

How to Boost the Penetration of Mobile Banking Micro-Fisheries Enterprises in the Rural Small Islands Region?

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Abstract

Purpose – The objective of the study was to examine and analyze the determine factors of intention to use mobile banking for micro fisheries enterprises in Kei Islands, eastern Indonesia, using technology adoption model (TAM)

Methodology – We used purposive sampling and surveyed 320 future users of mobile banking in Kei Islands, eastern Indonesia from August to October 2024. Based on questionnaire validation there were 290 sample that fit to be used. Using PLS-SEM for data analysis.

Findings – The study offers valuable insights for the government and banking industry to enhance mobile banking in coastal island fisheries micro-enterprises by improving design effects mobile banking usage because it impacts utility, which is mediated by security and comfort

Originality – The outcome of the study recommends for government to improve literacy of micro-enterprises in small islands region and at the same bank industry can make sure to design mobile banking that offer simplicity but also maintain the security and functionality for not micro-enterprises in the region but also as guidance for region with similar socio-economy and geographical characteristic.

1. Introduction

The global trend of rapid expansion and increasing adoption of financial technology (FinTech) services across various sectors (Zhao et al., 2024). This surge has been propelled by technological advancements and a growing number of smartphone users. Empirical evidence indicates that mobile devices, including PCs (personal computers) and smartphones, have become primary channels for accessing and conducting financial transactions via FinTech platforms (Zhao et al., 2024). The use of non-bank money transfers and peer-to-peer payments also demonstrates a significant trend in digital financial activities (Nugraha et al., 2022). The global reach of FinTech is substantial, with companies operating in numerous countries, suggesting a widespread impact on financial service delivery. Collaborations with FinTech firms are increasingly seen as a way to reduce administrative costs and accelerate service provision, ultimately boosting market profitability. However, there is a noted deficiency in research that integrates multiple relevant

theoretical frameworks to capture the complex interplay of cognitive, social, cultural, religious, and risk-related factors influencing FinTech adoption across diverse geographical locations and user segments, including a lack of longitudinal studies and qualitative investigations to provide a deeper understanding of user experiences and the actual, sustained usage of FinTech services beyond mere adoption intention (Kumar & Rani, 2024; Robbana et al., 2025).

In rural coastal areas, micro-enterprises encounter challenges hindering their growth and sustainability. Among those challenges, micro enterprises in general and even more in coastal regions often face difficulties securing loans or credit, primarily due to a lack of sufficient collateral and an underdeveloped formal banking infrastructure. This situation highlights a critical issue concerning limited access to financing. However, financial technology can help medium, small, and microenterprises (MSMEs) overcome the challenges of accessing traditional financing by providing alternative financing solutions, enabling MSMEs to apply for online loans, obtain working capital, and support business development (Rizal et al., 2019). Furthermore, financial technology allows MSMEs to accept digital payments, such as through payment applications or digital wallets (Husna et al., 2021). In the Kei Islands, eastern Indonesia, the study showed that the proportion of micro fisheries enterprises in the region that want to access financial support institutions was higher than those who refuse to seek financial help (Pentury, 2021) and at the same time, there is also a positive trend in the penetration of FinTech for fisheries and marine farmers in the region for their daily transaction (Pentury, 2023). However, MSME characteristics and types of MSME businesses have different challenges and risks in using and adapting to the digital financial system and technology facilities that are currently emerging. Additionally, the intensity of introduction and familiarity with information technology remains very low among micro-entrepreneurs in rural areas, especially in coastal regions that are still relatively isolated.

Given the significant positive impact mobile banking applications can offer in enabling transactions and preserving financial records for business operations and daily transaction management, empirical research is therefore crucial on the adoption capabilities of micro-fishermen entrepreneurs in the coastal areas of the Kei Islands. Thus, the objective of the study was to examine and analyze the empirical condition of mobile banking use in micro fisheries enterprises in Kei Islands, eastern Indonesia. By doing so, we can provide an empirical condition of means to improve the penetration of mobile in business transaction. The business transaction with mobile banking for micro fisheries enterprises can help business owner to have an efficient transaction while at the same time improve their financial system which can boost their financial credibility to bank and loan enterprise, which became one of the main challenges of micro fisheries enterprises in the coastal region.

This study employs the Technology Adoption Model (TAM) as its foundational concept and methodology. The TAM method is commonly utilized to promote technology adoption among potential users who are not currently engaging with the technology to a significant extent (Albastaki, 2024). Moreover, the TAM method has seen extensive application within the financial sector, particularly regarding the adoption of internet banking, fintech, and mobile banking (Ashique Ali & Subramanian, 2024; Musa et al., 2024). Therefore, the problem-solving strategy employed in this study, which aims to enhance the adoption of mobile banking for micro-fishing business transactions in the coastal regions of the Kei Islands, has been validated and is effective in tackling the challenges identified in this research.

