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Banking access for the poor: Adoption and strategies in rural areas of Bangladesh

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ABSTRACT

The progress of Mobile Banking (M-banking) is unsatisfactory in terms of achieving a key objective, i.e. to reach the inaccessible unbanked customers at an affordable cost for financial inclusion. We identify the causes to this problem through the investigating the factors affecting the adoption of m-banking in remote areas of Bangladesh using a 236 primary sample of m-bank customers from seven geographical locations and across professions. We document a positive effect of perceived ease of use, trusts, and perceived usefulness, and a negative effect of user interface on adopting m-banking in rural Bangladesh. our findings provides significant policy implications for policy planners and the bank managers to enrich their policies and strategies for promoting financial inclusion as well as successful banking business in rural of Bangladesh.

1.0   Introduction

Financial inclusion (FI) and development are closely related. Sarma and Pais (2011) defined financial inclusion as *a process that ensures availability, the ease of access, and usage of the formal financial system for all members of an economy.* It facilitates efficient allocation of resources and financial management; increasing formal savings and credits; reduction of poverty and improving equality (Chibba, 2009; Sarma & Pais, 2011). Different countries especially lower and the middle-income group set FI as their policy priority to achieve SDGs by capitalizing the use of ICT to embrace the marginal people financially.

Mobile phone, a blessing of ICT, has shown promising outcome in both economic empowerment and social development in different countries (Rashid & Elder, 2009). Citizen around the world can access information related to health, education, weather, news, jobs, finance and market through mobile phones. People in developing countries are enjoying financial systems, government services, and citizen feedback mechanisms with the increased mobile penetration (Canuto, 2013). These economic and social benefits of a cell phone, however, evidently found to be the highest in rural areas (Sarma and Pais 2011), where the marginal, hard to reach and unbanked people live. These people have access to mobile but financially excluded, which is evident from the world development indicators.

The World Bank data (2014) shows that in the high-income group countries 73% of the population (age 15+) has bank account, and 126% of the population (age 15+) has mobile phone subscription; whereas in low to middle income countries about 53% of the population (age 15+) has bank account while 90% of the population (age 15+) has mobile access. In Bangladesh, 29% of the population (age 15+) has a bank account while 76% of the population (age 15+) has mobile access. The data reveals that people in the high-income group have higher banking and mobile access than that of lower and middle-income nations. Mobile banking is one of the best ways to reach these unbanked population for financial inclusion.

The term mobile banking simply means the banking services delivered and received using cell phones. The adoption of ICT in the banking and financial sector opened this new, innovative and affordable channel of delivering banking and financial services. Mobile banking, is using same technology like e-banking (Welch, 1999), enabled the banking industry to perform fastest wireless and Internet commercial transactions (Greenacre & Buckley, 2014). However, the core advantage of mobile banking is that banks can serve its customers even where the internet is absent and with minimum technological knowledge of customers. As a result, the modern means of sitting in front of computers for getting any services is no more required to obtain the defined services (Ahmed, Rayhan, Islam, & Mahjabin, 2012).

Taking the advantage of the mobility (Suoranta, 2003) and internet independent technology, mobile banking in different countries were launched to access the unbanked population for financial inclusion (Nabi et al., 2012). The assumption behind the financial inclusion of the unbanked population is facilitating them to access the economic benefits, such as increased savings, credits, increased income and protection from financial shocks (Donner & Tellez, 2008). The government can reap the benefits of increased capital from the untapped portion of the population, transparency in the transactions, increased tax potentiality and greater circulation of money that were currently not in the account. For example, M-Pesa, mobile banking service in Kenya is a blockbuster success story for the world. It was introduced in 2007 to make and receive payments. The household that adopted M-Pesa seemed to have increased in income by 5-30% (The Economist, 2013). Through mobile banking, the Kenya have been able to drop its financially excluded population to 3% (The Daily Prothom Alo, 2015). M-Pesa today operates in 10 countries. M-Pesa, the mobile banking model, has been replicated in other parts of the world including Bangladesh.

Mobile banking in Bangladesh, started in the year 2011, is playing a significant role in the rural economy of Bangladesh. The most popular services they enjoy from mobile banking are deposit and withdrawal of money, payment of gas, electricity and water bill. According to Bangladesh Bank (till May 2016), 29 banks are authorized for providing mobile banking services, of which 19 have already started their functions; about Tk. 6.2 billion transacted daily over mobile banking platform through 592 thousand agents.

