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Analyzing the Success of M-Banking Implementation by Integrating the Diffusion of Innovation and Service Convenience Framework: Based on the Experience of Students at the University of North Sumatera

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ABSTRACT

This study aimed to measure the impact of innovation diffusion and service convenience on the successful implementation of mobile banking among USU students. The research sample consisted of 408 respondents selected through accidental sampling. The study conducted descriptive statistical analysis tests and PLS-SEM analysis using Microsoft Excel and SmartPLS. All 10 hypotheses formulated were accepted, except for the third hypothesis which was rejected. The empirical evidence presented by the research findings demonstrates the significant influence of DOI and servcon. Benefit convenience emerges as the variable with the strongest influence, while post-benefit convenience has the weakest influence. These findings can provide valuable input for banks to achieve implementation success in m-banking. It also serves as preparation for banks to respond to disruptions in the digital reform era in the banking sector.

Keywords: diffusion of innovation, service convenience, implementation success, m-banking.

INTRODUCTION

Mobile banking applications (M-banking) represent an innovative aspect of banking and are considered one of the most advanced forms of digital banking (Picoto & Pinto, 2021). M-banking refers to financial services provided by banks that can be accessed via smartphones, with its inception dating back to the early 2000s (Castillo-Villar & Castillo-Villar, 2023; Saprikis et al., 2022). This service greatly benefits customers as banking transactions can be conducted anytime, anywhere (Marhaeni et al., 2023).

According to data from the International Monetary Fund, the volume of m-banking transactions in Thailand has consistently increased by about 2,959% (Ahdiat, 2022; Dihni, 2022). Significant increases are also evident in Malaysia (539%) and Vietnam (1,754%). However, in Indonesia, the growth in transaction volume only saw a 106% increase. This indicates that the growth of m-banking in Indonesia is significantly slower compared to Malaysia and Thailand in 2021.

According to the findings of the Indonesian Political Indicator survey, 67.9% of the population claimed to neither have an account nor have ever used m-banking applications (Dihni, 2022). Only 30% of the

population reported having ever used m-banking. This contrasts with the increasing number of bank accounts, with 508.21 million accounts in 2022, 386.3 million in 2021, and 350.3 million in 2020 (LPS, 2022).

In 2023, the value of digital banking transactions (internet banking, and SMS/mobile banking) fluctuated from January to August. Despite reaching 5 quadrillion, there was a decline in April and February (Ahdiat, 2023).

Nevertheless, students are indicated to be heavily reliant on these applications (Jahan & Shahria, 2022; Khan et al., 2022). This is because the services provided align with the needs and lifestyle of students, such as online shopping payments and transfer services (Al-Dmour et al., 2020). M-banking also aids students in paying their Single Tuition Fee (UKT). Therefore, students aged 18-22 dominate digital banking transactions and are a target demographic for banks to optimize the success of m-banking (Jahan & Shahria, 2022; Min et al., 2018; Ramezaninia et al., 2022).

Furthermore, the University of North Sumatra (USU) implemented the latest UKT payment method through m-banking via virtual accounts in 2021. This method is a program initiated by Bank Negara Indonesia (BNI) in collaboration with USU to promote and accelerate the adoption of digital banking. It also serves as preparation for banks to respond to disruptions in the digital reform era in the banking sector (BNI, 2021; BOPM, 2021).

Rogers (2003) stated that the characteristic dimensions of innovation from the Diffusion of Innovation (DOI) theory are determining factors in evaluating the success of technology (Moore & Benbasat, 1991). These characteristics (relative advantage, compatibility, complexity, trialability, and observability) influence the acceleration of implementation to evaluate success.

Merely experiencing accelerated implementation is insufficient for evaluating the success of a technology (Khan et al., 2022; Roy et al., 2016). Additionally, DOI's predictive power can be enhanced by incorporating and expanding additional constructs (Grantham & Tsekouras, 2005; Moore & Benbasat, 1991). Seiders et al. (2007) stated that the dimension of service convenience (SC) has been validated and is the most critical factor in assessing post-adoption technology. SC can influence implementation success through convenience dimensions (decision convenience, access convenience, transaction convenience, benefit convenience, and post-benefit convenience).

