FACTORS INFLUENCING THE USAGE OF 3G MOBILE SERVICES: AN EMPIRICAL STUDY ON BANGLADESHI YOUNG CITIZENS

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ABSTRACT

The purpose of this research is to explain the critical factors that are influencing the usage of 3G mobile services among the young citizens of Bangladesh. This study applied cross-sectional research design where the researchers used survey questionnaires for data collection. A total of 200 responses were collected from students of Bangladesh higher learning institutions. The data was analyzed through exploratory factor analysis (EFA) and regression. The results indicated two constructs (perceived usefulness and perceived ease of use) of technology acceptance model (TAM) along with personal innovativeness have positive and significant effect whereas perceived price has a negative impact and image factors failed to prove any significance on 3G mobile service usage intentions of young citizens. The repercussion originated from this study will help the policymakers of the mobile service operators to provide better service and to make this young consumer group more satisfied.

Keywords: 3G technology, TAM, User acceptance, Personal innovativeness, Perceived price, Image, Higher learning institution, Young citizen, Bangladesh.

1. INTRODUCTION

3G Mobile Technology represents an evaluation in the telecommunication industry in Bangladesh. Improved network and availability of low priced smart phones have been playing important roles in adopting 3G mobile services among young citizens (one of the largest groups of 3G users). 3G support variety of options for audio, video, and data services. Every one of these administrations ended up additional engaging when joined for secondary speed data (Adler, 2004). In Bangladesh, Teletalk, a state own telecom company,

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launched 3G services on 14 October 2012 on a test basis. Later, Bangladesh holds its first 3G spectrum's auction in September 2013 in which four more telecom operator - GP, Banglalink, Robi, and Airtel- were been awarded 3G frequencies along with Teletalk. However, within this short period, Bangladesh has shown a remarkable growth in 3G mobile services.

3G Mobile services have turned into essential part of individual lives and adoption of 3G growth are noticeable around the world (Mardikyan et al., 2012). According to Bangladesh telecommunication regulatory commission reports the mobile internet users are 66.779 Million in January 2017 and 94.45 percent of mobile users are using mobile Internet.

In the previous research, Technology acceptance model (TAM) (Davis et al., 1989) had been used for analyzing the construction that affects users acceptance and the adoption of IT/IS. TAM indicates two factors, perceived usefulness and perceived ease of use to predict and explains behavioral meanings of using any new technology to foresee and clarifies the behavioral expectations of utilization of any innovation. Some other prior research (Ong et al., 2008; Agarwal et al., 2007; Keu & Yen, 2009; Kumar & Sikri, 2013; Mardikyan et al., 2012) also suggested some variables such as image, personal innovativeness, network service influence consumers 3G using behavior. Most of the previous researches within consumer behavior and 3G technology acceptance have been pointed out few traditional theories separately, in developed countries perspective (e.g., Ho Cheong & Park, 2005). However, 3G technology acceptance and usage pattern among young generation is rarely explored in the context of Bangladesh. Moreover, many university students (representative of young citizens) represent a large segment of 3G users in Bangladesh and consequently understanding the factors that are influencing these students 3G usage behavior is vital for both researchers and industry players. For these reasons, it is evident that there is a rationale behind the expansion of a new framework to learn more about the behavior of young consumers to gain more of their adoption to 3G services. Furthermore, the objective of this study is to explain the factors that are contributing to the usage of 3G among the young citizens.

The following section provides the literature review of the theories of the Technology Acceptance Model and other variables. Next, methodology, instruments, and finding are discussed. At long last, researchers finish up the study with a discourse of management implications.

2. LITERATURE REVIEW

A good number of researches conducted for identifying the factors that have been influencing the acceptance of different technology and systems such as IT/IS/ITES since the mid-80s, (Ajzen, 1985; Davis et al., 1989). When it comes to predicting the acceptance of IT/IS, Technology Acceptance Model (TAM) is considered the most acceptable model, which is based on the theory of reasonable actions (TRA) (Mardikyan et al., 2012).

