

## EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL FOR ADOPTION OF E-SHOPPING BY CONSUMERS IN TURKEY

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### ABSTRACT

The Technology Acceptance Model (TAM) is a very important modelling approach in information technology research. In this study, an attempt is made to explain consumer acceptance of e-shopping by means of an extended model based on TAM. Perceived trust, perceived enjoyment, perceived information quality, perceived system quality and perceived service quality factors are added to the classical TAM to produce an extended research model. This extended research model is tested against data obtained from 606 internet users in Turkey, and a structural equation model is used to analyse these data. The results support the previous findings related to classical TAM; however, the recently included external factors are also effective in explaining the acceptance of e-shopping.

Keywords: E-commerce, Online Shopping, TAM, Structural Equation Models

### 1. Introduction

In the last few centuries, mankind has gone through industrial and electronic revolutions. In the 21st century, the network revolution has been added to its predecessors. The Internet, in particular e-commerce, is the driving force of this revolution. In the new electronic age, commercial transactions and functions have become sustainable in the electronic domain. The Internet and e-commerce are rapidly spreading new and very effective means of conducting commercial transactions. Along with the liberalisation of commerce on a global scale, e-commerce is a product of the recent technological developments witnessed in the last decade, which make information communication ever easier [Turban and King, 2003; Çelik, 2009].

Fast spreading of the internet has made the e-commerce an indispensable and effective tool to realize the commercial transactions. The first examples of the e-commerce have been about the money transfer as electronic [Kalakota ve Whinston, 1997]. And later, the transfer transactions among the financial institutions have followed it effectively and safely.

E-commerce is described like to make production, presentation, selling, insurance, distribution and payment transactions of the goods and services in the electronic domain. The developments in the information technology which are the effective ways to provide the new arrangements for the relations between firms and clients, called forth the new jobs and commercial tools [Goldsmith and Bridges, 2000; Crespo and del Bosque, 2008]. Zwass (1996), described the e-commerce as to share the commercial information's by preserving commercial transactions and relations conducted with telecommunication networks. Kalakota and Whinston (1997), stated to be defined it as the distribution of products and services via computer networks. Treese and Stewart (1998), referred the e-commerce as the usage of the universal internet for buying and selling of the goods and services. The simplest meaning of the e-commerce is described as buying and selling of the goods via internet [Shih, 2004; Bidgoli, 2002].

The development of e-commerce in Turkey gained impetus in 1998. Until 2003, computer ownership and internet access rates in Turkey were very low compared to those in developed countries, which posed an obstacle to obtaining the desired volume in e-commerce. As these rates increase, significant improvement is seen in the number of e-commerce transactions [SPO, 2006].

According to the results of the ICT (Information and communication Technologies) Usage in Households Research conducted in April 2008, 24.5% of households had internet access. Of the households which had no internet access, 29.6% stated that they did not need the internet. In the period of January-March 2008, 7.2% of the internet user households ordered or purchased goods or services for personal use over the internet. The percentage of households that had never purchased or ordered goods and services over internet was 88.4%. In the 12 month period between April 2007 and March 2008, 30.4% of the household members who ordered or purchased goods or services over internet bought electronic devices, followed by household goods (25.2%), “books, magazines and newspapers (23.4%)”, “apparel and sports materials (18.2%)” [TurkStat, 2008].

According to the OECD report titled “The Future of the Internet Economy” issued in 2008, more than 25% of the citizens of OECD member countries purchased goods and services over the internet in 2007. The OECD average is 26%, and Turkey ranks last according to this e-commerce research. Japan ranks first with 51.5%, followed by Norway with 47.7% [OECD, 2008].

At the end of the first half of 2008, e-commerce volume conducted in Turkey through virtual POS (Point of Sale) had increased by 65% compared to the first half of 2007 and reached 3.9 billion TLs (this is the total use of national credit cards at home and abroad; the volume abroad is less than 5%). If this increase in the volume of e-commerce continues at this rate, it is expected to reach 8.9 billion TLs in 2009. As the rate of credit cards in e-commerce also increases, an examination of the volume of e-commerce conducted through virtual POS in the total shopping with credit cards yields more useful results in terms of following the developments in e-commerce. When examined this way, the rates of e-commerce out of all credit card shopping have increased since 2005 and 2006, when the rates were 2% and 2.5%, respectively. In 2007 this trend continued, and in 2008, the share of e-commerce in shopping with credit cards exceeded the 5% level for the first time [ICC, 2008].

According to the results of research conducted by Turkish Statistical Institute in Turkey, consumers' security concerns in 2008 and 2009 in relation to e-shopping were significantly increased. Security concerns was 4.0% in 2007, whereas this rate was 34.7% in 2008, and in 2009 was 30.7%. Consumers' reasons for not shopping over the internet sorted, “Do not need to” was identified as the most important factor by the rate 72.6%. In second place with 34.7%, prefer to seeing the product, sales, loyalty and habits of the ground, respectively. According to traditional marketing methods this situation which is in the second place is the disadvantage of the e-commerce. Therefore, despite the expansion of Internet use, using traditional methods is still going to dominate purchases made. The security and privacy concerns took the third place. Security of electronic transactions, the validity of the documents / archives, and legal validity of electronic contracts and the unauthorized use of private information are the most basic reasons of this issue.

B2C (Business-to-consumer) e-commerce has changed many aspects of people's daily lives; in addition, as regards the determination of various surfaces related to the usage and adaptation of e-commerce, it has paved the way for several academic studies [Ngai and Wat, 2002].