Research on the success of m-banking implementation using DOI and SC theories remains limited (Kyari & Hudithi, 2022; Saha et al., 2022). Integrated models are needed to enhance the predictive power of DOI (Grantham & Tsekouras, 2005). Therefore, further research integrating DOI and SC theories is necessary to support the BNI program with USU and expand the use of m-banking to address ongoing implementation delays. Moreover, students are the appropriate target for optimizing m-banking success (Jahan & Shahria, 2022).

LITERATURE REVIEW

Diffusion of Innovation Theory (DOI)

DOI is a highly popular theory for measuring innovation implementation and is commonly used in information technology and communication research (Taghizadeh et al., 2022). DOI is a theory that elucidates the process of innovation implementation over time and how it can be communicated to individuals or other social groups (Rogers, 2003). The purpose of developing the DOI theory is to outline the process by which technological innovations are implemented and disseminated rapidly by users (Joia & Altieri, 2018). The success of implementation depends on how quickly or slowly the innovation is applied (More & Benbasat, 1991). Rogers (2003) explained

that innovation is an idea, practice, or object considered new, while diffusion is expressed as the process of transmitting innovation (Rogers, 2003).

According to the phases of innovation implementation, there are five attributes of innovation that can expedite the success of implementation: relative advantage, compatibility, complexity, trialability, and observability (Khan et al., 2022; Rogers, 2003). The descriptions of each innovation trait are outlined below:

1. Relative advantage: It is the individual's perception that the innovation being used is superior to previous innovations (Labay & Kinnear, 1981; Rogers, 2003).
2. Compatibility: This refers to the individual's perception that the innovation being used aligns and is consistent with previous values, past experiences, and current needs (Rogers, 2003; Verhoef & Langerak, 2001).
3. Complexity: It is defined as the individual's perception that the innovation being used is difficult to understand and apply (Bradford & Florin, 2003; Rahardja et al., 2023: Rogers, 2003).
4. Trialability: It is interpreted as the individual's perception that the innovation can be easily tried on a limited scope (Hsu et al., 2008; Rogers, 2003).
5. Observability: It is the individual's perception that the outcomes of using the innovation can be observed by others (Rijsdijk & Hultink, 2007; Rogers, 2003).

According to Rogers (2003), innovations are likely to be adopted faster if they offer a relative advantage and align with prevailing values, past experiences, and present needs. Moreover, innovations will see swifter adoption if they are easily comprehensible, trialable, and observable in their usage (Miles, 2012; Rogers, 2003).

Service Convenience Theory (SC)

Initially, the convenience dimension was classified solely as time and effort savings (Anderson, 1971). Yale and Venkatesh (1986) suggested that the convenience dimension be classified into time utilization, accessibility, portability, suitability, ease, and avoidance of discomfort. Meanwhile, Brown (1989) proposed five convenience dimensions: time, place, acquisition, usage, and execution. This categorization was used as a framework by earlier researchers but has been heavily criticized by Berry et al. (2002). The primary reason for this criticism is the lack of theoretical and measurement foundations (Berry et al., 2002; Grewal et al., 2020). Following this, Seiders et al. (2000) introduced the notion of convenience by associating shopper velocity with shopping simplicity. Expanding on this idea, Berry et al. devised a convenience framework known as service convenience (SC) in 2002. The SC framework includes five dimensions: decision convenience, access convenience, transaction convenience, benefit convenience, and post-benefit convenience. Subsequently, Seiders et al. confirmed the validity of the framework in 2007. Furthermore, Seiders et al. (2007) enhanced SC and furnished empirical support for validating shopping convenience.

According to Berry et al. (2002) and Seiders et al. (2007), each dimension of SC is defined as follows:

1. Decision convenience: It is the individual's perception of the time and effort expended in making a decision.
2. Access convenience: It is the individual's perception of the time and effort expended in accessing a service. Easy access without additional costs or effort creates a perception of convenience.
3. Transaction convenience: It is the individual's perception of the time and effort expended in completing a transaction for a service. Simplicity and

speed in transactions encourage individuals to avoid extra costs and effort, leading to a perception of convenience.

4. Benefit convenience: It is the individual's perception of the time and effort expended in obtaining benefits from using a service. The utility experienced during transactions can prompt individuals to avoid additional costs and effort.
5. Post-benefit convenience: It is the individual's perception of the time and effort expended after experiencing the benefits. Convenience is realized at this stage if the service used can address issues after the transaction occurs.