Perceived Usefulness and Perceived Ease of Use are two fundamentals aspects that come from the hypothetical constructs of TAM to see the attitude to use a system. The TAM elucidates the usage of IT, and it has been comprehensively associated with various fields to appreciate the personal affirmation of IT (Park et al., 2012). TAM has been used as the theoretical framework to scrutinize the students' receiving of implementing a smart device program (Elwood et al., 2006). Ho Cheong and Park (2005) received an extended TAM model to investigate purchaser's contributing factor of acknowledgment practices in utilizing the portable web. Extended TAM Models comprised of example perceived system quality, perceived content quality, perceived playfulness, perceived price level and internet experience. Park et al., (2012) and Fadare et al., (2010) use TAM Model to examine the factors influencing students' behavioral intention to use mobile learning. In Indonesia to see the Internet adoption among men and women, TAM has also been used (Wahid, 2007).

In the one crucial research, the researchers have scrutinized the interaction of role of factors in the adoption process of 3G and influence of exterior variables (Agarwal et al., 2007). These variables include service quality, self-efficacy convenience, the variety of service, and price on user adoption of this technology. Kumar & Sikri (2013) have recognized perceived quality, price level, perceived usefulness, ease of use, and behavioral factors.

2.1 Behavioral intentions

According to Zeithaml and Bitner (1996), behavioral intention is "a signal of whether customers will remain or exit the relationship with the service provider." Several factors including perceived ease of use and perceived usefulness might lead to how the customer will react with the technology. Customers may reject or accept the technology. Furthermore, Zeithaml and Bitner (1996) also found two magnitudes to measure behavioral intention – favorable and unfavorable. Favorable intention means the customers will say positive word-of-mouth, repurchase/Usage the technology, and show loyalty (Ladhari et al., 2011; Zeithaml and Bitner, 1996). On the other hand, unfavorable behavioral intention tends to convey the negative word of mouth, spread the bitter experiences to other customers, and even customers might develop the intention to switch to competitors. Indeed, the well-established notion is when customers feel positive; they will come back to the technology again and will say positively to other customers.

2.2 Perceived Usefulness

A few investigations (Davis, 1989; Davis et al., 1989; Kumar & Sikri, 2013; Fadare et al., 2010) illustrated that Perceived Usefulness is a discriminating cause for adoption, user acceptance, and user conduct. In the theory of diffusion of innovation, (Rogers, 2002) hypothesized that perceived usefulness is a discriminating factor, for the sake of ‘relative advantage'. According to Kumar & Sikri (2013), usability and completeness of any work with the help of 3G can be measured from Perceived Usefulness. Davis, F. D. (1993) showed

a positive relationship between perceived usefulness of the system and behavioral intention and also discussed the relationship between variables: perceived usefulness and attitude toward using technology that have the direct influence on behavior. It is evident by research that perceived usefulness also has a significant impact on consumers usage pattern or behavioral intention (Agarwal & Prasad, 1998; Venkatesh, 1999).

2.3 Perceived Ease of Use

Perceived Ease of Use is additionally considered other than Perceived Usefulness in the TAM Model. It is apparent by a few examinations that technologies that are less demanding to utilize and basic will probably be embraced by users (Moore and Benbasat, 1991). According to Mardikyan et al., (2012), the technology that is simple to use is critical to understand how user adopts new technology. Several studies (Davis, 1989; Davis et al., 1989; Kumar & Sikri, 2013; and Fadare et al., 2010) demonstrated that perceived ease of use is gainful for essential acknowledgment of a development and is vital for appropriation and proceeded with utilize. Hence, when it comes to 3G mobile technology acceptance research, Perceived ease of use is proposed as a compelling element explicitly influencing the appropriation of the innovation. Several research contributions over the past decade give significant evidence that perceived ease of use has the considerable influence on customers' using behavior (Agarwal & Prasad, 1999; Jackson et al., 1997; Venkatesh, 1999; Venkatesh & Morris, 2000).

