

An Empirical Investigation on the Adoption of E-Commerce in Bangladesh

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Electronic Commerce or e-commerce implies such an industry where goods and services are bought and sold over electronic systems. This is rapidly growing sectors in Bangladesh which influence local and international trade. Government of Bangladesh has also initiated quite a good number of measures for the expansion of e-commerce. However, low adoption of e-commerce is not uncommon in Bangladesh. The objective of this study is to determine the factors that influence the adoption of e-commerce services in Bangladesh. Extended version of Technology Acceptance Model (TAM) is envisaged as the theoretical backbone of the study. Reliability analysis using Cronbach's Alpha test indicates that the research model is internally consistent. The study reveals that 35 percent of respondents became interested in e-commerce services from advertisement on Internet or other electronic media. The findings of the study shows that all the four constructs, namely-Computer Self Efficacy, Perceived Credibility, Perceived Usefulness and Perceived Ease of Use have significant effect on the adoption of e-commerce. The study has also demonstrated that Perceived Usefulness appeared as the most important factor in describing user's adoption of e-commerce.

Keywords : Technology Acceptance Model, e-commerce, Bangladesh

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I . Introduction

In the new global economy, electronic commerce has become a central issue for the new way of doing business. It is at the heart of new distribution channel which supports online vendor to provide product and service that are effective and superior in many ways to traditional channel [Lee *et al.*, 2003]. It is an increasingly important area in developing countries for promoting economic growth and welfare [Mannistor, 1999]. E-commerce provides twofold opportunities for the developing countries, one is it enables the business of developing country to participate as vendors in international market, another is it allow them to buy goods and services from the developed world at least possible time [UNCTAD, 1999]. As a result, developing countries have paid much attention to use e-commerce in their national trade strategies. A survey by UNCTAD on national e-strategies shows that a significant number of developing countries have included e-commerce in their national e-strategies and targeted specific sectors for the development of e-commerce [UNCTAD, 2002].

Bangladesh is one of the developing countries, which is located in South East Asia region. Since 2001, Bangladesh has faced a major economic crisis which is characterized by fall in Gross Domestic Product (GDP), dearth of liquidity and rise or fall due to inflation or deflation [Ferdous and Shahid, 2002]. Therefore, government of Bangladesh is attempting to use e-strategies for economic transition. E-strategies will also help to harmonize legislative and regulatory frameworks for e-commerce in Bangladesh. As mentioned in the *Empowering Consumers in E-Commerce* report, e-commerce can heal the losses due to

economic crisis as it makes consumers to be more cost-conscious since they visit websites of different companies and save money [OECD, 2009]. Moreover, driving more business online, e-commerce can act as a means to increase visibility.

One might question about the relevance or importance of e-commerce to the economy of Bangladesh. In view of recent rash of globalization and the commencement of the World Trade Organization (WTO), it has become imperative to investigate the e-commerce adoption in Bangladesh. It is evident from the review of trade scenario of Bangladesh that by pursuing the most liberalized trade regime in South Asia she has accepted the challenge of globalization. On the top of that, as a signatory of the WTO, she has accepted to adhere to various quality control and efficient payment mechanism in trade.

According to the national IT development plan 2010, some areas that Bangladesh government supports are e-government, e-commerce, e-education and e-industry. The development of e-commerce is strongly supported by Bangladesh government and e-commerce is viewed as a national trade strategy [Hossan *et al.*, 2006]. Although Bangladesh has planned to improve the utilization of information technology and the number of Internet user has reached 37 million at the end of April, 2014, Bangladesh has not yet succeeded in implementing of e-commerce strategies [BTRC, 2014]. There are a number of reasons behind that. First of all, poor governance demoralize trade specially e-commerce activities. It is the major cause of ineffective e-commerce development in Bangladesh. Poor governance is characterized by bottlenecks, red tape and corruption. Those facts together pushes up the cost of doing business and limit the efficiency gains emanated

from e-commerce. In addition to that weak infrastructure also obstructs development of e-commerce in Bangladesh [Hossain, 2000]. Moreover, Ali [2003] spotted out several factors that hinder the functioning of e-commerce in Bangladesh. These factors include technological backwardness, limited resources, inefficiency of management, strikes, etc.

According to a recent national e-commerce survey, there are a total of 6,460 Bangladeshi websites. Among those websites there are only 3,765 active and accessible websites and 88.85 percent (3,335 websites) of these websites are mainly used for promotional purpose. The other 11.42 percent (430 websites) provides additional value added services such as online reservation and online payment system, which is a step towards the adoption of e-commerce strategy. Comparing the survey in the previous year it is only a 1 percent increase towards adoption of e-commerce strategy. This is an early stage of the adoption of e-commerce as these websites provide information about companies and their products [JETRO, 2013].

In recent years, many Bangladeshi organizations are trying to build physical infrastructures to support the development of e-commerce and mimic e-commerce model from western countries. The present Government of Bangladesh aims at making digital Bangladesh. To materialize this dream the Government is initiating different e-commerce program. Bangladesh has already made a promising start in e-commerce. Several example of using e-commerce are: Mobile Phone Companies are using it in the form of Flexi Load, Bill Pay Services; Banks are using it as online banking system, Shopping Malls are using it though buying and selling in using the

Credit Card. Furthermore, Ministry of Commerce, Ministry of Information and Communication and Planning Commission are jointly promoting the e-commerce in Bangladesh. Government formed e-commerce committee headed by the Commerce Secretary. Ministry of Information and Communication is working for enacting a law regarding "Electronic Transaction Act". Moreover, Ministry of Industry (MoI), Government of Bangladesh, are currently facilitating e-commerce chat and help information in several industrial sectors, such as RMG, Frozen Goods, Leather & Leather Products, Diamond, etc.

Though there are many interventions taken to provide e-commerce services to the people, there is little evidence on the adoption process of e-commerce from customer's perspectives in Bangladesh. E-commerce is very promising on its supply section (e.g. providing infrastructure), but little has been done on the demand section (e.g. adoption). Most of the research and project are concerned how to develop the modern technologies. However, there is no research concerned with the adoption of e-commerce in Bangladesh from consumer's perspective. It is essential to analyze the factors influencing the adoption of e-commerce in Bangladesh. This study is an attempt to fill this gap by analyzing the adoption and acceptance issues of e-commerce in the context of Bangladesh. Extended Technology Acceptance Model (TAM) is used for theoretical underpinning of this research.

II. Literature Review

2.1 E-commerce

The term 'e-commerce' has already vigor itself

as an unavoidable module for developing business strategies. E-commerce is defined as the process of buying, selling, transferring or exchanging products, services or information via computer networks, including the Internet [Turban *et al.*, 2008]. Hunt (2007:1) provided a complete definition of e-commerce: "e-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals." It is defined as the type of industry where products and services are bought and sold over electronic systems such as the Internet and other computer networks.

Babita [2014] found that e-commerce may be a marketing process or technique that used by business organization, industries and corporation for business through the internet system. Wiengarten [2013] proved that e-commerce enabled collaboration influence directly and positively on the multiple dimensions of operational performance tested. Michael [2014] revealed that e-commerce positively affects overall firm's performance and internal process. Asghar and Stephen [2013] found that e-commerce influenced the brand and corporate image of company where security and privacy are considered the main barriers of e-commerce adoption. There is an extensive body of literature on adoption of e-commerce throughout different countries.

2.2 E-commerce in Developing Countries

E-commerce adoption in developing countries faces challenges different from those in developed countries [Molla and Licker, 2005]. Develop-

ing countries often lagged behind from financial, legal and physical infrastructure which is necessary for the implementation of e-commerce. In addition, developing countries also confront cultural stigma which hinders the applicability of e-commerce [Enns and Huff, 1999; Hemple and Kwong, 2001]. Different studies showed that developing countries adopt e-commerce very slowly and majority of them just linger in the lowest level of sophistication in this regard [Migiro, 2006; Sam and Leng, 2006; Sulaiman, 2000]. A plethora of factors are responsible for influencing customer and firms' decision to adopt e-commerce application in different countries.