SC is utilized to enhance satisfaction and evaluate success (Colwell et al., 2008; Mahapatra, 2017; Moeller et al., 2009). SC emerges as the most significant factor in user satisfaction with mobile phones and the internet (Kaura, 2013). Improving service convenience can enhance user satisfaction (Chang et al., 2010; Chang et al., 2013). Thus, maximal satisfaction can serve as a benchmark for the successful implementation of technology (Kaura et al., 2015; Roy et al., 2018).

Framework

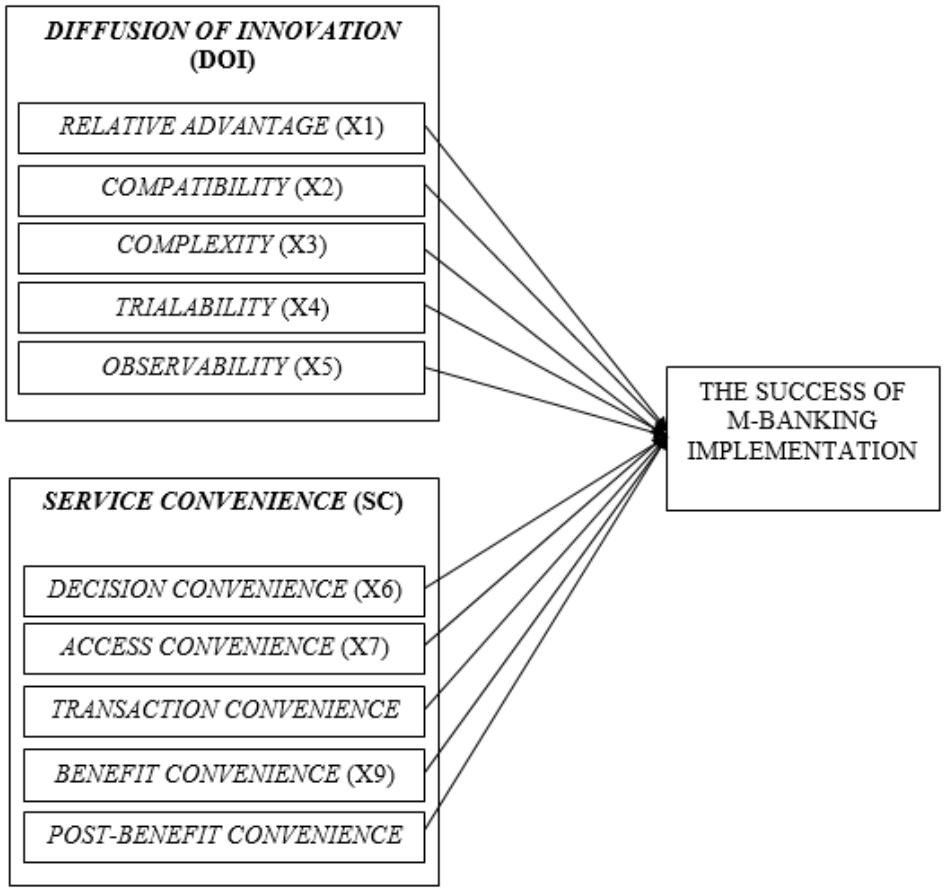

Figure 1. Framework

Therefore, the hypotheses in this research are as follows:

H1: Relative advantage has a positive influence on the success of m-banking implementation

H2: Compatibility has a positive influence on the success of m-banking implementation

H3: Complexity has a negative influence on the success of m-banking implementation

H4: Trialability has a positive influence on the success of m-banking implementation
H5: Observability has a positive influence on the success of m-banking implementation
H6: Decision convenience has a positive influence on the success of m-banking implementation
H7: Access convenience has a positive influence on the success of m-banking implementation
H8: Transaction convenience has a positive influence on the success of m-banking implementation
H9: Benefit convenience has a positive influence on the success of m-banking implementation.
H10: Post-benefit convenience has a positive influence on the success of m-banking implementation

MATERIALS & METHODS

This research adopted a pure research approach within a quantitative paradigm to achieve its objectives. Employing a cross-sectional design, this research utilized a survey methodology to collect data. The research population was drawn from the total number of active USU students and the sample was USU students who used m-banking. Accidental sampling was employed as the sampling technique. Data collection was conducted using an online questionnaire distributed via Google Form, with responses collected from USU students. Online questionnaires are considered effective and efficient in gathering data from a large number of respondents and reaching diverse respondents (Dewaele, 2018). Additionally, they offer advantages in terms of time and cost savings, making them a commonly utilized method (Jaeger & Cardello, 2022). Data analysis in this research utilized PLS-SEM analysis, which is based on two models: the measurement model and the structural model. The constructs employed were formative models, indicating the direction from indicators to variables, where indicators collectively shape variables (Ghozali & Latan, 2015). Each variable's indicators are constitutive and collectively form a cohesive unit.