2.4 Personal Innovativeness

Agarwal & Prasad (1998) have assured that people, who have high imaginativeness, will probably create constructive recognitions towards the development as far as a relative preferred standpoint, usability; subsequently are more worried to utilize it. Earlier research has revealed that individual ascribes exceedingly impact decisions to get or expel evolution (Rogers, 1995). It has been shown from the analysis that personal ingenuity assumes vital element in building person's state of mind to the use of Wireless Application Protocol (WAP) administrations (Hung et al., 2003). Some researchers have contemplated that own invention is one of the influential parts affecting individual's apparent relative preferred standpoint of using Group Support Systems (GSS). Early adopters tend to be the ones who will grasp the development before the others do. Personal innovativeness is also an essential factor impacting allotment for new ideas (Kuo and Yen, 2009). Imaginativeness is the eagerness to receive a creative innovation. Subsequently, individual inventiveness is likewise incorporated into the exploration as a dominant factor on reception aims. Personal innovativeness has a positive impact on adoption behavior of technologies (Agarwal & Prasad, 1998; Hung et al., 2003; Lin & Jeffres, 1998; Yang, 2005).

2.5 Perceived Price

Customers want to pay an amount of financial resource during purchasing time to get good or services is called price. Objective Price and Perceived Price are widely known as pricing system (Zeithaml, 1988). When customers compared the actual cost with the intended price, they got the perceived price. From research it has been shown that perceived price is mostly used in marketing research than objective price (Le Boutillier et al., 1994)). The price level is one of the critical determinants how customers are accepting 3G services. Venkatesh et al., (2012) indicated that the cost and pricing might influence on the behavioral intention of consumers.

2.6 Image

An image is to see how technology or 3G use help to construct a man appeared. Status Symbol and High profile are sometimes can be improved by using 3G as these two points are coming from Image. Moreover, scrutinized under 'relative advantage' attribute in Diffusion of Innovations theory (Moore & Benbasat , 1991), When it comes to acceptance of innovation considering the social impact pictures come as a dominant component from the perspective of subjective standards. Henceforth, an Efficacious element that affects the acknowledgment of the change is the picture, considering 3G portable innovation usage. Venkatesh & Davis (2000) provided evidence that image has an impact on the intention of adopting new technologies.

From the above literature review, researchers, therefore, expect that the following hypotheses hold in the consumers' 3G Usage context:

H1. Perceived usefulness positively affects consumer's 3G usage intention
H2. Perceived ease of use positively affects consumer's 3G usage intention
H3. Personal innovativeness positively affects consumer's 3G usage intention
H4. Perceived price negatively affects consumer's 3G usage intention
H5. Image positively affects consumer's 3G usage intention

2.7 Hypothitical Model

The hypotheses presented in the previous section led us to a theoretical model described in Figure 1. Based on past literature, five independent variables that may act as prominent factors affecting consumers' 3G using intention were investigated in the current study.

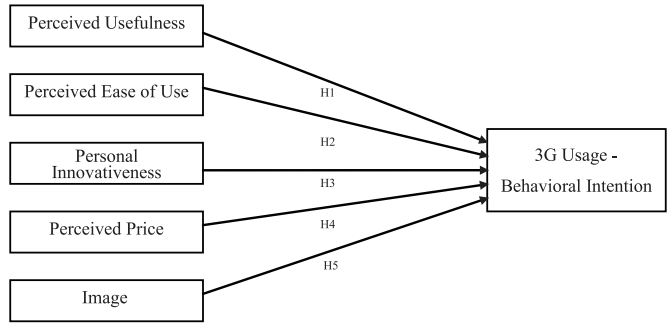

Figure 1: Research Model and Hypotheses

3. METHODOLOGY

This section presents the explanation of sampling procedure, data collection methods and also entails the discussion of the measurement of constructs of data analysis techniques.

3.1 Sample and Data Collection :

This study employed a cross-sectional survey procedure (e.g., Rahman et al., 2016). The respondents of this research were selected from major public and private Universities (Students of BUET, DU, JU, NSU, EWU, Brac, IUB & AIUB) from Dhaka Metropolitan city in Bangladesh. Self-administered questionnaires distributed to the respondents. In total, 200 usable questionnaires were obtained and therefore were used in the further analysis.

3.2 Measurement Development :

This empirical research adapted measurement scales of the Perceived Usefulness (PRU) and Perceived Ease of Use (PRE) from Davis (1989) and Van der Heijden (2004). Personal Innovativeness (PIN) from Hurt et al., (1977), Perceived Price (PPR) from Chu and Lu (2007), Image (IMG) variable from Venkatesh and Davis (2000) and Behavioral Intention (BIN) from Woodside et al., (1989). Researchers applied seven (7) points Likert scale to assess the rating of the respondents. The scale rating refers 1 (strongly disagree) to 7 (strongly agree) for the independent variable (Perceived Usefulness, Perceived Ease of Use, Personal Innovativeness, Perceived Price, and Image) and dependent variable (Behavioral Intention).