Different studies have identified different types of factors influencing technology and innovation adoption such as e-commerce. Organizational, technological and environmental factors are identified most important factors of e-commerce adoption in developing countries [Tornatzky and Fleischer, 1990]. The organizational factors are mostly cited in literature which include organizational structure; firm size; firm's process; IT users' community; technological competences of the employees; financial resources; technological resources and top level management support [Aguila-Obra and Padilla-Melendez, 2006]. Technological factors of e-commerce adoption include compatibility, complexity, relative advantage, usefulness and ease of use [Grandon and Pearson, 2004]. Researchers have also identified some environmental factors relating to the adoption of internet technologies (i.e. e-commerce) in developing countries such as customers or suppliers; pressure from competitors; partners, alliances; the role of government; image of internet technology; and users expectations [Aguila-Obra and Padilla-Melendez, 2006]. It is

argued that organizational factors appeared as most prevalent hindrance toward adoption of e-commerce in developing countries [Kartiwi and MacGregor, 2007].

E-commerce adoption in developing countries has been constrained by the quality, availability, and cost of accessing infrastructure [Humphrey *et al.*, 2003]. The low level of information and communications technology (ICT) and internet diffusion in developing countries can also limit the level of e-commerce adoption [Molla and Licker, 2005]. In addition, most businesses in developing countries are small. Lack of adequate resources to invest in information systems and information technology are possible obstacles for e-commerce adoption decision [Goode and Stevens, 2000]. The practice of doing business electronically, electronic-based intra and inter-business relations, dealing with non-cash payments are not common for businesses in developing countries but are important for e-commerce adoption in developing countries [Odedra-Straub, 2003; Montealegre, 1996].

Tan *et al.* [2007] analyzes the organizational and contextual factors that affect e-commerce adoption in China. They found that the important deterring factors in e-commerce adoption in China are restricted access to computers, lack of enterprise-wide information sharing, lack of internal trust, and incapability of dealing with rapid change. Suki [2010] argued that information regarding Internet banking services and its benefits is a critical factor influencing the adoption of e-commerce in developing countries. The findings of Chuang and Hu [2010] argued that online banking services for e-commerce need to put emphasizes on the core functions and designs these attributes with utmost

efficacy for the satisfaction of all customer's demand. The finding of Dixit and Dutta [2010] depicted that the acceptance of e-commerce services among Indian customer is influenced by many factors like security & privacy, trust, familiarity, and awareness level. Arun [2013] found that in case of online shopping, previous online buying experience, impulse buying intention and online trust have significant influences on buyer purchase intention.

Although adoption of e-commerce is well established research topic in developing countries, only few researchers in Bangladesh address this issue. Hossain *et al.* [2013] found that the use of B2C e-commerce in Bangladesh will not flourish because of low per capita income, a defective infrastructure and legal issues, lack of trust between business and consumers. Azam [2006] examined the effects of buying culture and infrastructural forces in implementing B2C e-commerce in Bangladesh. The study incorporated a multiple regression analysis which reported that buying culture of the country's citizenry is negatively related to the implementation of B2C e-commerce in Bangladesh. However, infrastructural forces are significantly positively related. Hoque [2008] identified some challenges such as infrastructure, awareness of customer about e-commerce, government support and legal framework which influence the adoption of e-commerce in Bangladesh.

2.3 Extended Technology Acceptance Model

Most of the e-commerce adoption works conducted earlier had adopted TAM to examine the user's intention for acceptance of technology.

Adensina and Ayo [2010] conducted a survey on a total of 500 survey questionnaires incorporating TAM and found that TAM is the most widely used model for technology adoption. The study of Suh and Han [2003] support the TAM for consumer acceptance of electronic commerce by validating the hypothesis. Shih [2004] applied TAM to predict user acceptance of e-shopping and found that perceived ease of use (PEOU) and perceived usefulness (PU) significantly influenced individual attitudes toward e-shopping. He also found that attitudes toward e-shopping were positively correlated with user acceptance.

Researchers have found that original TAM variables may not adequately capture key beliefs that influence consumer attitudes toward e-commerce [Pavlou, 2003]. In recent years, the coverage of TAM has been extended in a series of studies and trust, computer self-efficacy, personality and perceived enjoyment have been added by many e-commerce researcher [Qiu *et al.*, 2006; Gefen *et al.*, 2003; Wu and Chen, 2005; Daugherty and Biocca, 2005]. Qiu and Li [2008] applied an extended TAM model on e-commerce adoptions, which includes three supplementary constructs, trust, social presence, and perceived enjoyment. The research of Klopping and McKinney [2004] supports the use of extended TAM to predict online shopping activity, both the intention to shop online and actual purchases. Çelik and Yilmaz [2011] adopted extended TAM to explain consumer acceptance of e-shopping. They added perceived trust, perceived information quality, perceived enjoyment, perceived service quality and perceived system quality factors to the classical TAM. Their extended TAM model is tested against data obtained from 606 internet users

in Turkey. They found that the recently included factors are also effective in explaining the acceptance of e-shopping.

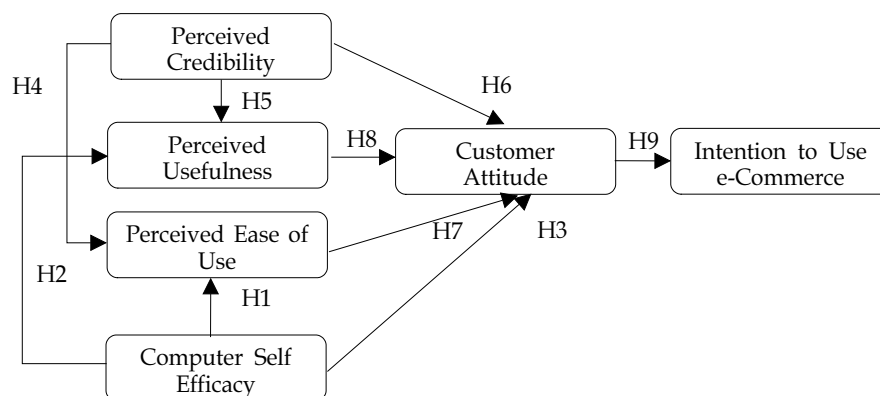
However, no study or research is conducted to incorporate the Technology Acceptance Model (TAM) in the arena of e-commerce in Bangladesh. The uniqueness of this study is the incorporation of Extended Technology Acceptance Model (TAM) in the arena of e-commerce in the context of developing country like Bangladesh. This study aims to gauge the factors that influence technology acceptance decision among users of e-commerce in Bangladesh.

III. Research Model and Hypotheses

The technology acceptance model (TAM) has been widely applied theories in information systems research since proposed by Davis [Shih, 2004]. The TAM focuses exclusively on constructs such as perceived usefulness and perceived ease of use [Davis *et al.*, 1989]. However, the present construct of TAM may have limited explanatory power when it is utilized in studying consumers' adoption intentions of e-commerce [Pavlou, 2003]. Based on variety of recent e-commerce research works and potential contribution to extant theories, this paper adopted Extended TAM with two additional constructs: 'perceived credibility' and 'computer self-efficacy' (see <Figure 1>).