RESULT

The questionnaire was distributed to USU students who used m-banking over a period of 14 days. The number of completed questionnaires totaled 436 respondents. A total of 28 respondents (6.4%) did not correctly complete the questionnaire. There were respondents who submitted the questionnaire twice, respondents who did not use m-banking, and respondents who did not complete the questionnaire fully. Therefore, 408 respondents (93.6%) completed the questionnaire adequately and were used in this research.

The Outer Model PLS-SEM

The analysis results indicated that the average factor loading for each questionnaire statement item ranged from 0.70 to 0.90. However, TRI1 still exhibited relatively low validity (0.645), although it was still considered sufficiently valid (Ghozali & Latan, 2015; Hair et al., 2022). Besides factor loading, data validity could also be assessed based on the average variance extracted (AVE). The average AVE in the research showed values between 0.60 and 0.80. Therefore, each variable could be considered valid since the AVE exceeded 0.5 (Ghozali & Latan, 2015; Hair et al., 2022).

The average composite reliability (CR) values suggested that variables typically ranged between 0.80 and 0.90. Similarly, the average Cronbach's alpha values fell within the 0.80 to 0.90 range. This indicated that each variable demonstrated strong and high reliability as CR exceeded 0.70 and Cronbach's alpha surpassed 0.60 (Ghozali & Latan, 2015; Hair et al., 2022; Sekaran & Bougie, 2016).

Moreover, concerning discriminant validity, it was evident that both the square root of AVE and cross-loading values exceeded all

correlations among other variables. This demonstrated that discriminant validity was effectively validated and aligned with the criteria (Ghozali & Latan, 2015; Sekaran & Bougie, 2016). The summarized results of the outer model analysis are presented in Tables 1 and 2 below:

Table 1. Fornell-Larcker

	AC	BC	CB	CX	DC	IS	OB	PC	RA	TC	TRI
AC	0.87										
BC	0.72	0.89									
CB	0.55	0.64	0.80								
CX	0.14	0.20	0.11	0.84							
DC	0.66	0.71	0.64	0.17	0.88						
IS	0.55	0.62	0.55	0.20	0.60	0.81					
OB	0.70	0.75	0.61	0.19	0.67	0.60	0.82				
PC	0.37	0.41	0.38	-0.09	0.39	0.35	0.36	0.89			
RA	0.37	0.39	0.67	-0.20	0.44	0.41	0.39	0.44	0.81		
TC	0.70	0.74	0.59	0.21	0.70	0.57	0.66	0.37	0.43	0.83	
TRI	0.58	0.68	0.53	0.20	0.68	0.62	0.64	0.38	0.36	0.56	0.84

Table 2. Internal Consistency Reliability and Convergent Validity

Variables	Items	Loading Factor	Cronbach Alpha	CR	AVE
Implementation success	IS1	0.75	0.943	0.952	0.664
	IS2	0.83			
	IS3	0.81			
	IS4	0.85			
	IS5	0.84			
	IS6	0.86			
	IS7	0.75			
	IS8	0.79			
	IS9	0.77			
	IS10	0.85			
Relative advantage	RA1	0.80	0.876	0.910	0.670
	RA2	0.85			
	RA3	0.87			
	RA4	0.72			
	RA5	0.83			
Compatibility	CB1	0.70	0.860	0.900	0.643
	CB2	0.84			
	CB3	0.83			
	CB4	0.80			
	CB5	0.81			
Complexity	CX1	0.76	0.837	0.880	0.711
	CX2	0.80			
	CX3	0.95			
Trialability	TRI1	0.64	0.791	0.875	0.705
	TRI2	0.92			
	TRI3	0.92			
Observability	OB1	0.77	0.776	0.868	0.687
	OB2	0.81			
	OB4	0.89			
Decision convenience	DC1	0.85	0.861	0.915	0.783
	DC2	0.90			
	DC3	0.89			
Access convenience	AC1	0.85	0.846	0.907	0.764
	AC2	0.88			
	AC3	0.87			
Transaction convenience	TC1	0.88	0.777	0.870	0.693
	TC2	0.87			
	TC3	0.72			
Benefit convenience	BC1	0.90	0.871	0.921	0.795
	BC2	0.89			
	BC3	0.87			
Post-benefit convenience	PC1	0.87	0.874	0.922	0.799
	PC2	0.90			
	PC3	0.90			
DOI	-	-	0.905	0.921	0.515
SC	-	-	0.931	0.942	0.577