The increased importance of e-commerce in Turkey makes it essential to determine the factors that affect consumer behaviour towards e-commerce. In this study, the Technology Acceptance Model (TAM) provides the basis for attempts to explain the e-shopping behaviours of Turkish consumers along with the causal relationships among factors that are believed to affect e-purchase. The research model used in this study is the first one developed in Turkey in this subject area. In this extended model, perceived trust, perceived enjoyment, perceived information quality, perceived system quality and perceived service quality factors are added to the classical TAM, and attempts are made to explain the causal relationships between the e-shopping acceptance of consumers and these external factors.

## 2. Literature review

The technology acceptance model [Davis, 1989; Davis et al., 1989] provides the conceptual framework for this study. TAM, proposed by Davis in 1986, has become a widely cited model for predicting and explaining user behaviour and IT usage. The origins of TAM can be traced back to the theory of reasoned action (TRA). The TRA requires that salient beliefs about attitudes towards a particular behaviour can be elicited every time the behaviour being studied is displayed. As a simplification of TRA, the TAM suggests that users' decisions to accept a new information technology are based on two rational assessments of its expected outcomes: (i) perceived usefulness (PU), defined as user expectation that using a new information technology could result in improved job performance and (ii) perceived ease of use (PEOU), defined as the degree to which a person believes that using a particular system would be effortless [Davis, 1989; Lingyun and Dong, 2008; Yuanquan et al., 2008]. In the past decades, PEOU and PU constructs have been considered important in determining an individual's acceptance and use of information technology (IT). Information system (IS) researchers have investigated and replicated these two factors and agreed that they are valid in predicting individual acceptance of various corporate information technologies.

The original TAM variables may not adequately capture key beliefs that influence consumer attitudes toward e-shopping. In a series of studies, the coverage of TAM has been extended and, in addition to the variables in the classical TAM approach, trust, social personality and perceived enjoyment have been added [Gefen et al., 2003; Pavlou, 2003; Wu and Chen, 2005; Lingyun and Dong, 2008]. However, in addition to these factors, several other factors, including personal characteristics (age, sex, income, education and culture), internet experience, normative beliefs, shopping tendencies, online experience, safety, system quality, psychological perception (the perception of risk and benefit), online shopping experience, availability, service quality and attitude, have been added to the TAM for better modelling. Although it was stated in the past that these factors would construct the online shopping model as a whole, the models where all these factors are handled as a whole were only theoretically examined, and some of these factors were not included in the model in practical studies [Moon and Kim, 2001; Devaraj et al., 2002; Chen et al., 2002; Alreck and Settle, 2002; Pavlou, 2003; Park et al., 2004; Susskind, 2004; Pires et al., 2004; Klopington and McKinney, 2004; Yu et al., 2005; Lim et al., 2005; Zhou et al., 2007; Crespo and del Bosque, 2008; Lingyun and Dong, 2008].

### 3. Extended model and research hypothesis

#### Factors added to the classical TAM

This paper presents an extended TAM model. Recent studies on e-commerce adoptions include five supplementary constructs, namely the perceived information quality, perceived service quality, perceived system quality, perceived enjoyment, and perceived trust. This extended model is shown in Figure 1. The following section gives an overview of these constructs, followed by an analysis of the roles they play in users' perceptions of their interactions with e-commerce websites.