Moreover, to the best of our knowledge, there are no previous study related to examine and analyze the penetration of mobile banking in small islands region in Indonesia with remote characteristic especially for micro fisheries enterprises. For the context, micro fisheries enterprises in the study refer to fishery, farmers, processing fisheries products and business owner that related

to exploitation and utilization of fisheries and marine resources in micro scale level. We choose micro enterprises because the group are the vulnerable one and tend to escape from the study. Furthermore, the structure of article as follows, literature review section contains review of previous related study for state of the art of the study, hypothesis of the study, and study conceptual framework. Followed by material and method which consist of description of study location, data collection approach and data analysis. In result section contain the report of the main result of the study, then discussion to analyze and justify the result and conclusion and recommendation as the closing section.

1.1. Hypothesis of the Study

The design of mobile banking significantly influences user comfort (Shams et al., 2020). The design of mobile banking relates to the user interface (UI) design, which is crafted to enhance user interaction with the technology, sometimes termed as user-friendly. An effective UI/UX design is crucial to an application's success. Developing a favorable, straightforward, and efficient user experience is essential for enhancing user adoption and ensuring their pleasure. The design and content of the mobile banking application must be meticulously organized; a series of judicious and harmonious graphic choices can captivate customer interest in the mobile banking brand, enhancing the application design's quality and subsequently increasing banking performance (Chaouali et al., 2019). Consequently, an appealing and user-friendly design might instill a perception of ease in utilizing mobile banking (Cyr et al., 2006).

H_{1a}: Design has positive and significant impact to ease to use of mobile banking

H_{1b}: Design has positive and significant impact to comfort using of mobile banking

H_{1c}: Design has positive and significant impact to security of mobile banking

The ease of use of mobile banking applications significantly contributes to user comfort, a crucial element in technological adoption. Applications that are user-friendly and comprehensible enable consumers to execute financial transactions seamlessly, hence enhancing their familiarity with the service (Davis, 1989). Moreover, user comfort with an application is significantly affected by a straightforward interface, simple navigation, and expedited transaction procedures, which diminish cognitive fatigue and enhance user pleasure (Venkatesh & Davis, 2000). User-friendly mobile banking applications alleviate technological irritation, fostering a positive experience that encourages ongoing ease in utilizing digital financial services (Gefen et al., 2003). The usability of mobile banking applications significantly contributes to user comfort, a crucial element in the adoption of technology. Applications that are intuitively built provide seamless financial transactions for users, hence enhancing their comfort with the service (Davis, 1989). User comfort with an application is significantly affected by a straightforward interface, simple navigation, and expedited transaction procedures, which diminish cognitive fatigue and enhance user pleasure (Venkatesh & Davis, 2000). User-friendly mobile banking applications alleviate technological irritation, fostering a positive experience that encourages ongoing ease in utilizing digital financial services (Gefen et al., 2003).

Furthermore, an intuitive system might inherently affect an individual's propensity to utilize it. The user-friendliness of mobile banking positively influences client engagement with the service. This aligns with the findings of the study done by (Raza et al., 2017), which indicates that the perception of ease to use positively influences customer interest in utilizing mobile banking. Research indicates that simplicity of use can significantly affect an individual's interest in utilizing mobile banking (Prayudi et al., 2022). The simplicity of a mobile banking system can motivate

individuals to adopt and utilize it, provided that the services offered are comprehensible and user-friendly.

H_{2a}: Ease to use has positive and significant impact to user comfort in use of mobile banking

H_{2b}: Ease to use has positive and significant impact to usefulness of mobile banking

H_{2c}: Ease to use has positive and significant impact to intention to use of mobile banking

Security is a significant determinant affecting the inclination to utilize mobile banking (Vaithilingam et al., 2013). In mobile banking, security encompasses the safeguarding of users' personal and financial information, along with the application's robustness against risks like hacking or data abuse. Studies indicate that the notion of elevated security enhances customers' trust in the service, therefore augmenting their desire to use the mobile banking application (Kim et al., 2010). Users who see their information as secure are more inclined to utilize the program consistently (Flavian & Guinaliu, 2006). Moreover, clear, and comprehensible security protocols, such two-factor authentication, and data encryption, enhance users' perception of security, hence reinforcing their inclination to embrace mobile banking (Shin, 2009). Moreover, Positive perceptions of security foster an enhanced experience, allowing users to concentrate on the advantages of the service without being hindered by potential threats, therefore reinforcing overall user comfort.