However, the effect of mobile banking on the financial inclusion of the poorest 40% of the adult population, who reside in the rural areas in Bangladesh, is scanty. In the year 2011, while the mobile banking was introduced, the financial inclusion of the poorest 40% adult in Bangladesh was 21.2% and in the year 2014, that grew to 21.5% (The World Bank, 2014a). Clearly, the policy makers both the government and the banks are missing something, which is deterring the poorest 40% of the adult population to adopt mobile banking although they are the subscribers of cell phones.

Till date, most of the research on mobile banking adoption (Aderonke, 2010; Akturan & Tezcan, 2012; Al-Jabri & Sohail, 2012; AlSoufi & Ali, 2014; Crabbe, Standing, Standing, & Karjaluoto, 2009; DiVanna, 2003; Goi, 2006; Gu, Lee, & Suh, 2009; Haig, 2002; Hanafizadeh, Behboudi, Abedini Koshksaray, & Jalilvand Shirkhani Tabar, 2014; Hassan, Rahman, Afrin, & Rabbany, 2014; Kabir, 2013; Karjaluoto, Koenig-Lewis, Palmer, & Moll, 2010; Karjaluoto, Riquelme, & Rios, 2010; Kazi & Mannan, 2013; Khraim, Al Shoubaki, & Khraim, 2011; Laforet & Li, 2005; Lee, Lee, & Kim, 2015; Luarn & Lin, 2005; Mattila, 2003; Mbiti & Weil, 2011; Medhi, Ratan, & Toyama, 2009; Nayak, Nath, & Goel; Oshunloye, 2009; Suoranta, 2003; Yu, 2012; Zhou, Lu, & Wang, 2010) either focus on developed countries or on developing countries from a narrow or urban scope. Most of the previous research is lagging behind in identifying the factors contributing to the adoption of mobile banking in rural areas. Reaching the unbanked inaccessible population of the countryside remain a challenge for any developing as well as developed nations. This study tried to fill this research gap by identifying the determinants of mobile banking adoption in rural areas.

2.0   Literature review

Mobile banking has given the opportunity to the customer to perform banking operations irrespective of time, place and the Internet (Chitungo & Munongo, 2013; Suoranta, 2003). It has opened the possibility of financial inclusion of millions of people remotely located and unbanked to share the economic development. However,

compared to the overall banking transactions, the market for mobile has remained subtle in Bangladesh. It seems that the widespread adoption of cell phones does not reflect the high level of mobile banking adoption(Yu, 2012). Customers of Iran, Guatemala and Mexico, can obtain banking services through the local mobile network. Pakistan has also launched mobile banking services with limited facilities, but India provides services in wider areas. The scenario in China, Brazil and Kenya is quite different regarding the number of users. Here the number of users soared over 100 %. In UK, USA, Singapore, South Korea and Sweden, banks provide new services to their customers via mobile handset (Khraim, et al., 2011).

In 2011, Zimbabwe started mobile banking services which were the panacea for the unbanked rural areas of the country. Now it has become the most popular financial channel for all in Zimbabwe (Aboelmaged & Gebba, 2013). Applications of mobile banking in Bahrain has been growing up rapidly and expected to increase in the coming year; most of the banks of Bahrain now operate mobile banking due to the popularity of this service (AlSoufi & Ali, 2014). However, the economy where banking access is comparatively higher, adoption of mobile banking seems to lower (Cudjoe, Anim, & Nyanyofio, 2015).

Direct marketing of mobile banking is very crucial for the penetration of mobile banking on a grand scale. The service providers sometimes think that promotion of mobile banking may occur within the branch, but the scenario has changed (Bankole, Bankole, & Brown, 2011). Customer's recognition or understanding of the potential value of mobile banking is very urgent for increasing the number of users. Creating awareness for the value of mobile banking can be a useful tool for this purpose (Nayak et al.).

Medhi et al. (2009) undertook a qualitative study in four countries (India, Kenya, Philippines and South Africa) on 90 respondents to identify the barriers to mobile banking adoption. They found that household type, services, usage frequency, ease of use and uptake deter the use of mobile banking adoption of the financially excluded group. On the contrary, Kazi and Mannan (2013) identified innovative promotional and pricing strategies should adopt by the service providers to increase the number of acceptance. Findings of the researchers on the mobile banking adoption have been summarized in Table 1.

