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Abstract

In recent years, m-banking has been developed rapidly around the world. The research aims to measure millennials' perception towards adaption and intention of m-banking from a developing country's perspective. A PLS-SEM modeling approach was performed to test the hypothetical model. The empirical results reveal that perceived ease of use, perceived security and privacy, and perceived cost significantly affect the millennials' attitude to adopt m-banking. In contrast, perceived usefulness and perceived self-efficacy have an insignificant effect. Furthermore, attitude towards adopting m-banking significantly impacts adoption and intention among millennials. Practical and theoretical implications have been identified based on the study results.

Keywords

Gen-Y, TAM, attitude, PLS-SEM, Bangladesh

Revisions

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Millennials' Perception Towards Adaption and Intention of M-Banking: Experience From a Developing Country

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Abstract

In recent years, m-banking has been developed rapidly around the world. The research aims to measure millennials' perception towards adaption and intention of m-banking from a developing country's perspective. A PLS-SEM modeling approach was performed to test the hypothetical model. The empirical results reveal that perceived ease of use, perceived security and privacy, and perceived cost significantly affect the millennials' attitude to adopt m-banking. In contrast, perceived usefulness and perceived self-efficacy have an insignificant effect. Furthermore, attitude towards adopting m-banking significantly impacts adoption and intention among millennials. Practical and theoretical implications have been identified based on the study results.

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Introduction

The quality and modes of offering services have been transforming through tremendous change with the immense improvement of information and communication technology in recent decades (Mulia et al., 2021; Parayil Iqbal et al., 2023). The widespread use of advanced technology in the business sector, aimed at finding innovative methods to maintain consumer loyalty, has created numerous prospects for all sectors of companies (Dam, 2023). Among the service industries, the banking industry has seen prodigious reform after information and communication technology development (Hamakhan, 2020; Khan et al., 2018; Mulia et al., 2021; Nasri & Charfeddine, 2012). Traditional branch-based retail banking is losing its appeal, while Internet and mobile-based banking is gaining colossal popularity (Farzin et al., 2021; Wang et al., 2003). Over the past decades, the banking sector's incessant innovation has led to a change in the way these services are offered, making mobile banking (m-banking) the channel that will set financial institutions apart (Ciunova-Shuleska et al., 2022; Dey & Majumder, 2024). In this era of modernization and technology, banks should offer higher productivity, faster and 24x7 services, profitability, and efficiency (Nasri & Charfeddine, 2012). Besides, banks should offer their customers a fast and

secure platform where personalized digital interaction is a demand from a customer's perspective (Boonsiritomachai & Pitchayadejanant, 2017; Ciunova-Shuleska et al., 2022).

Recently, banks have been adopting different technologies to offer improved and faster services to their customers (Farzin et al., 2021; Liao et al., 2021; Tiwari et al., 2021). Among the different technologies, m-banking has been considered one of the disruptive technologies in the banking industry (Shaikh & Karjaluoto, 2015; Singh & Srivastava, 2020). M-banking refers to the banking services provided using mobile networks, and customers can avail of the services using mobile devices (Lule et al., 2012). M-banking helps bankers catch the unbanked population in remote areas where branch banking is impossible. Values such as ubiquity, personalization, and flexibility can be availed through m-banking (Shaikh & Karjaluoto, 2015). The expansion of m-banking is tremendous, encouraging traditional banking service providers to move towards m-banking platforms (Al Tarawneh et al., 2023). A report from Allied Market Research in 2021 highlighted that the market for mobile payments was valued at 1.48 trillion dollars worldwide in 2019 and is projected to grow to 12.06 trillion dollars by 2027 (Ullah et al., 2022).

Millennials or *Generation Y* (Gen-Y) is a group of people born between 1980 and 2000 (Cavagnaro et al., 2018). Different scholars termed the people born in these years as millennials (Kelan & Lehnert, 2009). Right now, Gen-Y people constitute a significant number of populations around the world and expect to form more than 75% of the world's total population by 2030 (Naim & Lenkla, 2016; Shafiq, 2019). In short, Gen-Y people drive the world's economy worldwide; thus, this group of people's perspectives has been considered very seriously by researchers and policymakers worldwide (Bagheri & Zhu, 2023). Besides, numerous academics have determined that to improve the reliability of any future service development and marketing strategy, millennial customers' intention to use m-banking must be thoroughly investigated (San et al., 2015; Tan & Leby Lau, 2016). Recently, several theoretical foundations have been used to deliver an understanding of the factors of m-banking adoption and use (Mitchell et al., 2024). For example, the technology acceptance model (TAM; Davis et al., 1989), an adaptation of the theory of reasoned action (Fishbein, 1980; Fishbein & Ajzen, 1977), and the theory of planned behavior (Ajzen, 1991), the unified theory of acceptance and use of technology (Venkatesh et al., 2003) are mostly cited and used intention models that can predict technology acceptance behavior (Gefen & Straub, 2000). This study utilized the extended TAM to predict the m-banking use behavior as it is the most widely cited and used TAM.