H_{3a}: Security has positive and significant impact to user comfort in use of mobile banking

H_{3b}: Security has positive and significant impact to usefulness of mobile banking

H_{3c}: Security has positive and significant impact to intention to use of mobile banking

Good service quality significantly enhances the perceived usefulness of mobile banking applications, hence influencing user happiness and the desire to persist in use the service. Users are more inclined to regard the program as a valuable resource in their daily routines when they consider customer service as consistently attentive, competent, and adept at swiftly addressing issues or inquiries (Zeithaml et al., 2002). Effective and prompt service enables users to finalize transactions or get assistance seamlessly, hence enhancing their sense of the use of mobile banking (Parasuraman et al., 1988). Moreover, services that guarantee reliable application performance with few mistakes and provide convenient access to diverse financial features enhance utility, as users see the application as efficiently addressing their financial requirements. Consequently, superior service quality enhances customers' impression of the high utility value of mobile banking applications in fulfilling their financial requirements. Moreover, users who perceive high-quality services as beneficial typically exhibit greater intents to persist in utilizing mobile banking applications, as they regard these services as useful and dependable in addressing their financial requirements (Sampaio et al., 2017). Consequently, high service quality can promote the intention for sustained and recurrent usage of mobile banking. This continuous engagement enhances user happiness and fosters trust and comfort in utilizing the application, which are crucial elements in sustaining customer loyalty (Ladhari, 2009).

The comfort experienced by consumers when utilizing a mobile banking application significantly influences their intention to utilize the service (Qatawneh & Makhlof, 2025). This convenience encompasses navigational ease, rapid access, and an intuitive interface, enabling users to execute transactions seamlessly and without hindrance (Zhou et al., 2010). When users experience comfort and security when utilizing the application, they are more inclined to feel content and regard the mobile banking application as an effective instrument for their everyday financial requirements (Bhattacherjee, 2001). An elevated degree of comfort diminishes the likelihood of worry or anxiety stemming from technical elements, fostering a favorable inclination

to persist in using the program over the long run (Venkatesh et al., 2003). Consequently, the convenience of mobile banking for consumers immediately increases their intention to use the service consistently.

H4: User comfort has positive and significant impact to user comfort in use of mobile banking

The utility of a mobile banking application significantly influences the desire to utilize the service. Users are more inclined to accept and persist in utilizing a mobile banking application when they recognize that it enhances their financial operations, including swiftly and effectively checking balances, executing transactions, or settling payments (Davis, 1989). Furthermore, studies indicate that perceptions of utility correlate favourably with user pleasure, thereby enhancing the intention to persistently utilize the mobile banking application (Luo et al., 2010). Consequently, the belief that a mobile banking application is beneficial immediately enhances users' intention for prolonged usage. Moreover, a positive user experience might stem from pertinent and effective features that facilitate job completion, hence enhancing the sense of the application's genuine utility in daily life (Tractinsky et al., 2000). The positive correlation between usability and user experience indicates that a more functional mobile banking application yields enhanced user experience.

H5: Usefulness has positive and significant impact to intention to use of mobile banking

The goal to utilize a mobile banking application is pivotal in cultivating a favourable user experience. Users with a strong purpose to utilize an application are often more engaged in discovering its capabilities. This fosters a more profound engagement, enhancing users' comprehension of the program while also allowing them to uncover previously unrecognized advantages. Users dedicated to a program exhibit greater patience when confronted with technical difficulties and demonstrate increased receptiveness to updates or modifications, enhancing their overall user experience (Figure 1).