Computer Self-Efficacy (CSE)

Bandura [1982, p. 122] defined self-efficacy as "judgments of how well one can execute courses of action required to deal with prospective situations". One of the proximal determinants of behavior is self-efficacy and it is regarded as



<Figure 1> Research Model

its function. Compeau and Higgins [1995, p.191] defines Computer self-efficacy as “an individual’s perceptions of his or her ability to use computers in the accomplishment of a task rather than reflecting simple component skills”. The theoretical basis of the proposed relationship between computer self-efficacy and perceived ease of use is the argument developed by Davis [1989]. Many studies have found the impact of computer self-efficacy on e-commerce adoption and use. Saade and Kira [2009] indicate that computer self-efficacy plays a significant role on perceived ease of use. Talebpur *et al.* [2009] reported that computer self-efficacy has a notable direct impact on perceived usefulness and perceived ease of use as well. Hanudin [2007] found that there is a causal link between computer self-efficacy and perceived ease of use. Eastin [2002] revealed that computer self-efficacy have a significant impact on customer attitude and played important role in the e-commerce adoption processes. Thus, to determine the adoption of e-commerce in Bangladesh, we hypothesize following:

Hypothesis 1: Computer self-efficacy has a positive impact on perceived ease of use of

e-commerce in Bangladesh.

Hypothesis 2: Computer self-efficacy has a positive impact on perceived usefulness of e-commerce in Bangladesh.

Hypothesis 3: Computer self-efficacy has a positive impact on customer attitude of e-commerce in Bangladesh.

Perceived Credibility (PC)

Perceived credibility is a key indicator of behavioral intention to use an information system [Hanudin, 2007]. In this research, the term “perceived credibility” (PC) indicates the perception of protection of user’s transaction details and personal data against illegal entrance. Perceived credibility has also been tested empirically and proved to yield a significant effect on perceived ease of use and perceived usefulness [Karjaluoto *et al.*, 2002; Lallmahamood, 2007]. Oni and Ayo [2010] found that Perceived Credibility (PC) have positive impact on Perceived Ease of Use (PEOU), Perceived Usefulness (PU) and customer attitude. As a result, to study the effect of perceived credibility on user’s acceptance of e-commerce in Bangladesh, the study hinges on the following hypotheses:

Hypothesis 4: Perceived credibility has positive impact on perceived ease of use of e-commerce in Bangladesh.

Hypothesis 5: Perceived credibility has positive impact on perceived usefulness of e-commerce in Bangladesh.

Hypothesis 6: Perceived credibility has positive impact on customer attitude of e-commerce in Bangladesh.

Perceived Ease of Use (PEOU)

Davis [1989, p.320] defined PEOU as “the degree to which a person believes that engaging in online transactions would be free of effort”. PEOU is the fundamental determinant for the acceptance and use of information technology [Moon and Kim, 2001]. Jahangir and Begum [2008] found that PEOU is a major facet that influences customer attitude towards the use of an information system. Shih [2004] confirmed that there is a significant effect of perceived ease of use on individual attitudes toward e-shopping. Using these to e-commerce, we hypothesize that:

Hypothesis 7: Perceived ease of use has a positive effect on customer attitude of e-commerce in Bangladesh.

Perceived Usefulness (PU)

PU is defined as the degree to which a person believes that engaging in online transactions would enhance his or her performance [Davis, 1989]. The use of an application or gadget is dependent upon the extensity of people’s believe on their aid at their performance. Subramanian [1994] found that perceived usefulness had significant correlation with attitude toward usage behavior. It is noted that perceived usefulness possess the strongest predictor of an individual’s

attitude to use an information technology [Adams *et al.*, 1992]. Pikkarainen *et al.* [2004] indicate that perceived usefulness on the Web site is the main factor influencing the customer attitude toward online transaction. We hypothesize that:

Hypothesis 8: Perceived usefulness has a positive effect on customer attitude of e-commerce in Bangladesh.

Customer Attitude

Karjaluoto *et al.* [2002] defined attitude as the users’ desirability to use the system. Attitude of customer is based on beliefs about the object and perceived significance of some features in decision making regarding adoption. Jahangir and Begum [2008] has argued that attitude of consumer have a sturdy, straight and positive effect on consumers’ intention to use new information system. Shih [2004] confirmed that customer attitude have a positive effect on customer acceptance of e-shopping. Klopping and McKinney [2004] revealed that there is a strong positive correlation between customer attitude and intention to use e-commerce. Therefore, we develop the final hypothesis to resolve that:

Hypothesis 9: Customer attitude have a positive effect on customer intention of e-commerce in Bangladesh.

IV. Research Methodology

4.1 Measurement Item Development for Construct

The operationalized definitions of different variable used in the research model and their

source are described in <Table 1>. The questionnaire items were espoused from the prior studies. The details item and their sources are presented in <Table 2>.

<Table 1> Operationalized Definition of Construct

Constructs	Definition	Source
Intention to use	Intention to use refers to the extent to which individuals would like to use e-commerce	Gupta <i>et al.</i> [2008]
Attitude	Attitude towards behavior is made up of beliefs about engaging in the behavior and the associated evaluation of the belief.	Fishbein and Ajzen [1975]
Perceived Usefulness	The degree to which a person believes that using a particular technology will enhance his performance.	Davis [1989]
Perceived ease of use	The degree to which person believes that using a particular system would be free of effort.	Davis [1989]
Perceived Credibility	Perceived credibility indicates the perception of protection of user's transaction details and personal data against illegal entrance	Oni and Ayo [2010]
Computer Self Efficacy	Individuals' judgment of their capabilities to use computers in diverse situations.	Thatcher <i>et al.</i> [2002]

<Table 2> Measurement Item

Constructs	Items		Sources
Intention to use	1. I would use the e-commerce for my purchasing needs. 2. Using the e-commerce for handling my business transactions is something I would do 3. I would see myself using the e-commerce for handling my business transactions	BI1 BI2 BI3	Cheng <i>et al.</i> [2006], Jahangir and Begum [2008]
Attitude	1. Using e-commerce is a good idea 2. I would feel that using e-commerce is pleasant 3. In my opinion, it would be desirable to use e-commerce 4. In my view, using e-commerce is a wise idea	ATT1 ATT2 ATT3 ATT4	Lee [2009], Klopping and McKinney [2004]
Perceived Usefulness	1. Using e-commerce would enable me to accomplish my tasks more quickly 2. Using the e-commerce would make it easier for me to carry out my tasks 3. I would find the e-commerce useful 4. Overall, I would find using the e-commerce to be advantageous	PU1 PU2 PU3 PU4	Davis <i>et al.</i> [1989], Pikkarainen <i>et al.</i> [2004]
Perceived ease of use	1. Using the e-commerce is easy for me 2. It is easy for me to become skillful at the use of the e-commerce services 3. Overall, I find the use of the e-commerce services easy	PEOU1 PEOU2 PEOU3	Davis <i>et al.</i> [1989], Moon and Kim [2001]
Perceived Credibility	1. Using e-commerce would not divulge my privacy. 2. Information and News on e-commerce site are more credible 3. I would find e-commerce reliable in conducting my transactions. 4. I would find e-commerce site kept my information confidential.	PC1 PC2 PC3 PC4	Wang <i>et al.</i> [2003], Yang [2007]
Computer Self Efficacy	1. I am confident of using e-commerce if I have only the online instructions for reference. 2. I am confident of using e-commerce even if there is no one around to show me how to do it. 3. I am confident of using e-commerce even if I have never used such a system before. 4. I believe I have the ability to install and configure the software to access the e-commerce	CSE1 CSE2 CSE3 CSE4	Lee <i>et al.</i> [2011] Talebpur <i>et al.</i> [2009]

4.2 Questionnaire Design and Data Collection

A comprehensive set of questionnaire is being used in this research. The questionnaire design was divided into two sections. The first section is comprised of six questions which consist of demographic profile and sources of getting interested in e-commerce. The second section consist of 22 questions; 4 questions on perceived usefulness, 3 questions on perceived ease of use, 4 questions on perceived credibility, 4 questions on computer self-efficacy, 4 questions on customer attitude, and 3 questions on intention to use. The participants were asked to scale the relevant facts on a likert scales from 1 to 5 with a response continuum from “strongly disagree” to “strongly agree”. The data used in this study were collected from users of e-commerce in Bangladesh. Dhaka, the capital of Bangladesh, was selected as the sampling area considering the number of internet users. 80% of total country’s internet users are living in Dhaka. Two hundred questionnaires were collected for this study.