Though several studies investigate the quality of the services of m-banking (Khan et al., 2018), internet banking (Nasri & Charfeddine, 2012; Wang et al., 2003), e-banking (Nupur, 2010) very few studies (Farah et al., 2018; Masrek et al., 2014; Shaikh & Karjaluoto, 2015; Singh & Sharma, 2023) focuses on m-banking adoption using TAM model on millennials' viewpoint in the context of developing country perspective. However, knowing the factors that affect the consumers' attitude to adopt new technology is crucial for service designers and policymakers to be better equipped for the future. By applying a well-accepted and cited extended TAM model, this study's objective is to investigate millennials' perceptions of adaption and intention to m-banking from a developing country's perspective. The remaining paper is structured as follows. The related literature and hypotheses development are outlined in the next section. The subsequent sections contain research methods, results, and discussion. The paper finally concludes with implications, conclusions, limitations, and future research directions.

Theoretical Framework

Technology Acceptance Model (TAM)

The TAM developed by Davis (1985) has gained popularity to assess and predict user acceptance of emerging information technology (IT) in recent years (Mulia et al., 2021; Tiwari et al., 2021). In association with IBM Canada, Ltd., TAM was developed in the mid-1980s (Davis & Venkatesh, 1996). According to Davis (1985), if one is certain about two factors—perceived usefulness and perceived ease of use—s/he will adopt new technology. Hajli (2014) argued that TAM is the most valid theory for predicting a person's intention to use new technology. Further, TAM is the most tailored theory for modeling users' acceptance of IT (Lai, 2017). A wide range of research has pointed out that TAM as a model has a high validity and strong power of predictability in different sectors, including e-banking and e-commerce (Mulia et al., 2021). Further expansion on the original TAM model has been proposed by different researchers, i.e., Venkatesh and Davis (2000) proposed TAM 2 model, and Venkatesh and Bala (2008) proposed TAM 3 model. A meta-analysis looking over 145 study categories identified three main reasons for TAM's appeal. First, the model incorporates IT. It predicts and understands technology adoption by varied users across enterprises and cultural competence levels. TAM has good credentials and dependable scalability. It is also reliable and steady. Finally, the model's core features and qualities are supported by substantial data (Singh & Sharma, 2023). Because of its practicality, TAM is now the most widely used notion to describe how a person accepts and adopts a certain information system (Kim et al., 2010; Singh & Sharma, 2023) i.e., m-banking, which is why the TAM model has been used as the theoretical background for this study.

M-Banking

M-banking refers to the provision of financial and non-financial services by a bank or microfinance organization through the use of mobile devices such as mobile phones, smartphones, or tablets (Shaikh & Karjaluoto, 2015). In m-banking consumers can avail banking services using a handheld mobile phone instead of using computers (Lin, 2013). M-banking offers new facilities to consumers, such as ubiquity, flexibility, and mobility, compared to traditional banking services (Lin, 2013). Besides these, m-banking provides verities of services to the consumers like balance checks, fund transfers, utility bill payments, shop purchases, online ticketing, and so on (Farah et al., 2018). However, the adoption of m-banking is quite lower than expected in developing countries compared to developed countries (Sharma et al., 2017). This is because banks and financial institutions in developing countries still did not focus on the factors that might influence the adoption of this technology. Besides, m-banking costs are still high in developing countries like Bangladesh.

M-Banking in Bangladesh

Banking is one of the most extended industries in Bangladesh, and it is undergoing immense reforms. The country experienced a new revolution in m-banking this decade. Over 170 million people live in Bangladesh (The World Bank, n.d.), and only about half can use traditional banking channels (Islam et al., 2024). Most adults in Bangladesh have access to a cell phone, but not many of them use an m-bank (Islam et al., 2024). It is a relatively huge untapped market for commercial banks. However, serving those people by establishing branches of banks across rural Bangladesh

is not a better option because of the regulatory constraints of Bangladesh Bank in a new branch opening. Thus, m-banking is an effective and better option for providing the required banking services to customers (Islam, 2013; Mamun et al., 2023). Providing an understanding of the service users' behavior and value perception is one of the fundamental requisites of service development.

In 2011, the journey of m-banking started in Bangladesh, and Dutch-Bangla Bank Limited was the pioneer institution that introduced the m-banking system in the country. Now, 13 banks are providing m-banking services through 17,24,685 agents (Bangladesh Bank, n.d.). Over time, m-banking became popular, especially among students and rural people. In January 2024, total transactions reached BDT129,445.47 crore (approximately USD11,066.55 million), whereas the average daily transaction in January 2024 through m-banking was BDT4,175.66 crore (approximately USD356.99 million; Bangladesh Bank, n.d.). In recent days, m-banking has become easier after releasing m-banking apps in the app stores by leading m-banking service provider banks. For example, the m-banking app bKash has been downloaded one million times within six months of its release, and the Rocket app half a million times in three and a half years (The Financial Express, 2018; World Remit, 2017).

