

# The Technology Acceptance Model: An E-Commerce Extension

Rima Fayad; David Paper

**Abstract**—Electronic-commerce has gained a great importance as a medium for conducting business. Researchers and market executives alike are still studying online consumer behavior with the purpose of better understanding it. One model widely used for understanding technology adoption in general is the technology acceptance model (TAM). In this study, we develop and test an E-commerce specific extension of the TAM. Two predictor variables are added to the original TAM, namely, process satisfaction, and outcome satisfaction. In addition, the TAM is extended by measuring actual behavior, in contrast to previous TAM application studies that measured intentions as a substitute for actual behavior. We measured actual use variable in terms of four criterion variables, namely, purchase, access number, access total time, and access average time. The extended TAM proved to better fit E-commerce environments by better explaining actual behavior than the original TAM.

**Keywords**— *Technology Acceptance Model; User Satisfaction; Process Satisfaction; Outcome Satisfaction; Intentions; Actual Behavior; E-commerce; Perceived Usefulness; Perceived Ease of Use.*

## I. Introduction

Electronic-commerce (E-commerce) has become an important way of conducting business. It is defined as all aspects of business and market processes enabled by the Internet. The growth of E-commerce is evidenced by the large amounts of money spent online. Forrester Research estimates the online retail sales to reach \$278.9 billion in 2015 in the United States alone [1]. Therefore, the economic impact of E-commerce is increasing exponentially. Web based companies, Net Enabled Organizations (NEO), and researchers are still trying to understand and predict online consumer behavior.

Online consumer behavior has been explored by Information systems (IS) researchers in terms of online shopping adoption [2] [3]. Davis's technology acceptance model (TAM) [4] is the most widely referenced adoption model in IS [5]. The TAM is an adaptation of the theory of reasoned action (TRA) [6] [7] for predicting IS adoption [8].

Although designed to explain new technology adoption, not specifically E-commerce behavior, researchers have recently used the TAM to explore Internet consumer behavior [9] [10].

The TAM in its current form cannot be used to fully explain online consumer behavior. E-commerce adoption is significantly different from new technology adoption. One difference is that the decision to buy online is voluntary, while the decision to use new software in an organization is mandated by organizational policy. In addition, shopping online is normally one choice among alternatives (e.g. shopping in a conventional store), while typically there is no choice among different software or systems mandated by an organization. While the use of the original TAM, is not likely to lead to a full explanation of online consumer behavior, an E-commerce specific, extended TAM may prove helpful in explaining such behavior. In this study, we propose and test an extended E-commerce specific TAM to serve as an online shopping adoption model.

## II. Theoretical Background

Before developing and testing our model we examined the published literature about the subject. Following is our review and evaluation of that literature. Based on that evaluation and grounded in the literature, our new TAM extending variables are identified.

### A. The Technology Acceptance Model

The TAM has two elements, perceived usefulness (PU) and perceived ease of use (PEOU), that are correlated with the decision to adopt a new technology [4]. Davis defined PU as “the degree to which a person believes that using a particular [information] system would enhance his or her job performance”, and PEOU as “the degree to which a person believes that using a particular [information] system would be free of effort”. A visual representation of the elements in the TAM is presented in Fig. 1.



Figure 1. A Representation of Elements in the TAM

Rima Fayad, Assistant Professor  
Lebanese University / University Institute of Technology  
Lebanon

David Paper, Professor  
Utah State University / Huntsman School of Business  
United States of America

## B. The TAM Application and Extension Studies

A number of studies with the purpose of applying and/or extending the TAM ensued.

In a study to evaluate the TAM [11], the researcher measured subjects' PU, PEOU, intentions to use an email system, as well as self-reported usage. In addition, the researcher measured actual use of the email system as the number of computer logs of messages sent. PU explained 52% of the variance in reported intention to use the system. Reported intention to use the system explained 32% of the variance in subjects' self-reported use of the system and only 6% of the variance in actual use. The researcher warned against the substitution of self-reported usage for actual usage of information systems in future research.

In a study with the purpose of reviewing user acceptance models (TAM and TRA among them) and formulating a unified model of technology use, a measure of intention to use a technology to predict adoption of that technology was employed [12]. A longitudinal study was carried out on four new technologies at four different organizations for both voluntary and mandatory use. The authors recommended that researchers study the relationship between user acceptance of the technology and the outcomes of technology usage. They stated that little or no research has been conducted to study this relationship. They also suggested that researchers examine technology adoption in non-organizational settings, namely E-commerce.

