

Structural Modeling Using AMOS to Identify the Demographic Factors Affecting Shopping through E-payment

K. M. Salah Uddin^{1,*}, Md Tuhinur Rahman²

¹Associate Professor, Department of Management Information Systems, University of Dhaka, Dhaka, Bangladesh

²Lecturer, Department of Management Information Systems, University of Dhaka, Dhaka, Bangladesh

Abstract In the recent years the world is sensing the rapid growth of e-commerce and people around the world are using electronic payment system for shopping and purchasing their necessities. It is happening because of the introduction of new technologies for business. Nowadays people use e-payment system for shopping which saves their time and money at a time and this is an easier way of paying the shopping bill. The objective of this paper is to identify the demographic factors which are affecting shopping through e-payment. It is clear that people are being influenced by demographic factors (age, gender, income, education) for shopping using e-payment. For this purpose a research model was constructed and using AMOS the relationships were tested as well as the reliability and the fitness of the model were also tested. The study shows that demographic factors which are age, gender, income and education have considerable impact on people use of e-payment for their shopping purposes.

Keywords Demographic factors, e-payment, Mobile Payment System (MPS), Technology Adoption

1. Introduction

In this 21st century, technology has become the foundation of our day to day activities. It's making the life of people easier than it was before of its introduction. Because of this the world is now digitalized and don't need to be physically available for doing many of your important activities like-shopping. You can do that just staying at your place or even while travelling in your car and the most important this is that you don't even need to think about the payment of those shopping. Nowadays you needn't to go with wallet full with money because you can do the transaction by making a single click in your mobile phone for digitally enabled payment systems and e-payment. So this digital way of paying the bill of your purchased items has opened the new era of payment system which we actually call e-payment system. This new form of payment system is not only saving your time but also it will keep you away from physically going there. Many people all over the world are using this form of payment and enjoying the unlimited benefits of this system. Van der Heijden (2002) stated that it should not be

any surprise to make transaction through mobile payment. As today people are using this form of payment system along with other e-payment system like credit card, debit card, digital cash, digital accumulating balance payment system, digital credit accounts, and online stored value system etc. today you will see that businesses are being converted to the digital form or e-commerce which is giving the businesses a new dimension of doing business through using Internet. For the business e-payment system is working as facilitator where transactions are being completed without having any face to face communication. So it can be said that e-payment is the magic touch of the unbelievable growth of e-commerce.

Electronic payment is more convenient and people are rapidly using this when it comes to choose the payment options for shopping or buying anything. When it comes for comparison with other payment options available in the market then it is visible that mobility is the most important factor which is making this payment system popular among people. There are many factors which are actually motivating people to use this e-payment system for purchasing like- trust, perceived usefulness, usability, reputation, mobility, demographic factors etc. researcher from all over the world have done excellent work on all those factors but it is the demographic factors which don't get enough attention in their research. Some of them may have cited about the impact of demographic factors but in a combined way which were not broad enough to explore the

* Corresponding author:

salahuddin@du.ac.bd (K. M. Salah Uddin)

Published online at <http://journal.sapub.org/ijis>

Copyright © 2019 The Author(s). Published by Scientific & Academic Publishing

This work is licensed under the Creative Commons Attribution International

License (CC BY). <http://creativecommons.org/licenses/by/4.0/>

exact impact of those demographic factors on purchasing through e-payment. In this paper, it is aimed to address those demographic factors in a broader sense so that the impact of those factors gets attention. So this paper aims to find the demographic factors which actually affect the buying decision through e-payment system.

2. Literature Review

User's acceptance promotes any new technological implementation whether it creates small or large scale of change. Because of that human behavior or attitude is considered as the most influential factor for implementing any new technology. Vankatesh *et al.* (2003) developed a Unified Theory of Acceptance and Use of Technology (UTAUT) model by extending the earlier one where he showed the intension of people to use technology and also stated about that the demographic variables like gender, age, experience and voluntariness are moderating the relationships between dependent and independent factors. Luarn and Lin (2005) stated about how to make this model fit for the study in the current context. In this paper technology acceptance is measured through analyzing the demographic factors affecting the purchasing behavior of people through e-payment. Davis (1989) introduced technology acceptance model and through that model he identified and showed the behavior of the technology users. Lu *et al.* (2003) said that the popularity of this technology acceptance model for predicting information technology usage and user's intension. IAB (2010) showed that now-a-days for reaching to the customers for e-commerce, mobile technology or mobile payment system is very crucial which is actually making people's life easier and providing numerous benefits to the companies. That's why people all over the world are rushing towards the digital way of transaction which is actually saving their time and money at the same time. As a payment system, you will see people are using mobile technology payment system or other form of e-payment systems and most of the cases there are seen the e-payment system is being used to activate, initiate and confirm the payment of any purchase (Karouskos and Fokous, 2004). So in short e-payment is a payment system which is conducted using electronic device like- mobile phone, tablet or even debit or credit cards. Around the world there has been conducted many surveys on the adaptation of electronic payment system and what are the factors affecting that payment system. Schierz *et al.* conducted a survey where 1447 individuals participated and that survey was about the factors which are affecting the MPS (Mobile Payment System) for any transaction (Schierz *et al.*, 2010). In their study, the factor which has significant impact on the buying decision through using mobile payment was perceived compatibility. Another research was conducted on how the factors affect MPS adoption and the results were like-perceived usefulness and perceived ease of use (Kim *et al.*, 2010). In that survey other factors were innovativeness,