Table 1: Determinants of mobile banking adoption identified in different research / countries		
Researchers	**Determinants Identified**	**Location / Context**
Suoranta (2003)	relative advantage, compatibility, communication and trialability	Finland
Laforet and Li (2005)	security, perception of risks, technological skills, and awareness	China
Crabbe et al. (2009)	perceived credibility, facilitating conditions, perceived elitisation, and demographic factors	Ghana
Medhi et al. (2009)	household type, key service adopted pace of uptake, frequency of usage, and ease of use.	India, Kenya, Philippines and South Africa (rural / poor)
Karjaluoto, Koenig-Lewis, et al. (2010)	compatibility, perceived usefulness, and risk	Germany
Bankole et al. (2011)	culture, utility expectancy, effort expectancy, and behavioral intention	Nigeria
Khraim et al. (2011)	self-efficacy, trialability, compatibility, complexity, risk and relative advantage	Jordan
Al-Jabri and Sohail (2012)	relative advantage, compatibility, received risk and observability	Saudi Arabia
Akturan and Tezcan (2012)	attitude, perceived usefulness, perceived social risk, perceived performance risk and perceived benefit	Turkey
Kazi and Mannan (2013)	perceived risk, ease of use, usefulness and social influence	Pakistan
Aboelmaged and Gebba (2013)	Attitude, subjective norm, perceived ease of use and perceived usefulness	Dubai
Kabir (2013)	perceived risks (except social risk), trust, convenience, and comparative advantages	Bangladesh
Chitungo and Munongo (2013)	perceived ease of use, relative advantages, social norms, personal innovativeness, perceived risks, perceived usefulness, and costs	Zimbabwe
AlSoufi and Ali (2014)	perceived Usefulness and Ease of Use	Bahrain
Ndumba and Muturi (2014)	perceived risk, perceived convenience, perceived usefulness and trust	Kenya

Table 1: Determinants of mobile banking adoption identified in different research / countries

Researchers	Determinants Identified	Location / Context
Blumenstock, Callen, and Ghani (2014)	violence, intention	Afghanistan
(Nayak, Nath, & Goel, 2014)	awareness, perceived usefulness, perceived ease of use, trust	India
K. S. Lee et al. (2015)	perceived risk, trust, and perceived usefulness	South Korea
(Cudjoe et al., 2015)	perceived credibility, perceived financial cost, perceived usefulness and perceived ease of use	Ghana

3.0   Theoretical framework and hypotheses development

Our study aimed at finding out the determinants of mobile banking adoption by the rural people. Previously, researchers have used many models available to identify the adoption of new technology; such as the technology acceptance model (Davis, Bagozzi, & Warshaw, 1989), the Unified Theory of Acceptance and Use of Technology (Venkatesh, Thong, Chan, Hu, & Brown, 2011), Theory of Planned Behavior (Venkatesh et al., 2011), Theory of Reasoned Action (Albarracin, Johnson, Fishbein, & Muellerleile, 2001), and the Innovation Diffusion Theory (Moore & Benbasat, 1996), etc. Among these, Technology acceptance model (TAM) is the most dominant model used for the study of the adoption of information technology and thus TAM has been used for this study. The theoretical framework has been shown in Figure 1.

3.1   Perceived ease of use and m-banking adoption

Perceived ease of use has significant influences on technology adoption (Iqbal & Bhatti, 2015). In mobile banking, it means a degree to which a person is free of difficulty with the usage of mobile banking technology (Aderonke, 2010). The relationship between perceived ease of use and mobile banking efficacy is positive because it indicates the hands on experience of the users (Luo, Li, Zhang, & Shim, 2010). We hypothesized that:
H1: PEU has significant positive influences on mobile banking adoption.

3.2   User interface and m-banking adoption

The user interface requires an in-depth understanding of user need (Thakur & Srivastava, 2014). The best interface is that a user will have all types of access regarding usability and understanding. It enhances the relationship between users and the system (Ha, Canedoli, Baur, & Bick, 2012). So we hypothesized that:
H2: User interface has positive influences on mobile banking adoption.

