal of Retailing and Consumer Services*, 74, 103432.
<https://doi.org/https://doi.org/10.1016/j.jretconser.2023.103432>