

# Factors Affecting on Users' Intentions toward 4G Mobile Services in Bangladesh

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## ABSTRACT

This study discusses the amalgamation of Technology Acceptance Model with the underlying 8 factors to investigate the intensity of users' intentions towards 4G adoptions in Bangladesh. So, it has tried to list all the latest released facilities and the adoption tendency. A sample size of 119 respondents with random sampling as well as in-depth interviewing methods have used and collected primary data from different institutions across Bangladesh with a self-administered field survey questionnaire as well as having secondary sources from different webs, books, journals, annual reports, and unpublished research works. The SPSS and the 5-Point-Likert scale have used to validate the results. Also the tests include correlation, multiple regression technique, ANOVA, and co-efficient of variance have used. The study indicates that 36% respondents are positively prone to 4G ( $r^2=.362$ ,  $f=5.531$ ,  $p=.000$ ). Besides, among the 8 factors, the image has the greatest influence on it ( $\beta=.249$ ,  $t=2.558$ ,  $p=.012$ ) followed by the variety of services ( $\beta=.189$ ,  $t=1.608$ ,  $p=.111$ ), the perceived enjoyment ( $\beta=.148$ ,  $t=1.803$ ,  $p=0.109$ ), the perceived ease of use ( $\beta=0.108$ ,  $t=0.916$ ,  $p=0.368$ ), the personal Innovativeness ( $\beta=.098$ ,  $t=.934$ ,  $p=.352$ ), and the network effects ( $\beta=.002$ ,  $t=.025$ ,  $p=.980$ ). Conversely, the price ( $\beta=-.027$ ,  $t=-.406$ ,  $p=.685$ ) and the perceived usefulness ( $\beta=-.069$ ,  $t=-.629$ ,  $p=.303$ ) have a rare impact on it. However, with the outcomes, the telecommunication services providers will be able to accelerate the winning strategies at different levels in Bangladesh. As there are few studies published in this regard, future research is necessary to investigate the financial and industrial implications associated with it.

**Key words:** Perceived Usefulness, Variety of Services, Perceived Enjoyment, Image, Personal Innovativeness, Network Effects, Price

## INTRODUCTION

Due to widespread demand as a means of communication, the mobile services market is being as the most rational part in the telecommunications sector. The fourth-generation mobile communication service, 4G, is a combination of 3G as well as having the high-quality image and video transmission with a high definition television technology (Velmurugan & Velmurugan, 2017). It has opened up doors for high-speed transfer of both voice and data (Parikh & Basu, 2011). One of the reasons for shifting 3G to 4G among the users is that 3G does not concentrate on developing its technical standards (Xu et al., 2017). 4G services are now providing high-speed communication facilities around the globe via more updated applications in mobile phone which were not possible by previous technology (Campilho & Kamel, 2004). Now, it has brought easy intranet/extranet access,

customized infotainment, multimedia messaging service (MMS), mobile internet access, location-based services, rich voice, and so forth. Mobile intranet/extranet access is a business service that allows the safe access to local area networks (LAN) and virtual private networks (VPN) (Hwang et al., 2007). Location-based services allow users to identify their locations, terminals of transportations, the position of vehicles, and the advanced voice capabilities, for example, VoIP, Web-initiated phone calls, etc. (UMTS Report, 2000a). The adoption tendencies of mobile services such as video and multimedia messaging have increased together with the progress of the 4G. This modern technology reached 100 million subscriptions, with a rate of 3 million subscribers per month (UMTS Forum, 2001b & 2006c). It also reported that "by 2010, subscribers will spend about \$30 per month for 4G services and total 4G services provider retained revenues will exceed \$ 300 million."