m-payment knowledge, mobility, reachability, compatibility, convenience (Kim *et al.*, 2010). If you study further about the background of the factors affecting shopping or buying through e-payment then you will see that this payment system is affected or influenced directly or indirectly through behavioral beliefs, social influence and personal traits which are considered as very significant factors about the adoption of this payment system (Yang *et al.*, 2012). In another study Zohu (2013) stated that in the use of MPS (Mobile Payment System) is necessary to be continued then it is the flow and trust which is very important factor. Puschel *et al.* (2010) described that compatibility and relative advantage are influencing the attitude of the Brazilian customers and that they are accepting the online way of payment for transaction. Trust is also considered as essential factor which is actually affecting people to use or adopt mobile payment system or electronic payment system for shopping or purchasing anything (Mallat, 2007; Chandra *et al.*, 2010; Zohu, 2013).

Many studies have found that investment in e-payment or some other mobile payment will also generate sustainable development for any country. Islam (2015) said that if investment is made on digitalization then the economic condition will be developed which actually opens the opportunity for e-payment system. Davis, F.D (1989) stated about the perceived usefulness, perceived ease of use and user acceptance of information technology where he showed how people are being affected by different factors or accepting technology for their purposes. Singh *et al.* (2010) showed how social influence and behavioral intention affect people to use mobile payment system or mobile banking and the factors are visible which are affecting people to choose the payment system. Yu, C.S. (2012) stated some factors which are affecting people or influencing people to adopt mobile banking technology for their transaction or purchasing purposes. In that paper there is shown how people are getting motivated and using that electronic form of banking system for their daily life. In another paper there is shown about an important factor, absence of that can create huge loss, which is security and the researcher found that because of poor security issues people lost their money which is very alarming for e-payment system (Moretaza, 2015).

3. Research Model and Hypothesis

The research model is developed based on the objective of the research which is to identify the demographic factors which are affecting people to use e-payment for shopping. At the first part there is analyzed the relationship between the factors and the attitude and in the second part there is the relationship between the attitude to the actual adaptation of e-payment. All the papers regarding the acceptance model of technology showed all other related factors which are affecting actual adaptation except the demographic factors. But in this paper the main focus is on the impact of demographic factors on the adaptation of e-payment for

shopping. The demographic factors are the following:

Age: Age is an important demographic factor which affects people regarding the decision of whether they will use the e-payment system for shopping or not. Different studies around the world show that demographic factors affect the adaptation of technology but none did ever cited about the impact of age on taking the decision of accepting e-payment. At a certain age like 21-35, found in this study, people are more interested in using e-payment system for shopping. That's why age is a considerable factor.

H1: There is a significant relationship between age and the attitude to use e-payment

Gender: depending on the gender the shopping behavior of people change. Like- female are more likely to shopping whereas male are not that much. Among the female most of them now-a-days are using e-payment system for shopping and through this research that is being tried to be identified. In this paper it is found that 45% of the respondent are female and are using this e-payment system for shopping. H2: There is a significant relationship between gender and the attitude to use e-payment.

Income: Another important factor which didn't get proper attention in others study is income. Depending on income level the acceptance of e-payment for shopping varies. The people with higher income are more interested in using e-payment for shopping while people with less income are reluctant in using e-payment. Because of income varies, the life styles also varies and the uses of technologies for daily necessities also vary.

H3: There is a significant relationship between income and the attitude to use e-payment

Education: Education actually makes the people familiar with the technological advancement which is not easily possible for the uneducated people. That's why education has impact on the adaptation of e-payment system for shopping. The level of education of people encourages them to use the e-payment system for shopping as it is very easy way of doing shopping nowadays.

