Ertugrul Tarcan and Ergin Sait Varol

Role of the demographic factors in the process of hotel information systems adoption

Abstract

With the ever changing business environment of more and innovative competitors, information technologies (ITs) have become a strategic tool for attaining competitive advantages in organizations. The hospitality sector also extensively relies on the hotel information systems (HISs) to improve their organizational outputs. HISs being up to the expectations of the stakeholders have a great potential in achieving higher levels of service quality and satisfaction with lower costs. Hence, it should be taken into account the roles of the factors influencing intention to use (IU) of an information system (HIS) before any such system is applied. Then this study attempts to examine the impact of the demographic factors on employees' beliefs and intentions of usage related to HISs in the five star hotels context in Turkey. For this assessment, a modified version of the technology acceptance model (TAM) extended with the gender (GEN), age (AGE) and level of education (EDU) variables had been used. Although the affects of demographic variables on TAM constructs were partially approved, this study indicates that demographic variables will be able to be a helpful tool for managers in better understanding the technology acceptance process, and in decision making process for the right choice of HISs.

Keywords:
demographic factors; hotel information systems; technology acceptance model; information technology acceptance; Turkey

Introduction

With the ever changing business environment characterised with the increased number and more innovative competitors, most service organizations recognize the need to introduce innovations and new technologies within their organizational processes to stay in the market, or to retain their competitive advantage compared to their competitors. The rapid rate of change in the business landscape has continuously pushed the need for technologies and acceptance of these technologies at an accelerating rate. Thus, the information technology has become a strategic tool for attaining competitive advantages in organizations.

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Under such pressures, organizations have gradually increased their investment in information technology for planning in order to increase the efficiency of their business processes, support management decision-making and improve productivity. The hospitality industries, in particular, also extensively relies on information technology to improve employees' productivity and efficiency, as well as to improve customer satisfaction, since information technology has been perceived to give a notable competitive advantage (Ham, Kim, & Jeong, 2005; Lam, Cho, & Qu, 2007; Walder, Weiermair, & Perez, 2007). Indeed, many studies have found that there is a positive relationship between information technology investment and organization productivity and performance (Powell, & Dent-Micallef, 1997; Rai, Patnayakuni, & Patnayakuni, 1997). The ability to harness the technologies to improve the efficiency of hotel operations and service to guests will be the key to future success in the hotel industry (Siguaw, & Enz, 1999). Thus, information technology has profound impacts on hotels, as a large amount of information has to be processed and communicated among internal and external customers.

Given the importance of the information technology, researchers and practitioners in the hospitality industry have largely conducted studies related to technology adoption and diffusion (Siguaw, Enz, & Namasivayam, 2000), which have indicated that even though there are positive effects and benefits, new information technology would not be fully accepted if barriers of external factors influenced the acceptance of information technology (IT) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1992). In that context, the most widely applied model is the Technology Acceptance Model (TAM) developed by Davis (1989). The model, based on the theory of reasoned action, explains process of the acceptance of information technology on an individual level. For this reason, in this study, Davis's (1989) technology acceptance model (TAM) is utilized as a theoretical background as it is regarded as one of the most influential research models in explaining the users' information technology usage or acceptance behavior in various contexts (Davis, Bagozzi, & Warshaw, 1989; Hong, Thong, Wong, & Tam, 2002; Lee, Kim, & Lee, 2006).

Davis's original technology acceptance model (TAM) was extended by integration of the external variables' effects on perceived usefulness (PU) and perceived ease of use (PEOU), and the antecedents of these two beliefs were also investigated (Agarwal, & Prasad, 1999; Jackson, Chow, & Leitch, 1997; Lee, Kim, Rhee, & Trimi, 2006; Venkatesh, & Brown, 2001; Venkatesh, & Davis, 2000). Finally, mediating and moderating variables were also incorporated in the original model to explain information technology acceptance behaviour (Davis et al., 1992; Paul, John, & Pierre, 2003; Shin, 2004). In hotel organizations, with their unique characteristics, examination of technology adoption behaviour also requires that organizational technology climate and technology characteristics be considered (Wang, & Qualls, 2007). According to Law and Jogaratnam (2005), hotels have widely adopted technologies to improve operational efficiency, enhance service quality and lessen costs.

At the same time, despite increasing use of technology in the hospitality industry, few studies were conducted to investigate the relationship between the external variables and the (TAM) framework in order to explain the acceptance behavior of technology in hospitality organizations (e.g., Lam et al., 2007; Lee et al., 2006; Wöber, & Gretzel, 2000). In hotels, the most typical information technology tool used is the hotel information system. Hotel information system (HIS) is divided into four categories of front office system, back office system, restaurant and banquet management system, and guest-related interface (Ham et al., 2005), which operates 24 hours a day, 365 days a year. Service employees at the point of contact with the customer also use this system. Therefore, the employees who use the hotel information system (HIS) are the most important group of users to study in hotel organisations.