V. Result

5.1 Demographic Profile and e-commerce Usage

Two hundred questionnaires were examined. The percentage of male respondent to female respondent very much skewed. Only 16 percent of respondents are females while majority of 84 percent are males. 3 percent of the respondent is aged below 20 years; 15 percent were aged between 21~25, 40 percent were age between 26~30 years, while the figure for the age group of 31~35, 36~40 and 41~45 were 30 percent, 7

percent and 3 percent, respectively and only 2 percent above 45 years of age. Most of the respondents had bachelor degree (60 percent). The occupation of the respondents encompasses education, civil service, trading, manufacturing and IT & Telecommunication. The figures shows mostly higher educated portion (Honours level and above) of sample uses the e-commerce facilities intensively. A snapshot on demographic profile of the respondents is listed in the <Table 3> mentioned below.

<Table 3> Demographic Profile of Respondents

Facts	Frequency	Valid Percentage
Gender		
Male	168	84.0
Female	32	16.0
Total	200	100.0
Age		
Below 20	6	3.0
21~25	30	15.0
26~30	80	40.0
31~35	60	30.0
36~40	14	7.0
41~45	6	3.0
Above 45	4	2.0
Total	200	100.0
Occupation		
Education	23	11.5
Civil Service	37	18.5
Trading	52	26.0
Manufacturing	38	19.0
IT & Telecommunication	46	23.0
Total	200	100.0
Education Level		
Below Secondary Level	4	2.0
S.S.C.	27	13.5
H.S.C	43	21.5
Honours	68	34.0
Post Graduate	52	26.0
Others	6	3.0
Total	200	100.0

Along with demographic characteristics of respondents, descriptive survey findings have also been represented here. Key descriptive findings reveal how e-commerce users became interested in e-commerce (see <Table 4>). It reports the sources through which clients get attracted or getting interested to use e-commerce. In other words, the table depicts the mediums through which users of e-commerce become engrossed with e-commerce services. Majority of the clients are getting interested through advertisement on the internet or other media followed by their own interest. Only 10 percent of them had started using e-commerce services imitating other clients.

<Table 4> Sources of Getting Interested in e-commerce

Sources of getting interested	Frequency	Valid Percentage
Client's own interest	60	30.0
Other clients who used it	20	10.0
Advertisement on Internet/other electronic media	70	35.0
Neighbors and friends	40	20.0
Others	10	5.0
Total	200	100.0

5.2 Analysis of the Measurement Model

In order to analyze the collected data, we followed the two-step procedure. First, we examine the measurement model to measure construct reliability and convergent validity. Then, we examined the structural model to examine the direction and strength of the relationships among theoretical constructs.

5.2.1 Construct Reliability Analysis

To determine the internal consistency across items for each measure, Cronbach's Alpha test was conducted. The Cronbach's alpha values were represented in <Table 5>. Here, all dimensions range from 0.713 to 0.906. All of them exceed the minimum alpha of 0.7. This indicates good internal reliability on all measures [Pallant and Tennant, 2007].

<Table 5> Construct Reliability Analysis

Determinants	Number of Items	Cronbach's Alpha
PU	4	0.738
PEOU	3	0.885
PC	4	0.713
CSE	4	0.816
ATT	4	0.906
BI	3	0.862

5.2.2 Convergent Validity Analysis

According to Fornell and Larcker [1981] the convergent validity of the measurement scales can be evaluated on the basis of following criteria:

1. Factor loading of all indicators should exceed 0.5 and be significant.
2. Average variance extracted (AVE) by each construct should surpass the variance due to measurement error for the construct (e.g. AVE should exceed 0.5).

The values of all factor loadings <Table 6> in confirmatory factor analysis of the measurement model surpassed 0.5 and were significant at 1 percent level of significance ($p = 0.01$).

<Table 6> Cross-Loading

Construct/ Indicator	Item	Factor Loading					
		PU	PEOU	CSE	PC	ATT	BI
PU	PU1	0.846	0.402	0.358	0.251	0.322	0.254
	PU2	0.872	0.391	0.347	0.212	0.314	0.248
	PU3	0.894	0.385	0.312	0.205	0.306	0.227
	PU4	0.862	0.367	0.297	0.214	0.291	0.210
PEOU	PEOU1	0.396	0.842	0.318	0.458	0.254	0.368
	PEOU2	0.374	0.874	0.234	0.421	0.216	0.274
	PEOU3	0.359	0.895	0.216	0.384	0.194	0.266
CSE	CSE1	0.328	0.312	0.812	0.371	0.224	0.412
	CSE2	0.314	0.232	0.824	0.328	0.204	0.405
	CSE3	0.287	0.212	0.916	0.302	0.189	0.392
	CSE4	0.254	0.194	0.816	0.276	0.177	0.382
PC	PC1	0.231	0.438	0.362	0.902	0.308	0.289
	PC2	0.204	0.412	0.317	0.898	0.291	0.276
	PC3	0.195	0.347	0.294	0.818	0.261	0.254
	PC4	0.180	0.314	0.248	0.879	0.244	0.231
ATT	ATT1	0.318	0.241	0.216	0.308	0.745	0.212
	ATT2	0.304	0.202	0.192	0.291	0.782	0.192
	ATT3	0.302	0.191	0.174	0.261	0.788	0.186
	ATT4	0.212	0.181	0.171	0.244	0.784	0.175
BI	BI1	0.239	0.364	0.404	0.278	0.181	0.826
	BI2	0.213	0.271	0.386	0.265	0.179	0.816
	BI3	0.198	0.243	0.378	0.243	0.164	0.844

It is evident from <Table 7> that composite reliabilities of constructs ranged from 0.80 to 0.91. In addition, AVE ranges from 0.5978 to 0.8257, was larger than the variance due to measurement error. As a result, conditions for convergent validity were met.

5.3 Multicollinearity

To explore the relationship between variables, correlation analysis was conducted on all variables. Bivariate correlation analysis is subject to two tailed tests at 0.01% and 0.05% levels of significance. <Table 8> represents the result of correlation. This indicates that there are pos-

itive correlations between customers' attitude towards the use of c-commerce and its variables; i.e. perceived credibility, computer self-efficacy, perceived ease of use, and perceived usefulness. According to <Table 8>, several correlations between constructs are high (e.g. CSE, PC and ATT), exceeding 0.7. A common measure of multicollinearity in regression analysis is the variance inflation factor (VIF), which indicates the degree to which each predictor variable is explained by other predictor variables [Hair *et al.*, 2011]. The VIFs for CSE, PC and ATT were 9.01, 8.14 and 7.57, respectively. These values provide lush evidence against multicollinearity.

