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Understanding Consumers' acceptance of Mobile Value Added Services in Bangladesh

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Abstract

Mobile telecommunication services are emergent very fast in some countries while it is relatively slow in others. This study attempts to explore the factors that contribute to influence use intention of value added services (mVAS) of mobile telecommunication in Bangladesh. Following the Technology Acceptance Model, this study develops a model for consumers' use behavior towards mVAS. Based on a sample of 230 consumers' survey, the main factors of use behaviour of mVAS are found as perceived usefulness, attitude towards use, and perceived enjoyment. The overall findings of this study provided some contribution to the business researchers in the area of mobile telecommunication and way out of some assistance to service providers in articulating better strategies to retain current mVAS users as well as potential customers.

Keywords: *Mobile Value Added Services, influencing factors, Use behaviour, User Acceptance, Bangladesh*

1. Introduction

Mobile phone services are the fast growing services in telecommunication industry in Bangladesh. This sector is showing an inspiring growth in last few years. Along with voice call service, it has introduced lots of value added services including SMS, MMS, ringtone, games, E-transaction, mobile banking and internet browsing etc. to vast use of mobile telecommunication services. Mobile value added services (VAS) are those services that offer differentiation and the ability for mobile operators to charge a fix or premium price. Value added services (VAS) refers to advanced and or additional services a content provider (network operator) offers to possibly increase their revenues, or make their offering more competitive. Mobile value added services (VAS) include non-voice advanced messaging services such as SMS, MMS and mobile data services based on mobile data bearer technologies such as GPRS, WAP, with value added service applications including mobile gamming etc. Not only non-voice service mobile value added service also includes voice based services such as- PTT, IVR, and WDA. Bangladesh has become the 10th highest mobile phone penetrated country in the world having more than 116 million subscribers base. It is characterized by high levels of awareness and adoption of mobile phones and services. It has introduced GSM in 1989, GPRS in 2005, UMTS networks in 2012, and High Speed Downlink Packet Access (HSDPA) has experimented in 2013. Smartphones and Laptops use are growing with 22.86% internet penetration. Almost twenty-two percent of all Bangladeshi households access the internet via mobile phones. Compared to other countries, tariffs for mobile services are relatively low. So, mobile phone operators' revenue comes highly from call tariffs where Average Revenue Per User (ARPU) is only around $1.75 per month. Thus mobile value added services (VAS) will become new opportunities for telecom service providers to generate more revenues in high competitive market.

Although new services are being released at all times, whether they are appealing to consumers and can induce positive purchase intention after consumers have used them so as to effectively increase revenue and sustainable development will be an important issue for mobile service providers. However, the conditions for the use of MVAS appear to be favourable, different market analysis indicate that consumers are reluctant to use their mobile phones to access them. Accordingly, service providers are looking for ways to show consumers the VAS are offerings. Practitioners and academics try to predict the conditions for usage of mobile VAS. Technology acceptance model (Davis, 1989)has been used to predict the attitudes and behavior of users of mobile services, based on perceived usefulness (PU) and perceived ease of use (PEOU) of mobile system. Therefore, this study tried to explore the driving forces to use intention towards mobile values added services in

Bangladesh based on Technology Acceptance Model (TAM). The main objectives of this study are to explore the factors affecting consumers use intention towards mobile VAS, and to analyse the relationships among these factors. Results of this study are useful to practitioners in the telecommunications sector for formulating appropriate marketing strategies to increase mobile value-added services in the future.

2. Literature review

Though there are large numbers of innovation adoption models exist, this study focuses on Technology acceptance model as theoretical perspectives. This theory is considered the most relevant and applicable for explaining use behavior in the context of mobile value added services. The following paragraphs are briefly explains the technology acceptance model and review on relevant literatures on mobile value added services researches.