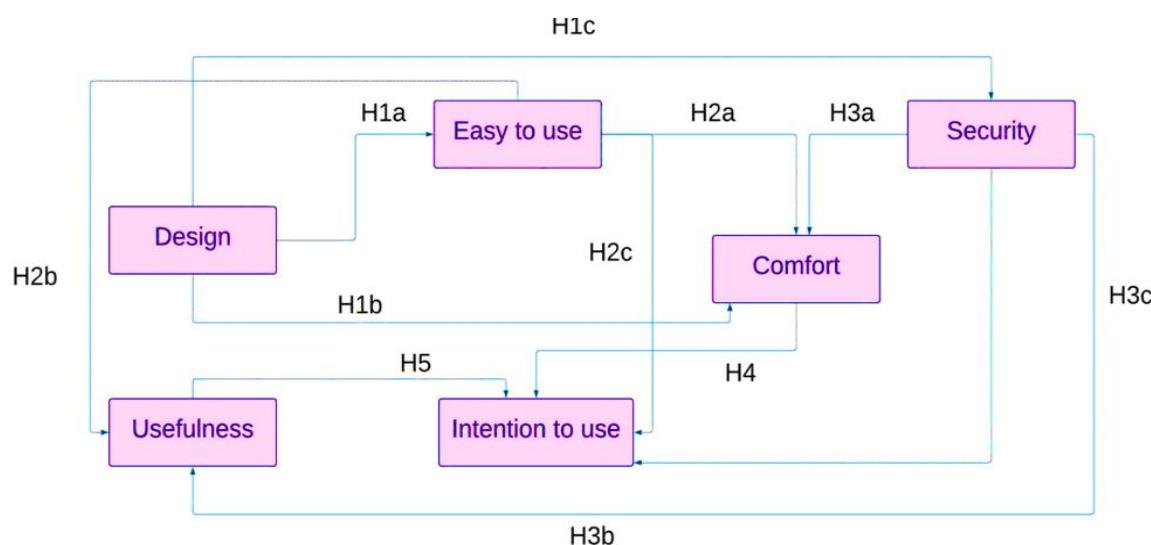


Figure 1. Conceptual Framework

The utilization of mobile banking by microentrepreneurs, particularly in the fishing industry within coastal island regions, might facilitate transactions and enable microentrepreneurs to manage their financial operations effectively. Thus, the design of the mobile banking application may enhance the convenience and preferences of mobile banking customers. Moreover, the security of mobile banking is crucial for maintaining user comfort, and the bank's service through

the mobile banking application significantly enhances the desire to use the program. The interplay of these elements might significantly enhance the perceived usefulness of mobile banking for microentrepreneurs, hence augmenting their inclination to use the mobile banking application and fostering a sense of positivity in its usage.

2. Research Methods

2.1. Conceptual Model

The Kei Islands, an exquisite archipelago in Eastern Indonesia, are located in the Maluku region, especially inside the Arafura Sea. The islands are situated in the southern Moluccas and consist of many islands, with Dullah Island, Kei Kecil and Kei Besar being the biggest to form two administrative regions namely Kota Tual and Southeast Maluku District. The Kei Islands are situated around 2,000 kilometers from Jakarta and are reachable by air or boat from other large islands like Ambon and Timor. The Kei Islands have a total population of around 50,000 inhabitants, largely of Melanesian descent, who predominantly communicate in the Kei language, in addition to Indonesian as the official language. The islands face significant challenges, particularly a high poverty rate, with approximately 20–25% of the population living below the national poverty line. Restricted access to education, healthcare, and employment prospects exacerbate the economic predicament, hindering overall growth in the region.

2.2. Population and Sample of the Study

According to statistics from the Ministry of SMEs and Cooperatives of the Republic of Indonesia, the total number of SMEs in Tual City and Southeast Maluku Regency is 7,260. However, just 10% of all SMEs are engaged in the fisheries industry, with some of these existing SMEs also engaged in general trade. Consequently, the total number of microenterprises involved in the fishing industry is 726. Out of 320 sent questionnaires, 290 were deemed appropriate for this study after sorting. Consequently, the quantity of 290 samples surpasses the minimal sample size utilized in this investigation. Survey conducted from August to October 2024.

2.3. Variable Construct

We utilized this nominal scale to assess many parameters, including the ages of the interviewees. One may "strongly disagree" and five could "strongly agree" according to an adjusted five-point Likert scale. Much of the framework and design was based on what was already published. Table 1 provides a detailed explanation of the operational definitions of the variables. Variable design, security, usefulness and intention to use all consist of five questions; easy of use consists of six questions; comfort consists of four questions.

Table 2. Operational Variables

Variable	Construct	Source
Design	<p>The design of the mobile banking application is pleasing to the eye</p> <p>The colour, font size, animation and others of the mobile banking application are very appropriate and attractive</p> <p>The design of the layout of the functions and operating buttons makes it easy to use the mobile banking application</p> <p>In general, the mobile banking application is suitable for the development of application design on today's smartphones</p> <p>When used, the mobile banking application does not often error</p>	(Naruethara dhol et al., 2021)