3.3 Reliability and Validity Measures :

Data reliability and validity constructs are required to assess any proposed model. Here, the internal consistency of multiple measurements was investigated through Cronbach alpha. The values for the measure were 0.71 for perceived usefulness, 0.77 for perceived ease of use, 0.86 for personal innovativeness and perceived price, 0.80 for image and 0.77 for behavioral intention variable (Table I). According to Nunnaly (1978), Cronbach alpha values should be more than 0.70 for confirming reliability.

To assess the constructs of independent variables that are antecedent to customers' behavioral intention, exploratory factor analysis (EFA) was employed to examine the measurements of 16 items determining independent variables. The Bartlett trial of sphericity confirmed the relationship framework of the following independent variables items, showing the appropriateness for EFA. Moreover, Kaiser-Meyer-Olkin Measures to examine adequacy was 0.74, proving the relevance of EFA. The Kaiser criterion (Eigenvalue > 1) was verified in merging with an assessment of scree plots to determine the number of factors to retain.

The bivariate correlations between the independent variables (Perceived Usefulness, Perceived ease of use, personal innovativeness, perceived price, and image) and dependent variables (Behavioral intention) are mentioned in Table II. The primary independent variables were considerably correlated with young consumers' behavioral intention.

Table I. Reliability of the Measures

Construct Name	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Perceived Usefulness (PRU)				
PRU1	15.8	18.0	0.16	0.79
PRU2	16.4	13.3	0.45	0.68
PRU3 (α= 0.71)	16.7	10.1	0.74	0.48
PRU4	16.5	9.80	0.68	0.51
Perceived Ease of Use (PEU)				
PEU1	7.98	19.9	0.57	0.73
PEU2 (α= 0.77)	8.80	10.6	0.56	0.73
PEU3	7.96	9.69	0.68	0.60
Personal Innovativeness (PIN)				
PIN1	8.28	8.89	0.68	0.84
PIN2 (α= 0.86)	9.05	8.40	0.71	0.82
PIN3	8.86	7.74	0.81	0.72
Perceived Price (PPR)				
PPR1	8.28	8.89	0.68	0.84
PPR2 (α= 0.86)	9.06	8.42	0.71	0.82
PPR3	8.86	7.79	0.81	0.73
Image (IMG)				
IMG1	11.7	5.54	0.68	0.70
IMG2 (α= 0.80)	11.6	6.66	0.61	0.77
IMG3	11.4	6.95	0.67	0.72
Behavioral Intention (BIN)				
BIN1	9.95	9.77	0.60	0.71
BIN2 (α= 0.77)	9.82	8.46	0.60	0.71
BIN3	9.21	8.95	0.63	0.66

Table II. Correlation matrix of variables

	Perceived Usefulness	Perceived Ease of Use	Personal Innovativeness	Perceived Price	Image
Independent Variables					
Perceived Usefulness	1.00				
Perceived Ease of Use	0.43**	1.00			
Personal Innovativeness	0.37**	0.57**	1.00		
Perceived Price	0.47**	0.66**	0.76**	1.00	
Image	-.105	-.089	-0.15**	-.06	1.00
Dependent Variables					
Behavioral Intention	0.47**	0.55**	0.58**	0.48**	-.099

Note: **Indicating that the Correlation is significant at the level of 0.01 (two-tailed)

4. STATISTICAL ANALYSIS AND RESULTS

Multiple regression analysis was applied to examine the relationship between the dependent variable (behavioral intention) and the five independent variables (Perceived Usefulness, Perceived ease of use, personal innovativeness, perceived price, and image). A significant number of studies such as Fotinatos-Ventouratos and Cooper (2005), Jian Wang et al., (2012) have applied multiple regression. According to Cohen et al., (2003) multiple regression methods is better to understand the overall construct and more comfortable to implement in applied research. The whole model using simultaneous estimation proved statistical significance ($p < 0.05$), demonstrating the satisfactory model fit (Tables III-V). Multicollinearity was evaluated by the VIF value of each independent variable. As shown in Tables III-V, each of the independent variables had a variance inflation factor (VIF) value far less than the recommended threshold of 10, and thus, each one had satisfactory variability (Cohen et al., 2003).