2.1 Technology acceptance model

Technology acceptance model (Davis, 1989)has been used to predict the attitudes and behavior of users of mobile services. Derived from the Theory of Reasoned Action (Fishbein and Ajzen, 1975) the TAM includes five constructs: perceived usefulness, perceived ease of use, attitude towards use, intention to use, and actual use. The model of this theory proposes that (1) perceived usefulness and perceived ease of use have a direct impact on attitude towards using an innovation, while perceived ease of use has a direct influence on perceived usefulness; (2) perceived usefulness alone directly affects intention to use an innovation; (3) attitude towards innovation has a direct impact on intention to use such an innovation; and (4) intention to use has a direct influence on actual system use. This model has gone through extensive validation and extension from many replication studies. Several recent empirical studies have validated adoption theory in relation to a wide range of products (Labay & Thomas, 1981); (Ostlund, 1973); (Rogers, 1995)and technology (Beatty, Shim, & Mary, 2001); (Plouffe, Vandenbosch, & Hulland, 2001). There is a causal structure among relative advantage, compatibility, complexity, divisibility and communicability, perceived risk to form the intention to buy an innovation and lead to various implications for R&D guidelines and product design (Holak & Lehmann, 1990).

Some researchers have extended the original model by adding additional constructs that they felt more relevant to their studies (Bhatti, 2007); (Pagani, 2004); (Klopping & McKinney, 2004); (McCoya, Everardb, & Jonesc, 2005); (Nysveen, Pedersen, & Thorbjørnsen, 2005). While others have dropped the link between perceived usefulness and perceived ease of use as this relationship has proven to be the least significant (Chen, Gillenson, & Sherrell, 2004). The attitudinal and social factors compare to perceive behavioral control factors play a significant role to influence intention to adopt WAP-enabled mobile phone services and perceptions of relative advantage, risk, and image influence adoption intention (Teo & Pok, 2003). The social influences and perceived usefulness along with job relevance, output quality, and result demonstrability significantly influence user acceptance of technology (Venkatesh & Davis, 2000). This research goal is to explore different driving factors those affect user acceptance of MVAS in the context of Bangladesh applying TAM model.

2.2 Driving factor affecting user acceptance

Different studies have been explored, confirmed, and made some modelling to measure the acceptance and intention of mobile services in different countries. People are low willing to use mobile services in general, but an exceptionally high willing to use certain applications (Anckar & D'Incau, 2002). Different factors like perceived usefulness, perceived ease of use, perceived enjoyment positively affect satisfaction with m-services while perceived cost has a negative effect (Revels, Tojib, & Tsarenko, 2010). Usefulness describes the generic efficiency increase due to new technology use and mobility, includes time and place independent service access, reduced queuing, and substituting for other services (Mallat, Rossi, Tuunainen, & Öörni, 2009). This study has added view that use context was a new concept in this study. The most important factor in increasing consumer's behavioural intention to use 3G mobile value added services is attitude, followed by perceived ease of use, perceived cost and perceived usefulness (Kuo & Yen, 2009). Entertainment value as well as information value as the strongest drivers of the acceptance of the mobile phone as an innovative medium of advertising content communication (Bauer, Reichardt, Barnes, & Neumann, 2005).

The effect of perceived enjoyment was very important but usefulness did not influence an individual's attitude where age can be key moderator of mobile VAS acceptance (Ha, Yoon, & Choi, 2007). Compatibility of the mobile service is a major determinant of adoption and others like budget constraints, availability of alternatives, and time pressure were also have a strong effect (Mallat , Rossi, Tuunainen, & Öörni, 2008) The key factors explaining success of mobile value added service business model are advanced in-house technology, technological advancement of mobile devices, positive network externalities, service targeting, and advertising knowledge (Sirasoontorn, 2010). Service quality and fair price also have influences on customer satisfaction through perceive value where perceived value has mediating role among quality, charge fairness and satisfaction. Whereas, there is no significant impact of service quality found on customer satisfaction (Uddin & Akhter, 2012). The mobile service attributes of personalization, identifiability, and perceived enjoyment have significant positive influences

on the key brand loyalty, perceived quality, brand awareness, and brand association (Wang & Li, 2012). Building an adoption network that involves organizations with high brand awareness in the eyes of prospective customers positively impacts the early market survival of services relying on mature technologies (Dell'Era, Frattini, & Ghezzi, 2013).

Mobile services can be used to organise everyday lives and there are risks which can discipline discourses (Berg, Mörtberg, & Jansson, 2005). In adoption of technology, traditional antecedents of behavioural intention, ease of use and perceived usefulness can be linked to diffusion-related variables, such as social influence and perceived benefits (López-Nicolás, Molina-Castillo, & Bouwman, 2008). Mobile services quality attributes that are important to Generation Y-eras and baby boomers has significant differences between the two groups in terms of the effect of perceived value on satisfaction (Kumar & Lim, 2008).