**Inauguration and present 4G status in Bangladesh**

In February 2018, 4G arrived in Bangladesh through Teletalk, Robi, Grammenphone, and Banglalink (The Daily Star, 2018). As of 2018, Android has over 80% global market share having nice polyphonic ringtone, FM radio, 3.5 mm jack, fun and games, Bluetooth and some of them also had a standard quality back camera (The Economic Times, & ETTelecom, 2018). 4G has been the latest as well as the fastest growing mobile services and provides the high-speed internet facilities in Bangladesh (bdnews24.com, 2018). It can download at a speed of 100Mbps, and meet nearly all the user's requirements (The Daily Star, 2018). Users are getting entertainment through mobile TV at any 4G coverage areas, and also enjoying many Bangladeshi TV Channels including BTV, Channel I, Independent, and IP TVs , as for example, Cartoon TV, Travel TV, Bollywood TV, etc (Hassan et al., 2015). Nowadays, subscribers are being able to make video calling and communicate people who are distant, share a story, celebrate a birthday, hold a meeting, work with colleagues, etc. (He & Zhao, 2008). In Bangladesh, the major services provided by it are mobile TV, video calling, video on demand, enhance voice telephony, other upload-download services, video conferencing, navigation on transportation, city surveillance, etc., (Dhaka Tribune, 2018).

**REVIEW OF LITERATURE**

Users are enjoying the high-speed internet facilities and a variety of services from internet service providers (ISP) with reasonable price in Bangladesh (Dhaka Tribune, 2018). Some researchers also developed different models to understand the consumer behaviours and attitudes towards the adoption tendency of innovated technologies (Sirdeshmukh et al., Lin et al., Ha., Li, 2018; Venkatesh & Davis, 2000; & Rogers, 1995). Besides, this study has not found sufficient numbers of related studies towards the 4G adoption in Bangladesh, is an attempt to mitigate the research gap in this regard. Thus, the paper aims at identifying the factors influencing on it. Recently this service is tremendously developing itself technically and conveniently. This study has reviewed many articles related to current 4G adoption tendency, customer behavior, customer segmentation, acceptance, and features that affect use in various countries. In 2009, TeliaSonera introduced it in Stockholm and Oslo commercially; a year later in Finland, and in 2014, it offered 4G in 10 states (Jansson, Karin. n.d.). By drawing the Technology Acceptance Model (TAM), this study has examined the factors influencing the intentions towards 4G in Bangladesh.

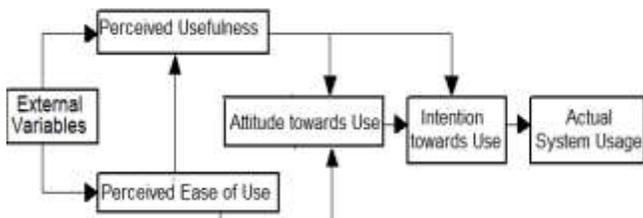


Figure 1: The Technology Acceptance Model (TAM)

**RESEARCH METHODOLOGY**

**Sampling size and plan**

Lack of time and resources, a sample size of 119 respondents have used. The study has spent some days for planning a sample size and collected data from different institutions like Rajshahi University, Rajshahi University of Engineering & Technology, Rajshahi College, Varendra University, and more government and private educational institutions from 7 divisions of Bangladesh like Dhaka, Khulna, Barisal, Chittagong, Sylhet, Mymensingh, Rangpur, etc. It has also collected data from Boshundhara City, Jamuna Future Park, Banglalink customer care points, Grameen Phone customer care points, Robi customer care points, Airtel customer care houses, different banks like Bangladesh Bank, MBBL, MTB, NCCB, Dutch Bangla Bank First Track, and so forth. It took time because respondents were from all parts of Bangladesh and not always in the mood to talk, and sometimes different types of complications arose so that the study had to wait to make a favorable scope. But at last the sampling plan was done appropriately and the study got the desired outcomes.

**Sampling method and source of data**

This study has used random sampling as well as in-depth interviewing methods, and focused on primary data collected from various educational, government and private institutions from Bangladesh with a self-administrated questionnaire. The secondary sources include different webs, online published articles, blogs, books, journals, annual reports, and unpublished research works.

**Types of tests and statistical software applied**

The study has used SPSS statistical software and Likert scale to analyze the relationship among different properties in the proposed model and to identify the respondents' intentions towards 4G acceptance. The test includes correlation; multiple regression technique, ANOVA, and co-efficient of variance.