Social psychology theories - the theory of reasoned action, the theory of planned behaviour and theories of habits - suggest that behaviors are determined by subjective norms, individual differences and habits beside attitude and beliefs (Burton-Jones, & Hubona, 2006; Fishbein, & Ajzen, 1975; Huh, Kim, & Law, 2009; Igbaria, Guimaraes, & Davis, 1995). According to the study of Varol and Tarcan (2009) the personal innovativeness and organisational innovativeness can be used as additional variables in order to build up a more complete TAM. On the other hand, 60% of the studies related to the TAM included external variables such as gender, age, level of education, system training, task characteristics, organisational innovativeness, personal innovativeness, subjective norm and facilitating conditions. In spite of that, there is no conclusive evidence on the role of external variables and, therefore, further investigation on the subject of external variables is needed. (Burton-Jones, & Hubona, 2006; Legris, Ingham, & Collerette, 2003; Varol, & Tarcan, 2009). Individual factors with widely differing demographic characteristics appear important in planning implementation and/or upgrading and acceptance of hotel information systems (Burton-Jones, 2006; Lucas, 1978). Accordingly, in this study, demographical variables of gender (GEN), age (AGE) and level of education (EDU) are applied as external variables to the technology acceptance model (TAM).

The aim of this study is to investigate the relationship between antecedents and users' acceptance of a hotel information system through the TAM framework, which is based on the survey of hotel employees. Utilizing the result, this study demonstrates the acceptance of hotel information systems from the perspective of hotel employees through gender, age and level of education as the external variables. Especially, the objectives of this study are: (1) to investigate the direct and mediated impacts of the individual factors of gender (GEN), age (AGE) and level of education (EDU) on the belief factors of the technology acceptance model (TAM) and intention to use (IU) related to hotel information systems; (2) To assess the impact of the perceived easy of use (PEOU) on perceived usefulness (PU) and intention to use (IU) hotel information system; (3) to examine the impact of PU on IU hotel information systems.

Current study contributes to the theoretical development of behavior formation regarding hotel information system acceptance in the hotel industry. Results of the

study can also provide practical implications for hotel managers and hotel information system practitioners to plan strategically and implement effective tools to motivate employees towards acceptance and usage of hotel information systems.

Literature review related to the technology acceptance model

There are varied models in the literature trying to explain individual technology adoption, although those based on the technology acceptance model (Davis et al., 1989) are the most widely accepted. As already pointed out, the technology acceptance models are inspired by the Theory of Reasoned Action (Fishbein, & Ajzen, 1975), grounded in social psychology and, to date, one of the most fundamental and influential theory of human behavior (Davis, 1989). Theory of Reasoned Action contends that, both, the attitude towards a specific behavior and subjective norm have an impact on behavioural intention which, in turn, determines actual behavior. Intentions are assumed to capture the motivational factors that influence a behaviour and thus indicate how hard people are willing to try or to what extent they are planning to make an effort in order to perform the behavior (Ajzen & Fishbein, 1980). An attitude can be defined as a person's negative or positive evaluation of performing the target behavior (Ajzen, & Fishbein, 1980; Fishbein, & Ajzen, 1975). The assertion of the Theory of Reasoned Action, that any other factors influencing behavior do so only indirectly by influencing attitude, subjective norm or their relative weights, constitutes one of the key assumptions of the technology acceptance model (Davis et al., 1989).

The technology acceptance model was the first model to incorporate psychological factors affecting computer acceptance and the model assumes that, both, perceived usefulness and perceived easy of use of the new technology are central in influencing the individual's attitude towards using that technology. An individual's attitude is hypothesized to influence the behavioural intention to use a technology, eventually relating to actual use. The technology acceptance model deviated from the Theory of Reasoned Action from the start, by leaving subjective norm out of the model. Moreover, the mediating role of attitude was doubtful. In the follow-up model, the technology acceptance model 2, developed by Venkatesh and Davis (2000), the attitude component was excluded and the perceived technology characteristics directly influenced the individual's intention to use the new technology under consideration. In addition, social influences (used as subjective norm) re-entered the model.

There were relatively few studies dealing with the application of the technology acceptance model and its extended versions in hospitality/tourism contexts. According to the meta-analysis study of Huh et al. (2009, p. 124), these few studies uses the technology acceptance model extended with the variables such as task fit, career fit, accessibility, self-efficacy, information quality, system quality. Varol and Tarcan (2009) have conducted a study on the user acceptance of hotel information systems and have found that the personal innovativeness and organizational innovativeness variables can be used as a fundamental tool in order to enhance the power of explanation of the technology acceptance model. The study reported here is a continuation of that earlier study but this time taking into account demographic variables that might influence

the process of technology acceptance. In the current study, the technology acceptance model was modified by using demographic variables of gender, age and level of education in order to examine the impacts of these individual antecedents on perceived usefulness, perceived easy of use and intention to use constructs related to the hotel information system acceptance.