3. Proposed Model and Research Hypotheses

There are growing interests in and understanding of the behavioral intention towards mobile value added services (mVAS) in businesses and individuals' daily life not wide spread enough. In this regard, understanding why diffusion and acceptance of the mVAS is delayed is one important research issue to be explored. Based on the review of literatures on technology acceptance model (TAM) and field study, this study proposed a research model in an attempt to investigate influences in consumers' intention towards mVAS in Bangladesh.

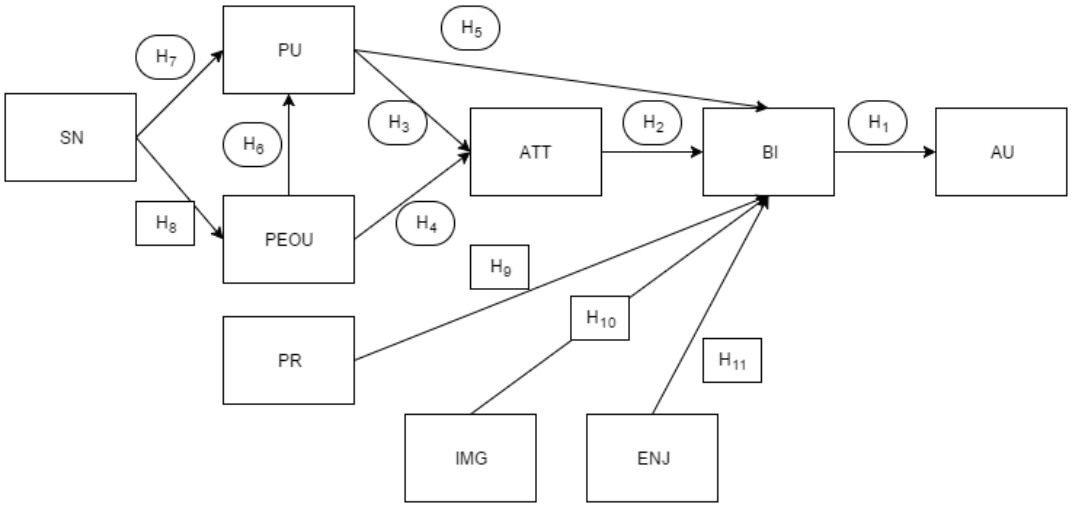

Figure 1 Proposed research model

Considering the theoretical framework of TAM, different literatures and field study it would be logically hypothesized that positive intention towards mVAS will lead to early use and positive attitude will lead to behavioral intention by the consumers in Bangladesh. Understanding the above proposed model the hypotheses might be:

H_1: The behavioral intention to use will have positively direct impact on the actual use of mVAS in Bangladesh
H_2: The attitude toward using will have positively direct impact on behavioral intention of mVAS in Bangladesh
H_3: The perceived usefulness will have positively direct impact on attitude towards use mVAS in Bangladesh
H_4: The perceived ease of use will have positively direct impact on attitude towards use mVAS in Bangladesh
H_5: The perceived usefulness will have positively direct impact on behavioral intention of mVAS in Bangladesh
H_6: The perceived ease of use will have positively direct impact on perceived usefulness of mVAS in Bangladesh
H_7: The subjective norms will have positively direct impact on perceived usefulness of use mVAS in Bangladesh
H_8: The subjective norms will have positively direct impact on perceived ease of use of mVAS in Bangladesh
H_9: The perceived risks will have negatively inverse impact on behavioral intention of mVAS in Bangladesh
H_{10}: The perceived image will have positively direct impact on behavioral intention of mVAS in Bangladesh
H_{11}: The perceived enjoyment will have positively direct impact on behavioral intention of mVAS in Bangladesh