## C. E-commerce and User Satisfaction

User satisfaction is a potentially important variable in IS and the online environment research. In discussing the online environment, Szymanski and Hise [13] first used the term E-satisfaction to refer to customer satisfaction with an E-retailer. However, the relationship between E-satisfaction and intention to use E-commerce was not tested.

Although user satisfaction with E-commerce [14] [15] [16] [17] [18] has been addressed in several studies, none has reported a test of the relationship between E-satisfaction and E-commerce use or intention to use.

In user satisfaction with information systems studies, IS researchers have used user satisfaction measurement instruments [19] [20] that were not balanced between process and outcome satisfaction items. Researchers have recommended revising those instruments to include items for both process and outcome satisfaction in future IS user satisfaction research [21].

## D. Evaluation of the Literature

The TAM application and extension studies presented above are a representative sample of the plethora of such studies. There exist, to our knowledge, around 100 TAM application and extension studies. After thorough review of these studies, we detected the following affirmations. First, PU is a strong predictor of behavioral intentions in

different environments (E-commerce and non E-commerce). Second, there is a relationship between PU and PEOU. This relationship is evident in different environments (E-commerce and non E-commerce). Third, there is a need to measure actual use instead of substituting it with behavioral intentions. Also, there is a scarcity of TAM studies measuring actual use. In fact, all the TAM studies we examined, with the exception of three [11] [12] [22], used intention or self-reports as a substitute measure for behavior. Fourth, we identified process satisfaction (PS) and outcome satisfaction (OS) with the online shopping behavior [21] as possible predictor variables of adoption [23].

## III. Purpose and Objectives

The purpose of this exploratory study is to extend the TAM in E-commerce research by adding the following variables: user satisfaction with the process of online shopping experience, and user satisfaction with the outcome of the online shopping experience. Using the extended TAM as the theoretical framework, we will determine how much variance in the criterion variable actual E-commerce use is explained by the extended TAM variables: perceived usefulness, perceived ease of use, user process satisfaction, and user outcome satisfaction.

### A. Research Question 1

The hypotheses that we present next are intended to operationalize the first research question. The purpose of this question is to examine the extended TAM predictor variables with the purpose of finding the variable or variables that best explain the variance in the criterion variable E-commerce use.

(H1) The relative predictive importance of the extended TAM predictor variables is higher than that of the original TAM variables in explaining E-commerce use (access).

(H2) The relative predictive importance of the extended TAM predictor variables is higher than that of the original TAM variables in explaining E-commerce use (purchase).

\* E-commerce use (access) is measured as the number of times subjects access the website, the total time they spent on the website, and the average time per session they spent on the website.

\*\* E-commerce use (purchase) is measured as the number of purchases the subjects make through the website.

### B. Research Question 2

The hypotheses that we present next are intended to operationalize the second research question. The purpose of this question is to compare the extended TAM to the original TAM to determine whether the extended model adds to the explained variance of online shopping behavior.

(H3) The variance in the extended TAM predictor variables explains more variance in the criterion

variable E-commerce use (access) than the original TAM predictor variables do.

- (H4) The variance in the extended TAM predictor variables explains more variance in the criterion variable E-commerce use (purchase) than the original TAM predictor variables do.

#### IV. METHODS

In the following section, we describe the population from which we chose the study sample, the sample itself, and the design of the study including measurement, reliability and validity assessment, and data collection.

##### A. Population and Sample

The population of interest is Internet users in general. We selected a random sample of 189 university students, consistent with Davis [4]. Our subjects were from different departments from across the university. Since they were in their first year of studies, they were not technically oriented yet are able to use the computer in their tasks. As a result, generalization to the accessible population is viable and logical.

##### B. Design

We intended to measure actual E-commerce use, consistent with Szajna's [11] recommendation. As such, we used free simulation to measure the study variables. The free simulation allowed us to measure actual E-commerce use by each subject in addition to PU of, PEOU of, process satisfaction with, and outcome satisfaction with E-commerce use. In a free simulation design, the researcher creates an artificial environment that attempts to closely resemble the real world. The subjects are therefore exposed to real-world experiences, but in an artificial environment. One method for collecting data for this type of design is through questionnaires [24].