**THEORETICAL FRAMEWORK**

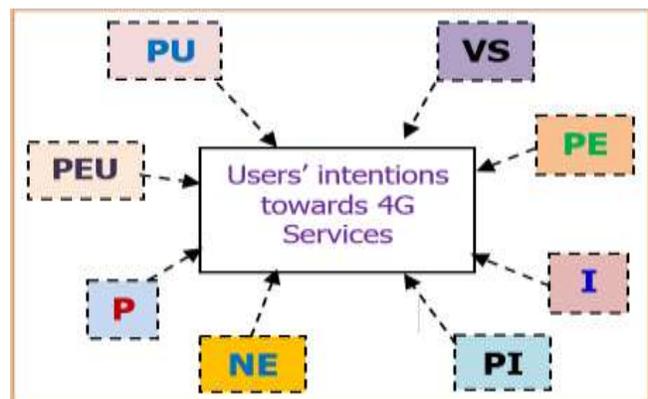


Figure 2: Proposed research model

**Critical factors affecting acceptance of 4G and hypothesis**

After going through different kinds of innovation-adoption literature, the study found that there are several factors behind the 4G acceptance in Bangladesh which are identified as more influential and described as following categories.

**Perceived Usefulness (PU):** According to the TAM model by Davis et al. (1989), perceived usefulness is a critical factor with the name of “relative advantage” in adoption of a technology. Hence, for the sake of 4G acceptability in Bangladesh, it is considered influential.

H1: PU influences positively on 4G acceptance.

**Variety of Services (VS):** It refers to the availability of functions, such as MS Office compatibility, download facilities, organizer functions, games, other mobile apps, etc. (Hassan et al., 2015). The more services are, the more powerful the technology is. 4G provides a wide variety of audios, videos and data services, faster and better games, location services, televisions, etc. (Dhaka Tribune, 2018).

H2: VS influences on 4G acceptance.

**Perceived Enjoyment (PE):** Fundamentally PE means having fun, gaming on mobiles, watching movies on entertainment appliances, traveling with peers, etc. (Velmurugan & Velmurugan, 2017). Hence, concerning the 4G acceptance in Bangladesh, this element is considered influential.

H3: PE influences on 4G acceptance.

**Image (I):** The image refers to a symbolic status in a telecommunication industry which ensures the perceived relative advantages among the users. It has a social influence which affects the acceptance of innovations (Hassan et al., 2015).

H4: Image influences on 4G acceptance.

**Personal Innovativeness (PI):** According to Rogers (1995), “personal characteristics highly affect decisions to adopt or reject innovation.” Other researchers have claimed that “individuals, who have high Innovativeness, are more likely to develop positive perceptions towards the innovation” (Koschate-Fischer et al., 2018).

H5: PI influences on 4G acceptance.

**Network Effects (NE):** NE provides a technical support that can ensure the uninterrupted speed of internet access which plays a crucial role in the adoption of communication technology (Pagani, 2004). Hence, NE tends to impact on 4G adoption.

H6: NE influences on 4G acceptance.

**Price (P):** Sellers can manipulate customer’s perceived price by providing reference price, such as the price from the other vendors, etc. (Koschate-Fischer et al., 2018; Martins & Monroe, 1994). The studies also suggested that the external reference price derives from the observation of the vendor’s promotional or advertised price and the internal reference price resides within the customer’s memory which impacts on adoption of innovation.

H7: Price influences on 4G acceptance.

**Perceived Ease of Use (PEU):** It indicates that how conveniently and effortlessly users are getting services. So, it also refers easily to use and less difficult to adopt the new technology by users (Hassan et al., 2015).

H8: PEU influences on 4G.