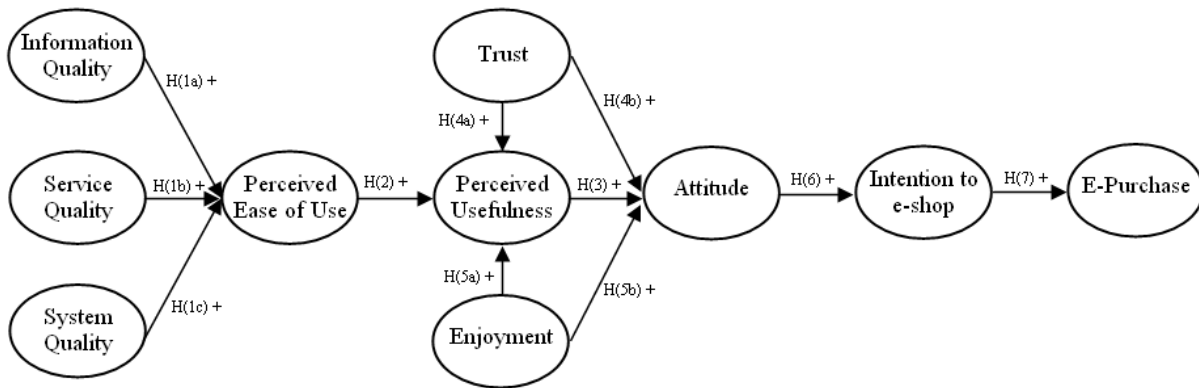


Figure 1. Research Model

#### 3.1. Perceived quality of e-shopping

When shopping online, consumers usually expect the web site to support them. For example, obtaining correct and accessible information on target products and services is essential for consumers. There are three factors in evaluating the quality level of a website, namely the perceived information quality, service quality and system quality. These three constructs define the success of a web site. The perceived information quality (PIQ), the perceived service quality (PSvQ) and the perceived system quality (PSQ) can positively or negatively affect e-commerce behaviour [Shih, 2004; Chang et al., 2005]. PIQ is assessed as the output quality of information systems. It is used to show the characteristics of the information. In the studies conducted in the literature, information quality was often used to measure the performance of information systems [Shih, 2004]. During e-shopping, companies and consumers share and exchange information, which results in coordination and communication. PIQ evaluates the quality of information provided through the network in a consumer-centred manner. It is assumed that PIQ will affect PU, PEOU and attitude. For PSvQ, Parasurman et al. (1998), developed SERVQUAL, a measurement device consisting of 45 items. In many studies in the literature, SERVQUAL was used to measure the information quality of information systems [Kettinger and Lee, 1994; Shih, 2004; Chang et al., 2005]. Experimental results have shown that service quality is a defining characteristic of information systems [Liao and Cheung, 2002; Shih, 2004]. It is assumed that PSvQ of a website affects PU, PEOU, attitudes and intentions. PSQ is defined as the transaction characteristic of an information system, supporting functions of which are measured as system quality. It is assumed that PSQ affects PU, PEOU, attitudes and intentions.

Information quality is a result of information systems [Shih, 2004]. Previous studies have noted that the quality of information used is the measure of information systems. Information quality includes an assessment of the effects of web usage. During e-commerce transactions, companies and consumers share and exchange information over the internet. Perceived information quality is used in the assessment of the information perceived by consumers on the net. It is assumed that perceived service quality affects PU, PEOU, attitudes towards e-commerce and user acceptance.

System quality refers to the ability of the information system to conduct transactions. In several studies, system quality measurements have been used to measure the performance of information systems. The supporting functions of an information system are a measure of its quality. In models extended with TAM, it has been determined that perceived quality affects PU, attitudes towards e-commerce and user acceptance [Liu and Arnett, 2000; Shih, 2004].

**Hypothesis 1a.** PIQ positively affects individual PEOU.

**Hypothesis 1b.** PSvQ positively affects individual PEOU.

**Hypothesis 1c.** PSQ positively affects individual PEOU.

### 3.2. Perceived Ease of Use and Perceived Usefulness

In prior TAM-based studies, perceived usefulness typically had a stronger direct effect on attitudes than perceived ease of use and a direct effect on perceived usefulness. In recent studies on TAM, it has been shown that the relations between PEOU, attitudes and intentions are not significant [Gefen and Straub, 2000; Hassanein and Head, 2007]. These research studies have found significant relations between PEOU and PU and shown that PEOU explains PU. It has also been determined that PU affects attitude [Gefen and Straub, 2000].

**Hypothesis 2.** Individual PEOU positively affects PU.

**Hypothesis 3.** Individual PU positively affects attitudes toward e-shopping.

### 3.3. Perceived Trust

Trust is a complicated and multi-dimensional structure. In conventional shopping methods, the risk level is very low, but in e-commerce, consumers have a lower level of trust. In e-commerce, trust plays an important role. Increases in the level of trust directly and positively affects the intention for e-shopping. Relations between classical TAM and trust have been widely discussed in prior studies in the literature. Successful e-shopping web sites and marketing activities are channels that ensure a low level of consumer risk perception and a high level of consumer trust. Trust in an online seller improves PU in the short term and the long term [Gefen, 2000; Corbitt et al., 2003; Chang et al., 2005; Wang and Head, 2007; Kim et al., 2008].

Due to the nature of internet shopping, consumers take some risk levels for granted. In the relations included in the marketing paradigm, trust is generally handled as an obligatory component in the establishment of a successful relationship [Corbitt et al., 2003]. In traditional trade, trust is generally seen as the confidence between consumers and sales personnel [Lingyun and Dong, 2008]. Many studies have determined that trust has a positive significant impact on e-commerce [Gefen, 2000; McKnight et al., 2002; Bhattacharjee, 2001; Gefen et al., 2003]. Kim (2003) examined the factors that affect user trust for e-businesses, which are a part of developing trust in general. Trust in e-commerce definitely increases the perceived ease of use [Pavlou, 2003]. The connection between perceived trust (PT) and TAM structures have been widely discussed in a series of studies [Gefen et al., 2003; Pavlou, 2003; Wang and Benbasat, 2005; Wu and Chen, 2005]. Several studies have found out that there is a positive relation between user trust and PU and PEU [Corbitt et al., 2003; Kim et al., 2008; Lingyun and Dong, 2008]. At the same time, it has also been determined that consumer trust affects the risk perceived by consumers in a commercial transaction negatively, and the purchasing intention of consumers positively [Kim et al., 2008]. Under the "Online B2C perceived trust model" developed by Corbitt et al. (2003), in their study titled "Trust and e-commerce", it has been determined that perceived trust has positive relations with the web experience, market orientation of users, and technological reliability. Their hypothesis "trust is in positive relation with e-commerce participation" as formulated in their studies, has been found to be significant, and a positive relation between trust and e-commerce has been determined to exist [Corbitt et al., 2003; Gefen et al., 2003; Pavlou, 2003; Wang and Benbasat, 2005; Wu and Chen, 2005].

**Hypothesis 4a.** Perceived trust positively affects individual PU.

**Hypothesis 4b.** Perceived trust positively affects attitudes toward e-shopping.

### 3.4. Perceived Enjoyment (PE)

The enjoyment perceived in computer-human interaction and in the information systems literature is a sub-dimension of the different structure measures related to the real motives of users [Lingyun and Dong, 2008]. PE plays an increasingly important role, attracting growing interest in information systems research. In the intention for a certain behaviour, the effect of perceived enjoyment acts as an intermediary for PU and PEOU. PE makes web sites more attractive and directly affects the intentions of users. Lee et al. (2003), have determined that enjoyment is positively correlated with customer satisfaction and online shopping. When a feeling of enjoyment and pleasure is

provided for individuals, they display a certain type of behaviour. Davis et al. (1992), found out that perceived enjoyment had a significant impact on intention of using a word processing program.

