Perception And Adoption of Technology Based Services by Students of Higher education

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Abstract- It is very important for both businesses and governments to be able to understand and analyze the time and process through which a technology-based service will be accepted by potential consumers. They should understand all the motives and perceptions that may have an effect on customers' technology readiness as these factors could be part of new service development strategies. Customers' technology readiness must play a lead role on predicting the perception and behavior of consumers. People's beliefs about technology must be analyzed in order to determine their predispositions to use new technologies. In this research, which steps on Parashuraman's and Colby's study, the technology readiness index is tested within Greek culture and particularly higher education students. The goal is to find whether there are differences between the technology readiness index as it is and the technology readiness of Greek consumers.

Index Terms- : technology readiness, technology based services, technology segments

I. INTRODUCTION

On account of technologies' broadening characters in service delivery, it is necessary to comprehend customers' readiness to use technology-based systems such as e-service (Parasuraman, 2000; Burke, 2002; Lin et al., 2007). Customers' technology readiness (TR) should be taken into account in order to accurately predict the perception and behavior of customers (Parasuraman, 2000). Customer readiness (CR) is a mental desire that plays a role in determining whether to use and continue using SST (Lin and Hsieh, 2006; Parasuraman, 2000). Studies investigating predictors of technology usage have generally focused on ease of use, usefulness, and other technology design features (Meuter et al. 2005; Zhu et al. 2007) as well as consumer demographics and traits (Dabholkar and Bagozzi 2002; Bruner and Kumar 2007; Weijters et al. 2007).

Previous research on technology acceptance suggests that individual differences, including personality traits, generalized beliefs, and affects about technology, as well as demographics, may affect the acceptance (Im, Bayus, & Mason, 2003; Meuter et al., 2005; Parasuraman, 2000). For example, the lack of security feeling surrounding technology may negatively reflect on one's willingness to embrace technology based services. So, it is of great interest to gain an in-depth understating of which are the drivers that lead to the acceptance or rejection of technology acceptance (adoption and usage)

Considering the commercial value of technology, electronic services can be described as the result of a protracted industrial approach, research and development and continuously evolving innovation plans and actions. Given the fact that technology based services are introduced and promoted to specific target markets, the importance the process of consumer's adoption process must be highlighted. The innovation in technology has changed how services are conceived and delivered (Massey et al. 2007). It offers customers convenient channels to access services, allows producers to better meet customer demands, and increases customer satisfaction (Liljander et al. 2006).

Diffusion is a process whereby an innovation spreads across a population of potential adopters over time through various channels (Fichman and Kemerer, 1999). Individuals within the cultures are not passive recipients of innovations. Although it varies in terms of the extent, they seek innovations, experiment with them, evaluate them, develop feelings about them, complain about them, and gain experience with them often through dialogue with other users (Greenhalgh et al., 2004). Consequently, the element of interactivity, that characterizes technology based services, creates experiences and value for the customer, resulting to a high diffusion rate. Also the characteristics of an innovation have a major impact on its rate of adoption among members of a social system (Rogers, 2002).

Fifteen years ago, the Clinton Administration stated that "Over the next decade, advances on the GII [Global Information Infrastructure] will affect almost every aspect of daily life, education, health care, work, and leisure activities. Disparate populations, once separated by distance and time, will experience these changes as part of a global community."

According to David Dean et al (2012), the Internet has become pervasive and its economic impact considerable. It will represent more than 5 percent of GDP in the G-20 nations by 2016, and in the most advanced countries, that figure will exceed 12 percent. As The Boston Consulting Group's latest update to the BCG e-Intensity Index indicates, the gap between the world's Internet leaders and laggards is widening. Governments of countries that are at the top of the e-Intensity Index rankings-or are rapidly moving up-encourage Internet use among consumers, businesses, and within government itself, because they recognize that it can be a powerful edge in the competitive global economy. Countries further down the list in many cases have failed to implement effective policies that encourage widespread adoption and use. These countries risk falling further behind if they do not act.

The digital economy is often described as the "always on" or "real time" economy. The challenge for governments and businesses is to be always on too, in touch with the technology's impact on their functions and continually evaluating ways to promote its use. Governments and businesses need to adopt a different style of policymaking. By choosing the right approach and organizing themselves accordingly, they can make sure that

they keep up with the best and move ahead by promoting their technology based services' particular advantages.

II. TECHNOLOGY READINESS

Technology readiness refers to people's propensity to embrace and use new technologies for accomplishing goals in home life and at work (Parasuraman, 2000). TR construct can be viewed as an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person's predisposition to use new technologies. At the measurement level, the Technology Readiness Index (TRI) was developed to measure people's general beliefs about technology. TR construct comprises four sub-dimensions: optimism, innovativeness, discomfort, and insecurity. Optimism relates to a positive view of technology and a belief that technology offers people increased control, flexibility, and efficiency. Innovativeness refers to a tendency to be a technology pioneer and thought leader. Discomfort consists of a perception of lack of control over technology and a feeling of being overwhelmed by it. Insecurity involves distrust of technology and skepticism about its ability to work properly (Chien-Hsin Lin, 2007).