There are a number of studies published on the impact and importance of the individual variables as external variables related to the variations of the technology acceptance model (TAM) and the technology acceptance model 2 (TAM2). In particular, gender was an important variable in studies on decision making process (Evanschitzky, & Wunderlich, 2006; Gilly, & Zeithaml, 1985; Goldsmith, & Goldsmith, 1996). However, few studies investigated the effect of gender on information technology acceptance process related to the pre-implementation, implementation and redesigning. According to the study of Venkatesh, Morris and Ackerman (2000), women's decisions related to the usage of the new information technology were more strongly impacted by subjective norm and perceived behaviour control when compared to men's. In contrast, attitude affects more strongly men's decision about using the new technology. Also, these results are valid when controlled for income, organization position, education, and computer self-efficacy levels. In another study, Venkatesh and Morris (2000) found that perceived easy of use has more impact on men's information technology usage decisions than women's. On the other hand, the results show that the perceived easy of use and subjective norm affects more information technology usage decisions of women than men's. Consumer lifestyle factors are also related to the gender, age and level of education. This situation directly or indirectly affects consumer's intention to use and usage of information technology (Lee, Lim, Jolly, & Lee, 2009).

Another factor that might have an influence on the technology acceptance is age. Because of weaker self efficacy, age shows a negative effect on perceived behavioral control as an antecedent to it (Morris, & Venkatesh, 2000). Also, habits get stronger with ageing; making them more difficult to change (Nickel, & Pinto, 1986) and, therefore, is diminishing perceived usefulness of information technology (Gomez, Egan, & Bowers, 1986). Hence, age is likely to negatively impact the information technology adoption and use. In addition, it seems that age also has a negative effect on frequency of use (Burton-Jones, & Hubona, 2005; Harrison, & Rainer, 1992). According the logic of the theory of planned behaviour, age can not be fully mediated by belief constructs on usage of information technology (Ajzen, 1991), and age also has a direct effect on the intention to use or usage of information technology. On the other hand, another study used individual's tenure in the workforce as a surrogate for age indicates that it did not have any affect on the perceived usefulness and perceived easy of use of information technology innovation (Agarwal, & Prasad, 1999).

Finally, it is important to consider education as a factor influencing the technology acceptance. Education is antecedent to the potential learning of information technology and so it is likely to have a positive relationship with the beliefs constructs of the technology acceptance model – perceived usefulness and perceived easy of use (Davis,

& Davis, 1990). According to Agarwal and Prasad, (1999), level of education positively influences beliefs about the perceived usefulness and perceived easy of use in the technology acceptance model and, according to the theory of planned behaviour, education also has a direct impact on usage of information technology (Ajzen, 1991). A study related to the usage of information technology in public organizations indicates that there is positive and significant relationship between information technology use if compensation exists. If compensation does not exist, there is statistically significant but negative relationship (Hamner, & Qazi, 2009).

Research model and hypotheses

In the light of the preceding discussion, a research model can be proposed that consists of several dimensions. As illustrated in Figure 1, the research model is hypothesising relationship between age (AGE), gender (GEN) and level of education (EDU) as external variables of the technology acceptance model (TAM) impacting on perceived usefulness (PU), perceived easy of use (PEOU) and intention to use (IU). In general, PU and PEOU have constituted a significant influence on an individual's IU a technology or system (Ma, & Liu, 2004; Schepers, & Wetzels, 2006). The mediating role of attitude between these perceptions has been doubtful from the start of the technology acceptance model research and was therefore not considered in later assessments of the model (Venkatesh, & Davis, 2000). We follow this trend and consistent with existing research we hypothesize:

Hypothesis 1: An employee's PU of hotel information systems would positively influence his or her IU hotel information systems.

Hypothesis 2a: An employee's PEOU of hotel information systems would positively influence his or her PU of hotel information systems.

Hypothesis 2b: An employee's PEOU of hotel information systems would positively influence his or her IU hotel information systems.

In terms of gender (GEN) and based on the current insights on its influence on the technology acceptance in general, we hypothesised that gender will be related to the three outcome variables. Specifically, we have formulated the following hypotheses:

Hypothesis 3a: There is a significant relationship between an employee's gender and his or her PU of hotel information systems.

Hypothesis 3b: There is a significant relationship between an employee's gender and his or her PEOU of hotel information systems.

Hypothesis 3c: There is a significant relationship between an employee's gender and his or her IU hotel information systems.

As the research evidence to date suggests that the age might have a negative influence on the technology acceptance, we propose the following:

Hypothesis 4a: An employee's age would negatively influence his or her PU of hotel information systems.

Hypothesis 4b: An employee's age would negatively influence his or her PEOU of hotel information systems.

Hypothesis 4c: An employee's age would negatively influence his or her IU hotel information systems.