**Hypothesis 5a.** Perceived enjoyment positively affects individual PU.

**Hypothesis 5b.** Perceived enjoyment positively affects attitudes toward e-shopping.

### 3.5. Attitudes toward e-shopping, intention to e-shop and e-purchase

According to the transactional definition of TRA, individual attitudes toward a certain type of behaviour are determined by individual beliefs and evaluations about the consequences of the behaviour [Shih, 2004]. Attitudes are defined as an individual's overall evaluation of performing a behaviour. According to Theory of Planned Behaviour (TPB), individual attitudes affect the behavioural intentions of users, which in turn influence their actual behaviour. When individuals develop positive attitudes towards e-shopping, they have stronger intentions toward adopting it, and they are more likely to use it. Many e-commerce studies have shown that consumers' intentions to engage in online transaction are significant predictors of their actual participation in e-commerce transactions [Kim et al., 2008].

**Hypothesis 6.** An individual attitude toward e-shopping positively affects the intention to use e-shopping.

**Hypothesis 7.** Individual intention to use e-shopping positively affects e-purchases (physical-digital products, ordering-post-purchase service etc.).

## 4. Research Methodology

### 4.1. Questionnaire

Survey research was the predominant methodology used in this study. The measurement device included in the research model was developed as a result of several studies. The purpose of the measurement device was to determine the factors that were believed to affect real e-commerce-related behaviours of consumers in Turkey and the relations between these factors in a multi-dimensional manner. A questionnaire was developed to measure the relevant constructs. The items included in the measurement device were translated to Turkish by two persons educated in English Language and Literature. A 5-level Likert scale was adopted in the measurement device, namely "strongly agree", "agree", "neither agree nor disagree", "disagree" and "strongly disagree". The measurement device, which was published on the web, is given in the Appendix, organised in terms of factors and defining resources.

### 4.2. Sample

In this study, e-survey was used to collect the data. In many studies where e-surveys are used, the number of internet users is taken into account when determining the size of the sample [Couper, 2000]. According to a 2008 survey of household usage of information technology conducted by TurkStat, the rate of internet usage in the 16-74 age group in cities is 44.6%. In order to compile relevant data, member users in 3 different forums were asked to participate in an e-survey through the net. Self-selection and intersection-probability based sampling approaches were employed to create a sample. In these forum pages, a casual digital search determined 800 people to whom invitations were sent to participate in the survey. At the end of the application, 606 of the 800 persons answered the survey. Socio-demographic features of the 606 participants who answered the measurement device are given in Table 1 below.

Among the sample participants, 38% stated that they used the Internet for 20 hours or more; 24.4% stated that they used it for 10-20 hours; 26.1% for 3-10 hours; 10% for 1-3 hours, and 1.5% stated that they used the Internet for less than 1 hour (on a weekly basis). One hundred fifteen participants (19%) stated that they had bought seven or more products online during the last year; 32.8% stated that they had bought no tangible products online so far.

Table 1. Socio-demographic profile of sample

Variable		n	%
<b>Age</b>	16–26 years	303	50.00
	27–37 years	212	35.00
	38–48 years	73	12.00
	49–59 years	15	2.50
	60 and over	3	0.50
<b>Gender</b>	Male	261	43.1
	Female	345	56.9
<b>Education level</b>	Elementary school	5	0.80
	High school and equivalents	46	7.60
	Vocational college	55	9.10
	University	357	58.90
	MA/MS	99	16.30
	PhD	44	7.30
<b>Monthly family income</b>	0- 750 TL	181	29.90
	751 YTL –1500 TL	209	34.50
	1501 YTL –2250 TL	129	21.30
	2251 YTL –3000 TL	47	7.80
	More than 3000 TL	40	6.60

## 5. Data analysis and result

Several statistical methods for SEM, such as the Maximum Likelihood (ML), Generalised Least Squares (GLS) and Full Information Maximum Likelihood (FIML) methods for standard and multilevel SEM, assume that the data follow a multivariate normal distribution. In practice, however, the assumption of a multivariate normal data distribution does not often hold. Consequently, alternative methods such as Weighted Least Squares (WLS), Diagonally Weighted Least Squares (DWLS) and Robust Maximum Likelihood (RML) are recommended to fit SEM to these data sets [Bollen, 1989]. In this study, Mardia's skewness and kurtosis coefficients were used to determine the multivariate normalness, and normality tests with single and multiple variables were conducted. As a result of the analysis conducted, it was found that the data set does not satisfy the multivariate normalness assumption ( $p < 0.05$ ). Mardia's relative multivariate kurtosis measurement was calculated as 1.24. CFA and SEM were carried out by the RML estimation method in order to analyse the efficiency of the proposed model.