To simulate an E-commerce environment, we replicated (in appearance and functionality) a popular E-commerce site. We published the replica website on the Internet. Subjects were able to access it anytime (throughout the study period) and from any computer with an Internet connection and a web browser.

Subjects were able to order items from our website. We actually mailed them the items they ordered. To ensure anonymity of subjects' personal and financial information when ordering while keeping the use of the site close to a real world experience, the payment for the items was done through *PayPal*—a third party vendor that processed the financial transaction. By using *PayPal*, we did not have access to subjects' credit card numbers, bank accounts or any other form of financial information. Subjects were asked to supply a username and a password at the beginning of each use session. The use of a username and a password by each subject allowed us to measure actual E-commerce use.

##### C. Data and Instrumentation

The variables used in this study are actual E-commerce use, PU, PEOU, process satisfaction, outcome satisfaction with the use of a website.

###### 1) Measurement Instruments

In order to measure the study variables, we adapted the measurement instruments from previous TAM research reviewed. Specifically, we adapted the PU and PEOU instruments from Davis [4] and Koufaris [3]. We adapted the instruments for process and outcome satisfaction from Doll and Torkzadeh [20]. The adapted instruments are presented in Appendix I. The instruments were administered at three time periods. The first, Time 1 ( $T_1$ ) was at the beginning of the study after a one (50 minutes) introductory session. The second, Time 2 ( $T_2$ ) was one month into the study. The third, Time 3 ( $T_3$ ) was two months into the study.

###### 2) Operationalization of the Variables

Consistent with the literature, anytime the TAM has been extended, the original TAM variables were included and new variables were added to better explain user behavior. In this tradition, we extended the TAM to potentially serve as a better E-commerce model by adding the predictor variables PS, OS, behavioral expectations, and the criterion variable actual use. The original TAM variables, namely, PU, and PEOU were preserved.

The extended predictor variables PS and OS were measured using the factor analysis regression method.

Since E-commerce use was never reported to have been measured in the reviewed TAM and TAM extension literature, we divided E-commerce use into access and purchase. We relied on the Nielsen/NetRatings (a leader in Internet media and market research) to operationalize E-commerce access. The Nielsen/NetRatings report several metrics for Internet access, namely the number of sessions/visits per person, PC time per person, and duration of a web page viewed. To operationalize the number of sessions/visits per person, we used the measure access number. Access number was measured as the number of times each subject accessed the website in a certain time period. To operationalize PC time per person, we used the measure access total time. Access total time was measured as the total time in seconds each subject accessed the website in a certain time period. Finally, to operationalize duration of a web page viewed, we used the measure access average time. Access average time was measured as the average time, in minutes, per session for each subject in a certain time period. We operationalized E-commerce use by measuring Web purchases. Web purchase was measured as the number of items each subject bought in a certain time period.

The original TAM predictor variables PU and PEOU were measured using the factor analysis regression method. As such, the four items on the PU scale were reduced to a one factor score for PU and the four items on the PEOU scale were reduced to a one factor score for PEOU. Using the regression method for estimating factor score coefficients, the scores produced have a mean of 0 and a variance equal to the squared multiple correlations between the estimated factor scores and the true factor values.

## D. Descriptive Statistics

In the following section, we present the demographics of the study subjects. The purpose of the demographics analysis is to address any threats to the validity of the study due to attrition over the study period.

**Time 1:** At  $T_1$ , 189 subjects completed the survey. Males constituted 64% of the sample, while females constituted 36%. As for age, the highest percentage belonged to subjects between the ages of 20 to 25 years old with 64%. The 16 to 19 years old group followed with 31.7%. The 26 to 30 years old group constituted only 3.7% of the sample. Finally the above 30 years old group constituted a mere 0.5% of the sample.

**Time 2:** At  $T_2$ , 178 subjects completed the survey. Males constituted 62.9% of the sample, while females constituted 37.1%. As for age, the highest percentage belonged to subjects between the ages of 20 to 25 years old with 62.9%. The 16 to 19 years old group followed with 32.6%. The 26 to 30 years old group constituted only 3.9% of the sample. Finally the above 30 years old group constituted a mere 0.6% of the sample.