**RESULTS AND DISCUSSIONS**

Table 1: Socio-demographic characteristics of the respondents

Gender	Frequency	Percent
Male	84	70.6
Female	35	29.4
Total	119	100
Age range	Number	Percent
15-25	76	63.9
26-35	35	29.4
36-45	5	4.2
46-55	3	2.5
Total	119	100
Occupations	Number	Percent
Teaching	13	10.9
Doctor	1	0.8
Government Job	2	1.7
Private Company	3	2.5
Multinational Corporation	2	1.7
NRB (Non-Resident of Bangladesh)	1	0.8
Business	4	3.4
Bank Job	9	7.6
NGO	1	0.8
Self Employed	1	0.8
Housewife	1	0.8
Student	78	65.5
Unemployed	2	1.7
Others	1	0.8
Total	119	100
Marital status	Number	Percent
Marred	33	27.7
Single	84	70.6
Separated	2	1.7
Total	119	100

Source: Author’s field survey, 2018

The study found the results (Table 1) from the socio-demographic characteristics of the respondents that



among the 100 respondents, the numbers of males and females were respectively 84 (70.6%), and 35 (29.4%); the group of age range 15-25 had more tendency to adopt the 4G; around 84 (70.6%) were single, 33 (27.7%) were married; the most of them were students and teachers respectively 78 (65.5%), and 13 (10.9%).

Table 2: Descriptive statistics of the respondents

Perceived Usefulness (PU)					
	Respondent	Minimum	Maximum	Mean	Std. Deviation
4G increases the work efficiency.	119	1	5	4.07	.778
It increases the quality of communication.	119	1	5	3.77	.797
Average mean				3.92	
Variety of Services (VS)					
It provides a wide variety of services.	119	1	5	3.73	.841
Perceived Enjoyment (PE)					
It allows doing things faster.	119	1	5	3.92	.885
What kinds of basic problems are you facing for getting 4G services from your mobile operator?	119	1	6	3.72	1.677
Average mean				3.82	
Image (I)					
Using 4G is a symbol of prestige.	119	1	5	3.48	.901
Personal Innovativeness (PI)					
I like to purchase new information/communication technologies.	119	2	5	3.96	.706
Network Effects (NE)					
I think my mobile service providers are interested to provide 4G.	119	1	5	3.90	.906
Price (P)					
Using cost of 4G is reasonable in Bangladesh.	119	1	5	2.81	1.181
Perceived Ease of Use					
It is very easy to use 4G in mobile.	119	1	5	3.81	.773
It is compatible and user friendly.	119	1	5	3.81	.762
Average mean				3.81	
Overall Customers' Intension					
Users of Bangladesh have the favorable intention to use 4G.	119	1	5	3.65	.898

Source: Author's field survey, 2018

From the descriptive analysis (Table 2, 3, 4, 5, & 6), the study found that 36% respondents are positively prone to 4G ( $r^2=.362$ ,  $f=5.531$ ,  $p=.000$ ). Besides, among the 8 factors the image has the greatest influence on it ( $\beta=.249$ ,  $t=2.558$ ,  $p=.012$ ) followed by the variety of services ( $\beta=.189$ ,  $t=1.608$ ,  $p=.111$ ), the perceived enjoyment ( $\beta=.148$ ,  $t=1.803$ ,  $p=0.109$ ), the perceived ease of use ( $\beta=0.108$ ,  $t=0.916$ ,  $p=0.368$ ), the

personal innovativeness ( $\beta=.098$ ,  $t=.934$ ,  $p=.352$ ), and the network effects ( $\beta=.002$ ,  $t=.025$ ,  $p=.980$ ). Conversely, the price ( $\beta=-.027$ ,  $t=-.406$ ,  $p=.685$ ) and the perceived usefulness ( $\beta=-.069$ ,  $t=-.629$ ,  $p=.303$ ) have a rare impact on it.