### 5.1. Measurement Model

The data obtained were tested for reliability and validity using confirmatory factor analysis (CFA). The measurement model included 34 items describing ten latent constructs: *PEOU*, *PU*, *PIQ*, *PSvQ*, *PSQ*, *enjoyment*, *trust*, *attitude toward e-shopping*, *intention to use e-shopping*, and *e-purchase*. The initial test of the measurement model using CFA indicated that some construct revisions were needed. After respecifying the instruments, 29 items were retained. The test of the final measurement model demonstrated a good fit between the data and the proposed measurement model. The chi-square for the measurement model was calculated to be 694.29 with 332 d.f. The CFA also showed that the overall model fit indices were good:

$\chi^2 / (df = 332)$  2.09, RMSEA 0.03, SRMR 0.035, GFI 0.93, AGFI 0.90, CFI 0.99 and NFI 0.99.

In addition to the global measures of fit, several other assessment criteria were considered. Cronbach's alpha values and composite reliabilities (CR) provided strong evidence of measurement reliability [Fornell and Larcker, 1981; Nunnally and Bernstein, 1994]. According to Nunnally (1978) and Hair et al. (1998), Cronbach's alpha values and CR must be above 0.70 in order to establish scale reliability. Internal consistency reliability reflects the stability of individual measurement items across replications from the same source of information; it was assessed by computing Cronbach's alpha, whose coefficients for the ten construct above 0.70, indicating a reasonable level of internal consistency among the items of which it is constituted [Hair, et. al, 1998].

We conducted CFA to test the convergent validity of each construct. Convergent validity is supported by CR [Fornell and Larcker, 1981] and the high and significant standardised loadings for the measures. A single factor model was specified for each of the constructs. The convergent validity of the constructs was demonstrated because all standardised factor loadings exceeded 0.5 on their own constructs.

Discriminant validity is the degree of uniqueness achieved from item measures in defining a latent construct. Discriminant validity can be tested by using a chi-square difference test where the chi-square statistics for two models are compared [Bolen, 1989; Suh and Han, 2002; Brown, 2006]. Each model includes two constructs of interest. In one model, the correlation between the two constructs is fixed at 1.00, assuming that the constructs are

identical. The other model freely estimates the correlation between constructs. Forty-five comparisons were made, consisting of dual-comparisons of 10 constructs, in order to determine discriminant validity; as a result, it was seen that each pair of constructs was indeed distinct ( $p < 0.0001$ ).

In summary, the fit indices demonstrate a good overall fit between the measurement model and the data. The statistical results indicate that the measurement model has high reliability and validity, and retained items were able to measure the constructs under study. CFA results are given in Table 2.

Table 2. Confirmatory factor analysis results

Factor / Item	Standard loading	t-value	Cronbach's $\alpha$	CR
<b>Factor PIQ.</b>			0.95	0.95
PIQ 1.	0.88	22.41		
PIQ 2.	0.96	23.64		
PIQ 3.	0.95	23.64		
<b>Factor PSvQ.</b>			0.92	0.92
PSvQ 1.	0.90	20.93		
PSvQ 2.	0.90	20.06		
PSvQ 3.	0.86	19.82		
<b>Factor PSQ.</b>			0.78	0.78
PSQ 1.	0.78	18.64		
PSQ 2.	0.78	21.24		
PSQ 3.	0.65	15.54		
<b>Factor Enjoyment.</b>			0.91	0.91
EN 1.	0.84	29.50		
EN 2.	0.90	27.51		
EN 3.	0.90	25.05		
<b>Factor Trust.</b>			0.83	0.76
TR 1.	0.67	14.10		
TR 2.	0.88	15.79		
<b>Factor PEOU.</b>			0.74	0.76
PEOU 1.	0.67	14.87		
PEOU 2.	0.70	17.80		
PEOU 3.	0.67	14.83		
<b>Factor PU.</b>			0.79	0.79
PU 1.	0.75	21.21		
PU 2.	0.81	22.37		
PU 3.	0.69	18.38		
<b>Factor Attitude.</b>			0.79	0.76
AT 1.	0.75	20.02		
AT 2.	0.57	11.82		
AT 3.	0.67	17.69		
AT 4.	0.83	25.04*		
<b>Factor Intention.</b>			0.91	0.91
In 1.	0.83	26.28		
In 2.	0.91	33.39		
In 3.	0.89	31.45		
<b>Factor Purchase.</b>			0.90	0.90
Items	0.92	37.05		
Spent	0.88	39.68		

## 5.2. Structural Model

The causal structure of the proposed research model was tested using SEM. The test demonstrated a reasonable fit between the data and the proposed structural model. The fit statistics,  $\chi^2 / (df=332)$  2.38, RMSEA 0.04, SRMR 0.05, GFI 0.91, AGFI 0.89, NFI 0.98, NNFI 0.99, CFI 0.99, were all indicative of a good fit.

In order to determine the validity of the hypothesised paths, the statistical significance of all structural parameter estimates was examined. The structural parameters estimates and the hypothesis-testing results are shown in Table 3. The model is presented in Figure 2.