**Time 3:** At  $T_3$ , 149 subjects completed the survey. Males constituted 61.7% of the sample, while females constituted 38.3%. As for age, the highest percentage belonged to subjects between the ages of 20 to 25 years old with 62.4%. The 16 to 19 years old group followed with 32.2%. The 26 to 30 years old group constituted only 4.7% of the sample. Finally the above 30 years old group constituted a mere 0.7% of the sample.

By comparing the descriptive statistics of the subjects at the three time periods we can conclude that although, due to attrition, the sample size was smaller at  $T_2$  than it was at  $T_1$ , and at  $T_3$  than it was at both  $T_1$  and  $T_2$ , it was almost the same composition (in terms of gender and age percentages) at all three times. Therefore, there is no threat to the validity of the study due to attrition.

## v. Results

Our goal was to study how well the extended and original TAM predictor variables explain the variance in E-commerce use. Consistent with the previous TAM literature [4] [11] [12], we were interested in studying how well the predictor variables PU, PEOU, PS, and OS explain the variance in e-commerce use.

We explored two regression equations at  $T_2$  and  $T_3$ . We will not report regression analysis at  $T_1$  because E-commerce use access was a constant of 30 minutes and E-commerce use purchase was zero. Access was constant because we introduced the website to the subjects at  $T_1$  and instructed them to complete the study's instrument after the 30 minutes browsing time. Purchase was zero because the purpose of  $T_1$  was introductory only. Moreover, outcome satisfaction was not measured because no purchases could be made at  $T_1$ . The regression equations at  $T_2$  and  $T_3$  are as follows:

Number of E-commerce actual use = PU + PEOU (1)

Number of E-commerce actual use = PU + PEOU + Process Satisfaction (PS) + Outcome Satisfaction (OS) (2)

The results of the linear regression analysis on equations (1) and (2) are presented in accordance with Davis [4]. The beta coefficients are tabulated with significance notes after each table. In addition, R Square values are tabulated so we can evaluate overall model fit. Table 1 summarizes the coefficients of regression at time  $T_2$ . Table 2 summarizes the coefficients of regression at time  $T_3$ .

To address research question 2, which compares the extended TAM to the original TAM to determine whether the extended model adds to the explanation of online shopping behavior, we performed linear regression analyses on the following functions at  $T_2$ , and  $T_3$ :

Number of E-commerce use (purchase)  
= PU + PEOU (original TAM)  
= PU + PEOU + PS + OS (extended TAM)

Number of E-commerce use (access)  
= PU + PEOU  
= PU + PEOU + PS + OS

The results of the linear regression analyses on the equations of research question 2 at both  $T_2$ , and  $T_3$  are summarized in Table 3.

Table 1. Regression Coefficients in Equations 1 & 2 at  $T_2$

Dependent Variable	Independent Variable			
	PU	PEOU	PS	OS
(1)				
Purchase	0.301*	0.149*		
Access Number	0.331*	0.133**		
Access Total Time	0.329*	0.160**		
Access Average Time	0.291*	0.162***		
(2)				
Purchase	0.207**	0.011	0.302*	0.319*
Access Number	0.162*	0.019	0.541*	0.066
Access Total Time	0.183**	0.034	0.471*	0.157***
Access Average Time	0.193*	0.059***	0.314*	0.175**

\* $p < 0.001$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

Table 2. Regression Coefficients in Equations 1 & 2 at T<sub>3</sub>

Dependent Variable	Independent Variable			
	PU	PEOU	PS	OS
(1)				
Purchase	0.284*	0.169**		
Access Number	0.342*	0.115**		
Access Total Time	0.342*	0.146**		
Access Average Time	0.277*	0.144***		
(2)				
Purchase	0.159**	0.031	0.316*	0.316*
Access Number	0.151**	0.019	0.497*	0.101
Access Total Time	0.172**	0.032	0.437*	0.185***
Access Average Time	0.158**	0.041	0.302*	0.207**

\*p&lt;0.001, \*\*p&lt;0.05, \*\*\*p&lt;0.01

Table 3. Explained Variances in E-Commerce Use

	Percentage of Explained Variance in:			
	Purchase	Access Number	Access Total Time	Access Average Time
TAM-original	15%	17%	18%	14-15%
TAM-extended	37%	40-43%	40-42%	27-29%

## VI. Discussion of Results

In the following section, we discuss the results of the statistical analysis as they relate to the study research questions.