H4: There is a significant relationship between education and the attitude to use e-payment

Adaptation: Adaptability means changes behavioral style or method of approach when necessary to achieve a goal; adjusts style as appropriate to the needs of the situation. Responds to change with a positive attitude and a willingness to learn new ways to accomplish work activities and objectives has the impact on the adaption for e-payment for shopping.

H5: There is a significant relationship between attitude and the adaptation of e-payment

4. Methodology

4.1. Research Objective

The major objective of this study is to identify the demographic factors which are affecting people to use e-payment for shopping.

4.2. Sampling and Data Collection

For the purpose of this paper a questionnaire was developed and circulated to the respondents through online and by this way the responses from people were collected. In this survey 45 people were participated but 5 of them had no experience about the e-payment. That's why they are left out of the analysis. The analysis is done using the responses from the 40 people.

Table 1. Respondents profile

Demographic Variable	Classification	No. of Respondents	Percentage
Gender	Male	22	55%
	Female	18	45%
	Total	40	100%
Age	15-20	1	2.5%
	21-25	4	10%
	26-30	14	35%
	31-35	14	35%
	36-40	4	10%
	41-45	2	5%
	45+	1	2.5%
	Total	40	100
Occupation	Student	7	17.5%
	Businessman	7	17.5%
	Service holder	25	62.5%
	Others	1	2.5%
	Total	40	100%
Frequency of usage of e-payment per month	More than 4 times	4	10%
	3 – 4	12	30%
	1 – 2	18	45%
	<u>0 times</u>	<u>6</u>	<u>15%</u>
	Total	40	100%

The above table shows the data about the respondents. The people took part in this survey among the 22 people were male and 18 were female which is almost half. Most of the respondent's ages are fall in between 21 to 30 years and there are 18 people which mean 70 percent of the total respondents. Among the respondents the majority are doing different service job which constitutes 62.5% of the total respondents. When they answered the question like frequency of usage of e-payment for shopping per month, there are 45% respondents respond about 1-2 times per month and 30% respond about 3-4 times per month where as 15% respond they don't do that per month.

4.3. Data Analysis

The proposed research model with the path coefficient is shown in the following table. The path coefficients are represented by the numbers on the line. Where the value of path coefficient is less than 0.05 ($p < 0.05$), that path (hypothesis) is supported by the test result. So in this model all hypothesis are supported by the test result except the line between education and attitude where the p value is more than 0.05. The model is inspired from the Unified Theory of

Acceptance and Use of Technology (UTAUT) model but used in a different situation where the impact of demographic factors on the adaptation of e-payment for shopping is shown.

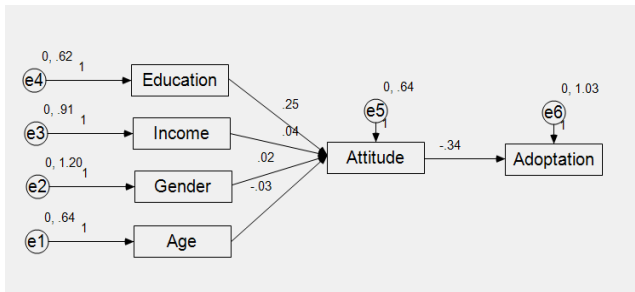


Figure 1. Research model

The data are analyzed using the Amos 16.0. Prior to using Amos the reliability of the data were tested using the SPSS where the Cronbach's Alpha of the variables was found. The value of Cronbach's Alpha of the study is .73 for age, 0.784 for gender, 0.75 for income and 0.8 for education which are acceptable as the internal consistency is acceptable if the Cronbach's Alpha is greater than or equal to 0.7 and less than 0.8 and if it is 0.8 or more than that is good. So in that sense it can be said that it is acceptable in terms of the reliability statistics.

Table 2. Reliability Measures

Variables	Cronbach Alpha
Age	0.73
Gender	0.784
Income	0.75
Education	0.8

Confirmatory Factor Analysis (CFA)

Table 3. Results of CFAs of the Four Factors

Goodness-of-fit statistics	Normed-Chi Square	RMSEA	CFI
Age	1.12	0.061	0.903
Gender	0.673	0.02	1.000
Income	0.543	0.013	1.210
Education	1.22	0.065	0.956
Threshold values for the fit indices	< 5.0	< 0.08	> 0.90

There are two processes in the structural equation modeling (SEM) which are: the structural model and testing the measurement model. The suitability is pointed by the measurement model (Kline, 2010). Confirmatory factor analysis (CFA) performs the adequacy of a measurement model. That's why the model fitness is checked through normed chi-square, root mean square error approximation (RMSEA) and comparative fit index. Table 3 shows the CFA's for the factors which are age, gender, income and education. The information of table 2 shows all the indices

are adequately satisfied. Also the overall Chi-square of the test result is 8.887 which indicates the correctness of the model used in this study.