Table 3. LISREL results for research model

Hypothesis	Causal path	Path coefficient	t-values	Remarks
H1a	PIQ → PEOU	0.26	2.98*	Supported
H1b	PSvQ → PEOU	0.27	2.96*	Supported
H1c	PSQ → PEOU	0.19	2.00*	Supported
H2	PEOU → PU	0.66	11.35**	Supported
H3	PU → Attitude	0.65	9.41**	Supported
H4a	Trust → PU	0.07	1.62	Not Supported
H4b	Trust → Attitude	0.17	3.73**	Supported
H5a	Enjoyment → PU	0.37	8.40**	Supported
H5b	Enjoyment → Attitude	0.23	4.14**	Supported
H6	AT → Intention	0.88	15.78**	Supported
H7	Intention → E-purchase	0.64	16.11**	Supported

Structural Equations	R <sup>2</sup>
$PEOU=0.26 \times PIQ+0.27 \times PSvQ+0.19 \times PSQ$	0.44
$PU=0.37 \times Enjoyment+0.07 \times Trust+0.66 \times PEOU$	0.77
$Attitude=0.23 \times Enjoyment+0.17 \times Trust+0.65 \times PU$	0.80
$Intention=0.88 \times Trust$	0.77
$E-purchase=0.64 \times Intention$	0.41

\* denotes significance at the 0.05 level; \*\* denotes significance at the 0.01 level

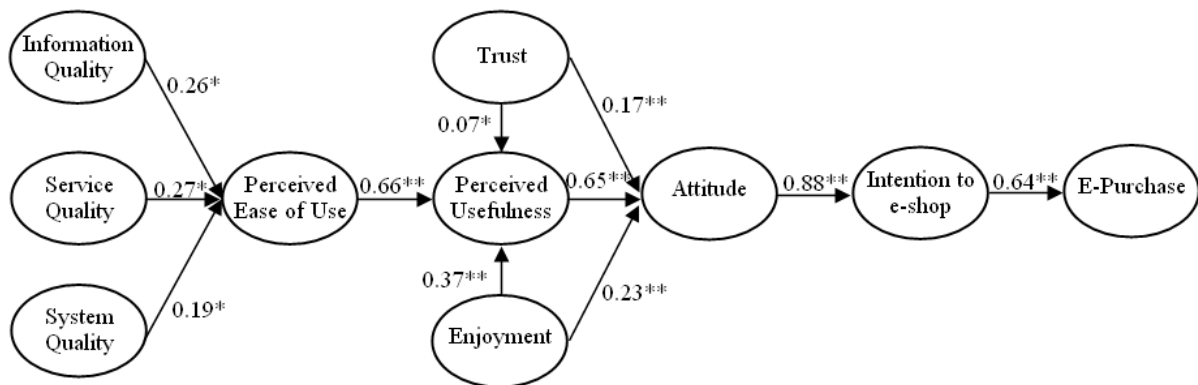


Figure 2. LISREL analysis of the research model showing standardised coefficients.

Hypothesis H(1a) was statistically verified ( $\gamma=0.26$ ;  $t=2.98$ ). A positive impact of PIQ on PEOU was detected. Hypothesis H(1b), which states that PSvQ of e-commerce has a positive impact on PEOU, was also statistically verified ( $\gamma=0.27$ ;  $t=2.96$ ), as was Hypothesis H(1c) which states that PSQ of e-commerce has a positive impact on PEOU ( $\gamma=0.19$ ;  $t=2.00$ ). The results that verify Hypotheses H(1a), H(1b) and H(1c) were not compared, as TAM does not include the implicit variables of PSQ, PSvQ and PSQ. However, as a result of the literature research conducted, which took into consideration the extended models based on the TAM model, it has been determined that the impact of these implicit variables on perceived ease of use was limited.

In previous studies, it was stated that the information, service and system quality variables of the system used had a significant impact on the ease of use. Ha and Stoel (2009) suggested that these three implicit variables could collectively explain the dimension of e-commerce quality, and determined that the combined impact of these implicit variables on ease of use was statistically significant. The impact of the information, service and system quality of system perceived by individuals indirectly explains the real usage of the system through their impact on ease of use.

Hypothesis H(2), which asserts that PEOU has a positive effect on PU, was statistically verified, and the relation between these two implicit variables was found to be significant ( $\beta=0.66$ ;  $t=11.35$ ). Many studies have stated that the perceived ease of use has a significant effect on perceived user-friendliness in classical TAM and



extended TAM models [Chen et al., 2002; Yu et al., 2008]. In their research model, used for virtual store consumer acceptance in terms of 6 implicit variables, Chen et al. (2002), argued that perceived ease of use has significant effect on perceived user-friendliness. Their analysis verified their hypothesis ( $\beta=0.28$ ;  $p<0.05$ ). In their extended model, Burton-Jones and Hubona (2006) found the impact of PEOU on PU statistically significant ( $\beta=0.49$ ;  $p<0.05$ ). Hassanein and Head (2007) stated that highly-perceived ease of use affects highly-perceived user-friendliness in online shopping websites, which was verified by their analysis ( $\beta=0.328$ ;  $p<0.01$ ). Lu et al. (2009), stated that the relation between these two variables was statistically significant, and that the hypothesis formulated in relation to this argument was verified ( $\beta=0.53$ ;  $p<0.001$ ). Ha and Stoel (2009) claimed that there was a positive impact between these two variables ( $\beta=0.38$ ;  $p<0.01$ ).