<Table 7> Convergent Validity

Construct/Indicator	Item	t-value	Composite Reliability (CR)	Average Variance Extracted (AVE)
PU	PU1	19.310	0.90	0.8257
	PU2	18.728		
	PU3	18.835		
	PU4	19.006		
PEOU	PEOU1	19.182	0.91	0.7736
	PEOU2	18.861		
	PEOU3	18.458		
CSE	CSE1	18.764	0.82	0.7882
	CSE2	12.301		
	CSE3	12.168		
	CSE4	11.245		
PC	PC1	20.884	0.91	0.7334
	PC2	21.144		
	PC3	21.046		
	PC4	20.334		
ATT	ATT1	9.978	0.89	0.5978
	ATT2	10.345		
	ATT3	9.546		
	ATT4	9.446		
BI	BI1	11.092	0.80	0.6906
	BI2	10.430		
	BI3	10.850		

5.4 Analysis of the Structural Model

To continue the analysis, it is obligatory to assess the fit of individual parameters in the hypothesized model to assess the adequacy of the model. The Comparative Fit Index (CFI), Goodness of Fit Index (GFI) [Hair *et al.*, 2006], Normed Fit Index (NFI), and Root Mean Square Error of Approximation (RMSEA) [Steiger, 1990] were used in judging the model fit. The Comparative Fit Index is a recommended index of overall fit [Gebring and Anderson, 1993], Goodness of Fit Index measures the fitness of a model compared to another model (Hair *et al.*, 2003), Normed Fit Index measures the proportion by which a model

is improved in terms of fit compared to base model [Hair *et al.*, 2003], and the latter (RMSEA) provides information in terms of discrepancy per degree of freedom for a model [Steiger, 1990]. As suggested in the literature [Bollen and Long, 1993; Joreskog and Sorbom, 1993; Kline, 2011] model fit was assessed by several indices. As reported in <Table 9>, all the fit statistics indicate a well fit. Value of key fit statistics, i.e. chi-square (165/df) is 294.05 ($p = 0.01$) demonstrates that the model has a decent overall goodness-of-fit. In addition, the model has GFI of 0.91, NFI of 0.95, CFI of 0.98, and RMSEA of 0.05. For statistical significance of parameter estimates, t values were used.

<Table 8> Correlation Analysis of the Variables

		PU	PEOU	CSE	PC	ATT	BI
PU	Pearson Correlation Sig. (2-tailed)	1					
PEOU	Pearson Correlation Sig. (2-tailed)	.690* (.00)	1				
CSE	Pearson Correlation Sig. (2-tailed)	.720* (.00)	.357* (.00)	1			
PC	Pearson Correlation Sig. (2-tailed)	.481* (.00)	.440* (.00)	.318* (.00)	1		
ATT	Pearson Correlation Sig. (2-tailed)	.382* (.00)	.710* (.00)	.415* (.00)	.391* (.00)	1	
BI	Pearson Correlation Sig. (2-tailed)	.320* (.00)	.414* (.00)	.480* (.00)	.564* (.00)	.464* (.00)	1

Note: * denotes correlation is significant at the 0.05 level (2-tailed), N = 200.

<Table 9> Fit Indices of Hypothesized Model

Fit statistic	Suggested	Obtained
Chi-square		294.05
<i>df</i>		165
Chi-square significance	p < or = 0.05	0.01
GFI	> 0.90	0.91
NFI	> 0.90	0.95
CFI	> 0.90	0.98
RMSEA	< 0.05	0.05

5.5 Hypothesis Testing

Although Path model (e.g. Structural Equation Model) seems to be more rigorous than multiple regression model, we used multiple regression model to test the model. Partial Least Square (PLS) is used for small sample since it used bootstrapping methods [Gupta *et al.*, 2008]. We have relatively large sample in this study. So, we did not see the need to use PLS in our data analysis.

Computer self-efficacy and perceived credi-

bility are significantly associated with the perceived ease of use of e-commerce system as indicated by the results of multiple regression analysis. H1 is established with the study results which demonstrate that computer self-efficacy has a positively associated with perceived ease of use ($t = 3.915$, $\text{Beta} = 0.181$, $p\text{-value} = 0.00$). The result is consistent with the previous studies conducted by Adesina [2010].

H2 is inveterate, this indicates that computer self-efficacy has a momentous impact on perceived usefulness ($t = 3.276$, $\text{Beta} = 0.072$, $p\text{-value} = 0.00$). H3 is also sustained, which indicates computer self-efficacy has a positive impact on customers' attitude to use e-commerce ($t = 6.639$, $\text{Beta} = 0.104$, $p\text{-value} = 0.00$). It is found that user's perception of information system's ease of use is affixed to his or her computer self-efficacy at all times [Venkatesh and Davis, 1996]. The study of Reid and Levy [2008] also found that computer self-efficacy has positive impact on perceived usefulness and customer attitudes to use e-commerce.

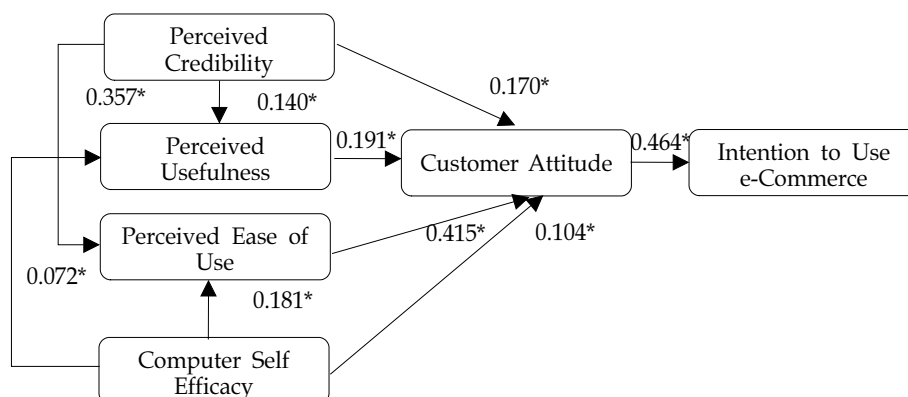
<Table 10> Regression Result

	Regression 1	Regression 2	Regression 3	Regression 4
Constant	2.333	3.667	3.688	0.745
	PU	PEOU	Attitude	BI
PC	0.140(0.00)	0.357(0.00)	0.170(0.00)	
CSE	0.072(0.00)	0.181(0.00)	0.104(0.00)	
PU			0.191(0.00)	
PEOU			0.415(0.03)	
Attitude				0.464(0.00)
F-statistic	40.608	26.514	46.908	164.710
	0.220	0.156	0.412	0.386

It is also been demonstrated by results that perceived credibility is significantly related with perceived ease of use, perceived usefulness and customer attitude. H4 asserted that perceived credibility has a significant impact on perceived ease of use ($t = 5.533$, $Beta = 0.357$, $p\text{-value} = 0.00$). H5 is also established. This indicates that perceived credibility has significant effect on perceived usefulness ($t = 4.789$, $Beta = 0.140$, $p\text{-value} = 0.00$). Further, H6 signified that perceived credibility is significantly associated with customer attitude ($t = 5.945$, $Beta = 0.170$, $p\text{-value} = 0.00$). Our result is consistent with the previous studies

conducted by Muniruddeen [2007], Hanudin [2007] and Ayo [2010].

In furtherance, to find out the factors responsible for customer attitude, the effects of perceived ease of use and perceived usefulness on customer attitude were examined. H7 asserted that perceived ease of use has a positively impact on customer attitude ($t = 6.652$, $Beta = 0.415$, $p\text{-value} = 0.03$). H8 is also accepted indicating that perceived usefulness has a positive effect on customer attitude ($t = 5.792$, $Beta = 0.191$, $p\text{-value} = 0.00$). A number of studies that utilize the TAM confirmed the path from PU to customer



Note: * denotes correlation is significant at the 0.05 level.

<Figure 2> Results of Structural Model Analysis

attitude and PEOU to customer attitude [Oni, 2010]. The positive influences of perceived usefulness and attitude toward using, as suggested by TAM, are confirmed. We also found that PU was more influential than PEOU in explaining technology acceptance. The technology acceptance literature suggests that PU is more influential than PEOU on technology acceptance [Davis, 1989; Davis *et al.*, 1989; Teo *et al.*, 1999].