4. Research methodology

4.1 Questionnaire design

The questions in the questionnaire were developed considering on review of literatures and the specific characteristics of Bangladeshi people & market context. The specific characteristics represented different services and facilities provided by the mobile network operators (MNOs) and expected by the consumers of Bangladesh. The questionnaire was translated into Bengali language to make clear and simple to understand by every respondent. The items in the questionnaire were

constructed based on the consumer intention and use of mobile value added services. A pre-test was performed on users and experts familiar with mobile value added services to modify ambiguous expressions. Based on the respondents' feedback, the questionnaire was adjusted to improve its readability and ensure its accuracy and appropriateness. The questionnaire was then adopted in a pilot test involving 30 undergraduate and graduate students from one public university in Bangladesh. It was consisted of 33 questionnaire items on nine factors including actual use, behavioral intention, attitude towards use, perceived usefulness, perceived ease of use, subjective norms, perceived risks, perceived image and perceived enjoyment. The items were measured on a 6-point Likert scale to avoid the tendency of answering neutral comment of Bangladeshi respondents. The questionnaire also includes six demographic items including gender, age, occupation, income, residence, and mobile operator use.

4.2 Sample

The sample of this study included 230 respondents from different regions of Bangladesh those are representative of the country's population. The respondents comprise of 60% male and 40% female mostly (74.8%) are in the 18-30 years age range. Among the respondents, most them (50%) were students and others business (15.2%), service (27.8%), and agriculture (7%). Among 230 valid respondents, highest uses are mobile internet service (35.7%) followed by messaging (25.2%), music & ring tone download (22.6%), utility payment (13.5%), and games (3%). In terms of occupation, mostly students are using mobile value added services (50%). In this study found most of the services users getting mobile value added services were provided by Grameen Phone (56.1%). Among the different income group, 83% of the respondents' earnings are less than 21,000 taka ($1=78.5 Taka).

4.3 Data collection

Subjects of this study were recruited from either in front or beside of the mobile phone shops in different public places in Bangladesh. The researcher approached potential respondents and asked for their willingness to participate in the study. Participants were selected on a convenience basis. At the time of intercepts, the researchers asked whether the participant had prior experience with using mobile value added services.

4.4 Data analysis

As far as scale-based variables were concerned, principal factor analysis was performed. In this study, the correlation matrix was used to obtain Eigen values. To facilitate the interpretation of factor loading, VARIMAX rotation was performed. In addition, Pearson correlation analyses were also conducted to examine the relationships among the constructs. SPSS software version 18 was used for analysing the data.

5. Results and discussions

5.1 Reliability and validity

There are twenty four items have been considered for the study. Multi-item scales (Six Point Likert Scale) response format has been used to operationalize each individual item of the questionnaire. The overall measurement for contextually formatted items is described in Table 1 result shows that scales used for the data collection are mostly reliable with highly recommended alpha scores which is within the range of good scale reliability (O'Leary-Kellya & Vokurkaa, 1998).

The study identifies 33 items based on Eigenvalue - 1 or above includes into the list of items. Statistically 33 items construct nine factors which can explain 69.25% of the field. So, this study considers these factors are important for the study. Factor-1 explains 22.876% having Eigenvalue of 7.55 and Factor-9 explains 3.101% with Eigenvalue 1.02 as lowest (Table 3). Hence, factor-1 is the most important in the current study which is related to perceived usefulness of mobile VAS consumers in Bangladesh.

5.2 Factor Analysis

The results had been thoroughly analyzed which obtained from 230 respondents. The Principal Component Analysis (PCA) has carried out to explore the underlying factors applying SPSS those associated with 33 items. The constructs validity was tested by Bartlett's Test of Sphericity and the Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy which analyses the strength of association among variables. The result of the Bartlett's Test of Sphericity and KMO have revealed that both were highly acceptable (0.824) and finally concluded that these variables were appropriate for the factor analysis (Table 2). Deciding upon the number of factors which initially runs based on Eigenvalues showed 9 factors explained 69.246% of total variance (Table 3). Here, it has selected factor loading of 0.656 or greater as the general criteria. It has approved that the minimum loading necessary to include an item in its respective constructs, loading 0.50 or greater are very significant (Hair, Anderson, Tatham, & Black, 1992).

The factor analysis revealed nine factors affiliated from 33 items (Table 1). Generally, the factor is the natural affinity of an item for a group.