Variable	Construct	Source
Easy to use	The procedure for using mobile banking is very easy to understand The mobile banking application is very easy to operate I am very familiar with all the services in the mobile banking application The instructions on the mobile banking application are clear and easy to follow I know how to install and update the mobile banking application When there is a disruption in the mobile banking application, I know what to do to overcome this	(Munoz-Leiva et al., 2017)
Security	All data and information that I enter into the mobile banking application is safe and protected by the bank All transactions through the mobile banking application are safe and protected I am confident in the confidentiality of all information related to financial transactions using the mobile banking application There are security settings offered by the mobile banking application to ensure my comfort and peace of mind (such as passwords, fingerprints and phone number verification) Security settings on the mobile banking application mean that only I can use this mobile banking application	(Naruethara dhol et al., 2021)
Comfort	The use of mobile banking applications relieves some of the burden of financial transactions that previously occurred When using mobile banking is very enjoyable The mobile banking application has never annoyed me due to very severe disruptions	(Naruethara dhol et al., 2021)
Usefulness	Having an account and mobile banking application helps control my financial activities Having an account and mobile banking application makes it easier for me to make financial transactions Having an account and mobile banking application helps with other transaction needs such as electricity, credit, and others. Having an account and mobile banking application increases the level of security of financial transactions that are carried out Having an account and mobile banking application is very useful for me	(Rafique et al., 2020)
Intention to use	I will always use the mobile banking application for all financial transactions All matters related to paying bills, transferring money for business or personal matters and other transactions, I will always use the mobile banking application I want to recommend the mobile banking application to my family and friends for financial transactions Current developments and conditions make me want to always use the mobile banking application Using the mobile banking application is the best choice for all financial matters	(Kamal et al., 2020)

Source: processed data

2.4. Data Analysis

Partial Least Squares (PLS) analysis was implemented in the present study. (Hair et al., 2011) asserts that the reliability of PLS remains consistent regardless of the size of the sample. While determining an appropriate sample size, power analysis evaluates the model's most

predictive variables. PLS is the preferable method when precise model parameters are unattainable. The integration of both formative and reflecting elements within a distinct model is facilitated by PLS, as it requires fewer assumptions regarding data distribution. (Farooq & Radovic-Markovic, 2016) employed the PLS to account for the measurement errors introduced by the structural model, as it could display the connection between all latent constructs simultaneously.

3. Results and Discussions

The gender distribution within the micro-enterprises sample in the study was fairly balanced, with men representing 55.9% and women comprising 44.1% of the total sample. Additionally, regarding age distribution, over 50% of the samples were aged over 40 years, followed by those between 30 and 40 years at 32.5%, and those under 30 years at 13.8%. The data indicates that 33.4% of participants attained a high level of education, while 32.8% had no formal education and only received basic education. Additionally, 8.4% of the sample achieved a college education level. On the income front, a significant portion of the samples, specifically 46.9%, reported earnings of less than IDR. 1.000.000 per month, while only 22.5% is earned above the regional minimum wage in this area (Table 2).

Table 2. Respondent Characteristic

Category	Variable	Frequency	Percentage
Gender	Male	174	55.9
	Female	138	44.1
Age	< 20 y.o	1	0.3
	20-30 y.o	42	13.5
	>30-40 y.o	80	25.7
	>40-50 y.o	101	32.5
	>50 y.o	87	28.0
Level of education	No education and elementary	102	32.8
	Junior high	79	25.4
	High school	104	33.4
	College	26	8.4
Level of Income	< IDR. 1.000.000	146	46.9
	IDR. 1.000.000 - 2.000.000	94	30.2
	> IDR.2.000.000 - 3.000.000	23	7.4
	> IDR. 3.000.000 - 4.000.000	16	5.1
	> IDR. 4.000.000 - 5.000.000	8	2.6
	> IDR. 5.000.000	23	7.4

Source: processed data

The gender distribution within the micro-enterprises sample in the study was fairly balanced, with men comprising 55.9% of the sample and women making up 44.1%. Additionally, regarding age distribution, over 50% of the samples were aged over 40 years, while those between 30 and 40 years accounted for 32.5%, and individuals under 30 years made up 13.8%. The data indicates that 33.4% of the participants had a high level of education, while those without formal education or only basic education comprised 32.8%. Additionally, only 8.4% of the individuals reached a college education level. On the income front, a significant portion of the samples, specifically

46.9%, reported earnings of less than IDR. 1.000.000 per month, while only 22.5% earned above the regional minimum wage, for this area (Table 2).

Additionally, the analysis of research samples utilizing banking and savings and loans facilities indicates that a significant number of micro entrepreneurs in this region are clients of Bank Rakyat Indonesia (BRI). This is a result of BRI's extensive reach via brilink, which connects with remote areas, and the small business credit program (KUR) that effectively draws micro entrepreneurs to become customers at BRI, distinguishing it from other banks and financial institutions in this region (Figure 2).