The assessment of the formative model involved scrutinizing the variance inflation factor (VIF) for multicollinearity and the outer weights of variables. Elevated VIF values might have signified problems with the formative model, while values under 5.0 would have implied no worries regarding multicollinearity (Hair et al., 2022). According to the analysis findings, all VIF values fell below 5.0, indicating the absence of multicollinearity concerns with the formative model for each construct. Moreover, the outer weights values and their associated p-values were positive. Consequently, all DOI and SC variables remained retained and appropriate for utilization in the formative model (Hair et al., 2022).

The Inner Model PLS-SEM

The analysis of the inner model included testing the coefficient of determination R2 and hypotheses using bootstrapping PLS. The findings showed that the adjusted R square value for the implementation success variable was 0.486 (48.6%). This suggested that the research model explained 48.6% of the variation in implementation success, categorizing it as moderate according to Vincenzo (2010). Following the analysis of the coefficient of determination, the subsequent step involved hypothesis testing using path coefficients. If a t-statistic value exceeded 1.64 and a p-value indicated significance at the 5% level less than 0.05, it suggested the influence of a variable, and the hypothesis was accepted. Conversely, if the values indicated otherwise, the hypothesis was rejected (Band, 2006).

The table below demonstrates that the t-statistics for relative advantage (5.916), compatibility (6.034), trialability (5.851), and observability (5.647) exceeded the threshold of 1.64, with p-values of 0.000 (<0.005). Thus, it can be inferred that these four DOI variables significantly impacted the success of m-banking implementation. Conversely, the complexity variable (X3) exhibited a t-statistic of (0.816) below 1.64, and its p-value (0.415) exceeded 0.05. Consequently, it can be concluded that complexity did not influence the success of m-banking implementation.

Table 3. T-Statistic and P Values

Variables	Original Sample	Standars Deviation	T Statistic	P Values
DOI > IS	0.3370	0.0560	6.0510	0.000
RA > DOI > IS	0.0960	0.0160	5.9160	0.000
CB > DOI > IS	0.1800	0.0300	6.0340	0.000
CX > DOI > IS	0.0010	0.0020	0.8160	0.415
TRI > DOI > IS	0.0810	0.0140	5.8510	0.000
OB > DOI > IS	0.0430	0.0080	5.6470	0.000
SC > IS	0.4050	0.0630	6.4450	0.000
DC > SC > IS	0.1240	0.0190	6.4140	0.000
AC > SC > IS	0.1200	0.0190	6.4160	0.000
TC > SC > IS	0.0760	0.0120	6.2060	0.000
BC > SC > IS	0.1240	0.0190	6.4240	0.000
PC > SC > IS	0.0220	0.0040	5.3380	0.000

DISSCUSION

The research findings indicated that relative advantage (X1) had a positive and significant influence on DOI and the successful implementation of m-banking (Y) among USU students, thereby confirming the first hypothesis. Consistent with the DOI theory, the adoption of innovation accelerated when it was perceived as superior to previous alternatives (Rogers, 2003). M-banking was developed with enhanced features to address challenges and complexities present in earlier banking innovations (Riquelme & Rios, 2010). These findings are consistent with research by Jahan and Shahria (2022), Kyari and Hudithi (2022), and Shahid (2022), indicating that relative advantage significantly influenced implementation success. Based on demographic profiles,

respondents perceived m-banking to possess relative advantages. This was evidenced by the majority of respondents requiring only 1-5 minutes (75.7%) to use m-banking, showcasing its high efficiency and effectiveness, especially among USU students. Regarding responses to relative advantage statement items, respondents concurred that m-banking excelled in facilitating financial management (43.1%), efficiency (39.2%), effectiveness (40.4%), strong financial control (40.4%), and reliable financial resource management (41.2%).