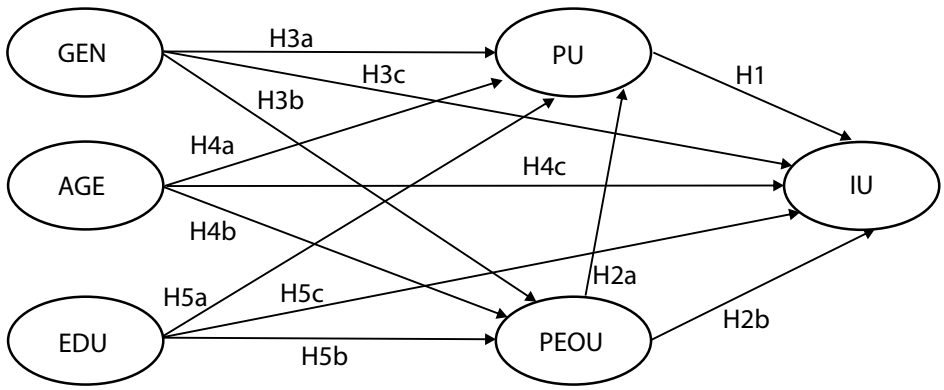
Contrary to the influence of age, we proposed that level of education will have positive influence on the outcome variables:

Hypothesis 5a: An employee's level of education would positively influence his or her PU of hotel information systems.

Hypothesis 5b: An employee's level of education would positively influence his or her PEOU of hotel information systems.

Hypothesis 5c: An employee's level of education would positively influence his or her IU hotel information systems.

Figure 1
RESERCH MODEL*



* GEN: gender; AGE: age; EDU: level of education; PU: perceived usefulness; PEOU: perceived easy of use; IU: intention to use

Methodology

Sample for this study were employees working for five star-hotels located in Alanya, which is one of the important tourist destinations in the southwest of Turkey. Questionnaires were distributed to the employees by the human resources or general managers between September and November 2008. In total, 396 usable questionnaires were obtained, yielding a response rate of 46.6%. In terms of socio-demographic composition, 72.9 per cent of the employees were males; 49.2 per cent were between the ages of 18 and 30 years, and also 41.4 per cent between 31 and 40, 7.8 per cent between 41-50 and also 1.6 per cent for 51-60; 31.8 per cent had primary and secondary school diplomas; 43.8 per cent high-school diplomas; 22.5 percent associate and bachelor degrees; and the remainder, 1.9 per cent, master and doctorate degree. 1.6 per cent was top management managers; 6.3 per cent from the accounting and finance departments; 37.4 per cent from the food & beverage and supplying departments; 37.6 per cent from the rooms departments; 3.7 per cent marketing departments; 2.6 per cent human-resources departments; 10.8 facilities management departments (Table 1). As this is a continuation of the earlier study, for detailed methodology see Varol and Tarcan (2009).

Table 1
AGE, GENDER , EDUCATION AND DEPARTMENTS OF RESPONDENTS (N=396)*

Characteristics	N (valid number)	%
Gender		
Female	104	27.1
Male	280	72.9
Total	384	100.0
Age		
30 and below	188	49.2
31-40	158	41.4
41-50	30	7.8
51-60	6	1.6
61 and up	0	0.0
Total	382	100.0
Level of education		
Primary	43	11.4
Secondary	77	20.4
High school	165	43.8
Associate - bachelor	85	22.5
Master - doctorate	7	1.9
Total	377	100.0
Departments		
Top management	6	1.6
Accounting and finance	24	6.3
Food & beverage and supplying	142	37.4
Rooms	143	37.6
Marketing	14	3.7
Human resources	10	2.6
Facilities management	41	10.8
Total	380	100.0

*Valid number for PU, PEOU and IU in Figure 1.

In Table 2, information on the scales and items used to measure the three outcome variables are presented: PU consisted of 5 items taken from Davis (1989), and Chin and Todd (1995); PEOU was measured using 4 questions developed by Davis (1989),and Adams, Nelson and Todd (1992); and, 3 items taken from Ajzen and Fishbein (1980) were used for IU. A Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) were used for measuring 12 items in the technology acceptance model (TAM) factors of the research model. 3 of the demographic data variables were used in the model: The gender (GEN), age (AGE) and level of education (EDU) factors were measured with categorized scales (see Table 1).

Table 2

SCALES, ITEMS AND SOURCES

Perceived usefulness
PU1. Using technology increases my productivity.
PU2. Using technology improves my job performance.
PU3. Using technology enhances my effectiveness on the job.
PU4. Using technology makes it easier to do my job.
PU5. Overall, I find technology useful in my job.
Davis (1989), Chin & Todd (1995).
Perceived ease of use
PEOU1. Learning to operate technology is easy for me.
PEOU2. I find it easy to get the technology to do what I want it to do.
PEOU3. My interaction with the technology is clear and understandable.
PEOU4. Overall, I find the technology easy to use.
Davis (1989), Adams et al. (1992).
Intention to use
IU1. I intend to use technology in my job when it becomes available to me.
IU2. I intend to use technology for my customers as often as needed.
IU3. To the extent possible, I would use technology with my customers and management frequently.
Ajzen & Fishbein (1980)

RESEARCH ANALYSES

Kaiser-Meyer- Olkin (KMO), Barlett's test of sphericity and Measures of Sampling Adequacy (MSA) tests were performed with SPSS for sampling adequacy. For questionnaire scales, an explanatory factor analyses (Kaiser-Meyer- Olkin and Barlett's Test, Maximum Likelihood and Direct Oblimin Rotation Method) were used. The internal consistency values for each of factors in the model were computed using Cronbach's alpha reliability analyzes. Overall measurement quality was determined using Confirmatory Factor Analysis (CFA) with Lisrel software. Structural Equation Modeling was used to evaluate the assumed hypotheses and to determine the relationships between external variables (gender, age and level of education) and the technology acceptance model (TAM) factors (PEOU, PU and PEOU).