Lastly, the result of the single linear regression between customer attitude and behavioral intention confirmed that customer attitude is positively associated with behavioral intention ($t = 5.273$, $\text{Beta} = 0.464$, $p\text{-value} = 0.00$). These results confirmed H9. It demonstrates that actual behavior of customers of e-commerce in Bangladesh is highly correlated with his or her behavior intentions.

VI. Contribution

6.1 Theoretical Contribution

This study makes several important theoretical contributions. It is an attempt to study e-commerce adoption using extended TAM in a developing country, specifically Bangladesh. Although prior studies have addressed e-commerce adoption, the strength of this research lies in combining the behavioral and technological determinants from extended TAM established adoption models. This is evidenced by high explanatory power of our research model. Since our study is based on Bangladesh, as a developing country it will be increase in future with the improvement of the customer acceptance of technology. In addition, this study also put together on and validates the use of attitudinal theory in explaining and predicting consumer acceptance of emerging technologies.

dinal theory in explaining and predicting consumer acceptance of emerging technologies.

6.2 Practical Contribution

This research serves important practical implications to decision makers, IT departments, and marketing departments involved in the implementation and deployment of e-commerce services. The findings of this study reveal that perceived usefulness is an important factor affecting attitude towards intention to use e-commerce. Therefore, organization need first of all to make sure that an e-commerce platform is technically sound, with carry out good security to maximize the demand of the end users. In realizing, e-commerce platforms' performance and Internet platforms' ease of use are two other factors that affect intention, institutions need to teach people to use the platform and describe the main reimbursement of e-commerce [Bussakorn and Dieter, 2005]. Organization should publicize to prospective users that e-commerce is a user friendly service, by promoting information of security platform. Besides these e-commerce service provider can take effective risk-reducing strategies through include money back guarantees and prominently displayed consumer satisfaction guarantees, so that consumers feel more contented and safe with the system. Both e-commerce service provider and users can take financial advantage from the adoption.

VII. Limitation and Future Direction

The study has some limitations. First we do not take a cross cultural approach which may

limit the generalizability of our study. Second, our results are cross-sectional and therefore only provide a narrow scope in the complex world of e-commerce. Third, most of our respondents from Dhaka, capital city of Bangladesh, have experience purchasing online. Despite some of limitations, we believe this study makes an important contribution to knowledge in the areas of e-commerce adoption in developing countries. Additional research in different developing countries is required to further examine the adoption of e-commerce. Future research should revalidate the measurement scales developed in this research. More research is required to establish important moderators such as culture, age and gender that affect the dependent and independent variable of e-commerce adoption. Future research should also focus on qualitative study which would provide more insight into some of the result.

VIII. Conclusion

This paper intended to provide a portrayal of the factors that determine the acceptability of e-commerce at the focal point. The authors have

used extended version of TAM to stand along with the argument by other researchers who argued that perceived usefulness and perceived ease of use is not the only factors to determine the acceptability or adoption of e-commerce. In this paper, along with above mentioned factors, perceived credibility and computer self-efficacy were selected as additional factors to TAM construct to justify the adoption of e-commerce. The statistical analysis breed from the result demonstrated that all the four factors have significant impact on the acceptance of e-commerce system. The findings of the study clearly demonstrate that clients find e-commerce as a useful, easy to use, and convenient system. Perceived usefulness appeared as one of the major factor in describing user's adoption of e-commerce. One of the major concerns regarding the acceptability of e-commerce is its credibility and should be dealt with great care. Security concern and privacy aspects are crucial issues that hinder the systems adoption. The relevant figures shows that clients of e-commerce are bit worried about the security issues. It reveals that the level of trust is low in this regard.

⟨References⟩

- [1] Adams, D.A., Nelson, R.R., and Todd, P.A., "Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication," *MIS Quarterly*, Vol. 16, No. 2, 1992, pp. 227-247.
- [2] Adesina, A.A. and Ayo, C.K., "An Empirical Investigation of the Level of User's Acceptance of E-Banking in Nigeria," *Journal of Internet Banking and Commerce*, Vol. 15, No. 1. 2010, pp. 11-12.
- [3] Ajzen, I. and Fishbein, M., "Attitude-behavior relations: A theoretical analysis and review of empirical research," *Psychological bulletin*, Vol. 84, No. 5, 1977, p. 888.
- [4] Ali, M.M., "E-Business in the Age of Globalization: Bangladesh Perspective," *The Bangladesh Observer*, 2003.
- [5] Al-Somali, S.A., Gholami, R., and Clegg, B.,

- "Adoption of Internet Banking: An Empirical Study in Hong Kong," *Technovation*, Vol. 29, 2009, pp. 130-141.
- [6] Arun, T., "Determinants of customers' online purchase intention: an empirical study in India," *Journal of Indian Business Research*, Vol. 5, No. 1, 2013, pp. 17-32.
- [7] Asghar A.J. and Stephen, X.Z., "E-commerce for SMEs: empirical insights from three countries," *Journal of Small Business and Enterprise Development*, Vol. 20, No. 4, 2013, pp. 849-865.
- [8] Azam, M.S., "Implementation of B2C E-Commerce in Bangladesh: The Effects of Buying Culture and E-infrastructure in Bangladesh," *Advances in Global Business Research*, Vol. 3, No. 1, 2006, pp. 55-56.
- [9] Babita, S., "E-Commerce in India," *The International Journal of Business and Management*, Vol. 2, No. 2, 2014, pp. 202-234.
- [10] Bandura, A., "Self-efficacy mechanism in human agency," *American psychologist*, Vol. 37, No. 2, 1982, p. 122.
- [11] Bollen, K.A. and Long, J.S. (Eds.), *Testing structural equation models* (Vol. 154). Sage Publications, 1993.
- [12] BTRC, *Bangladesh Internet Subscribers Statistic Report*, Bangladesh Telecommunication Regulatory, 2014.
- [13] BTRC, *Bangladesh Internet Subscribers Statistic Report*, Bangladesh Telecommunication Regulatory Commission, 2014.
- [14] Bussakorn, J. and Dieter, F., "Internet banking adoption strategies for a developing country: The case of Thailand," *Internet Research*, Vol. 15, No. 3, 2005, pp. 295-311.
- [15] Çelik, H.E. and Yilmaz, V., "Extending the technology acceptance model for adoption of e-shopping by consumers in Turkey," *Journal of Electronic Commerce Research*, Vol. 12, No. 2, 2011, pp. 152-164.
- [16] Chau, P.Y.K., "An Empirical Assessment of a Modified Technology Acceptance Model," *Journal of Management Information Systems*, Vol. 13, No. 2, 1996, pp. 185-204.
- [17] Cheng, T.C., Lam, D.Y., and Yeung, A.C., "Adoption of internet banking: an empirical study in Hong Kong," *Decision support systems*, Vol. 42, No. 3, 2006, pp. 1558-1572.
- [18] Compeau, D.R. and Higgins, C.A., "Computer self-efficacy: Development of a measure and initial test," *MIS quarterly*, 1995, pp. 189-211.
- [19] Chuang, C.C. and Hu, F.L., "An Empirical Study of Customers' Perception of E-Banking Service Based on Time Usage," *Journal of Internet Banking and Commerce*, Vol. 16, No. 2, 2010, pp. 1-11.
- [20] Daugherty, T., Li, H., and Biocca, F., "Experiential e-commerce: a summary of research investigating the impact of virtual experience on consumer learning," *Online Consumer Psychology: Understanding and Influencing Consumer Behavior in the Virtual World*, Vol. 457, 2005, p. 489.
- [21] Davis, F.D., "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS quarterly*, 1989, pp. 319-340.
- [22] Del Aguila-Obra, A.R. and Padilla-Melendez, A., "Organizational factors affecting Internet technology adoption," *Internet Research*, Vol. 16, No. 1, 2006, pp. 94-110.
- [23] Dixit, N. and Dutta, S.K., "Acceptance of E-banking among Adult Customers: An Empirical Investigation in India," *Journal of Internet Banking and Commerce*, Vol. 15, No.2, 2010, pp. 1-17.
- [24] Eastin, M.S., "Diffusion of e-commerce: an