Research hypothesis H(3), which argues that PU has a positive impact on attitude, was also verified and the relation between these two variables was found to be statistically significant ( $\beta=0.65$ ;  $t=9.41$ ). The result obtained has some similarities with the findings of researchers who used different TAM models. Many studies have shown that perceived ease of use positively affects the attitudes of users [Chen et al., 2002; Ha and Stoel, 2009; Moon and Kim, 2001; Yu et al., 2008]. In the original TAM, it was found that there was a strong statistical relation between these two implicit variables ( $\beta=0.305$ ;  $t=4.334$ ) [Moon and Kim, 2001]. In their research model, used for virtual store consumer acceptance in terms of 6 implicit variables, Chen et al. (2002) argued that perceived ease of use has a significant effect on perceived user-friendliness. Based on the results of YEM, the research hypothesis that there was a relation between PU and attitude was verified ( $\beta=0.30$ ;  $p<0.1$ ). Shih (2004) statistically verified the hypothesis that perceived ease of use would positively affect individual attitudes related to e-commerce, and obtained similar results. In their research model, Hassanein and Head (2007) stated that highly-perceived ease of use affects highly-perceived user-friendliness in online shopping websites, which was verified by their analysis ( $\beta=0.24$ ;  $p<0.05$ ). In their research model, developed using classical TAM and flow theory, Lu et al. (2009), stated that the relation between these two variables was statistically significant, and that the hypothesis formulated in relation to this argument was verified ( $\beta=0.37$ ;  $p<0.001$ ). Ha and Stoel (2009) claimed that there was a positive relation between these two variables ( $\beta=0.55$ ;  $t=6.39$ ).

Research hypothesis H(4a), that the implicit variable of perceived trust has an impact on PU, was statistically rejected ( $\gamma=0.07$ ;  $t=1.62$ ), whereas another hypothesis H(4b), that it has an impact on attitude, was accepted ( $\gamma=0.17$ ;  $t=3.73$ ). As trust is a multi-dimensional element, studies have often handled and discussed its effect on online sales behaviour. Few classical TAM models added it as an external variable to the model. Hassanein and Head (2007) stated that perceived trust has a positive impact on attitude ( $\gamma=0.43$ ;  $p<0.01$ ). Ha and Stoel (2009) claimed and statistically verified ( $\gamma=0.29$ ;  $p<0.001$ ;  $\gamma=0.13$ ;  $p<0.05$ ) that perceived trust has a positive impact on perceived ease of use and attitude.

Research hypothesis H(5a) claims that perceived shopping enjoyment has a positive impact on PU and was accepted. It has been determined that the implicit variable of perceived enjoyment affects PU-dependent intermediate implicit variables in a statistically significant manner ( $\gamma=0.37$ ;  $t=8.40$ ). Hypothesis H(5b), which is formulated as "research enjoyment positively affects e-commerce attitude," was statistically verified ( $\gamma=0.23$ ;  $t=4.14$ ). Extended TAM models that include perceived enjoyment generally handle the impact of this variable on attitude and perceived ease of use in a similar way. In their studies, Lim et al. (2005), determined with their dual-intermediate effect model that there was a positive relation between perceived enjoyment and perceived user-friendliness ( $\gamma=0.71$ ;  $p<0.05$ ). In their research model, Hassanein and Head (2007) found that perceived enjoyment only affects attitude ( $\gamma=0.196$ ;  $p<0.05$ ). In their research model, Ha and Stoel (2009) claimed that perceived enjoyment has a positive impact on user-friendliness and attitude-dependent implicit variables. Their analysis results statistically verified the claims of the authors ( $\gamma=0.23$ ;  $p<0.001$ ;  $\gamma=0.23$ ;  $p<0.001$ ).

The H(6) hypothesis, which claims that individual attitudes have a positive impact on e-shopping intention, was verified with the analysis obtained as a result of SEM ( $\beta=0.88$ ;  $t=15.78$ ). In the classical TAM model, it is stated that attitude implicit variable positively affects the e-shopping intention ( $\beta=0.378$ ;  $p<0.001$ ). Chen et al. (2002), statistically verified their research hypothesis that consumer attitudes towards using virtual stores would affect the intention to use virtual stores ( $\beta=0.77$ ;  $p<0.001$ ). In their 6 implicit-variable model, Moon and Kim (2001) verified their research hypothesis that the intermediate dependent variable, which was attitude towards using e-commerce system, positively affected the intention of using the system ( $\beta=0.289$ ;  $p<0.05$ ). Ha and Stoel (2009) found out that attitude has a positive impact on the intention of e-shopping ( $\beta=0.53$ ;  $p<0.001$ ).

Research hypothesis H(7) explains that intention of e-shopping positively affects e-shopping behaviour, and this hypothesis was accepted ( $\beta=0.64$ ;  $t=16.11$ ). Chen et al. (2002), statistically verified that intention to use e-shopping could positively affect real usage ( $\beta=0.82$ ;  $p<0.001$ ). Klopping and McKinney (2004) verified their hypothesis that intention to use e-shopping websites could positively affect the real usage with their research model, which was a combination of classical TKM and technology adaptation ( $\beta=0.38$ ;  $p<0.01$ ). Using their research model, which

combines trust, risk and benefit, Kim et al. (2008), stated that purchasing intention has a positive impact on purchasing decision ( $\beta=0.379$ ;  $p<0.01$ ).

## 6. Discussion and conclusion

In this paper, a model was generated of consumer acceptance of e-shopping in Turkey for the purpose of showing the factors not included in the classical TAM model, such as enjoyment, trust and quality of e-shopping, which determine behaviour, intentions and attitudes towards e-shopping. Theoretical models obtained as a result of a comprehensive literature research on e-shopping were compared to each other, and a research model that is able to explain the tendencies of consumers in different dimensions was devised. This research model was determined to be unique in the factors that it includes. In addition to the factors employed by the classical TAM to explain the behaviours of consumers, five new factors were added and attempts were made to explain the causal relations between these factors and their impact on consumer behaviour for e-shopping. The five new factors added to the classical TAM consist of two belief factors (perceived trust and perceived enjoyment), and three e-quality-related factors (perceived information quality, perceived service quality and perceived system quality). The research model created in the study is the first and most comprehensive model of e-commerce in Turkey.