Results

The values of the sampling adequacy for PU, PEOU and IU constructs of the extended the technology acceptance model (TAM) were consistent. Kaiser-Meyer- Olkin (KMO) test result was 0.94. Significance values for Barlett's test of sphericity showed reliability with the value of p=0.00. Measures of Sampling Adequacy (MSA) values were between 0.926 and 0.961. Results of the factor analysis with Maximum Likelihood and Direct Oblimin Rotation Methods approved the research data. The data proved that the indicators are consistent in terms of their internal consistency: The composite reliabilities of the technology acceptance model constructs ranged from 0.80 to 0.93. The reliabilities, means, standard deviations and spearman correlation coefficients related to the scales are presented in Table 3. Because of composite relia-

bility value of 0.80 for the IU construct, item 3 with the low factor value of 0.54 was retained in the factor to check it also with CFA. After these analyses, all data values of results were determined suitable for, and included into the further tests.

Table 3
RELIABILITIES, SCALES MEANS, STANDARD DEVIATIONS AND CORRELATIONS

Construct (number of items) [Category: minimum; max.]	Croanbach's Alpha	Mean[a] Mod[b]	1	2	3	4	5	6
1. Perceived usefulness (5)	0.93	4.47[a]	1					
2. Perceived ease of use (4)	0.92	4.24[a]	0.693*	1				
3. Intention to use (3)	0.80	4.30[a]	0.618*	0.646*	1			
4. Gender [1; 2]		1[b]	-0.051	-0.073	0.028	1		
5. Age [1; 4]		2[b]	0.075	-0.028	0.062	0.074	1	
6. Level of education [1; 5]		3[b]	0.147*	0.113**	0.134**	-0.09	-0.051	1

*p < 0.01; **p<0.05.