Table 1 Reliability analysis and Factor loading matrices

Factors	PU	PR	BI	AU	PEU	IMG	ENJ	ATT	SN	Mean	Std. Dev.
05.MBN	0.772									4.86	1.073
02.MSG	0.728									4.78	1.151
04.GAM	0.708									4.83	1.135
03.INT	0.677									4.81	1.195
20.FFR	0.557									4.40	1.317
01.RTM	0.543									4.81	1.170
31.PNC		0.967								2.51	1.543
33.PSC		0.959								2.57	1.603
32.PNS		0.955								2.51	1.543
30.POC		0.424								2.55	1.579
16.SPU			0.759							4.09	1.074
17.DRQ			0.756							4.08	1.064
14.RUS			0.659							4.10	0.999
15.LEX			0.530							4.13	1.001
27.UMS				0.905						3.35	1.406
26.DRM				0.887						3.39	1.332
25.UIN				0.823						3.41	1.376
07.SEC					0.820					4.14	1.070
09.AWU					0.709					4.22	0.983
08.ATU					0.677					4.20	1.039
06.EAS					0.631					4.23	1.038
11.QAC						0.783				3.00	1.106
12.CNT						0.783				2.97	1.148
13.ESL						0.759				2.98	1.142
28.DGA							0.912			3.32	1.415
29.PUP							0.885			3.32	1.389
23.UMB								0.755		4.41	1.196
24.VOU								0.697		4.36	1.202
21.MCD								0.649		4.36	1.273
22.PUB									0.592	4.17	1.057
19.FNU									0.530	4.39	1.313
18.HAD									0.529	4.38	1.335
10.SIN									0.472	4.39	1.179
% of Var.	22.876	10.910	9.306	5.481	5.148	4.533	4.190	3.701	3.101		
Alpha	0.826	0.900	0.770	0.889	0.764	0.730	0.930	0.657	0.656		
Eigen Value	7.55	3.60	3.07	1.81	1.70	1.50	1.38	1.22	1.02		

Table 2 KMO and Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.824
Bartlett's Test of Sphericity	Approx. Chi-Square	4507.517
	df	528
	Sig.	.000

The higher factor loading indicates the stronger affiliation of an item to a specific factor. The findings of this study indicate that each of the nine factors: perceived usefulness (PU), perceived risk (PR), behavioral intention (BI), actual use (AU), perceived ease of use (PEU), perceived image (IMG), perceived enjoyment (ENJ), attitude towards use (ATT), and subjective norms (SN) were homogeneously loaded to the different factors. Each of the items that loaded into nine different factors has proven as significant related to the mVAS consumers' expectation.

5.3 Multiple Regression Analysis

The performance of regression analysis should be justified with the normality of distribution and no presence of multi-collinearity among the indigenous variables. The normality has been checked through histogram while the multi-collinearity has been examined through tolerance level and VIF value of regression statistics. The tolerance level and VIF value justify the absence of multi-collinearity among the predictors (Azam, 2007); (Kendall, Tung, Chua, Ng, & Tan, 2001).

Table 3 Total variance explained

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.55	22.876	22.876	7.549	22.876	22.876
2	3.6	10.91	33.787	3.6	10.91	33.787
3	3.07	9.306	43.093	3.071	9.306	43.093
4	1.81	5.481	48.573	1.809	5.481	48.573
5	1.7	5.148	53.721	1.699	5.148	53.721
6	1.5	4.533	58.254	1.496	4.533	58.254
7	1.38	4.19	62.444	1.383	4.19	62.444
8	1.22	3.701	66.145	1.221	3.701	66.145
9	1.02	3.101	69.246	1.023	3.101	69.246

Table 4 Regression Statistics Model

Model	R^2	Adjusted R^2	F Value	Factors	Coefficients	t	Sig.	Collinearity Statistics	
					Beta			Tolerance	VIF
Model 1	0.710	0.690	25.457	(Constant)		3.327	0.001		
Dependent Variable: Actual Use				Behavioral Intention	0.317	5.045	0.000	1.000	1.000
Model 2	0.353	0.338	24.416	(Constant)		3.010	0.003		
Dependent Variable: Behavioral Intention				Attitude towards Use	0.333	5.755	0.000	0.864	1.158
				Perceived Usefulness	0.361	6.048	0.000	0.809	1.237
				Perceived Image	0.078	1.395	0.164	0.922	1.085
				Perceived Enjoyment	0.137	2.288	0.023	0.805	1.242
				Perceived Risks	-0.080	-1.371	0.172	0.840	1.191
Model 3	0.780	0.730	9.65	(Constant)		7.191	0.000		
Dependent Variable: Attitude towards Use				Perceived Usefulness	0.199	2.704	0.007	0.748	1.337
				Perceived Ease of Use	0.121	1.636	0.103	0.748	1.337
Model 4	0.520	0.490	68.822	(Constant)		5.557	0.000		
Dependent Variable: Perceived Usefulness				Perceived Ease of Use	0.326	5.576	0.000	0.801	1.248
				Subjective Norms	0.395	6.756	0.000	0.801	1.248
Model 5	0.399	0.375	56.506	(Constant)		10.08	0.000		
Dependent Variable: Perceived Ease of Use				Subjective Norms	0.446	7.517	0.000	1.000	1.000

