

CONSTRUCTING PERCEIVED INTENTION TO USE SMART PHONES AT BOTTOM OF THE PYRAMID (BOP) MARKET

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ABSTRACT

This research investigates the factors contributing to the perceived intention to use smart phones by customers at the Bottom of the pyramid (BOP) market. Although proliferation literature exists on mobile adaption, studies centered at the BOP market are limited. The scales if this study were adapted from previous research, namely, Technology Acceptance model (TAM). To identify and prioritize factors affecting perceived intention to use smart phones, a sample size of 100 respondents (from the BOP segment) participated in this study; exploratory factor analysis (EFA) was later conducted. The results of this study confirms that BOP consumers' intention(s) to use smart phones is positive and significantly associated with attitude to use smart phones. The Findings of this study may contribute to phone manufacturers and other industry players (i.e. Telecom companies) to devise strategies (i.e. communication) and target this potentially vast, yet untapped market.

Keywords: BOP, Smart Phones, Perceived intention to use, TAM, TRA, Bangladesh

Paper Type: Research Papper

1. INTRODUCTION

With the commercial launch of mobile phones, the use of the technology has increased dramatically worldwide (Carlson et al., 1999). Coupled with innovations in information communication technologies (ICTs) and technological improvements (i.e. cell towers, 3G and 4G technology) the demand has been further augmented (Clarke, 2014) and is being adapted by

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many consumers (Keshav 2005). Mobile phones are regarded as one of the main cornerstone for ICTs and are currently being used by 4.08 million users globally; while smart phone usage in 2014 are estimated to be 1.75 million worldwide (Zhang, 2017). Despite the rapid adoption of mobile phones, literature however, suggests access to telephone usage in rural areas is relatively low, especially in developing countries (Kalba, 2008). According to Zhang (2017, pp. 446), “people living in rural areas constitute the most nonusers of mobile phones”. On the other hand, literature also suggests adaptation of agricultural technologies by farmers (in developing countries) is on the rise (Adesina, & Baidu-Forson, 1995).

Moreover, literature on mobile phones adoption among the Bottom of the Pyramid (BOP) is depicted for micro-entrepreneurs in Morocco (Ilahiane, & Sherry, 2012), or for financial services in South Africa (Wentzel, Yadavalli & Sundar, 2013) and West Africa (Adesina, & Baidu-Forson, 1995). Predominantly these studies were conducted to identify various factors for behavioral intention to use and adapt technology based products and services through technology acceptance (TAM) model (Davis, 1989). However, literature for BOP consumers of Bangladesh has been largely scarce, with few authors focusing on understanding farmers’ behavioral intention to use ICT (i.e. Microfinance) (Amin, & Li, 2014). Therefore there is gap in literature to depict the intention to use (or not) mobile phone by BOP consumers in Bangladesh. This study therefore attempts to examine consumer’s attitude towards using smart phones, targeted specifically to the BOP consumers in a specified area (i.e. Dhaka, Bangladesh).

2. LITERATURE REVIEW

The “Bottom of the Pyramid” (BOP) concept was first coined by the authors C.K. Prahalad and Hart (Prahalad & Hart, 2002). Later on, the book titled “Fortune at the Bottom of the Pyramid” was launched by Professor Prahalad (Prahalad, 2005). The BOP concept proposed that the world’s poor can be served as a large market (i.e. 4 Billion people), with similar yet unique needs (Prahalad & Hart, 2002). According to Pitta, Guesalaga, & Marshall (2008), this market consists of individuals who has “an income below \$1,500 per year (\$4 per day) and those with per capita income below \$2,000 per year (\$6 per day)” (Pitta, Guesalaga, & Marshall, 2008, pp. 396) and can be a source of profit. Therefore companies need to adapt their product offering, prices and propositions to serve the individuals in this market (Prahalad & Hart, 2002; Prahalad & Hammond, 2002; Prahalad, 2005). The theory also indicates Multinational Companies (MNC) as being the front-runners in incorporating this target population in the value chain, while generating profit at the same time (Prahalad, 2005).

Using Hindustan Lever (now Unilever) as a base, potential successful business endeavors were highlighted, as well as proposing strategies for tapping into the BOP markets via alternative routes. Needless to say, their work received keen interest in both the world of business and academia alike (Banerjee & Duflo, 2007).