Technology Acceptance Model that is used in the study has been proven by showing parallels with the literature. Moreover, direct and indirect effects of the other factors included in the model were significant on the behavior of the e-procurement (e-purchase). PEU considered that the information, the quality of service and system to be effective factors and service quality was found to be the most important factor. Trust have a significant rate impact on the attitude, while this effect rate on PEU was statistically significant but weak. The enjoyment was also determined as the other important factor in explaining that the attitude.

The model developed in this paper must be handled and construed in a careful manner when used to explain and predict the e-shopping behaviours of non-experienced internet users or consumers using other traditional shopping methods, as the sample constructed in this study consisted of users with internet experience. Almost 67.2 % of the participants in this research had e-shopping experience. Contrasting conceptual impacts can appear when evaluating the perceived user-friendliness and usefulness of e-commerce among experienced and non-experienced users.

Basically, the research model will yield more effective results when used for predicting the acceptance and willingness of users related to e-shopping based on the theoretical definition of information systems and technologies provided by the studies. There is a need for further theoretical and experimental studies in order to expand the classical TAM. Although TAM is one of the most-widely used modelling approaches in the evaluation of information systems, it must be revised in line with new developments in information technologies.

The results obtained in this study can be used to determine the marketing strategies employed by e-stores to improve the willingness of consumers to engage in online shopping. Using the model in this study, the factors that are seen as important by users in e-shopping systems were clearly defined. E-shopping is developing rapidly. An effective e-store design is of critical importance if the e-store wants to meet the expectations of e-consumers. Changing consumer and life patterns are introducing more and more consumers to the virtual environment. Acceptance and adoption by consumers of this virtual life will change according to the marketing performance of service providers, who are seen as important actors in the virtual environment. E-stores have to develop strategic plans that will reverse the negative behaviours, attitudes and beliefs of consumers.

The results obtained in the developed research show interesting implications for e-commerce diffusion and for the management of sale initiatives through the Internet. Specifically, the understanding of the overall process of virtual shopping acceptance by final consumers is very useful to define strategies and performances that aimed at leading Internet users to make electronic transactions. Lastly, when carrying out research on e-commerce, it would be also interesting to consider other variables, such as the subjects' socio demographic characteristics, way of life or personal values among others.

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**Appendix. Measurement Items for Constructs**

<i>Constructs / Measurement Items</i>	<i>Adapted from</i>
<b><i>Perceived Usefulness (PU)</i></b>	
Use the e-shopping web sites increases my shopping performance	[Davis,1989; Moon and Kim, 2001; Hassanein, Head, 2007]
The e-shopping web sites are useful for shopping	
Using the e-shopping web sites enhances my shopping effectiveness	
<b><i>Perceived Ease of Use (PEOU)</i></b>	
Learning to use “the virtual store” was easy for me.	[Davis,1989; Moon and Kim, 2001; Hassanein, Head, 2007]
My interaction with “the virtual store” was clear and understandable	
I found it easy to use “the virtual store” to find what I want	
<b><i>Perceived Enjoyment</i></b>	
For me, using e-shopping web sites is unpleasant-pleasant	[Lim and Lim, 2005; Hassanein, Head, 2007; Lu et al., 2009]
For me, using e-shopping web sites is dull-exciting	
For me, using e-shopping web sites is unenjoyable-enjoyable	
<b><i>Attitudes Toward Online Shopping</i></b>	
Using a virtual store saves me time	[Moon and Kim, 2001; Suh, 2002; Crespo and del Bosque, 2008]
Using a virtual store is not secure	
Using a virtual store saves me money	
I think using online shopping is beneficial for me	
<b><i>Perceived system quality (PIQ)</i></b>	
The completeness of information will affect my decision to e-shop	[Liu and Arnett, 2000; Corbitt, 2003; Shih, 2004]
The understandability of information will affect my decision to e-shop	
The timeliness of information will affect my decision to e-shop	
<b><i>Perceived service quality (PSvQ)</i></b>	
The speed of delivery will affect my decision to e-shop	[Liu and Arnett, 2000; Corbitt, 2003; Shih, 2004]
The ease of returning merchandise will affect my decision to e-shop	
The ease of paying will affect my decision to e-shop	
<b><i>Perceived system quality (PSQ)</i></b>	
The query supporting function of Web sites will affect my decision to e-shop	[Liu and Arnett, 2000; Corbitt, 2003; Shih, 2004]
The functions of search engines will affect my decision to e-shop	
The reliability of Web sites will affect my decision to e-shop	
<b><i>Perceived Trust</i></b>	
Personal information protection will be important in using e-commerce.	[Gefen, 2000; Gefen et al., 2003; Kim et al., 2008]
I think products or services purchased by using e-commerce will be trustworthy.	
<b><i>Intention</i></b>	
I intend to use e-commerce as soon as possible	[Chen et al., 2002; Suh and Han, 2002; Kim et al., 2008; Crespo and del Bosque, 2008]
I intend to continue using online shopping in the future	
I will regularly use online shopping in the future	
<b><i>E-purchase</i></b>	
How many items have you purchased using e-shopping over the Internet in the past one year?	[Lim and Lim, 2005; Shih, 2004]
How much money have you spent on e-shopping in the past one year?	