3.3   Trust and m-banking adoption

When the user chooses a particular system, (s)he must consider the overall trust on that technology (Slade, Williams, & Dwivedi, 2013). Trust on using a technology fosters the adoption of technology (Lee, Kim, & Ahn, 2011) and the degree of confidence heading towards the adoption of new technology (Shareef, Kumar, Kumar, & Dwivedi, 2011). Based on above discussion, we hypothesized that:
H3: Trust has positive influences on mobile banking adoption.

3.4   Perceived usefulness and m-banking adoption

Perceived usefulness is a critical construct in our proposed model which means that to what extent the person believes that using the technology will enhance his/ her performance (Hoque, Bao, & Sorwar, 2016). In mobile banking, it means obtaining services as desired by the user (Karjaluoto, Koenig-Lewis, et al., 2010). Accordingly, we hypothesized that:
H4: Perceived usefulness has positive influences on mobile banking adoption.

4.0   Research design and methods

4.1   Research setting

Due to the limited research on the adoption of mobile banking in rural areas of Bangladesh, we undertook an exploratory research in rural parts of Bangladesh with a structured questionnaire. Sample frame included Gazipur (40), Tongi (30), Norsingdi (25), Faedabad (33), Savar (35), Narayanganj (42) and Comilla (31) regions of Bangladesh. Due to the cost effectiveness, a convenience sampling method was used. The participants were informed about the purpose of the study.

Figure 1: Research model
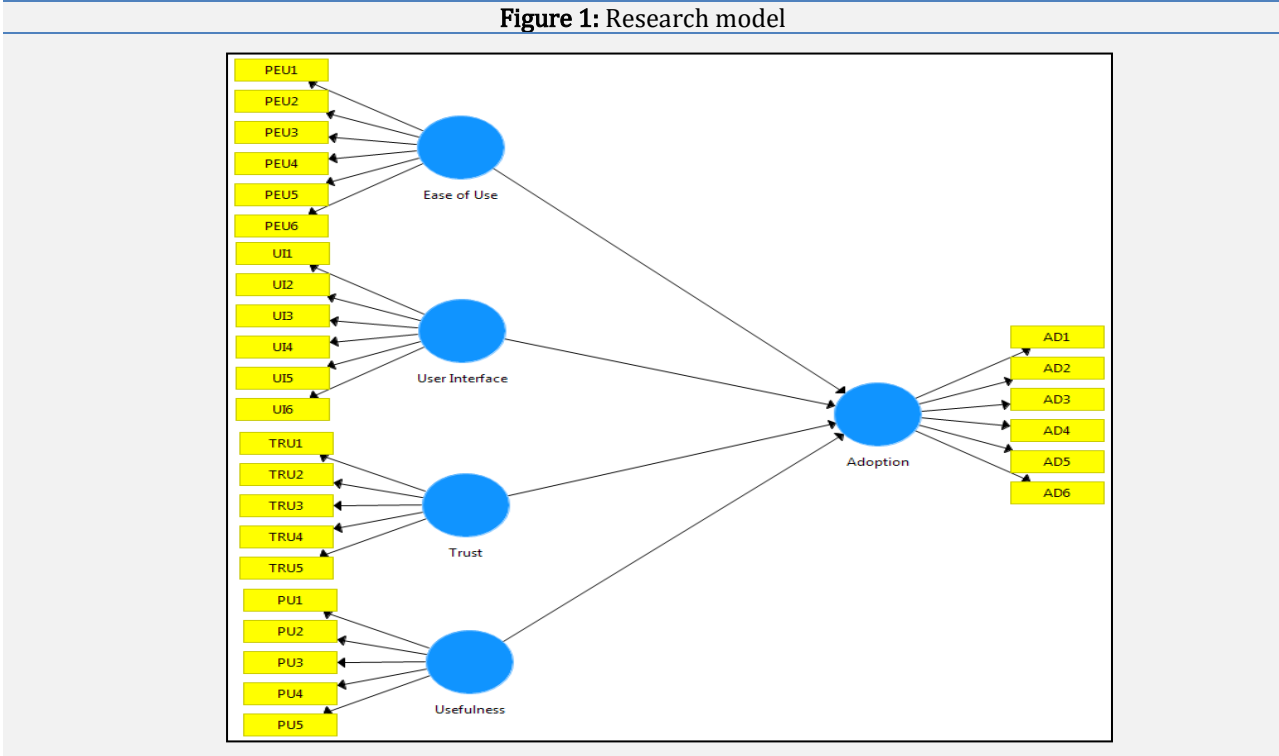
4.2   Questionnaire design and data collection

To collect the relevant data for measuring the latent constructs in the research hypotheses, we adopt the structured questionnaire survey method. There were two parts in the questionnaire. Part A contains the demographic information that was used to have the descriptive characteristics of the sample.