Conceptual Framework and Hypotheses Development

Perceived Usefulness

Perceived usefulness is defined as an individual's perception of the ability of a system to increase his/her work performance (Davis, 1985). Extensive research confirmed the effect of perceived usefulness on IT adoption attitude (Davis et al., 1989; Venkatesh & Davis, 2000; Venkatesh et al., 2003). The main reason people use m-banking is its usefulness. Using m-payment technologies, customers can expeditiously accomplish their jobs and use technological advantages (Oliveira et al., 2016). Based on this assumption, the following hypothesis has been developed:

- H1. Perceived usefulness has a significant impact on attitude toward the adoption of m-banking.

Perceived Ease of Use

The concept of perceived ease of use refers to a person's assessment of how simple a system is to operate—whether it requires less mental or physical effort. Davis et al. (1989) defined perceived ease of use as the extent to which a person thinks it will be easy to use a specific information technology system. Prior research confirmed that people use m-banking as it requires less effort and is very easy to use, especially when m-banking is performed using smartphones (Lule et al., 2012; Wang et al., 2003). Several research studies have pointed out that perceived ease of use influences consumers who purchase online and adopt business-to-consumer e-commerce through websites (Kim et al., 2010; Wen et al., 2011). Based on this discussion, the following hypothesis has been developed:

- H2. Perceived ease of use has a significant impact on attitude toward the adoption of m-banking.

Perceived Self-Efficacy

The capacity to use technology to carry out a task or work is referred to as self-efficacy (Venkatesh et al., 2003). It also means one's capacity to use a computer/ proficiency in computing (Compeau & Higgins, 1995). Self-efficacy indirectly affects m-banking adoption (Boonsiritomachai & Pitchayadejanant, 2017). Self-efficacy is an essential concept to consider when assessing the use of innovative technology, particularly in the context of the adoption of mobile payment systems (Zhang et al., 2023). Perceived self-efficacy in this research assesses an individual's ability to use m-banking applications. Based on the assumptions, the following hypothesis can be developed:

- H3. Perceived self-efficacy has a significant impact on attitude toward the adoption of m-banking.

Perceived Security and Privacy

Perceived security highly influences m-banking adoption. If the bank can provide proper security in the case of m-banking, customer attitude will be positively influenced. In m-banking, privacy is a major concern in every country (Boonsiritomachai & Pitchayadejanant, 2017). Mobile platforms and services should be reliable so that customers can be assured about data privacy, monetary transactions, and other personal information. Therefore, we have developed the following hypothesis:

- H4. Perceived security and privacy have a significant impact on attitudes toward the adoption of m-banking.

Perceived Cost

Transaction cost is one of the important factors in adopting m-banking services (Lule et al., 2012). If customers think about the cost of using m-banking services, then they will use the service; otherwise, they will not. Adopting IT systems depends on economic motivation and outcomes (Mathieson, 1991). Higher transaction costs may prevent customers from adopting m-banking (Lule et al., 2012). Adopters typically encounter hidden expenses that impact the adoption costs of m-banking and must be considered when calculating the real expenses and assessing the costs of obtaining and utilizing new technologies (Moudud-Ul-Huq & Perhiar, 2023). That is why the following hypothesis has been developed:

- H5. Perceived cost has a significant impact on attitude toward the adoption of m-banking.

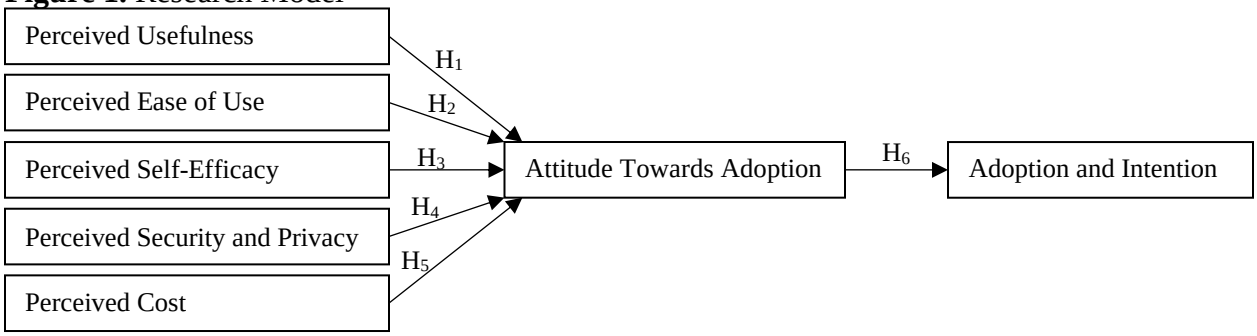
Attitude Towards Adoption and Adoption and Intention of M-Banking

Attitude is a vital factor affecting the adoption of new technology (Davis et al., 1989). Attitude refers to an acquired propensity to react consistently favorably or unfavorably to a specific thing (Ajzen & Fishbein, 1977). Several research has shown the connection between attitude and behavioral intention (Kim & Lennon, 2008). Now, it has become vital for marketers to know the attitudes and intentions of the customers why they purchase a particular product or use a particular service (Gursoy et al., 2006). Therefore, the following hypothesis has been considered:

- H6. Attitude towards the adoption of m-banking has a significant impact on the adaption and intention of m-banking.