Though this new target market was deemed viable, researchers were skeptical about the overall size and potentiality of the market (Karnani, 2007). The question arose in respect of the actual size of the market along with business practices, marketplace transactions and multinational involvement in serving this target audience (Wood et al., 2008). This argument is augmented by the number of 'the poor' as being 2.7 billion by World Bank, while others argued to be only 600 million individuals (The Economist, 2004). Nevertheless, due to the sheer potential market size and promised opportunities, the BOP market still serves as topic by of interest by both practitioners and academics alike. Studies conducted on the BOP consumers' ranges from buying power index (BPI) (Guesalaga and Marshall, 2008), purchase behavior of individuals (Midha et al., 2012) and family purchase decisions (Chikweche et al., 2012), Purchasing Power (Guesalaga & Marshall, 2008), Entrepreneurship (Webb, et al., 2010), Advertising (Rahman, 2014), Branding (Rajagopal, 2009; Chikweche & Fletcher, 2012), mobile telecommunication and mobile banking (Anderson & Kupp, 2008), mobile telephony (De Angoitia & Ramirez 2009), micro-finance (Chu, 2007)), Microcredit (Jebarajakirthy, & Lobo, 2015), value chain (Parmigiani & Rivera-Santos, 2015) and life satisfaction (Martin & Hill, 2011). Studies were also carried out as cases and examples in developing countries including China, Philippines, Brazil, Latin America, South Africa and Bangladesh (Kolk et al., 2014), Zimbabwe (Chikweche & Fletcher, 2011) and Kenya (Kariuki, 2012). Additionally, studies were conducted understand shopping behavior among rural trade areas (Adesina & Baidu-Forson, 1995).

With respect to the Technology Acceptance Model (TAM) studies were conducted in rural contexts of Africa (i.e. Ethiopia) which highlighted the relative advantages, personal innovativeness and cooperative behavior in adapting agricultural technology. In the context of Bangladesh, TAM had been applied to understand farmers' behavioral intention to use mobile phones in rural areas relating to ICT based Microfinance (Amin & Li, 2014). Although these studies highlights the potential benefits of using TAM, the extent of literature on motivating cues forming behavioral intention to actual usage of mobile phones is limited. This study therefore investigates the extent of apprehensiveness in determining mobile phone adaption among BOP consumers at Dhaka, Bangladesh.

2.1 Theoretical Background

Previous studies on the use and acceptance and of information communication technology (ICT) has been traced to three main theories: the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), theory of planned behavior (TPB) (the extension of TRA) (Ajzen, 1991) and the technology acceptance model (TAM) (Davis, 1989).

TRA is one of the most widely used theories to identify the determinants affecting consciously intended behavior (Fishbein and Ajzen, 1975). Derived from social psychology, the model is commonly used to predict and explain various human behavior, including, consumer behavior (Graeff, 1996), communication behavior (Roberto et. al., 2011) and sexual behavior (Albarracin et. al, 2001). The theory suggests behavioral intention can be explained by the attitude towards behavior and subjective norm (Wadie, 2012). Therefore an individual's feelings (positive or negative) and evaluation about performing the target behavior is defined as "attitude towards the behavior"; while subjective norm deals with the perception of the "performance of the behavior" (Fishbein and Ajzen, 1975).

TRA suggests "one's behavior is a function of one's intention to engage in the behavior" (kulviwat et al., 2009, pp. 707). Thus the best predictor of behavioral intention is attitudinal and normative influences (Fishbein and Ajzen, 1975). In retrospect, attitudinal influences (i.e. positive or negative) toward a particular behavior are characterized by the strength of the belief and evaluations. On the other hand, Normative influences are based on perceptions of an individual and their beliefs of how certain behaviors should (or should not) be performed.

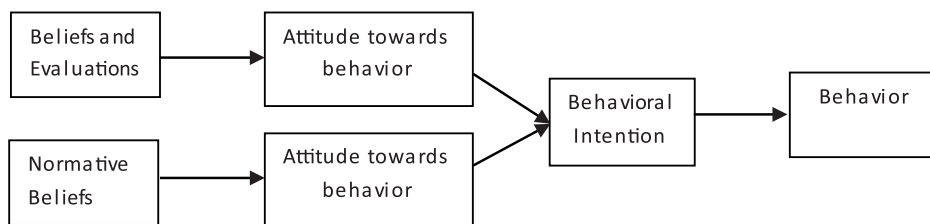


Figure 1: Theory of Reasoned Action (TRA)

TPB on the other hand, links beliefs and behavior of individuals when they "do not have complete control over their behavior" (Nysveen et. al, 2005, pp. 332; Ajzen 1991). TPB was an extension of the TRA model, along with its constructs (i.e. Normative Belief, Subjective norm). However TPB adds the variables "Control beliefs" and "Perceived behavioral control".