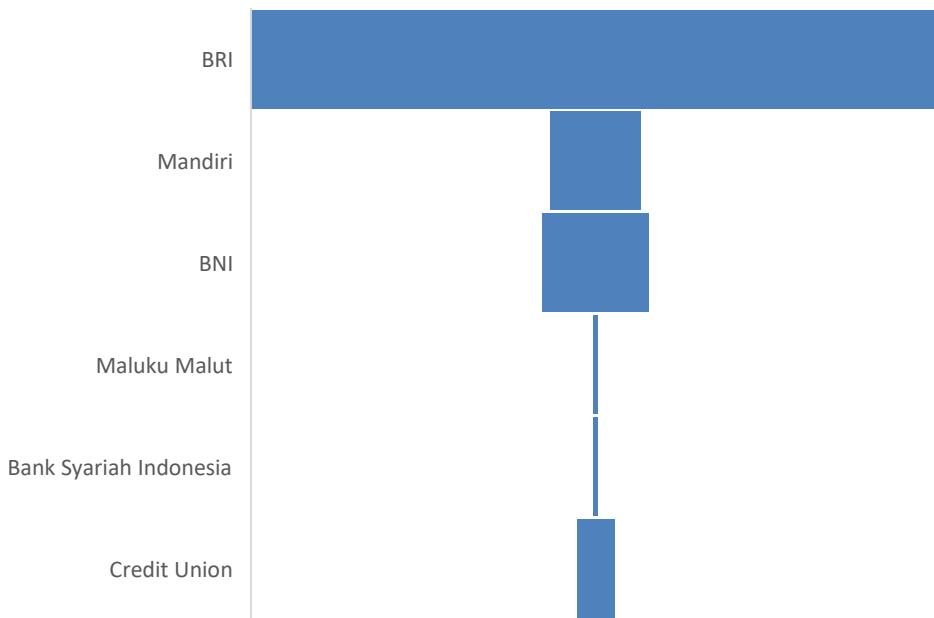


Figure 2. Description of Customer Financial Institution Account

The calculation of convergent validity involved the use of Average Variance Extracted (AVE), Composite Reliability (CR), and item loadings, ensuring that a minimum AVE of 0.50 is present for establishing construct validity. The data presented in Table 3 indicates that the Cronbach's Alpha value ranges from 0.992 to 0.997, consistent with the findings for CR. The values for AVE fall between 0.975 and 0.988, indicating that this measurement significantly exceeds the established threshold for validity test (Henseler et al., 2015).

Furthermore, Table 3 illustrates the validity test results, showing individual loadings for design from 0.986 to 0.989, ease of use from 0.976 to 0.998, security from 0.986 to 0.988, comfort from 0.985 to 0.990, intention to use from 0.988 to 0.995, and usefulness from 0.990 to 0.994. This result indicates that this measurement significantly surpasses the established threshold for the validity test (Henseler et al., 2015). Furthermore, the information displayed in Table 3 indicates that the Cronbach's Alpha values range from 0.992 to 0.997, aligning with the results for CR, while the AVE values are between 0.975 and 0.988. All also positioned significantly above the threshold (Gefen et al., 2000; Hair et al., 2013).

Table 3. Measurement Model Indicator

Construct	Items	Loadings	Cronbach's Alpha	CR	AVE
Design	Des ₁	0.989	0.994	0.994	0.975
	Des ₂	0.986			
	Des ₃	0.988			
	Des ₅	0.986			
Easy to use	Eas ₁	0.993	0.996	0.996	0.975
	Eas ₂	0.988			
	Eas ₃	0.994			
	Eas ₄	0.998			
	Eas ₅	0.977			
	Eas ₆	0.976			
Security	Sec ₁	0.989	0.994	0.994	0.977
	Sec ₂	0.988			
	Sec ₃	0.986			
	Sec ₅	0.989			
Comfort	Com ₁	0.990	0.992	0.992	0.975
	Com ₂	0.987			
	Com ₃	0.985			
Intention to use	Int ₁	0.993	0.997	0.997	0.985
	Int ₂	0.993			
	Int ₃	0.994			
	Int ₄	0.995			
	Int ₅	0.988			
Usefulness	Us ₁	0.994	0.996	0.996	0.988
	Us ₂	0.990			
	Us ₅	0.997			

Source: processed data

Moreover, Table 4 showed confirming discriminant validity. Where the diagonal elements exceed their respective correlation coefficients, demonstrating the presence of discriminant validity which signifies each construct exhibited greater variation among its components than the variance shared with other constructs (Gefen et al., 2000). Table 5 indicates that out of the five hypotheses, H_{1a}, H_{1c}, H_{2b}, and H_{3b} are accepted at a significant level corresponding to a 99% confidence level. The study's results indicate that design has a positive and substantial impact on the perceived ease of use and security of mobile banking; therefore, perceived ease of use positively and significantly influences perceived utility, while security also impacts perceived usefulness.