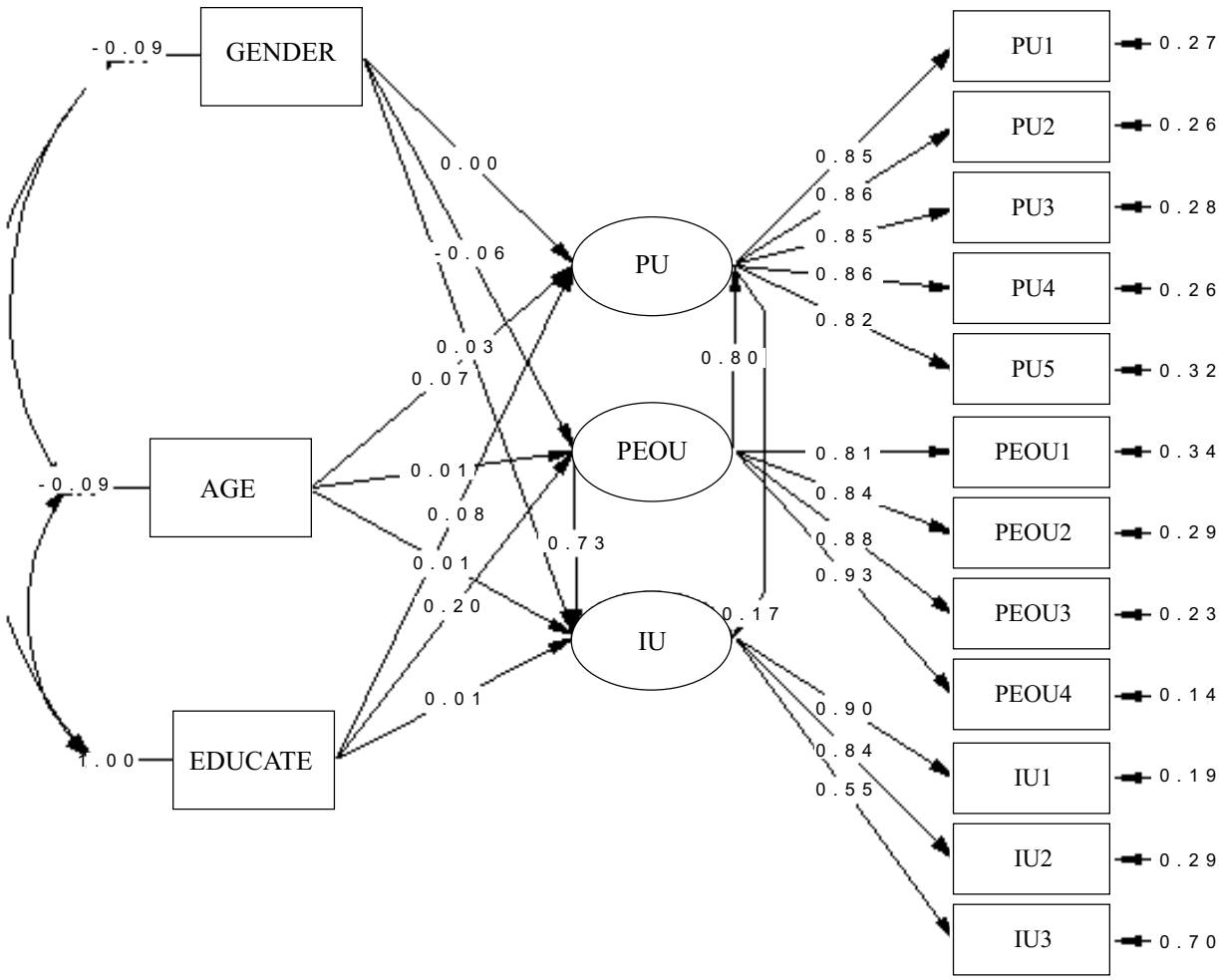
MEASUREMENT MODEL

CFA for the test of measurement model was performed with Lisrel. The results of CFA approved the exploratory analysis outputs. The measurement model had a Chi-square of 162.41 (p= 0.000) with 48 degrees of freedom (df). The ratio of chi-square/df of the measurement model was 3.38. The root mean square error of approximation (RMSEA) of the measurement model was 0.078, and the root mean square residual (RMSR) was 0.021, indicating an acceptable fit (Hooper, Coughlan, & Mullen, 2008; Reisinger, & Mavondo, 2006). Overall, the measurement model indicated an acceptable fit with a normed fit index (NFI) of 0.98, and a comparative fit index (CFI) of 0.99 (Hu & Bentler, 1999). The goodness-of-fit index (GFI) is 0.94, the adjusted goodness-of-fit index (AGFI) is 0.90, and the parsimony normed fit index (PNFI) is 0.71. CFA results confirmed the overall measurement quality of the research model (Gerbing, 1988).

RESEARCH MODEL

The test findings of the structural equation model shown in Figure 2 represent an acceptable fit of the data. The resulting Chi-square is 275.96 with 78 degrees of freedom (Chi-square/df = 3.54, p< 0.000, RMSEA= 0.080, RMSR=0.025, GFI = 0.91, AGFI = 0.87, NFI=0.97, CFI=0.98) (Hooper, Coughlan, & Mullen, 2008). Standardized path coefficients and their corresponding t-values and results related to the research model hypotheses are presented in Figure 2 and Table 4.

Figure 2
INITIAL STRUCTURAL MODEL



Chi-Square=275.96, df=78, P-value=0.00000, RMSEA=0.80

Hypothesis H1 predicted that PU has a positive affect on IU. As expected, path coefficient from PU to IU was statistically significant ($p < 0.01$) and this hypothesis was accepted (Figure 2 and Table 4). H2a suggested that PEOU has a positive affect on PU. H2b predicted that PEOU positively affects IU. Standardized path coefficients support both hypotheses ($p < 0.01$). Hypotheses of H3a, H3b and H3c, predicted that gender has a significant relationships with PU, PEOU and IU. Contrary to expectation, the path coefficients did not indicate any significant relationships with PU, PEOU and IU ($p > 0.05$) (and these hypotheses were rejected.

Table 4
RESULTS OF HYPOTHESIS TESTS

Hypothesized paths		t Values	Standardized path coeffi.	Results
H1	Perceived usefulness - Intention to use (PU–IU)	2.62 *	0.17 *	Supported
H2a	Perceived ease of use- Perceived usefulness (PEOU-PU)	15.68 *	0.8 *	Supported
H2b	Perceived ease of use - Intention to use (PEOU–IU)	10.15 *	0.73 *	Supported
H3a	Gender - Perceived usefulness (GEN–PU)	0.09	0.00	Not supported
H3b	Gender - Perceived ease of use (GEN–PEOU)	-1.19	-0.06	Not supported
H3c	Gender - Intention to use (GEN–IU)	1.03	0.3	Not supported
H4a	Age - Perceived usefulness (AGE–PU)	2.15 *	0.07 **	Supported
H4b	Age - Perceived ease of use (AGE–PEOU)	0.25	0.01	Not supported
H4c	Age - Intention to use (AGE–IU)	0.18	0.01	Not supported
H5a	Level of Education - Perceived usefulness (EDU–PU)	2.18 *	0.08 **	Supported
H5b	Level of Education -Perceived ease of use (EDU– EOU)	3.8 *	0.2 *	Supported
H5c	Level of Education - Intention to use (EDU–IU)	0.36	0.01	Not supported