Control beliefs are coined as “beliefs of an individuals’ performance” with respect to factors that are either accommodating or can hinder performance (i.e. intention to quit smoking), while “Perceived behavioral control is the person’s perceived ease (or difficulty) in performing a behavior” (Downs & Hausenblas, 2003, pp. 223) (i.e. performing actions to quit smoking). Thus perceived behavioral control is a combination of the level of difficulty required to perform a behavior (i.e. self-efficacy) and factors that deem performance to be controlled (or uncontrolled) by internal or external factors (i.e. controllability). However, criticism of this theory suggests behavioral intention does not always lead to actual behavior (Limayem, et.al, 2001); because a person’s control over their behavior is dependent on other factors. The additional variable of "perceived behavioral control" was thus added by Ajzen to predict behavioral intention and actual behavior. Therefore, according to the theory “behavioral intention is affected by attitude toward behavior, subjective norm (Ajzen, 1985, 1991, 2002), and perceived behavioral control (Ajzen, 2005)” (Setiawan, & Tjiptono, 2013, pp. 49) on actual behavior. [See fig 2].

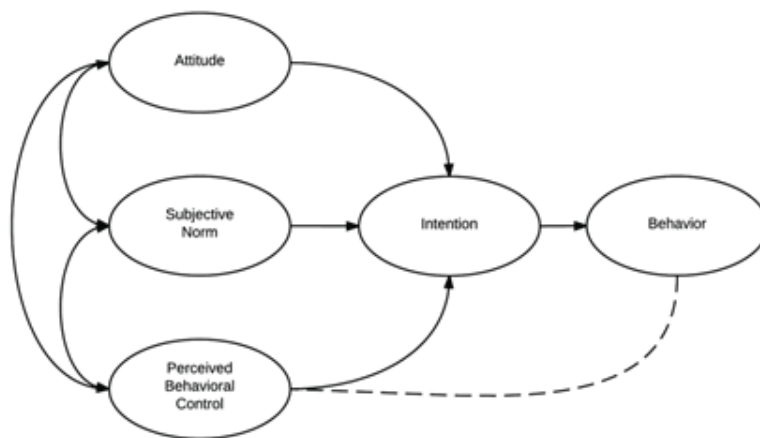


Figure 2: Theory of Planned Behavior (TPB)

TAM (Davis, 1989; Davis, Bagozzi & Warshaw, 1989) was adapted from the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) has been significantly used in literature to determine ICT behavior (use & adaptation). TAM focuses on “attitudinal explanations of intention to use a specific technology or service” (Wadie, 2012, pp. 950) and coins “perceived usefulness (PU)” and “perceived ease of use (PEOU)” as the determinants to form attitudes towards using a new technology (ATU).

PU is the users’ belief on “changes in performance (i.e. improvement)” while using a system; while PEOU is derived on the users’ beliefs of being “free from effort”.

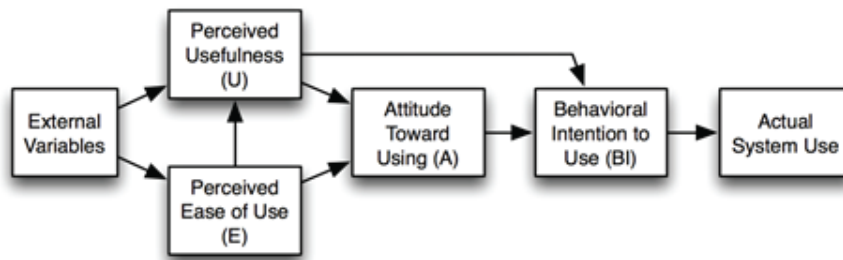


Figure 3: Technology Acceptance Model (TAM) Source: Davis (1989)

3. RESEARCH METHODOLOGY AND DATA ANALYSIS PROCEDURES

To obtain an exact measure of intention to adapt mobile phones, the researchers administered survey instrument with the assistance of a trained research assistant. Given the empirical nature of this study, the aggregation of data through the distribution of questionnaires was challenging due to budget and time constraints. Therefore, the researchers decided to administer survey questionnaires to respondents at Bashundhara Residential area using convenient sampling procedure.

The researchers used 17 items (see table 1) in the whole instrument, which was adapted from previous literature. The instrument was pretested through convenience sampling procedure consisting of 15 respondents. The researchers used the pretest of the instrument in order to diagnose the possible shortcomings, doubt, and the reliability of the construct's items (DeVellis, 2003).