- analysis of the adoption of four e-commerce activities," *Telematics and informatics*, Vol. 19, No. 3, 2002, pp. 251-267.
- [25] Enns, H.G. and Huff, S.L., "Information technology implementation in developing countries: advent of the Internet in Mongolia," *Journal of Global Information Technology Management*, Vol. 2, No. 3, 1999, pp. 5-24.
- [26] Ferdous, M. and Shahid, E.M., *Study on nature of inflation and its relationship with GDP growth rate: a Case Study on Bangladesh*, 2002.
- [27] Fornell, C. and Larcker, D.F., "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research (JMR)*, Vol. 18, No. 1, 1981, pp. 39-50.
- [28] Gefen, D., Straub, D., and Boudreau, M.C., "Structural equation modeling and regression: Guidelines for research practice," *Communications of the association for information systems*, Vol. 4, No. 1, 2000, p. 7.
- [29] Gefen, D., Karahanna, E., and Straub, D.W., "Trust and TAM in online shopping: an integrated model," *MIS quarterly*, Vol. 27, No. 1, 2003, pp. 51-90.
- [30] Gerbing, D.W. and Anderson, J.C., "Monte Carlo evaluations of goodness-of-fit indices for structural equation models," *Sage Focus Editions*, Vol. 154, 1993, pp. 40-40.
- [31] Goode, S. and Stevens, K., "An analysis of the business characteristics of adopters and non adopters of World Wide Web technology," *Information technology and Management*, Vol. 1, No. 1-2, 2000, pp. 129-154.
- [32] Grandon, E.E. and Pearson, J.M., "Electronic commerce adoption: an empirical study of small and medium US businesses," *Information and management*, Vol. 42, No. 1, 2004, pp. 197-216.
- [33] Gupta, B., Dasgupta, S., and Gupta, A., "Adoption of ICT in a government organization in a developing country: An empirical study," *The Journal of Strategic Information Systems*, Vol. 17, No. 2, 2008, pp. 140-154.
- [34] Hair, J.F., Tatham, R.L., Anderson, R.E., and Black, W., *Multivariate data analysis* (Vol. 6). Upper Saddle River, NJ: Pearson Prentice Hall, 2006.
- [35] Hair, J.F., Ringle, C.M., and Sarstedt, M., "PLS-SEM: Indeed a silver bullet," *The Journal of Marketing Theory and Practice*, Vol. 19, No. 2, 2011, pp. 139-152.
- [36] Hanudin A., "Internet Banking Adoption Among Young Intellectuals," *Journal of Internet Banking and Commerce*, December 2007, Vol. 12, No. 3, <http://www.arraydev.com/commerce/jibc>.
- [37] Hemple, P.S. and Kwong, "B2B e-Commerce in emerging economies: i-metal.com's non-ferrous metals exchange in China," *Journal of Strategic Information Systems*, Vol. 10, 2001, pp. 335-355.
- [38] Hoque, M.R., "E-commerce in Bangladesh: Current Status, Problems and Ways to Improve," *ASA University Review*, Vol. 2, No. 1, 2008, pp. 46-59.
- [39] Hossain, M.A., Ali, M.A., Kibria, M.G., and Bhuiyan, M.N., "A Survey of E-Commerce of Bangladesh," *International Journal of Science and Research*, IJSR, India Online ISSN: 2013, pp. 2319-7064.
- [40] Hossain, N., "E-Commerce in Bangladesh: Status, Potential and Constraints," *A report prepared for JOBS/IRIS Program of USAID, 2000*, Available at obstrust.org/jobsproject/content/publication/E-Commerce_in_Bangladesh_s

- tatus.pdf, accessed on 11 August 2014.
- [41] Hossain, N., "E-Commerce in Bangladesh: Status, Potential and Constraints," *A report prepared for JOBS/IRIS Program of USAID*, 2000.
- [42] Hossain, C.G., Habib, M.W., and Kushchu, I., "Success and Failure Factors for e-Government projects implementation in developing countries: A study on the perception of government officials of Bangladesh," In *Proceedings of the 2nd European Conference on Mobile Government, Mobile Government Consortium International*, 2006.
- [43] Humphrey, J.M., Pare, R.D., and Schmitz, H., *The Reality of E-commerce with Developing Countries*, Media@ LSE, 2003.
- [44] Hunt, O., *Importance of Ecommerce Today*, 2007, p. 1.
- [45] Jahangir, N. and Begum N., "The role of perceived usefulness, perceived ease of use, security and privacy, and customer attitude to engender customer adaptation in the context of electronic banking," *African Journal of Business Management*, Vol. 2, No. 1, 2008, pp. 032-040.
- [46] JETRO, *Japan External Trade Organization*, Ark Mori Building, 6F 12-32, Akasaka 1-chome, Minatoku, Tokyo 107-6006 Japan, 2013.
- [47] Jöreskog, K.G. and Sörbom, D., *LISREL 8: Structural equation modeling with the SIMPLIS command language*, Scientific Software International, 1993.
- [48] Karjaluoto, H., Mattila, M., and Pentto, T., "Factors underlying attitude formation towards online banking in Finland," *International Journal of Bank Marketing*, Vol. 20, No. 6, 2002, pp. 261-272.
- [49] Kartiwi, M. and MacGregor, R.C., "Electronic commerce adoption barriers in small to medium-sized enterprises, SMEs in developed and developing countries: a cross-country comparison," *Journal of Electronic Commerce in Organizations*, JECO, Vol. 5, No. 3, 2007, pp. 35-51.
- [50] Kline, R.B., *Principles and practice of structural equation modeling*, Guilford press, New York, NY, 2011.
- [51] Klopping, I.M. and McKinney, E., "Extending the technology acceptance model and the task-technology fit model to consumer e-commerce," *Information technology learning and performance journal*, Vol. 22, 2004, pp. 35-48.
- [52] Lallmahamood, M., *An Examination of Individual's Perceived Security and Privacy of the Internet in Malaysia and the Influence of this on their Intention to Use E-commerce: Using an Extension of the Technology Acceptance Model*, Doctoral dissertation, Malaysian Institute of Management, 2007.
- [53] Lee, J.N., Pi, S.M., Kwok, R.C.W., and Huynh, M.Q., "The Contribution of Commitment Value in Internet Commerce: An Empirical Investigation," *Journal of the Association for Information systems*, Vol. 4, 2003, pp. 39-62.
- [54] Lockett, A. and Littler, D., "The adoption of direct banking services," *Journal of Marketing Management*, Vol. 13, 1997, pp. 791-811.
- [55] Mahler, A. and Rogers, E.M., "The diffusion of interactive communication innovations and the critical mass: the adoption of telecommunications services by German banks," *Telecommunications policy*, Vol. 23, No. 10, 1999, pp. 719-740.
- [56] Mannisto, L., "Electronic Commerce in Asia," International Telecommunication Union,

Asia and the Future World Economic System, Vol. 18, 1999, London.