In part B, there were some questions regarding the different constructs in the research model on a 5 point Likert scale. A face-to-face meeting was conducted to obtain the response of the participants for this study. We distributed 300 questionnaires, and 243 were returned. We used 236 questionnaires for further analysis, and seven incomplete questionnaires were excluded from the survey. We used statistical analysis technique, based on structural equation modeling (SEM) called the partial least squares (PLS) method to test and validate the proposed model and the relationships among the hypothesized constructs. Smart PLS 3.0 (Ringle, Wende, & Becker, 2015) software has been used to analyze the data.

5.0   Findings

5.1   Measurement model evaluation

The measurement model has been assessed through the internal reliability, convergent validity, and discriminant validity. The internal reliability was examined through the Cronbach's alpha and Composite Reliability (CR). For both of the measurement, the constructs had more than recommended value, i.e., greater than 0.7. So all the constructs or latent variables used in this study were found reliable. The average variance extracted (AVE) and item loading for all the elements or observed variables are above the threshold value of 0.50. The items used in this study thus have the convergent validity. Table 2 shows the Measurement model results.
The discriminant validity has been assessed by the square root of the AVE and crosses loading matrix. For discriminant validity, the diagonal elements must be larger than the entries in corresponding columns and rows.

From the results of Table 3, it can be seen that all the diagonal values are greater than the values of corresponding columns and rows, indicating the discriminant validity of the constructs.

Table 2: The measurement model					
Constructs	Items	Loadings	C.R	Cronbach's Alpha	AVE
Adoption	AD1	0.845			
	AD2	0.853	0.94	0.92	0.71
	AD3	0.809			

Table 2: The measurement model					
Constructs	Items	Loadings	C.R	Cronbach's Alpha	AVE
Perceived Ease of Use	AD4	0.834			
	AD5	0.845			
	AD6	0.863			
	PEU1	0.740			
	PEU2	0.702			
	PEU3	0.658	0.86	0.81	0.51
	PEU4	0.725			
	PEU5	0.761			
	PEU6	0.692			
Perceived Usefulness	PU1	0.822			
	PU2	0.843			
	PU3	0.766	0.90	0.87	0.70
	PU4	0.787			
	PU5	0.819			
Trust	TRU1	0.867			
	TRU2	0.805			
	TRU3	0.820	0.91	0.88	0.70
	TRU4	0.788			
	TRU5	0.820			
User Interface	UI1	0.931			
	UI2	0.920			
	UI3	0.952			
	UI4	0.930	0.98	0.97	0.87
	UI5	0.924			
	UI6	0.932			
AVE=Average Variance Extracted, CR=Composite Reliability					

Table 3: Correlation matrix and square root of the AVE (Latent Variable Correlations)					
	Adoption	Ease of Use	Trust	Usefulness	User Interface
Adoption	0.714				
Ease of Use	0.712	0.841			
Trust	0.650	0.816	0.820		
Usefulness	0.663	0.835	0.818	0.848	
User Interface	-0.682	-0.839	-0.718	-0.732	0.932

5.2   Hypotheses Testing

To identify the relationships among the constructs in the research model, we develop the structural model. By the path coefficient (β) and t-statistics, we evaluate the relationship between dependent and independent variables. Table 4 shows the PLS results of the structural model for this study. The results indicate the relationships between PEU and AD (t = 2.813, β=0.111, p<0.05), UI and AD (t = 7.999, β= -0.403, p <0.05), TRU and AD (t = 3.790, β=0.206, p <0.05), PU and AD (t = 4.673, β=0.290, p <0.05). So H1, H2, H3, and H4 were significant and accepted in the current study. Overall the constructs in this model explain about 83% of the variations in the adoption of mobile banking, which is greater than recommended level of 20-25%.