Table 4. Fornell-Lacker Criterion

	Comfort	Design	Easy	Intention to use	Security	Usefulness
Comfort	0.988					
Design	0.984	0.988				
Easy	0.971	0.981	0.988			
Intention to use	0.982	0.973	0.971	0.992		
Security	0.981	0.986	0.979	0.983	0.988	
Usefulness	0.963	0.984	0.971	0.958	0.976	0.994

Source: processed data

Table 6 illustrates two significant indirect effect pathways in the analysis results, indicating that the design of the mobile banking application positively and significantly influences the perceived usefulness of mobile banking via security and perceived ease of use. With R-squared over 95%, we can conclude that most of the variables used explained the model (Figure 3). The design of an effective mobile banking application must prioritize usability, a crucial element in fostering a gratifying user experience. The various demographics of mobile banking app users include those who possess less familiarity with digital technologies, like fisheries micro-enterprises in the Kei Islands, Indonesia.

Table 5. Summary of Measurement Assessment

	Value	P Values	Hypothesis	Decision
Design => easy	0.981	0.000	H _{1a}	Accept
Design => comfort	0.606	0.791	H _{1b}	Reject
Design => security	0.986	0.000	H _{1c}	Accept
Easy => comfort	0.024	0.976	H _{2a}	Reject
Easy => usefulness	0.390	0.017	H _{2b}	Accept
Easy => intention to use	0.160	0.978	H _{2c}	Reject
Security => comfort	0.359	0.823	H _{3a}	Reject
Security => usefulness	0.595	0.000	H _{3b}	Accept
Security => intention to use	0.533	0.971	H _{3c}	Reject
Comfort => intention to use	0.445	0.954	H ₄	Reject
Usefulness => intention to use	-0.146	0.917	H ₅	Reject

Source: processed data

Consequently, the interface design must be straightforward and comprehensible, with a streamlined layout, distinct colour selections, and easily interpretable icons and text to appeal to the user (Chaouali et al., 2019). Essential functionalities, including balance inquiries, fund transfers, bill payments, and transaction history, must be readily available with few steps for perceived usefulness (Ubam et al.). However, the design must prioritize security while maintaining user ease, as shown in the study. Where banks need to design mobile banking applications that are easy to use, even for security purposes, like dual authentication techniques, they must be meticulously crafted to provide security without overwhelming consumers. Nevertheless, emphasizing simplicity in interface design may compromise essential security elements vital for digital financial services. Not all users may comprehend cybersecurity hazards, and an excessively plain interface might diminish consumers' understanding of digital vulnerabilities, as shown by the study, where security concern became one of the main indicators for perceived usefulness of

mobile banking usage. Furthermore, user-friendliness is vital, security must remain paramount, even if it necessitates additional procedures for consumers to ensure the safety of their financial transactions, which can form positive perception of mobile banking (Vaithilingam et al., 2013).

Table 6. Specific Indirect Effect

	Value	P-values
Design => easy => comfort	0.024	0.976
Design => security => comfort	0.354	0.825
Design => comfort => intention to use	0.269	0.940
Easy => comfort => intention to use	0.011	0.999
Design => easy => comfort => intention to use	0.011	0.999
Security => comfort => intention to use	0.160	0.990
Design => security => comfort => intention to use	0.157	0.990
Design => easy => intention to use	0.157	0.979
Design => security => intention to use	0.526	0.971
Easy => usefulness => intention to use	-0.057	0.932
Design => easy => usefulness => intention to use	-0.056	0.932
Security => usefulness => intention to use	-0.087	0.905
Design => security => usefulness => intention to use	-0.085	0.906
Design => easy => usefulness	0.382***	0.017
Design => security => usefulness	0.586***	0.000

Source: processed data

Moreover, previous studies employing variations and extensions of the technology acceptance model consistently found that perceived usefulness and ease of use are significant predictors of user attitudes and intentions (Fernando et al., 2021; Kumar & Rani, 2024; Robbana et al., 2025), where these results contradicted with the result of this study. The insignificant role of perceived usefulness and ease to use to intention to adopt resulted on this study was due to the fact that study location are rural coastal region with literacy on FinTech still inadequate, as this study showed the important role of security as proxy of trust of user to mobile banking. As previous study showed trust emerges as a critical determinant, influencing both perceived usefulness and the intention to use FinTech services (Zhau et al., 2024).