### A. Research Question 1

The linear regression analyses revealed that the relative predictive importance of OS in explaining E-commerce use in terms of purchase was higher than that of PU and PEOU (Tables 1 and 2). OS was followed closely by PS. The relative predictive importance of PU was less than those of PS and OS, while the relative predictive importance of PEOU was the least in explaining purchase. In explaining access number, the relative predictive importance of PS was the highest, with PU following. The relative importance predictive of PEOU was less, while the relative predictive importance of OS was the least in explaining access number. In terms of explaining access total time and access average time, the relative predictive importance of PS was the highest, followed by PU and OS. The relative predictive importance of PEOU was the least in explaining both access total time, and access average time. A summary of the variances explained by the regression equations 1 and 2 is presented in Table 3. In the

following section, we evaluate the results as they relate to the hypotheses for research question 2.

The results of the linear regression analysis allow for the support of the alternative hypothesis (H1). User satisfaction with the process of online shopping experience had a relative predictive importance higher than those of user perceived usefulness and ease of use of online shopping in explaining E-commerce use (access) in its three forms. User satisfaction with the outcome of the online shopping experience however, had lower relative predictive importance than user perceived usefulness (but higher than ease of use) in explaining E-commerce use (access).

The results of the linear regression analyses also allow for the support of the alternative hypothesis (H2). User satisfaction with the outcome of the online shopping experience had relative predictive importance higher than those of user perceived usefulness and ease of use of online shopping in explaining E-commerce use (purchase). User satisfaction with the process of the online shopping experience had higher relative predictive importance than user perceived usefulness and ease of use of online shopping in explaining E-commerce use (purchase).

### B. Research Question 2

The linear regression analyses revealed that adding the extended predictor variables to the TAM led to a better explanation of online shopping behavior (Table 3). The variance in the original TAM predictor variables explained only around 15% (at both T<sub>2</sub> and T<sub>3</sub>) of variance in purchase, while the variance in the extended TAM predictor variables (extended and original) explained around 37% (at both T<sub>2</sub> and T<sub>3</sub>) of the variance in purchase. The variance in the original TAM predictor variables explained around 17% (at both T<sub>2</sub> and T<sub>3</sub>) of the variance in access number, while the variance in the extended TAM predictor variables explained between 40-43% (at 40% at T<sub>2</sub> and 43% at T<sub>3</sub>) of the variance in access number. The variance in the original TAM predictor variables explained around 18% (at both T<sub>2</sub> and T<sub>3</sub>) of the variance in access total time, while the variance in the extended TAM predictor variables explained between 40-42% (40% at T<sub>2</sub> and 42% at T<sub>3</sub>) of the variance in access total time. The variance in the original TAM predictor variables explained between 14-15% (14% at T<sub>2</sub> and 15% at T<sub>3</sub>) of the variance in access average time, while the variance in the extended TAM predictor variables explained between 27-29% (27% at T<sub>2</sub> and 29% at T<sub>3</sub>) of the variance in access average time.

The results of the linear regression analyses support the alternative hypothesis (H3). The variance in the extended TAM predictor variables explained more variance in E-commerce use (access), in its three forms, than did the original TAM predictor variables.

The results of the linear regression analyses also support the alternative hypothesis (H4). The variance in the extended TAM predictor variables explained more variance in E-commerce use (purchase) than did the original TAM predictor variables.

Based on the above, the current extension of the TAM proved to be a better fit for E-commerce use than the original TAM.

## VII. Conclusion

The contribution of this study is twofold. First, we extended the original TAM by adding new variables that better explain the variance in E-commerce use. Second, we measured actual behavior as recommended by the original TAM author [4].

This study is valuable for both academics and market executives. Its academic value is twofold. First, it is a replication of the TAM and an evidential instance of its robustness in explaining actual behavior. Second, it is an extension of the TAM in that it included several variables articulated in the literature to have potential importance to the future of the TAM in IS research.