Table 4: Structural model					
Hypothesis	Path	(β)	t-statistics	Comments	R^2
H1	PEU -> AD	0.111	2.813	Accepted	0.828
H2	UI -> AD	-0.403	7.999	Accepted	
H3	TRU -> AD	0.206	3.790	Accepted	
H4	PU -> AD	0.290	4.673	Accepted	

6.0   Discussion

We tried to identify the factors determining the adoption of mobile banking in rural Bangladesh using TAM model. Through analyzing the survey data of 236 respondents, we found that all the constructs have a strong relationship with the adoption of mobile banking. The results revealed the significant influences of PEU, UI, TRU and PU on the adoption of mobile banking.

The unique finding of this study is the User Interface, which is exceptional from the results of the previous studies (see Table 1). UI seems to work as a deterrent for the adoption of mobile banking in Bangladesh. The plausible cause may the language used in mobile banking. The language in the mobile banking is English, which is not understood by many rural users. Using the Bengali language might help here. Akturan and Tezcan (2012) has found that the user interface is more crucial when users have the lacking of experience in using technology. The rural adults are using mobile technology, which is relatively new to this section of the population. Using this technology for money transaction might make them nervous. We believe the use of local language and more experience over time will help the users to overcome UI related nervousness.

The second most influencing factor is the Perceived Usefulness (PU); which confirms most of the previous findings (see Table 1). Currently, the users of mobile banking are mostly using money transfer facility of the mobile banking services. Because a large number of people such as garments workers, factory workers, and rickshaw pullers are working remotely from their home. They constantly need to send money to their family members back at home safely. Mobile banking has become a safe tool for them to send and receive money. However, the transaction is mainly done through agents rather than opening an own mobile banking account. After PU, the user needs to trust the mobile banking system to adopt it.

Like the previous research (Kabir 2013, Ndumba and Muturi 2014, Lee et al. 2015; Nayak et al., 2014, Wu and Wang 2005), our research also found trust as an influencing factor for adoption of mobile banking. Mobile banking is more sensitive unlike any other technology because it relates to the money.

Lastly, Perceived Ease of Use (PEU) found to be a statistically significant factor for mobile banking adoption like previous studies (see Table 1). Complex and hard to use issues increase the barrier to learning new technology. For the rural people, this factor is more crucial because their exposure to new technology and their educational level do not allow them to accept new technology as easily as the rich group. For this reason, in Bangladesh the popular mobile banking service providers such as BKash, DBBL uses push and pull services which are easy to use and work even in feature phones.

7.0   Conclusion and implications

Financial inclusion is one of the vital indicators of development. It also indicates the financial strength of a nation. Mobile banking in different parts of the world found to be an effective tool to embrace financially the marginal people who do not have any banking access.

Mobile banking introduced in Bangladesh for about six years. However, its effect on the financial inclusion is found to be ineffective unlike other parts of the world. Our research tried to find the answer for this situation by identifying the determinants of mobile banking adoption by the rural people of Bangladesh.

We discovered that user interface (UI), perceived ease of use (PEU), trust, and perceived usefulness (PU) are statistically significant factor for the adoption of mobile banking in the rural parts of Bangladesh. However, the user interface has significant negative impact on the mobile banking adoption.

7.1   Theoretical Implications

This study contributes to IS research by providing a conceptual framework for using and accepting mobile banking in rural areas. Our study uniquely identified the user interface as the major influencing factor for mobile banking adoption by the marginal people. The research is conducted in only some specific rural areas of Bangladesh, so the results may not provide an accurate reflection towards the adoption of mobile banking in Bangladesh. A potential future research might be to focus on the wider areas of Bangladesh to identify and include some other possible factors for making a more widely applicable model.

7.2   Managerial implications

The managers of the mobile banking operations may use this finding to design their products and services more customer friendly and technologically superior for the adoption by the marginal rural population. They should especially concentrate on the user interface and perceived usefulness. Managers can design the push-pull services in local Bengali language so that the rural people can understand. Introduction of interactive voice response (IVR) service in addition to push-pull message interface may help the less educated and senior citizen to use the system. The more benefits relating to product and services the managers can offer, the more they can penetrate the market.

7.3   Policy implications for government

Policy makers as such the government should introduce different services that motivate the marginal people to adopt mobile banking to accelerate the adoption rate. For example, the government can disburse social security benefits and receive payment of tax, tariff, fees through personal mobile banking account. In this way, people can be benefited by micros savings, interest income, micro-credits, and payments; that will result in an equitable share of development.

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