Table 3: Correlations

	PU1	PU2	VS	PE1	PE2	I	PI	NE	P	PEU1	PEU2	OCI
PU1	1	.626**	.689**	.561**	.060	.280**	.036	.431**	.005	.458**	.479**	.374**
PU2	.626**	1	.516**	.469**	.060	.436**	-.032	.250**	.052	.355**	.430**	.231*
VS	.689**	.516**	1	.428**	.061	.339**	.066	.309**	.058	.415**	.421**	.401**
PE1	.561**	.469**	.428**	1	.054	.376**	.063	.477**	.010	.375**	.368**	.436**
PE2	.060	.060	.061	.054	1	.235*	-.024	.026	-.100	-.048	.064	.182*
I	.280**	.436**	.339**	.376**	.235*	1	.165	.299**	.199*	.353**	.383**	.431**
PI	.036	-.032	.066	.063	-.024	.165	1	.126	.285**	.171	.205*	.177
NE	.431**	.250**	.309**	.477**	.026	.299**	.126	1	.140	.383**	.426**	.310**
P	.005	.052	.058	.010	-.100	.199*	.285**	.140	1	.256**	.288**	.079
PEU1	.458**	.355**	.415**	.375**	-.048	.353**	.171	.383**	.256**	1	.540**	.365**
PEU2	.479**	.430**	.421**	.368**	.064	.383**	.205*	.426**	.288**	.540**	1	.358**
OCI	.374**	.231*	.401**	.436**	.182*	.431**	.177	.310**	.079	.365**	.358**	1

\*\*Correlation is significant at the 0.01 level (2-tailed)

\*Correlation is significant at the 0.05 level (2-tailed)

Regression analysis

This study used the multiple regression analyses technique to analyze the intensity of the 8 independent variables and a single dependent variable.

Table 4: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.602*	.362	.297	.753

\*Predictors: (Constant), all the underlying eight factors and their associated attributes.

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	34.500	11	3.136	5.531	.000
Residual	60.676	107	.567		
Total	95.176	118			

a. Dependent Variable: Users of Bangladesh have the positive intention to use the 4G.

b. Predictors: (Constant), all the underlying eight factors and their associated attributes.

Table 6: Coefficients

	Unstandardized Coefficients	Standardized Coefficients	Beta	t	Sig.
	B	Std. Error			
(Constant)	.265	.591		.449	.654
Perceived Usefulness	-.069	.138	-.062	-.629	.303
Variety of Services	.189	.118	.177	1.608	.111
Perceived Enjoyment	.148	.074	.171	1.803	.109
Image	.249	.097	.250	2.558	.012
Personal Innovativeness	.098	.105	.077	.934	.352
Network Effects	.002	.094	.002	.025	.980

Price	-.027	.066	-.035	-.406	.685
Perceived Ease of Use	.108	.119	.093	.916	.368

a. Dependent variable: Overall customers' intentions

## CONCLUSION AND RECOMMENDATION

### Conclusion

This article has revealed the intensity of influence of the 8 factors that centerline the intention of using 4G in Bangladesh. It has exposed that the users' intentions towards 4G depend on the image, a variety of services, the perceived enjoyment, an ease of use, the personal innovativeness, and the network effects. On the other hand, the price of services and the usefulness have a rare positive impact on it but the adoption tendency of it has a great deal of potentiality. The outcomes of this research are very informative for Bangladeshi mobile service providers.

### Recommendation

The major theoretical imposition in this study was to confirm the role of underlying 8 variables and their impacts on the adoption of 4G. Currently, the internet is providing a variety of enjoyment, for example, playing online games, downloading music and videos, chatting, and sending online messages (Tone et al., 2014). However, all these opportunities did not get the hope of light due to the slow speed of 3G (Xu et al., 2017). But 4G has overcome all these complexities and now offers faster download speeds, streaming capabilities to internet users more conveniently. So, considering the 8 factors in 4G comparing to in 3G, users who perceive 4G as a good means of entertainment will eventually adopt it. The findings support the underlying hypotheses that shape all factors will have a significant positive influence except the price and the usefulness on the attitude and behavioral intention toward using it. The broadband users are more likely to use the internet for amusement in comparison to narrowband users (Tone et al., 2014) which also support this study's findings. Moreover, the current findings have a significance on the understanding of the factors affecting users' intentions towards its acceptance which will be the useful suggestions for telecommunication services providers to make appropriate state-of-the-art strategies to attract the users and also recommends that the services providers must be careful about providing more variety of dynamic services in a convenient way. The study has some financial and time limitations, so future research is crucial to estimate and re-investigate the possibility.

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