The research findings suggested that compatibility (X2) had a significant and positive impact on both DOI and the successful implementation of m-banking (Y) among USU students, thus supporting the second hypothesis. According to DOI theory, the adoption of innovation accelerated when users perceived it to align with their existing values, past experiences, and current needs. M-banking, when aligned with user needs, fostered satisfaction and loyalty (Kyari & Hudithi, 2022; Winarti et al., 2021), thus expediting implementation towards success (Lutfi et al., 2022). These results are consistent with research conducted by Handfield et al. (2022), Hashem and Aboelmaged (2023), Hlee et al. (2016), Lutfi et al. (2022), Lutfi and Alqudah (2023), Winarti et al. (2021), and Zhang and Chan (2021), indicating that compatibility significantly influenced implementation success. Based on responses to compatibility statement items, most respondents agreed that m-banking was compatible with financial management (46.6%) and work style (46.1%). Additionally, a large majority strongly agreed that m-banking aligned with new technology (48%), new innovation (46.6%), and respondents' lifestyle (46.6%). Therefore, compatibility played a crucial role in influencing the success of m-banking implementation.

The research findings indicated that complexity (X3) did not influence DOI and the successful implementation of m-banking (Y) among USU students, thus rejecting the third hypothesis. The research findings contradicted the DOI theory, which stated that the complexity variable had a significant negative influence. M-banking was perceived as a solution to eliminate transaction complexities found in previous banking innovations. Therefore, one of the objectives of m-banking was to offer broader ease and convenience to users (Ramezaninia et al., 2022). The lack of impact from complexity may have stemmed from the absence of challenges in m-banking and the availability of user guides on various platforms (Lutfi & Alqudah, 2023). These findings align with research conducted by Ahmad et al. (2016), Hlee et al. (2016), Joia and Altieri (2018), Lutfi and Alqudah (2023), Mahakittikun et al. (2020), and Taghizadeh et al. (2022), which indicated that complexity did not influence implementation success.

The research results demonstrated that trialability (X4) had a positive and significant effect on DOI and the successful implementation of m-banking (Y) among USU students, leading to the acceptance of the fourth hypothesis. Consistent with DOI, the adoption of innovation accelerated when it was easily trialed within a limited context. M-banking was readily triable initially, due to ample guidance from banks (Al-Jabri, 2016; Handfield et al., 2022; Kyari & Hudithi, 2022), thereby enhancing the success of m-banking implementation. These findings align with research by Handfield et al. (2022), Lutfi and Alqudah (2023), and Winarti et al. (2021), indicating that trialability significantly influenced implementation success positively. Based on responses to trialability statement items, respondents perceived m-banking as highly triable within a limited context during initial usage. This was supported by the majority of respondents agreeing that m-banking was easy to trial at the outset (43.1%) and throughout the trial period (48.8%). Additionally, respondents concurred that m-

banking features were easily triable and comprehensible within a restricted context (49.8%). Consequently, trialability became pivotal in respondents' decisions regarding the success of m-banking implementation.

The research findings indicated that observability (X5) significantly and positively influenced both DOI and the successful implementation of m-banking (Y) among USU students, thus supporting the fifth hypothesis. Consistent with DOI, the uptake of innovation accelerated when its outcomes were easily observable and could influence others. The visible outcomes of implementing m-banking enhanced communication among individuals about m-banking (Al-Jabri, 2016; Kyari & Hudithi, 2022), leading to a faster implementation process that culminated in success (Ahmad et al., 2016; Al-Jabri & Sohail, 2012). These findings align with studies by Ahmad et al. (2016), Kyari and Hudithi (2022), Lutfi and Alqudah (2023), Shahid (2022), and Winarti et al. (2021), affirming that observability significantly and positively impacted implementation success. Based on responses to observability statements, respondents strongly agreed that m-banking was accessible anytime, anywhere, provided swift access due to the absence of queues, and could be accessed while abroad. This ease of access enabled the immediate observation of m-banking implementation outcomes. Furthermore, the majority of respondents also strongly agreed that transaction outcomes from m-banking were promptly monitored. Therefore, observability played a crucial role in determining the level of implementation success among young adults.