The following research model (see Figure 1) was developed based on the hypotheses developed.

Figure 1. Research Model



Research Methods

Survey Design

This study was conducted using a survey methodology and a structured questionnaire. A methodological process was used to create a structured questionnaire. The measuring items were first considered after a thorough literature study. Based on the literature review summary, seven constructs (including perceived usefulness, perceived ease of use, perceived self-efficacy, perceived security and privacy, perceived cost, attitude towards adoption and adoption and intention) were considered for this study. The constructs were taken based on previous research done by various researchers (Dash & Paul, 2021; Hair & Sarstedt, 2019). The socio-cultural aspects of the study area were also considered while considering the final constructs. The authors created, reviewed, and finished the questionnaire in English before professionally translating it into Bengali since that is the respondents' first language. The final questionnaire included two parts: The first part included demographic information, and the second section had twenty-six questions on the study topic's seven dimensions using a 5-point Likert scale ranging from *Strongly agree (1)* to *Strongly disagree* (5).

Data Collection

The demographic of the research is made up of all m-banking millennial users. This study adopted the purposive and snowball sampling technique to pick the respondents. The purposive sampling method was used since this research is focused on a specific subset of Bangladeshi m-banking users, and the snowball sampling method was used because the purposive sampling respondents also participated in data collection for this study. This snowball sampling method produced a sizable number of replies as the respondents were requested to forward the questionnaire link to their known people who would participate in the survey. For data collection in this study, physical copies of the questionnaires and Google forms were employed. 452 completed surveys in all were gathered (hard copy and online). Eventually, 414 replies in all were chosen for additional analysis. 38 questionnaires were excluded because of incomplete responses. In PLS-SEM analysis, the least sample size must be ten times the maximum number of structural paths indicated in a particular

latent construction (Hair et al., 2011). This study passes through the minimum sample size criteria stated by Hair et al. (2014a) and Hair et al. (2022). Again, considering the G*Power analysis for determining the minimum sample size, this study passes that criterion too (Hair et al., 2022).

Data Analysis

The PLS-SEM technique has been used to test hypotheses and estimate structural equation modeling. PLS-SEM is a regression-based method that reduces the remnants of endogenous constructs (Hair et al., 2011; Hair et al., 2022). Variation-based SEMs were preferred over query-based SEMs (Jöreskog, 1978), as they fit well with the features of the study and the nature of the data collected (Hair et al., 2014b). Since the present research is exploratory and employs a Likert scale, it is presumed that the data distribution is not normally distributed. So, the use of PLS-SEM is the first choice rather than using CB-SEM because a normal distribution of data is not required in PLS (Astrachan et al., 2014; Dash & Paul, 2021; Hair et al., 2014a; Hair et al., 2022). For this study purpose, SmartPLS (v.3.2.9) software was used to construct a model, assess the validity, and test the hypotheses.

Results

Demographic Information of the Respondents

Table 1 shows that the majority of the respondents were male (82.10%). According to the survey data, most of the respondents had taken higher education, and most of the samples use m-banking at least once a month.

Table 1. Profile of the Respondents' Demographics (N = 414)

Characteristic	Classification	%
Gender	Male	82.10
	Female	17.90
Marital Status	Single	94.00
	Married	6.00
Generation	Millennial	100.00
Academic Education	Higher Secondary	6.80
	Bachelor	62.10
	Masters	31.10
Monthly Income	Less than 5,000 BDT	27.50
	5,000-10,000 BDT	37.00
	10,001-30,000 BDT	28.30
	30,001-5,0000 BDT	6.00
	50,001 BDT and above	1.20
Mobile Banking Usages Frequency	Daily	8.90
	Weekly	34.80
	Monthly	56.30

Analysis and Results

As suggested by Anderson and Gerbing (1988), a two-tiered method has been used for data analysis and hypothesis testing. So, the suggested model of this research has been examined using SmartPLS v.3.2.9.

The Measurement Model

A confirmatory factor analysis was applied to test the measurement model's suitability. Discriminant validity, convergent validity, and reliability tests were applied to assess the robustness of the measurement model. Convergent validity is measured by the ability to load together as a single construct of the scale and by checking each load for each indicator (Osman & Sentosa, 2013). Outer loading values should be greater than .70, which suggests that indicators share more variance with respective latent variables than error variables. In exploratory research, a lower limit of .6 is also admissible (Chin, 1998). The values of outer loading are shown in Table 2, which satisfies the prerequisite benchmarks.