Table III. Multiple regression analysis results - analysis of variance

	Sum of squares	df	Mean square	F	Significance
Regression	190.51	5	38.102	34.40	0.00
Residual	214.82	194	1.107		
Total	405.33	199			

Table IV. Multiple regression analysis results- Independent variables

Standardized coefficients	Beta	t	Collinearity Significance	Statistics Tolerance	VIF
Perceived Usefulness	0.26	4.32	0.00	0.74	1.34
Perceived Ease of Use	0.30	4.28	0.00	0.53	1.87
Personal Innovativeness	0.46	5.61	0.00	0.39	2.50
Perceived Price	-0.19	-2.11	0.03	0.31	3.13
Image	0.01	0.30	0.76	0.96	1.04

Table V. Multiple regression analysis results- coefficient of determination

Dependent variable	Multiple R	R^2	Adjusted R^2	Standard error
Behavioral Intention	0.68	0.47	0.45	1.05

The five independent variables together associated an expounding power (R^2) of 47.0 percent for the variance in young consumers' 3G using behavior. Results showed that perceived ease of use was positively related to consumers' 3G Usage intention ($\beta = 0.26$, $p < 0.05$). Therefore, H1 was supported. As forecasted in H2 and H3 perceived ease of use ($\beta = 0.30$, $p < 0.05$) and personal innovativeness ($\beta = 0.46$, $p < 0.05$) had positive effect on consumer's 3G usage intention. Therefore H2 and H3 were supported. H4 perceived price ($\beta = -0.19$, $p < 0.05$) was supported and had a negative effect on consumers' 3G usage intention. The result revealed that image had a positive and nonsignificant effect ($\beta = 0.01$, $p > 0.05$) on consumers' 3G usage intention. Therefore, H5 was not fully supported. Therefore, the non-significant nature of H5 indicated that image variable does not hold a true impact on consumers' 3G usage behavior.

5. DISCUSSION AND IMPLICATION

The primary objective of this research was to extend the complete version of technology acceptance model (TAM) and other contributors that can explore the connection with young citizens 3G mobile service usage behavior. For this reason, researchers affianced innovative constructs based on the findings from previous research. In this study, the uppermost extrapolative power for the 3G usage intention belonged to the personal innovativeness, followed by the perceived ease of use and usefulness. This confirms the role of the individual innovativeness in foretelling the consumers' behavioral intention and, thus, supports the idea that this construct should carry on the subsequent technology-oriented research. Our experimental research outcomes also confirmed that the perceived price would be the sensible extension of TAM as both were found to be adverse influential in forecasting the consumers 3G usage intention. However, it was highly surprising as the image variable

(Status Symbol and High profile) provided negative test results. Therefore, this variable cannot be used for predicting customer's behavioral intention, particularly for 3G usage behavior.

This empirical finding helps top management to identify the young citizens 3G usage intention in understanding comprehensive contributory relationships among the constructs used in this revised technology acceptance model (TAM) and also helps managers to better implement the strategic ramifications in promoting 3G services.

6. CONCLUSION AND FUTURE RESEARCH DIRECTION

This research develops and empirically verified a dynamic model to capture the forces that will likely influence the young citizens of Bangladesh during the usage of the 3G wireless communication. Researchers vigilantly applied regression; correlation and factor analysis techniques to investigate the research data. The 3G usage behavior of young citizens vigorously depends on perceived usefulness, perceived ease of use, and personal innovativeness. However, the perceived price has a negative relationship with 3G usage behaviors, and the image factor proved insignificant when they consider the usage of 3G wireless communications.

This study only considered the technology acceptance model, personal innovativeness, perceived price and image factors in constructing the young citizens 3G usage behavioral model. It would have been more interesting to empirically test some other variables such as perceived playfulness, a variety of services and attitude. On the other hand, researchers investigated a small sample of University students. However, researchers are also proposing to collect samples from different segments in future research which may enhance the generalizability of the research findings. Furthermore, future studies can apply CFA and SEM techniques to understand the relationship between the variables and the young citizens 3G usage behavior.

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