Mobile banking can enhance financial inclusion by granting access to banking services for individuals previously excluded from the formal financial system. Mobile banking applications, characterized by user-friendly interfaces, are regarded as a solution to this issue, enabling convenient access without the necessity of visiting a real bank branch. Nonetheless, people with limited understanding are unacquainted with the notion of digital transactions and express concerns over security and potential abuse that may jeopardize their safety. In developing nations, fintech literacy frequently remains inadequate (Pentury, 2023). Moreover, the fundamental challenge of technology and financial literacy persists as a significant obstacle to mobile banking adoption (Ngangun et al., 2024). Furthermore, the introduction of mobile banking to users with minimal understanding, such as those engaged in fishery micro-enterprises can raise distrust. Continuous training and mentorship initiatives are seen as crucial for fostering trust and proficiency in application usage.

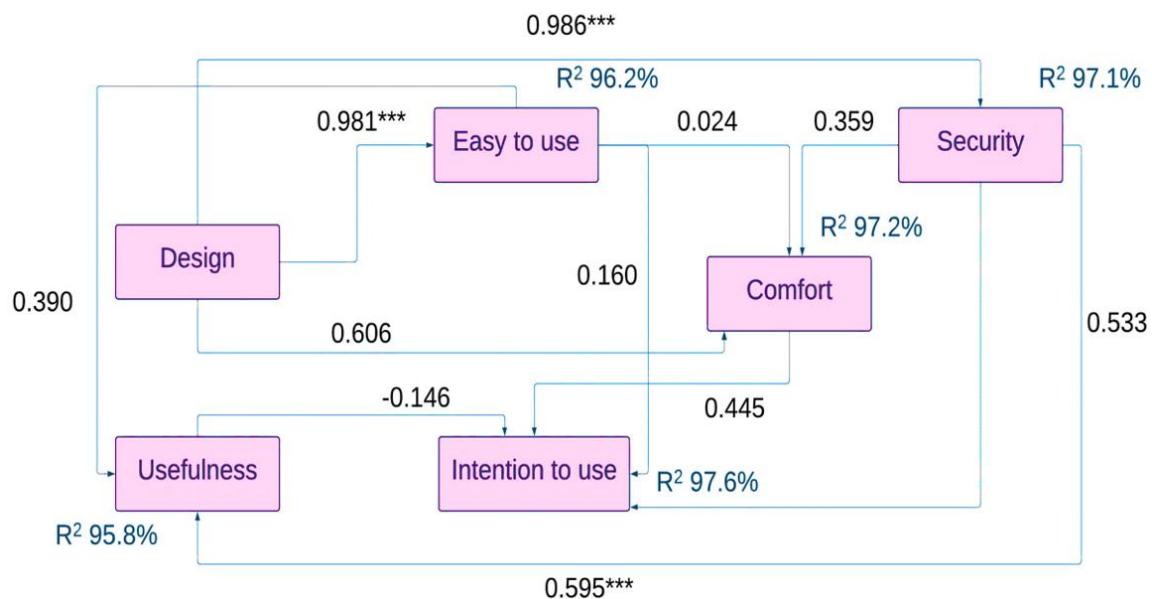


Figure 3. Path Analysis Model

The link between mobile banking design and user intent to use is frequently discussed. While appealing and straightforward design is thought to attract user attention, many feel that practical usability such as security, transaction speed, and service support has a greater influence on user intent to continue using an app. Even if the mobile banking design is appealing, consumers may be driven off by unpleasant self-experience or from word of mouth, owing to technical faults and security. Thus, improving literacy can exponentially improve the adoption of mobile banking by fishery micro-enterprises in this region and regions with similar characteristics.

4. Conclusions

The results of the study show that the main TAM factors do not significantly influence the intention to use mobile banking, however, this study offers valuable insights for the government and banking industry to enhance mobile banking in coastal island fisheries micro-enterprises. Design effects mobile banking usage because it impacts utility, which is mediated by security and convenience. Enhancing the utilization of mobile banking applications among micro entrepreneurs can facilitate improved financial management, as it allows for accurate recording of income and expenditures, thereby indirectly augmenting the capacity and competence of entrepreneurs. Design considerations are critical determinants in mobile banking utilization, since they influence the sense of utility, which is mediated by security and convenience of use. Furthermore, this study recommends for government to improve literacy of micro-enterprises in small islands region and at the same bank industry can make sure to design mobile banking that offer simplicity but also maintain the security and functionality. Further research can add factors such as trust, risk, social influence, and others beyond the perception of utility and convenience of a FinTech service in online transportation. The current study focuses on perceived usefulness and perceived ease of use. Additionally, future study can add more concepts as supplementary approach to TAM to add nuance of the impact of TAM to FinTech adoption. As the limitation of the study is the location of the study location poses unique characteristics in terms of the sample, infrastructure and social culture, thus more concepts can capture the empirical condition of the study location and sample characteristic.

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