In the structural measurement model, the intensity of the collinearity between the indicators is measured by the variance inflation factor (VIF). If the values of VIF are upper than 5, it designates a greater level of collinearity (Hair et al., 2014b). So, the values of VIF should be less than 5 (Amoah et al., 2021). Table 2 shows that all the values of VIF are less than 5, which is at the threshold level.

Table 2. Validity Assessment

Construct	Measurement Item	Loading	VIF	α	CR	AVE
Adaption and Intention	ADI1	.80	1.47	.75	.84	.57
	ADI2	.70	1.37			
	ADI3	.76	1.55			
	ADI4	.77	1.51			
Attitudes Toward Adoption	ATA1	.80	1.45	.76	.86	.67
	ATA2	.84	1.65			
	ATA3	.82	1.54			
Perceived Cost	PC1	.80	1.53	.78	.87	.69
	PC2	.88	1.79			
	PC3	.82	1.59			
Perceived Ease of Use	PEU1	.72	1.28	.69	.81	.52
	PEU2	.72	1.39			
	PEU3	.69	1.20			
	PEU4	.75	1.35			
Perceived Self-Efficacy	PSE1	.70	1.20	.65	.79	.49
	PSE2	.64	1.20			
	PSE3	.73	1.34			
	PSE4	.72	1.22			
Perceived Security and Privacy	PSP1	.74	1.85	.81	.87	.57
	PSP2	.69	1.80			
	PSP3	.78	1.86			
	PSP4	.80	1.83			
	PSP5	.74	1.73			
Perceived Usefulness	PU1	.82	1.50	.70	.82	.61
	PU2	.61	1.28			
	PU3	.89	1.42			

Internal consistency is measured by using Cronbach's alpha (α). General guidelines for measuring α are less than .50 unacceptable. The values of α should be higher than .70 (Hair et al., 2014a). However, in the case of exploratory studies, the value is considered acceptable from .60 to .70. Table 2 shows that α values are at the threshold level. Composite reliability (CR) has been considered another indicator of reliability measurement. The CR ranges from 0 to 1; higher values designate higher reliability. In exploratory research studies, values ranging from .60 to .70 are tolerable for CR (Hair et al., 2014a). Researchers like Fornell and Larcker (1981) also

recommended that the CR values should be greater than .70. In Table 2, it is seen that all the values of CR are above .70. To determine the convergent validity, Average Variance Extracted (AVE) is commonly used. The value of AVE should be greater than .5 (Fornell & Larcker, 1981). Table 2 shows that almost all the values of AVE are above .5 To qualify discriminant validity, the square root of each construct's AVE should be greater than its highest correlation with any other construct (Fornell & Larcker, 1981). Table 3 shows that all the constructs met the criteria, and discriminant validity has been confirmed.

Table 3. Discriminant Validity (Fornell Larcker Criterion)

Contract	1	2	3	4	5	6	7
Adoption and Intention	**.76**						
Attitudes Toward Adoption	.56	**.82**					
Perceived Cost	.24	.38	**.83**				
Perceived Ease of Use	.36	.39	.29	**.72**			
Perceived Security and Privacy	.34	.44	.55	.41	**.75**		
Perceived Self-Efficacy	.29	.29	.37	.38	.49	**.70**	
Perceived Usefulness	.29	.27	.27	.59	.33	.34	**.78**

The Heterotrait-Monotrait ratio (HTMT) is also used frequently to measure the discriminant validity. The threshold value of HTMT is below .9 (Henseler et al., 2015). Table 4 shows that all the values fall within the threshold level, suggesting a significant association between indicators and constructs.

Table 4. The Criterion for HTMT Discriminant Validity

Contract	1	2	3	4	5	6	7
Adoption and Intention							
Attitudes Toward Adoption	.73						
Perceived Cost	.30	.49					
Perceived Ease of Use	.49	.53	.39				
Perceived Security and Privacy	.42	.55	.69	.55			
Perceived Self-Efficacy	.42	.41	.51	.58	.67		
Perceived Usefulness	.38	.33	.35	.84	.43	.49	

The Structural Model

A bootstrapping technique was employed to generate the value of *t*-statistics and *p*-values based on a 5000-sample bootstrapping test (Tenenhaus et al., 2005). The *t*-statistics and *p*-values are used to check the hypotheses developed. An essential criterion for assessing the structural model is the coefficient of determination (R^2) of the endogenous latent variables (Chin, 1998). The values of R^2 greater than .2 are considered modest. The R^2 values of attitude towards adoption and attitude and intention are .264 and .318, respectively (.255 and .317 for R^2 adjusted value), which passes through the required minimum criteria (Hair et al., 2014b).

The blindfolding technique was employed to test the model's predictive capacity. The Stone-Geisser test (Q^2) was utilized to check the predictive relevance of the model (Ali et al., 2018; Geisser, 1974; Stone, 1974), which revealed that attitude towards adoption and attitude and intention's Q^2 values are .169 and .172, respectively, suggesting a moderate degree of predictive relevance as suggested by Hair et al. (2014b) and Chin (2010). The result shown in Table 5 represents that, among the six hypotheses, four are supported, and the other two hypotheses are not supported. The β value, *t*-statistics, and *p*-value for each of the hypotheses are illustrated in Table 5. The structural relationship of the hypothetical model is demonstrated in Figure 2.