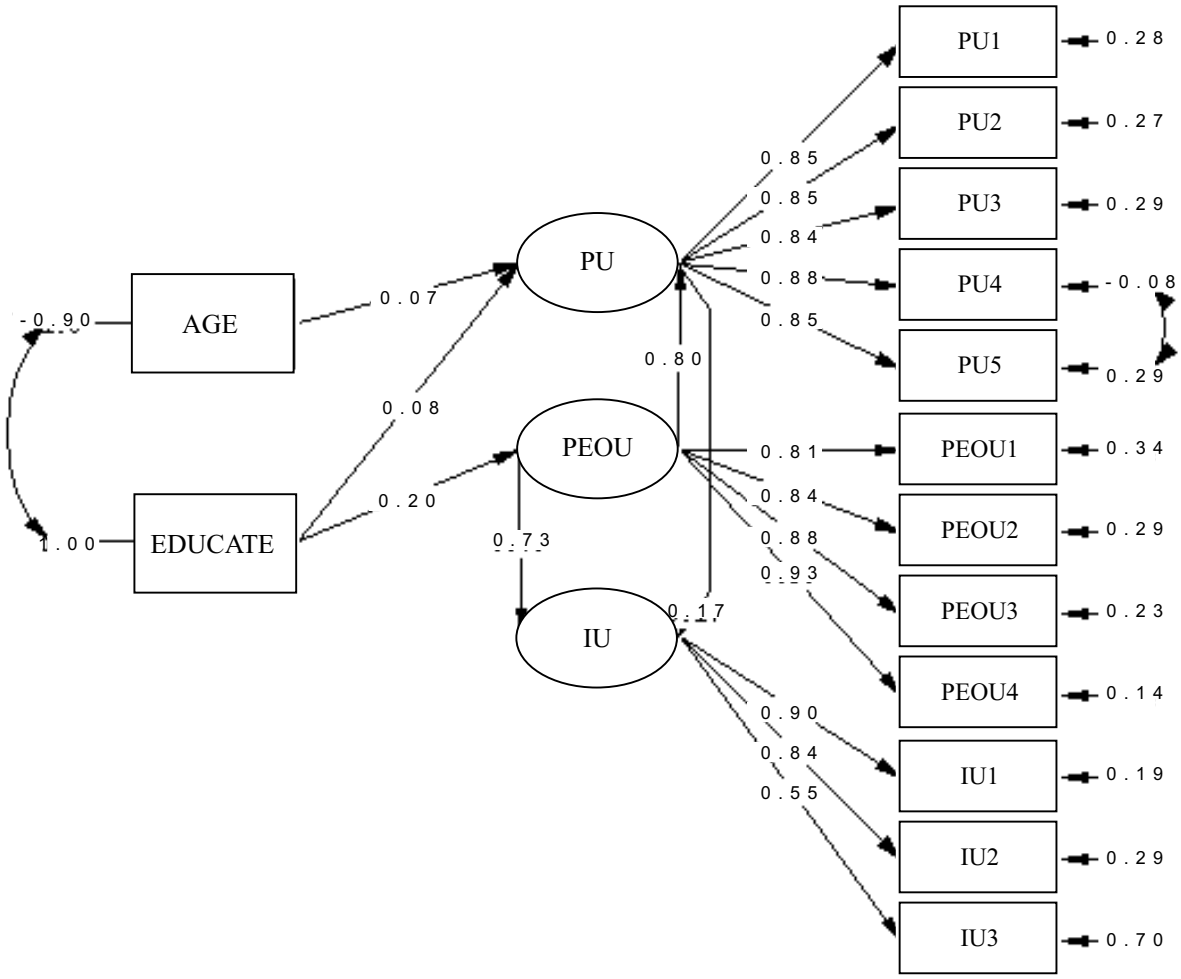
*p < 0.01, **p < 0.05; Chi-square = 275.96; df = 78; Chi-square/df = 3.54; p< 0.000; RMSEA= 0.080

Hypothesis H4a predicts that age (AGE) has a significant and negative impact on PU. As expected, path coefficient from age (AGE) to PU was statistically significant, but negatively (p< 0.01) and so that this hypothesis was also rejected. H4b and H4c suggest that age (AGE) has a negative affect on PEOU and IU. Path coefficient for H4b and H4c are not significant (p>0.05), and this suggestions were not supported. H5a supposes that level of education (EDU) positively affects PU. As expected, path coefficient between level of education (EDU) and PU was statistically significant at the 0.05 level, and this hypothesis was accepted. H5b suggests that an employee's level of education (EDU) would positively influence his or her PEOU, and standardized path coefficient supports this hypothesis (p< 0.01). H5c supposes that level of education (EDU) positively affects IU. As not expected, path coefficient between level of education (EDU) and IU was not statistically significant (p>0.05), and this hypothesis was not supported.

MODIFIED RESEARCH MODEL

The hypothesized research model was modified for further analysis: Rejected paths were crossed out from the hypothesized research model and a modified research model was designed for reanalyzing (Figure 3). After modification, the analysis results presented an acceptable fit of data for the modified model. This model had a Chi-square of 239.80 (p= 0.000) with 71 degrees of freedom (df). The ratio of chi-square/df of the model was 3.38. The root mean square error of approximation (RMSEA) was 0,078, and the root mean square residual (RMSR) was 0,025, indicating an acceptable fit (GFI = 0.92, AGFI = 0.88, NFI=0.98, CFI=0.98).

Figure 3
MODIFIED STRUCTURAL MODEL



Chi-Square=239.80, df=71, P-value=0.00000, RMSEA=0.078

All of the path coefficients obtained from these analyses related to the modified model were statistically significant (*p< 0.01 and **p< 0.05). These results showed that PEOU, age (AGE) and level of education (EDU) explained significantly 68% of the variance of PU, but the variance rate of PU explained by age (AGE) and level of education (EDU) were at a low level with the value of 6.1%. level of education (EDU) explained 4.1% of the variance of PEOU. PEOU and PU explained 76 % of the variance of IU (Table 5).