The TAM is extended on many levels. First, we were interested in whether satisfaction of purchasing a product online related to actual purchase behavior. The results substantiated the enjoyment of the process of buying online related to the actual purchase of a product. In addition, we were interested in whether a perceived pleasant experience of customers ordering from and browsing a website is related to actual purchase behavior. The results of the study substantiated that the perception of a pleasant website experience is related to actual purchase behavior. As a result, this is a valuable extension to the TAM because more variance is explained by incorporating satisfaction with the process of online shopping.

Second, we were interested in whether the enjoyment of receiving the actual product bought online related to actual purchase behavior. The results of the study substantiated that the enjoyment of receiving the product bought online related to the actual online purchase. In addition, we were interested in whether the enjoyment of receiving the purchased product on time related to actual purchase behavior. The results of the study substantiated that the enjoyment of receiving the purchased product on time related to the actual purchase behavior. Moreover, we were interested in if customers liked the E-vendor's return policy, and if so, was their perception related to actual purchase behavior. The results of the study substantiated that customers' perception of the E-vendor's return policy related to actual purchase behavior. As a result, this is a valuable extension to the TAM because more variance is explained by incorporating satisfaction with the outcome of the online shopping experience.

Third, we were interested in exploring actual behavior online. We examined actual behavior with four measures, namely, actual purchase, access number, access total time, and access average time. In terms of actual purchase, we examined how it related to satisfaction with the process and outcome of the online shopping experience. In terms of access number (number of times online customers accessed the website), we examined how it related to satisfaction with the process and outcome of the online shopping experience. In terms of access total time (total time online customers spent on a website), we examined it related to satisfaction with the process and outcome of the online shopping experience. In terms of access average time (average time online customer spent on a website), we examined how it related to satisfaction with the process and outcome of the online shopping experience. The results of the study supported the relationship between

actual online behavior in its four forms and satisfaction with the process and outcome of the online shopping experience.

As for the study's market value, executives can use the TAM extended model to increase their sales on the Internet. When online customers are satisfied with the online shopping experience (browsing, ordering, navigating, etc.) they will be more inclined to buy from the E-vendor. They will also be more inclined to access and spend more time browsing the E-vendor's website. When online customers are satisfied with their purchases (receiving product on time, return policy, receiving the exact product ordered, etc.) they will be more inclined to buy from the E-vendor.

Recommendations for future research in online consumer behavior include replicating the current study using real data from E-vendors who are larger E-commerce companies. Clients are presented with a wider selection of products. Therefore clients' interest in the site would go beyond the current study's incentives. It would be of great interest to see how well the model fits the real life.

Another recommendation is to refine the PU and PEOU instruments taking E-commerce into account. People use the Internet to buy because they can compare prices, quality, etc., in a matter of minutes. They can also save time and effort by doing their shopping from the convenience of their computer screen. To have the PU and PEOU instruments reflect the specificity of E-commerce use might prove helpful in explaining more of online shopping behavior.

Another recommendation is to apply the model to new environments in E-commerce, namely mobile computing. It would be of interest to see how well the model fits new technological advances and environments as opposed to the now traditional E-commerce of buying products.

## References

- [1] S. Mulpuru, Retrieved March 30, 2015, from <http://www.forrester.com/>, 2011.
- [2] S. Koch, A. Toker, P. Brulez, "Extending the TAM with perceived community characteristics", *Information Research* vol. 16, 2, 2011.
- [3] M. Koufaris, "Applying the technology acceptance model and flow theory to online consumer behavior", *Information Systems Research*, vol.13, pp. 205-224, 2002.
- [4] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, vol. 13, pp. 318-340, 1989.
- [5] D. Gefen, & D. W. Straub, "The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption", *Journal of the Association for Information Systems*, 1, 8, 2000.
- [6] I. Ajzen, & M. Fishbein, *Understanding attitudes and predicting social behavior*, Englewood Cliffs, NJ: Prentice Hall, 1980.
- [7] M. Fishbein, & I. Ajzen, *Belief, attitude, intention, and behavior: An introduction to theory and research*, Reading, MA: Addison-Wesley, 1975.
- [8] F. D. Davis, R. P. Bagozzi, & P. R. Warshaw, "User acceptance of computer technology: A comparison of two theoretical models", *Management Science*, vol. 35, pp. 982-1003, 1989.
- [9] D. Gefen, E. Karahanna, & D. W. Straub, "Trust and TAM in online shopping: an integrated model", *MIS Quarterly*, vol. 27, pp. 51-90, 2003.