Table 5. Hypotheses Statistics (Bootstrapping) and Endogenous Constructs Assessment

Path Coefficients and Bootstrapping

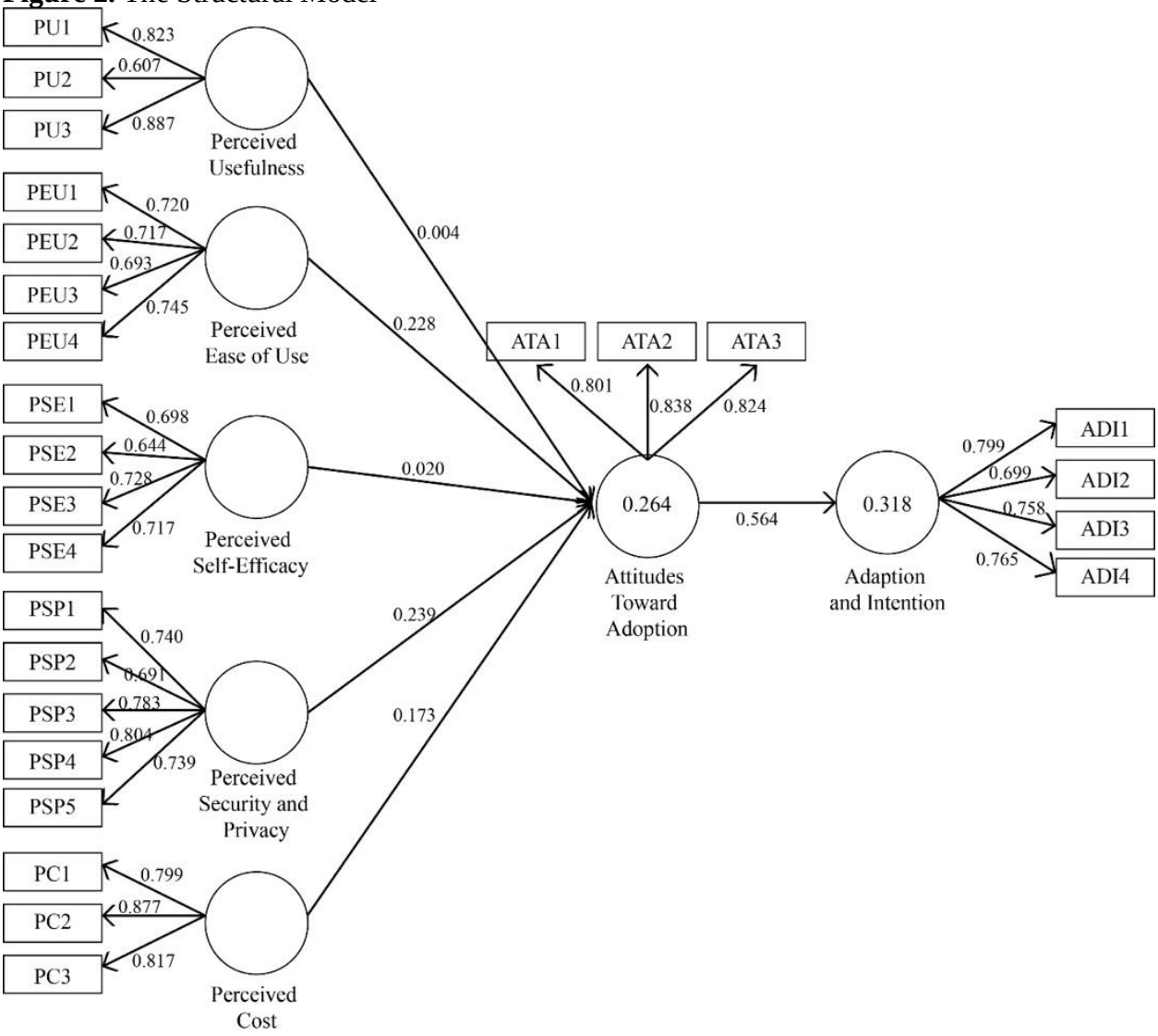
Hypothesis	Path	*β*	*t* (|*O*/*SD*|)	*p*	Result
H1	Perceived Usefulness –> Attitudes Toward Adoption	.004	0.060	.952	Not supported
H2	Perceived Ease of Use –> Attitudes Toward Adoption	.228	3.333	.001*	Supported
H3	Perceived Self-Efficacy –> Attitudes Toward Adoption	.020	0.323	.747	Not supported
H4	Perceived Security and Privacy –> Attitudes Toward Adoption	.239	3.338	.001*	Supported
H5	Perceived Cost –> Attitudes Toward Adoption	.173	2.988	.003*	Supported
H6	Attitudes Toward Adoption –> Adoption and Intention	.564	12.812	.000**	Supported

Endogenous Constructs Assessment

Variable	R^2	R^2 Adjusted	Q^2
Attitudes Toward Adoption	.264	.255	.169
Adoption and Intention	.318	.317	.172

Note. *$p < .05$. **$p < .001$. *t* (|*O*/*SD*|) and *p* are computed through the bootstrapping procedure with 414 cases and 5,000 samples.