The research results demonstrated that decision convenience (X6) had a positive and significant impact on both SC and the successful implementation of m-banking (Y) among USU students, confirming the sixth hypothesis. Consistent with SC principles, when individuals spent minimal time and effort making decisions, it fostered convenience for them. Convenience arose when customers could easily and quickly decide to choose m-banking as their financial service, thus affecting the level of implementation success (Jebarajakirthy & Shankar, 2021; Kaura et al., 2015; Mehmood & Najmi, 2018). These findings align with research conducted by Benoit et al. (2017); Kaura (2013); Khazaei et al. (2014); Kaura et al. (2015); Mehmood and Najmi (2017), indicating that decision convenience significantly and positively influenced implementation success. According to responses regarding decision convenience statements, the majority of respondents strongly agreed that they could select m-banking applications tailored to their needs, quickly determine which m-banking services and features to use, and promptly locate information about m-banking services. This suggested that respondents found m-banking comfortable as they invested minimal time and effort in choosing applications, service features, and information, potentially enhancing m-banking implementation success.

The research findings indicated that access convenience (X7) had a positive and significant influence on both SC and the successful implementation of m-banking (Y) among USU students, thus validating the seventh hypothesis. Consistent with SC principles, when individuals expended minimal time and effort accessing a service, it fostered convenience for them. This convenience was evident when respondents began downloading applications, registering, and accessing transactions (Reimers & Chao, 2014). Therefore, when respondents felt comfortable, it strengthened the success of m-banking implementation. These results align with research conducted by Benoit et al. (2017); Jebarajakirthy and Shankar (2021); Kaura (2013); Khazaei et al. (2014); Mehmood and Najmi (2017); Moeller et al. (2009), indicating that access convenience significantly and positively influenced implementation success. Based on responses regarding access convenience

statements, respondents perceived m-banking as having convenient access. This was evidenced by the majority of respondents strongly agreeing that m-banking was convenient to use anytime and anywhere. This perception stemmed from m-banking implementation being conducted online, saving time and energy. Moreover, the majority of respondents agreed that m-banking was always accessible for various transactions. Hence, it can be concluded that respondents found accessing m-banking comfortable, thereby enhancing its implementation success.

The research findings indicated that transaction convenience (X8) had a positive and significant influence on both SC and the successful implementation of m-banking (Y) among USU students, thereby confirming the eighth hypothesis. Consistent with SC principles, when individuals expended minimal time and effort conducting transactions within a service, it fostered individual convenience. Easy and quick transactions created a perception of convenience, thereby enhancing the success of m-banking implementation (Benoit et al., 2017; Jiang et al., 2013). These results align with research conducted by Benoit et al. (2017); Jebarajakirthy and Shankar (2021); Khazaei et al. (2014); Kaura et al. (2015); Mehmood and Najmi (2017), indicating that transaction convenience significantly and positively influenced implementation success. Respondents' feedback on transaction convenience statements revealed their perception of m-banking transactions as user-friendly. This was evidenced by the majority strongly agreeing that m-banking was easy to use during transaction completion, very efficient in completing various payments, and simple to navigate throughout the transaction process. Hence, it can be inferred that m-banking transactions were highly convenient, contributing to enhanced implementation success.

The research results demonstrated that benefit convenience (X9) had a positive and significant effect on both SC and the successful implementation of m-banking (Y) among USU students, confirming the ninth hypothesis. In line with SC principles, when individuals invested minimal time and effort to gain benefits from a service, they felt more at ease. This sense of ease arose when positive outcomes were achieved through m-banking implementation (Mehmood & Najmi, 2018), continually promoting comfort and successful implementation until the final stage. These results align with research conducted by Chang et al. (2010); Chang and Polonsky (2012); Chang et al. (2013); Jebarajakirthy and Shankar (2021); Kaura (2013); Kaura et al. (2015); Khazaei et al. (2014); Mehmood and Najmi (2017); Roy et al. (2016), indicating that benefit convenience significantly and positively impacted implementation success. Based on respondents' feedback on benefit convenience statements, respondents perceived m-banking to offer substantial benefits, resulting in their comfort. This was evidenced by the majority strongly agreeing that m-banking features were quickly accessible (50.5%) and easy to find (45.3%), as well as being user-friendly overall (55.1%). Thus, it can be concluded that m-banking provided significant benefits, fostering comfort and enhancing implementation success.