[10] D. Gefen, & D. W. Straub, "The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption", *Journal of the Association for Information Systems*, vol. 1, 8, 2000.

[11] B. Szajna, "Empirical evaluation of the revised technology acceptance model", *Management Science*, vol. 42, pp. 85-92, 1996.

[12] V. Venkatesh, M. G. Morris, G. B. Davis, & F. D. Davis, "User acceptance of information technology: Towards a unified view", *MIS Quarterly*, vol. 27, pp. 425-478, 2003.

[13] D. Szymanski, & R. Hise, "E-satisfaction: An initial examination", *Journal of Retailing*, vol. 76, pp. 309-322, 2000.

[14] N. N. Bechawati, & L. Xia, "Do computers sweat? The impact of perceived effort of online decision aids on consumer's satisfaction with the decision process", *Journal of Consumer Psychology*, vol. 13, pp. 139-148, 2003.

[15] S. Devaraj, M. Fan, & R. Kohli, "Antecedents of B2C channel satisfaction and preference: Validating e-commerce metrics", *Information Systems Research*, vol. 13, pp. 316-333, 2002.

[16] S. Y. Kim, & Y. J. Lim, "Consumer's perceived importance of and satisfaction with Internet shopping", *Electronic Markets*, vol. 11, pp. 148-154, 2001.

[17] V. McKinney, K. Yoon, & F. Zahedi, "The measurement of web-customer satisfaction: An expectation and disconfirmation approach", *Information Systems Research*, vol. 13, pp. 296-315, 2002.

[18] J. R. Otto, M. K. Najdawi, & K. M. Caron, "Web-user satisfaction: An exploratory study", *Journal of End User Computing*, vol. 12, pp. 3-10, 2000.

[19] J. E. Bailey, & S. W. Pearson, "Development of a tool for measuring and analyzing computer user satisfaction", *Management Science*, vol. 29, pp. 530-545, 1983.

[20] W. J. Doll, & G. Torkzadeh, "The measurement of end-user computing satisfaction", *MIS Quarterly*, vol. 12, pp. 258-274, 1988.

[21] J. B. Woodroof, & G. M. Kasper, "A conceptual development of process and outcome user satisfaction", *Information Resources Management Journal*, vol. 11, pp. 37-43, 1998.

[22] D. W. Straub, M. Limayem, & E. Karahanna, "Measuring system usage implications for IS theory testing", *Management Science*, vol. 41, pp. 1328-1342, 1995.

[23] R. Fayad, & D. Paper, "The technology acceptance model E-commerce extension: a conceptual framework", *Procedia Economics and Finance*, vol. 26, pp. 1000-1006, 2015.

[24] U. Sekaran, R. Bougie, *Research Methods for Business: A Skill Building Approach*. Hoboken, NJ: John Wiley & Sons, 2013.

**Process Satisfaction**

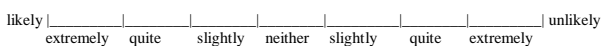
I find using Cdorderz.com enjoyable (PS1).  
 The actual process of using Cdorderz.com is pleasant (PS2).  
 I have fun using Cdorderz.com (PS3).  
 I am satisfied with the process of using Cdorderz.com (PS4).

**Outcome Satisfaction**

I find that by using Cdorderz.com, I receive the precise books/CDs I order (OS1).  
 I find that by using Cdorderz.com, I receive the books/CDs on time (OS2).  
 I am satisfied with Cdorderz.com return policy (OS3).  
 I am satisfied with the outcome of using Cdorderz.com (OS4).

**Appendix I**

The following items were used with the below scale.



**Perceived Usefulness**

Using Cdorderz.com can improve my shopping performance (PU1).  
 Using Cdorderz.com can increase my shopping productivity (PU2).  
 Using Cdorderz.com can increase my shopping effectiveness (PU3).  
 I find using Cdorderz.com useful (PU4).

**Perceived Ease of Use**

Learning to use Cdorderz.com would be easy for me (PEOU1).  
 My interaction with Cdorderz.com is clear and understandable (PEOU2).  
 It is easy for me to become skillful at using Cdorderz.com (PEOU3).  
 I find Cdorderz.com easy to use (PEOU4).