Table 5
THE RESULTS OF THE ANALYSIS OF THE MODIFIED MODEL

Hypothesized paths		t Values	Standardized path coeffi.	Results
H1	Perceived usefulness - Intention to use (PU – IU)	2.67 *	0.17 *	Supported
H2a	Perceived ease of use - Perceived usefulness (PEOU-PU)	15.67 *	0.8 *	Supported
H2b	Perceived ease of use - Intention to use (PEOU – IU)	10.17 *	0.73 *	Supported
H4a	Age - Perceived usefulness (AGE – PU)	2.01 **	0.07 **	Supported
H5a	Level of Education- Perceived usefulness (EDU–PU)	2.44 **	0.08 **	Supported
H5b	Level of Education-Perceived ease of (EDU–PEOU)	3.93 *	0.2 *	Supported
	Perceived ease of use	Perceived usefulness	Intention to use	
R^2	0.04	0.68	0.76	

*p<0.01, **p<0.05; Chi-square=239.80; df=71; Chi-square/df=3.38; p<0.000, RMSEA= 0.078.

Discussion and conclusions

The factors increasing the technology acceptance level were widely studied in the different sectors using various external variables based on the constructs of the technology acceptance model and the technology acceptance model 2. Social psychology theories suggest that behaviors are determined by subjective norms, individual differences and habits beside attitude and beliefs. It can be said that few studies include individual factors on their effects toward the acceptance of hotel information systems. Individual factors with widely differing demographic characteristics appear important in planning implementation and/or renovation and acceptance of hotel information systems. Hence, in this study, demographical variables of gender (GEN), age (AGE) and level of education (EDU) are applied as external variables to the technology acceptance model in order to determine the direct and/or indirect effects of demographic indicators on explaining of IU.

According to the results of the study, PEOU and PU have a significant affect on IU hotel information systems. Also PEOU has a mediating affect on IU through PU. These results confirm that the technology acceptance model part of the research model is valid in explaining the acceptance of hotel information systems by users and consistent to the findings related to the core technology acceptance model relations in the field.

In the model, explained variances for PU, PEOU and IU constructs were in order 68%, 4.1% and 80%. age (AGE) and level of education (EDU) have an effect at a low level with 6.1% in explaining the variance of PU.

As not expected, the results of analysis indicate that there is not any relation between gender (GEN) and PU, PEOU and IU hotel information systems. These findings are different to those of previous studies in the field (Lee, Lim, Jolly, & Lee, 2009; Venkatesh, & Morris, 2000; Venkatesh, Morris, & Ackerman, 2000).

Age (AGE) did not have any significant relationships with PEOU and IU. This unexpected situation supports the study of Agarwal and Prasad (1999) but does not the previous some results (Burton-Jones, & Hubona, 2005; Gomez, Egan, & Bowers, 1986; Harrison, & Rainer, 1992). The impact of age (AGE) on PU is significantly, but, as not expected, positively. This is not consistent to the previous findings (Agarwal, & Prasad, 1999; Burton-Jones, & Hubona, 2005; Gomez, Egan, & Bowers, 1986; Harrison & Rainer, 1992). However those having higher experience have higher beliefs while ageing (Agarwal, & Prasad, 1999): having a positive effect of age (AGE) on PU may be result from this reason.

The findings related to level of education (EDU) were partially consistent with the previous studies. As expected, level of education (EDU) has a significant and positive effect on PU and PEOU. This supports previous results (Ajzen, 1991; Davis & Davis, 1990; Hamner & Qazi, 2009). As not expected, level of education (EDU) does not have any significant direct influence on IU. This is not consistent to the previous studies (Ajzen, 1991; Davis, & Davis, 1990; Hamner, & Qazi, 2009).

Findings related to the acceptance of hotel information systems indicated that the core technology acceptance model relations resulted in just as well in a Turkish environment as they did in Western countries. Hotel information systems have a great potential in order to achieve higher level of service quality and of internal and external customer satisfaction with lower organizational costs. For profiting this big potential, firstly, it needs increasing the hotel information systems acceptance levels of the employees and external customers. Although our findings related to the demographic variables were partially consistent to the previous studies, this study showed that demographic variables can be used for further understanding of IU information technology with new antecedents to the technology acceptance model and the technology acceptance model 2 and variations.

Hotel managers aiming to achieve higher organizational outputs should be aware of the factors affecting their employees' acceptance in the process of accepting hotel information systems. The technology acceptance model extended with the individual variables will be a helpful tool for managers in better understanding this acceptance process. We believe in that this will helps managers in decision making process for the right choice of hotel information systems.

Our study had been performed using limited demographic factors in the five star hotel segment of an important destination of Turkey, so that it should be repeated with modifications for the diverse segments, regions and cultural environments to be able to generalize the results. Variables of time in job, experience of information technology and learning can be added to the new research models.

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