Figure 2. The Structural Model



Results and Discussion

By utilizing the TAM model, this study hypothesized six hypotheses. Among six hypotheses, four were supported, and two were not supported. More specifically, perceived usefulness ($\beta = .004$, t-value $= 0.060$, $p > .05$) and perceived self-efficacy $\beta = .020$, t-value $= 0.323$, $p > .05$ had an insignificant effect on attitude towards the adoption of m-banking services. Therefore, H1 and H3 were not supported. It may be due to the fact that people have not yet been able to adapt to the difficult functions of m-banking. Therefore, m-banking service providers should make the m-banking functions simple and easily understandable to the masses. In this case, m-banking service providers need to develop smartphone-based apps for m-banking, the icons of which should be easy to understand and clear to the common people. Besides, rather than using English-based functions, native language options should be given priority so that people with minimum education levels can use the service. Perceived ease of use ($\beta = .228$, t-value $= 3.333$, $p < .05$) had a significant positive impact on the attitude to adopt m-banking. Hence, H2 was supported. The policymakers of m-banking organizations should design the m-banking application as easily as possible so that consumers use it with free/ minimum effort. Perceived security and privacy had a significant impact ($\beta = .239$, t-value $= 3.338$, $p < .05$) on attitudes toward the adoption of m-banking. It means people use technology only when they feel secure and private. Therefore, policymakers should take extra precautions regarding data privacy and transaction security while designing m-banking applications. Moreover, Perceived cost ($\beta = .173$, t-value $= 2.988$, $p < .05$) had a significant positive effect on the attitude to adopt m-banking. Hence, H5 was supported. The cost of m-banking should be reasonable and fair. However, m-banking costs are still high in developing countries like Bangladesh. Finally, based on the aspects of TAM, m-banking users have a positive attitude towards the technology and are willing to adopt the services of m-banking, which has been confirmed by H6 ($\beta = .564$, t-value $= 12.812$, $p < .001$).

Conclusion

M-banking has been considered one of the fastest-growing segments of the banking industry in recent years. Thus, exploring adoption intentions and related aspects needs to be investigated from a developing country perspective, especially focusing on millennials or Gen-Y customers. For this, this study has been carried out to learn more about this field. The empirical result reveals that perceived ease of use impacts millennials' attitudes toward adopting m-banking. Prior research confirmed that people use m-banking as it requires less effort, especially when m-banking is performed using smartphones (Lule et al., 2012; Wang et al., 2003). Again, the positive association between perceived security and privacy with millennials' attitudes toward adopting m-banking also greatly influences this, as this remains the major concern for customers (Boonsiritomachai & Pitchayadejanant, 2017). Furthermore, the positive interconnection between perceived cost and attitudes toward adopting means that the millennials really consider cost seriously when choosing m-banking services, and if the cost is relatively higher, then it is possible to switch brands in m-banking (Lule et al., 2012). In contrast, the empirical result reveals that perceived usefulness and self-efficacy have insignificant relationships with attitudes toward adopting m-banking for millennials. Although those two aspects are essential elements for the m-banking perspective (Oliveira et al., 2016; Zhang et al., 2023), in the context of this study, it is found that the millennials are more advanced knowledge in operating handheld devices and thus the perceived usefulness and self-efficacy has less important among them. Moreover, the study findings also confirm the

positive association between millennials' attitudes toward adopting m-banking and the adoption and intention of m-banking relationships (Kim & Lennon, 2008).

This study adds significantly to the growing body of research on Generation Y customers, a group whose distinct buying habits and decision-making processes are making them more and more the focus of marketing strategies. Through exploring the many elements that affect Generation Y people's decisions, this study offers insightful information that can guide the creation of the next technology-based services. The findings of this study should be taken into consideration by industry practitioners when making decisions concerning market segmentation, product/service development, and market offers. This will result in an increase in the number of prospective customers and encourage them to break their set habits.

Implications

It is important to note that the findings and outcomes of the study have substantial consequences for the business community. This study contributes to the expansion of the TAM model from a theoretical standpoint, particularly with regard to the opinions of millennials and the viewpoints of emerging nations. The research findings indicate that the millennials' attitude towards embracing mobile banking is substantially influenced by their perceptions of factors such as perceived ease of use, perceived security and privacy, and perceived cost. Consequently, this indicates that clients of Generation Y take into consideration the simplicity of technology, privacy, and security, as well as cost, which represents their worry about these concerns. On the other hand, perceived usefulness and perceived self-efficacy have a negligible impact on the adoption attitudes of millennials. This indicates that customers are well-oriented regarding the adoption of technological advancements, and they are able to adopt new technologies without requiring a great deal of guidance and without experiencing a great deal of difficulty in adapting to new technologies. In addition, the empirical outcome supports a user-centric strategy to better satisfy customers' wants. This study adds to academic discourse by expanding and refining theoretical frameworks.