The final instrument consisted of 17 items and was distributed to 110 respondents residing at Bashundhara Residential area, Dhaka. Out of 140 distributed instruments, 100 respondent's responses were used for further analysis; 10 surveys were excluded because of incomplete or contained ambiguous information, making them unusable. Collected data were coded into SPSS for EFA Analysis followed by Reliability analysis (i.e. cronbach's alpha) to measure the internal consistency of the retained variables.

3.1 Operationalisation of the Instrument

The final questionnaire included constructs pertaining to perceived ease of use (PEOU) (5 items), perceived usefulness (PU) (4 items), Attitude towards use (ATU) (4 items) and Intentional to use (ITU) (4 items). The questionnaire for this study was developed based on the previous literature and was adapted by the researchers through relevant literature review

and adjusted for the content validity. The measurement of the items was tested through 7-point Likert - scale (1 = strongly disagree and 7 = strongly agree) for each statement. The likert scale was used due to it's wide use by marketing researchers to measure consumer's behavioral direction (agree or disagree) and intensity (strongly agree or strongly disagree) (Albaum, 1997; Rocereto et. al., 2011).

4. RESULTS & FINDINGS

The framework of this research was examined using exploartaroy factor analysis (EFA) for 17 items, i.e. PEOU, PU, ATU and ITU. According to Creswell and Clark (2017), in order to derive information about factors influencing a dependent variable (from the existing data), EFA is the appropriate method to use by researhcers. Therefore, no hypothesis nor specific expectations on the nature (and relationships) of the factors are derived by the researchers, as EFA was used.

The calculated value of Kaiser-Meyer-Olkin (KMO) measure revealed Sampling Adequacy (KMO = 0.854) was higher than the standard cut point of 0.60. The KMO Test is a measure of whether the data is suitable for Factor Analysis and measures sampling adequacy for each variable within and for the complete model. Similarly, the Bartlett's Test of Sphericity is significant at 0.000 (P<0.001) further indicating that EFA was appropriate for these data.

Table 1: Cronbach's alpha coefficients for the measurement of the constructs

Variables Name	Number of Items Used	Code	Cronbach Alpha (α)
Perceived Usefulness	5	PU_1	0.893
		PU_2	
		PU_3	
		PU_4	
		PU_5	
Perceived Ease of Use	4	PEOU_1	0.881
		PEOU_2	
		PEOU_3	
		PEOU_4	
Attitude Towards Use	4	ATU_1	0.784
		ATU_2	
		ATU_3	
		ATU_4	
Intention to use	4	ITU_1	0.816
		ITU_2	
		ITU_3	
		ITU_4	

Source: Estimated Results

Data Reliability was measured by using Cronbach's coefficient alpha (α); which reveals that the reliability of scale is free from random error. The reliability of the constructs (i.e. PU, PEOU, ITU & ATU) (Table1) has an alpha value greater than 0.70; exceeding the cut off score (Nunnally, 1978). The results indicate good reliability for all the four retained factors. Moreover, all of the measures of constructs had been used in past studies, and are validated via previous research.

The demographic variables revealed that out of the 100 repondents, 60 percent of the respondents were male while 40 percent were female participants. The respondents were between the ages of 18-25 years (60%), while 26% of the respondents were aged between 25-32 years and 14% were aged 32 and above. The respondents had very little (or no) education (52%), followed by individuals whom completed secondary school level education (48%) and none having passed the higher secondary school level. All the respondents were working at the garment sector, with a mean experience of 3 years. Moreover, the stated average monthly income of the respondents was between Tk. 1200 to Tk. 3000.

Table 2: Correlation Matrix

	PU1	PU2	PU3	PU4	PU5	PEOU_1	PEOU_2	PEOU_3	PEOU_4	ATU1	ATU2	ATU3	AUT4	ITU1	ITU2	ITU3	ITU4	
PU1	1.000																	
PU2	.846	1.000																
PU3	.906	.692	1.000															
PU4	.713	.542	.629	1.000														
PU5	.538	.571	.463	.525	1.000													
PEOU_1	.381	.351	.432	.395	.234	1.000												
PEOU_2	.267	.355	.329	.290	.200	.789	1.000											
PEOU_3	.315	.316	.346	.348	.298	.651	.638	1.000										
PEOU_4	.330	.454	.375	.388	.262	.603	.550	.676	1.000									
ATU1	.462	.334	.341	.439	.244	.365	.295	.244	.243	1.000								
ATU2	.645	.545	.586	.648	.437	.376	.259	.281	.363	.577	1.000							
ATU3	.346	.371	.321	.359	.358	.220	.211	.192	.195	.341	.642	1.000						
AUT4	.482	.360	.434	.435	.427	.399	.396	.360	.196	.401	.539	.414	1.000					
ITU1	.557	.603	.596	.434	.331	.569	.505	.400	.432	.464	.565	.395	.424	1.000				
ITU2	.362	.535	.437	.393	.324	.470	.436	.396	.365	.429	.323	.292	.296	.569	1.000			
ITU3	.399	.548	.485	.454	.451	.356	.336	.285	.309	.306	.406	.389	.233	.522	.466	1.000		