In this study most of the respondents fall in between 21-40 in terms of age which is almost 90% of the total sample size which is very relevant to the age of the people of Bangladesh as sample is taken from Bangladesh where large number of people fall in between that group. This percentage also indicates the level of e-payment usage among the young people of Bangladesh for shopping or other purchasing purposes. Almost all the previous studies were on the factors like-trust, perceived usefulness, perceived ease of use and mobility but this paper is based on the demographic factors like- age, gender, income and education of people. Here it is shown that these biological factors have considerable impact on the adaptation of e-payment for shopping among people. The result found in this study supports the factors which are actually affecting the people to accept the e-payment system for shopping.

5. Conclusions, Limitation and Future Research

This paper is aimed at finding out the demographic factors which are influencing people to accept the e-payment system for shopping. Age, gender, income and education are considered as demographic factors. A sample size of 40 was used for this study and the internal consistency of the measurement items meets the threshold value. Because the lowest Cronbach's Alpha is 0.73 and highest is 0.8 which indicates the acceptability of this model and the factors associated with this. The current study shows that the demographic factors age, gender, income and education have considerable impact on the acceptance of e-payment system for shopping of people now-a-days. In many study the demographic factors are shown but in a limited way or in a combined way but in this study the demographic factors are shown in a separate way. Through this way, it was tried to find out the individual impact of each of this demographic factor on the adaptation of e-payment system for shopping. This paper shows that people are affected positively by these demographic factors for using e-payment at the time of shopping.

This paper is not out of limitations as there are some limitations in this paper. As using a sample it is not possible to fully describe the whole scenario of the people. The sample size of 40 respondents could be increased and the number of factors used in this paper could also be increased. As a suggestion for future work it can be said that as the study is conducted taking sample from Bangladesh, so it can be analyzed on different regions as well as the number of demographic factors can be increased to see the impact.

REFERENCES

- [1] Amin, H., Hamid, M. R. A., Lada, S., & Anis, Z. (2008). The adoption of mobile banking in Malaysia: The case of Bank Islam Malaysia Berhad (BIMB). *International Journal of Business and Society*, 9 (2), 43.
- [2] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.
- [3] IAB (2010). \$6.4 Billion in Q3 2010 Sets New Record for Internet Advertising Revenues, retrieved from http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/pr-111710 (Access Date: 03.03.2014).
- [4] Islam, M. S. (2015). Impact of ICT on women empowerment in South Asia. *Journal of Economic & Financial Studies*, 3 (03), 80-90.
- [5] Karnouskos, S. (2004). Mobile payment: a journey through existing procedures and standardization initiatives. *Communications Surveys & Tutorials*, IEEE, 6(4), 44-66.
- [6] Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, 26(3), 310-322.
- [7] Lu, J., Yu, C. S., Liu, C., & Yao, J. E. (2003). Technology acceptance model for wireless Internet. *Internet Research*, 13(3), 206-222.
- [8] Luarn, P., & Lin, H.-H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21 (6), 873-891.
- [9] Mallat, N. (2007). Exploring consumer adoption of mobile payments—A qualitative study. *The Journal of Strategic Information Systems*, 16(4), 413-432.
- [10] Moretaza, T. (2015). The Independent. bKash customer at risk. Retrieved from <http://www.theindependentbd.com/print/version/details/16444>.
- [11] Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications*, 9(3), 209-216.
- [12] Singh, S., Srivastava, V., & Srivastava, R. (2010). Customer acceptance of mobile banking: A conceptual framework. *Sies journal of management*, 7 (1), 55.
- [13] UKessays. November 2013. The Electronic Payment Systems Information Technology Essay. [online]. Available from: <https://www.ukessays.com/essays/information-technology/the-electronic-payment-systems-information-technology-essay.php?vref=1> [Accessed 1 October 2018].
- [14] Van der Heijden, H. (2002). Factors affecting the successful introduction of mobile payment systems. *BLED 2002 Proceedings*, 20.
- [15] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425-478.
- [16] Venkatesh, V., & Zhang, X. (2010). Unified theory of acceptance and use of technology: US vs. China. *Journal of Global Information Technology Management*, 13 (1), 5-27.
- [17] Yang, S., Lu, Y., Gupta, S., Cao, Y., & Zhang, R. (2012). Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. *Computers in Human Behavior*, 28(1), 129-142.
- [18] Yu, C.-S. (2012). Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT model. *Journal of Electronic Commerce Research*, 13 (2), 104.
- [19] Zhou, T. (2013). An empirical examination of continuance intention of mobile payment services. *Decision Support Systems*, 54(2), 1085-1091.