- [57] Michael, A., "Electronic commerce adoption, entrepreneurial orientation and small- and medium-sized enterprise (SME) performance," *Journal of Small Business and Enterprise Development*, Vol. 21, No. 1, 2014, pp. 100-11.
- [58] Migiro, S.O., "Diffusion of ICTs and E-commerce adoption in manufacturing SMEs in Kenya," *South African Journal of Library and Information Science*, Vol. 72, No. 1, 2006, p. 35.
- [59] Molla, A. and Licker, P.S., "eCommerce adoption in developing countries: a model and instrument," *Information and Management*, Vol. 42, No. 6, 2005, pp. 877-899.
- [60] Montealegre, R., "Implications of electronic commerce for managers in less-developed countries," *Information Technology for Development*, Vol. 7, No. 3, 1996, pp. 145-152.
- [61] Moon, J.W. and Kim, Y.G., "Extending the TAM for a World-Wide-Web context," *Information and Management*, Vol. 38, No. 4, 2001, pp. 217-230.
- [62] Odedra-Straub, M.O.S.M., "E-commerce and development: Whose development?," *The Electronic Journal of Information Systems in Developing Countries*, Vol. 11, 2003, pp. 1-5.
- [63] OECD, Empowering E-consumers, Strengthening Consumer Protection in the Internet Economy Background Report, OECD, Washington, 2009, www.oecd.org/ict/econsumerconference/44047583.pdf.
- [64] Oni, A.A. and Ayo, C.K., "An empirical investigation of the level of users' acceptance of e-banking in Nigeria," *Journal of Internet Banking and Commerce*, Vol. 15, No. 1, 2010, pp. 1-13.
- [65] Pallant, J.F. and Tennant, A., "An introduction to the Rasch measurement model: an example using the Hospital Anxiety and Depression Scale (HADS)," *British Journal of Clinical Psychology*, Vol. 46, No. 1, 2007, pp. 1-18.
- [66] Pavlou, P.A., "Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model," *International journal of electronic commerce*, Vol. 7, No. 3, 2003, pp. 101-134.
- [67] Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., and Pahnla, S., "Consumer acceptance of online banking: an extension of the technology acceptance model," *Internet research*, Vol. 14, No. 3, 2004, pp. 224-235.
- [68] Poon, S. and Swatman, R.M.C., "An exploratory study of small business Internet commerce issues," *Information and Management*, Vol. 35, No. 1, 1999, pp. 9-18.
- [69] Qiu, L. and Li, D., "Applying TAM in B2C e-commerce research: an extended model," *Tsinghua Science and Technology*, Vol. 13, No. 3, 2008, pp. 265-272.
- [70] Qiu, L., Jiang, Z., and Benbasat, I., *Real experience in a virtual store: Designing for presence in online shopping*, 2006.
- [71] Reid, M. and Levy, Y., "Integrating trust and computer self-efficacy with TAM: An empirical assessment of customers' acceptance of banking information systems, BIS in Jamaica," *Journal of Internet Banking and Commerce*, Vol. 12, No. 3, 2008, 2008-12.
- [72] Rogers, R.W., "Attitude change and information integration in fear appeals," *Psychological Reports*, Vol. 56, No. 1, 1985, pp. 179-182.
- [73] Saadé, R. and Kira, D., "Computer anxiety

- in e-learning: The effect of computer self-efficacy," *Journal of Information Technology Education: Research*, Vol. 8, No. 1, 2009, pp. 177-191.
- [74] Sam, T.L. and Leng, A.C., "Adoption of Electronic Commerce amongst Small and Medium Enterprise," In *Knowledge Management International Conference and Exhibition*, 2006.
- [75] Shih, H.P., "An empirical study on predicting user acceptance of e-shopping on the Web," *Information and Management*, Vol. 41, No. 3, 2004, pp. 351-368.
- [76] Sillince, J.A., MacDonald, S., Lefang, B., and Frost, B., "Email adoption, diffusion, use and impact within small firms: a survey of UK companies," *International Journal of Information Management*, Vol. 18, No. 4, 1998, pp. 231-242.
- [77] Steiger, J.H., "Structural model evaluation and modification: An interval estimation approach," *Multivariate behavioral research*, Vol. 25, No. 2, 1990, pp. 173-180.
- [78] Stewart, K.J., De P., DeGross, J.I., "Transference as a means of building trust in World Wide Web sites," *Proc. 20th Internat. Conf. Inform. Systems* December, Charlotte, 1999, NC459-464.
- [79] Subramanian, G.H., "A Replication of Perceived Usefulness and Perceived Ease of Use Measurement," *Decision sciences*, Vol. 25, No. 5-6, 1994, pp. 863-874.
- [80] Suh, B. and Han, I., "The impact of customer trust and perception of security control on the acceptance of electronic commerce," *International journal of electronic commerce*, Vol. 7, 2003, pp. 135-161.
- [81] Suki, N.M., "An Empirical Study of Factors Affecting the Internet Banking Adoption among Malaysian Consumer's," *Journal of Internet Banking and Commerce*, Vol. 16, No. 2, 2010, pp. 1-11.
- [82] Sulaiman, A., "The Status of E-Commerce Applications in Malaysia," *Information Technology for Development*, Vol. 9, 2000, pp. 153-161.
- [83] Talebpur, A., Bairamzadeh, S., and Vajdi, S. S., "Extending the Technology Acceptance Model for Internet Banking: A Case Study of Iran," *Sixth International Conference on Information Technology: New Generations*, 2009.
- [84] Tan, J., Tyler, K., and Manica, A., "Business-to-business adoption of eCommerce in China," *Information and management*, Vol. 44, No. 3, 2007, pp. 332-351.
- [85] Tan, M. and Teo, T.S., "Factors influencing the adoption of Internet banking," *Journal of the AIS*, Vol. 1, No. 5, 2000, pp. 1-42.
- [86] Thatcher, J.B. and Perrewe, P.L., "An empirical examination of individual traits as antecedents to computer anxiety and computer self-efficacy," *Mis Quarterly*, 2002, pp. 381-396.
- [87] Tornatzky, L.G. and Fleischer, M., *The Process of Technological Innovation*, Leington, MA: Leington Books, 1990.
- [88] Turban, E., Leidner, D., McLean, E., and Wetherbe, J., *Information technology for management*, John Wiley and Sons, 2008.
- [89] UNCTAD, *Can Electronic Commerce be an Engine for Global Growth? Electronic Commerce and the Integration of developing countries and countries with economies in transition in international trade*, In the Fourth Session, Geneva, 19-23 July, 1999.
- [90] UNCTAD, *E-Commerce and Development Report*, United Nation, 2002.

- [91] UNCTAD, *Electronic Commerce Strategies for Development: The Basic Elements of an Enabling Environment for E-Commerce*, In the Expert Meeting on Electronic Commerce Strategies for Development, Geneva, 10-12 July, 2002.
- [92] Van der Heijden, H., "User acceptance of hedonic information systems," *MIS quarterly*, 2004, pp. 695-704.
- [93] Venkatesh, V. and Davis, F.D., "A model of the antecedents of perceived ease of use: Development and test," *Decision sciences*, Vol. 27, No. 3, 1996, pp. 451-481.
- [94] Venkatesh, V. and Davis, F.D., "A theoretical extension of the technology acceptance model: four longitudinal field studies," *Management science*, Vol. 46, No. 2, 2000, pp. 186-204.
- [95] Wang, Y.S., Wang, Y.M., Lin, H.H., and Tang, T.I., "Determinants of user acceptance of internet banking: an empirical study," *International Journal of Service Industry Management*, Vol. 14, No. 5, 2003, pp. 501-519.
- [96] Wiengarten, F., "Investigating the impact of e-business applications on supply chain collaboration in the German automotive industry," *International Journal of Operations and Production Management*, Vol. 33, No. 1, 2013, pp. 25-48.
- [97] Wu, I.L. and Chen, J.L., "An extension of trust and TAM model with TPB in the initial adoption of on-line tax: an empirical study," *International Journal of Human-Computer Studies*, Vol. 62, No. 6, 2005, pp. 784-808.
- [98] Yang, K.C., "Factors influencing Internet users' perceived credibility of news-related blogs in Taiwan," *Telematics and Informatics*, Vol. 24, No. 2, 2007, pp. 69-85.

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