Source: Estimated Results

The Correlation table (table 2) shows strong relationship among the variables, whereas Table 3 illustrates the initial communalities, which represents the relation between all other variables (before rotation). From table 3, we see PU1 (perceived usefulness) has highest communalities value (.890), followed by PU3 (.824), ATU2 (.810) & PEOU_1 (.807).

Table 3: Communalities

	Initial	Extraction
PU1	1.000	.890
PU2	1.000	.743
PU3	1.000	.824
PU4	1.000	.675
PU5	1.000	.529
PEOU_1	1.000	.807
PEOU_2	1.000	.783
PEOU_3	1.000	.732
PEOU_4	1.000	.655
ATU1	1.000	.551
ATU2	1.000	.810
ATU3	1.000	.627
AUT4	1.000	.624
ITU1	1.000	.637
ITU2	1.000	.596
ITU3	1.000	.764
ITU4	1.000	.663

Extraction Method: Principal Component Analysis.

Source: Estimated Results

Table 4, illustrated the four retained factors that were extracted having Eigen value greater than 1.0; demonstrating adequacy of the analysis. Extracted four factors together explained 70% of the total variance indicating BOP consumer in Dhaka considered using Smart Phones; while the remaining thirteen components explained nearly 30% of the variance.

The four obtained factors can be inferred in terms of the variables that weight high coefficients. From the rotated component matrix (Table 5), all components have high co-efficient.

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.899	46.465	46.465	7.899	46.465	46.465	3.523	20.725	20.725
2	1.907	11.215	57.680	1.907	11.215	57.680	3.317	19.511	40.236
3	1.085	6.381	64.061	1.085	6.381	64.061	2.640	15.530	55.765
4	1.021	6.004	70.065	1.021	6.004	70.065	2.431	14.300	70.065
5	.840	4.941	75.006						
6	.685	4.027	79.033						
7	.614	3.612	82.645						
8	.576	3.389	86.034						
9	.452	2.657	88.691						
10	.412	2.424	91.115						
11	.348	2.045	93.160						
12	.299	1.760	94.920						
13	.280	1.649	96.569						
14	.223	1.309	97.878						
15	.179	1.054	98.932						
16	.124	.732	99.664						
17	.057	.336	100.000						

Extraction Method: Principal Component Analysis.

Source: Estimated Results

Source: Estimated Results

Table 5: Rotated Component Matrix^a

	Component			
	PEOU	PU	ATU	ITU
PEOU1	.867			
PEOU2	.824			
PEOU3	.692			
PEOU4	.656			
PEOU5	.643			
PU1		.838		
PU2		.836		
PU3		.824		
PU4		.742		
ATU2			.727	
ATU3			.697	
ATU1			.673	
AUT4			.667	
ITU3				.803
ITU4				.648
ITU2				.622
ITU1				.584

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

5. CONCLUSION AND FURTHER RESEARCH DIRECTION

This study attempted to investigate factor affecting behavioral intention to adopt mobile phones in BOP markets. Derived from prior literature, the study examined four manifested variables and revealed these factors (i.e. by PEOU, PU, ATU and ITU) explained consumer's intention to use smart phones. The results of this study confirms that BOP consumers' intention(s) to use (ITU) smart phones is positive and significantly associated with attitude to use (ATU) smart phones. This study can further be extended by incorporating other manifest variables (i.e. perceived cost, trust, social influences etc.) to explore more additional factors associated with adoption of smart phones by the BOP segments in Bangladesh. Also, the relationship among PEOU, PU ATU and ITU could be explored by applying Pearson Correlations or other analysis to find interactions (or lack of) among all variables and its significance. Lastly, the effect of PEOU, ATU on ITU can be measured by other mediating variable (i.e. technical skills) for adaption by BOP consumers.

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