The research findings indicated that post-benefit convenience (X10) had a positive and significant influence on both SC and the successful implementation of m-banking (Y) among USU students, thus confirming the tenth hypothesis. Consistent with SC principles, when individuals expended minimal time and effort to address errors or issues with m-banking after experiencing benefit convenience, it fostered comfort. M-banking offered various avenues for swiftly addressing errors (such as contacting customer service, email, money-back guarantees, among others), thereby optimizing user comfort and leading to success (Jebarajakirthy & Shankar, 2021).

These results align with research conducted by Chang et al. (2010), Chang and Polonsky (2012), Chang et al. (2013), Kaura (2013), Colwell et al. (2008), Jebarajakirthy and Shankar (2021), Khazaei et al. (2014), Roy et al. (2016), which stated that post-benefit convenience had a positive and significant impact on implementation success. Based on responses regarding post-benefit convenience, respondents perceived m-banking as comfortable to use even when encountering errors during the final stages of implementation. It was evidenced by respondents agreeing that filing transaction failure claims was easy (33.3%), and they were promptly addressed by customer service (34.8%), with quick turnaround times for claim resolution (32.6%). Thus, it can be concluded that there was comfort in the post-benefit stage, contributing to implementation success.

CONCLUSION

Based on the 10 hypotheses, the research results indicated that 9 hypotheses were accepted, supporting the DOI and SC theories. All variables except for complexity provided a positive and significant impact on the success of m-banking implementation among USU students. However, complexity did not affect USU students because there were no difficulties encountered in m-banking, and there were numerous usage guides available from various platforms. Moreover, m-banking is highly demanded to meet lifestyle and daily needs, so whether or not there is system complexity, m-banking is still utilized. Looking at SC, benefit convenience had the strongest influence with the highest t-statistic value. Meanwhile, in DOI, compatibility showed the strongest influence.

Respondents perceived that m-banking aligns well with their lifestyle and daily needs and provides significant benefits. Consequently, there is a need to enhance the system with updated features that better suit users' requirements and offer wider utility. Following this, attention can be directed towards aspects: relative advantage, trialability, observability, decision convenience, access convenience, transaction convenience, and post-benefit convenience. Meanwhile, the least influential factor is post-benefit convenience. This could be attributed to the fact that most respondents remained neutral for each statement item. It is possible that they did not encounter any issues or errors during the final stages of implementation, thus may not have been familiar with the assistance services provided in m-banking.

These findings provided empirical evidence supporting the integration of DOI theory, SC, and success indicators proposed by Doll et al. (2004) across all variables used, an integration that has been limited in previous research. The practical contribution offered provides valuable insights for banks to extend and enhance the adoption of m-banking. It includes updating features and services to be more competitive, aligned with user needs and lifestyles, easy to trial, and observe outcomes. Additionally, the m-banking system should be refined to offer convenience across decision-making, access, transactions, benefits, and post-benefit stages. This research can support programs at USU and banks aimed at broadening m-banking adoption among students. Consequently, banks can implement similar initiatives across universities, such as using m-banking for UKT payments. These findings also better equip banks to navigate digital reforms and disruptions. Looking ahead, it is crucial to further expand the utility of m-banking, especially considering that benefit convenience is paramount in determining its success. Hence, improving the speed of accessing service features and enhancing service convenience are essential for m-banking to continue delivering substantial benefits to its users.

Research Limitation

This research faced limitations during the data collection process. Many respondents were hesitant to fill out the questionnaire via barcode scanning or through the provided link. This reluctance may be attributed to the current prevalence of m-banking balance theft through links. Additionally, there is a possibility that respondents did not provide honest or serious responses due to the extensive number of statement items across the 10 independent variables (X) and the dependent variable (Y). Therefore, the findings may not be widely generalizable.

Suggestion

Based on the research limitations, future studies could distribute questionnaires along with conducting brief interviews to ensure the honesty of respondents' answers and alleviate any reluctance in participation. The questionnaires and brief interviews could be administered to a more diverse group of respondents. Furthermore, future research is expected to expand the integration model with different theories and employ more easily understandable measurements such as e-service quality in the success of m-banking implementation.

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