Furthermore, it assists financial institutions in designing and implementing technology-based services that are more likely to be accepted and used by employees and consumers, resulting in increased efficiency, customer satisfaction, and a competitive edge in the market. The study findings are crucial for financial institutions trying to increase millennial m-banking use. Considering perceived ease of use, financial institutions offering m-banking should promote user-friendly interfaces. Simplifying navigation, transactions, and device compatibility can help millennials adopt m-banking. The study results indicated that millennials value security and privacy. Therefore, banks must invest in cybersecurity. Trust may be built through data protection transparency and security upgrades. Using biometric identification technologies like fingerprint or face recognition can boost security and convenience. Transparent and low-cost pricing and the cost reductions of m-banking over traditional banking might persuade this segment. The study reveals that perceived usefulness and self-efficacy do not affect millennials' views of m-banking. This may suggest that millennials understand the benefits of m-banking or are confident in their abilities to use it. Thus, banks should emphasize the advantages and features that fulfill millennials' requirements rather than their utility or convenience. Nevertheless, positive m-banking attitudes strongly influence adoption and intention, which might be connected to creating marketing initiatives that appeal to millennials' values and lifestyles. Millennials may relate to m-banking by

showcasing how it saves time, is convenient, and offers services as a financial management tool. The Asia Pacific region is experiencing a continuous upward trend in e-commerce, primarily due to a substantial surge in the usage of m-banking. In order to keep pace with current trends and capitalize on possibilities, organizations must think about m-banking to serve the customers better (Ponsree et al., 2023).

Limitations and Future Research Directions

This work has limitations, even if it offers several theoretical and practical applications. First, this study has taken the millennial generation. So, the result of this study cannot be generalized beyond this population. Future studies should consider people of all ages who use m-banking services. Besides, the majority of the respondents are male, single, and have bachelor-level education qualifications, which represents the bias in the data (budget is the main issue behind that, as the authors did not get any funding for conducting the research and collecting data from different groups of people). Thus, generalization of the result is somehow difficult based on the study result. Future studies may consider this issue and collect data from different groups of respondents. Second, this study was conducted in Bangladesh only. Future studies should be longitudinal or cross-country based to get more generalized results. Third, this study used the extended TAM model as a research framework. Since the unified theory of acceptance and use of technology can account for 69% of the intention to use IT, compared to other models' 40% ability to do so, future research initiatives may choose to employ it as a study framework (Kijsanayotin et al., 2009).

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Appendix 1. Measurement Items

Perceived Usefulness	PU1	I think that using mobile banking would make it easier for me to carry out my regular tasks.
	PU2	Using mobile banking services save my time.
	PU3	Overall, I think that using mobile banking is advantageous.
Perceived Ease of Use	PEU1	I think that the use of mobile banking is clear and easy to understand.
	PEU2	I think that it is easy to use mobile banking to accomplish my banking (e.g., send money, payment) tasks.
	PEU3	I think that it is easy to use mobile banking to accomplish my non-banking (e.g., mobile recharge) tasks.
	PEU4	Learning how to use mobile banking is easy.
Perceived Self-Efficacy	PSE1	I could complete my banking transaction using the mobile banking, if I had only the manuals or online help for reference.
	PSE2	I could complete my banking transaction using the mobile banking, if I had seen someone else using it before trying it myself.
	PSE3	I could complete my banking transaction using the mobile banking, if I had a lot of time to complete the job.
	PSE4	I could complete my banking transaction using the mobile banking, if someone showed me how to do it first.
Perceived Security and Privacy	PSP1	I trust on the technology a mobile banking is using.
	PSP2	I trust in the ability of a mobile banking to protect my privacy.
	PSP3	I trust in a mobile banking as a bank.
	PSP4	Using a mobile banking is financially secure.
	PSP5	I am not worried about the security of a mobile banking.
Perceived Cost	PC1	I think that the price charged by mobile banking operators in cash in/out is reasonable.
	PC2	I think that the mobile banking is providing less services than the cost.
	PC3	I think that the mobile banking operators are offering less technologically advanced services than the cost.
Attitudes Toward Adoption	ATA1	I think that using mobile banking for financial transactions would be a best idea.
	ATA2	In my opinion, everyone should use mobile banking.
	ATA3	I think that current users should inspire other people who are not using mobile banking yet.
Adoption and Intention	ADI1	I would use the mobile banking for my banking and non-banking needs.
	ADI2	I expect that mobile banking operators will provide their offers according to my needs.
	ADI3	I would continue to use mobile banking if I get alternative services.
	ADI4	I would say positive things about mobile banking to my relatives and close friends.