In this study VIF value appeared between 1.000 to 1.337 in five regression models. Again, the tolerance level appeared from 0.748 to 1.000 in five regression models (Table 4). These indicators prove that the predictors in the multiple regression analysis are free from the multi-collinearity.

Thus the regression model run should be directly administered for examining the degree and magnitude of the effects of variables. The regression model shows a good fit with F value of 25.457, 24.416, 9.65, 68.822 and 56.506 are sequentially from model 1 to model 5. The model 1 run results indicate that behavioral intention considered in the model account for 71% for mVAS use by the consumers in Bangladesh. Again, in model 2 five characteristics (attitude towards use, perceived usefulness, perceived image, perceived enjoyment, and perceived risks) considered in the model account for 35.3% mVAS use intention by the consumers in Bangladesh.

In model 3 two characteristics (perceived usefulness and perceived ease of use) considered in the model account for 78% on attitude towards use; perceived ease of use and subjective norms in model 4 considered 52% on perceived usefulness; and subjective norms in model 5 considered 39.9% on perceived ease of use by the mVAS consumers in Bangladesh. The study showed that eight hypotheses were supported out of eleven hypotheses significant at $p < 0.05$ (Table 5).

Table 5 Hypotheses Acceptance

Hypotheses	Dependent Factors	Independent Factors	P Value	Remarks
H_1	Actual Use	Behavioral Intention	0.000	Supported
H_2	Behavioral Intention	Attitude towards Use	0.000	Supported
H_3	Attitude towards Use	Perceived Usefulness	0.007	Supported
H_4	Attitude towards Use	Perceived Ease of Use	0.103	Not Supported
H_5	Behavioral Intention	Perceived Usefulness	0.000	Supported
H_6	Perceived Usefulness	Perceived Ease of Use	0.000	Supported
H_7	Perceived Usefulness	Subjective Norms	0.000	Supported
H_8	Perceived Ease of Use	Subjective Norms	0.000	Supported
H_9	Behavioral Intention	Perceived Risks	0.172	Not Supported
H_{10}	Behavioral Intention	Perceived Image	0.164	Not Supported
H_{11}	Behavioral Intention	Perceived Enjoyment	0.023	Supported

Conclusion and Implications

This study was attempted to examine and understand the consumers' behavioral intention and use behavior towards mobile value added services in Bangladesh. The mVAS providers are characterized by the involvement in intense competition with each other to attract and acquire the existing and potential consumers to use their mobile network. Presently, they are highly competing for providing value added services along with network quality, network extension and upgradation. According to this study, subjective norms is the highest significant factors following perceived usefulness, attitude towards use, perceived ease of use, behavioral intention and perceived enjoyment to influence actual use of mVAS to the consumers in Bangladesh.

The primary theoretical contribution of this study is the exploration of factors those can be used to exercise and predict consumers' intention and use of mobile value added services, particularly within the Bangladesh context. This research also creates a research interest on mVAS for the business researchers. Secondly, subjective norm has been found as strong factors of TAM model relevant to mobile value added services. Finally, the findings of the study can help mVAS providers in their operation and strategic plan of marketing of mobile VAS applications.

Limitation and future research

The sample size of this study has not necessarily demonstrative of the Bangladeshi population as a whole as it ignored large number of population. Secondly, the generalization of this research may be squeezed by fact that the sample's is skewed towards males. This may happened due to tradition of Bangladesh culture. In addition, this research only explores the factors to influence motivators and inhibitors on behavioral intentions and use. In terms of future research, a large scale study with more representative sample would be conducted to more authenticate these factors of the study and to enhance the generalizability of the research conclusions.

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