Optimism and innovativeness are drivers of TR, while discomfort and insecurity are inhibitors. Positive and negative beliefs about technology may coexist, and people can be arrayed along a technology belief continuum from strongly positive attitude at one end to strongly negative attitude at the other. The correlation between people's TR and their propensity to employ technology is empirically confirmed by Parasuraman (2000). Consumers' TR has a positive impact on their online service quality perceptions and online behaviors, but empirical findings are scarce (Zeithaml, Parasuraman, & Malhotra, 2002) and confounding (Liljander, Gillberg, Gummerus, & van Riel, 2006). Therefore, the role of TR may be minor in explaining individuals' online behaviors (Liljander et al., 2006). The limited knowledge about TR constitutes a need to investigate TR in a broader framework.

In describing TR, Parasuraman and Colby (2001) identify five distinct groups: Explorers, Pioneers, Skeptics, Paranoids, and Laggards. Explorers score higher on the contributors (optimism, innovativeness) and lower on inhibitors (discomfort, insecurity) than the other segments. Explorers are a relatively easy group to attract when a new technology-based product or service is introduced and represent the first wave of customers. Laggards are the opposite of Explorers, ranking lower on the contributor factors and higher on the inhibitor factors than all the groups as a whole. Laggards are also typically the last group to adopt a new technology-based product or service Demirci A. E. et al (2008).

The middle three segments (Pioneers, Skeptics, and Paranoids) have more complicated beliefs about technology. Pioneers share the optimism and innovative beliefs of Explorers, but they simultaneously feel some discomfort and insecurity. They desire the benefits of technology, but are more practical about the difficulties and challenges. Skeptics tend to be dispassionate about technology, but also have few inhibitions; thus, they need to be convinced of the benefits. Paranoids may find technology interesting, but they are also concerned about risks, and exhibit high degrees of discomfort and insecurity (Massey, Khatri and Montoya-Weiss, 2007). According to Parasuman's results, Table 1 shows the characteristics of technology segments (Jaafar et al., 2007).

Table 1. Characteristics of technology segments

Technology segments	Optimism	Innovativeness	Discomfort	Insecurity
Explorers	High	High	Low	Low
Pioneers	High	High	High	High
Skeptics	Low	Low	Low	Low
Paranoids	High	Low	High	High
Laggards	Low	Low	High	High

Source: Parashuraman (2000)

III. RESEARCH METHODOLOGY

The Technology Readiness Index (TRI), developed by Parasuraman (2000), was used as the survey measurement for this study. TRI is a multi-item scale comprising 36 technology belief statements, both positive and negative, related to one of the four TR dimensions. Each item was rated on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). All the statements in the survey instrument were mandatory. As the survey instrument was designed originally in English, a pilot study was carried out with 30 people to test the clarity of the statements translated into Greek. The final shape was given after the necessary corrections were made. Answering all the questions in the survey took the participants' 6-8 minutes.

1200 students were reached, through convenience sampling method, and were asked to fulfill the questionnaire from which 748 statistically usable answered questionnaires were gathered. 38 questionnaires were not taken into consideration as the answers were not complete or statistically unusable. The rate of return in this study is 62.3%.

The respondents were divided according to the area of science that they study: economic, law and political sciences, philosophy (which include psychology, philosophy, pedagogy etc), faculty of sciences (which include mathematics, chemistry, biology, informatics etc) and independent faculties (which include agriculture, theology, fine arts etc.).

IV. RESULTS

Of the 748 respondents 54.28 percent were male and 45.72 wee female. Almost 20% of them were at their first year of study, almost 24% at their second, 45.72% at the third and finally 10.56% were at their last year of their studies. 26.20% were studying in a school that is included in the faculty of economic, law and political sciences, almost 22% in a school that belongs to the faculty of philosophy, 33.02% in a school of the science faculty and lastly 18.85% were students in a school in the faculty of independent studies, Table2.

Table 2. Study demographics

Study demographics		
Characteristics	Frequency	Percentage
Gender		.
Male	406	54.28
Female	342	45.72
Year of study		.
First	148	19.79
Second	179	23.93
Third	342	45.72
Fourth	79	10.56
Type of studies	.	
Economic, law, and political sciences	196	26.20
Philosophy	164	21.92
Science	247	33.02
Independent faculties	141	18.85

As stated above there are 36 items in total which may drive or inhibit technology readiness in the TRI measurement scale of Parasuraman. Two-level principal component factor analysis was implemented in order for the variables to be sorted out. used in this study. Eleven items had loadings less than 0.40 and they were excluded from the final analysis which was performed with the remaining items. In concordance with Kaiser's (1974) criteria, only the factors with eigenvalues greater than 1 were retained; and only the items with factor loadings and communalities greater than 0.40 were included in the final factor structure.

Each factors' internal consistency was confirmed through the estimation of the Cronbach's alpha values for each dimension. The Kaiser-Meyer-Olkin (KMO) was 0.820, indicating that the sample was adequate for factor analysis (Kaiser, 1974).

The results of the principal component analysis revealed five factors that had eigenvalue equal or greater than 1. There was a total of 56.2 of the variance. The names of the factors were Innovativeness, Optimism, Discomfort, Insecurity and Suspiciousness. Innovativeness had the greater significance of all factors, according to the results of the factor analysis, with 21.48 of the total variance. The five elements concerning the level of the readiness that people have towards an innovation were included.

Table 3. Factors and items on technology readiness

Factors and items on TR

Factors	Mean	Standard Deviation	Factor Loadings	Cronbach 's Alpha	Eigenvalues (% of variance)
Innovativeness				,870	5,986 (21,48%)
INN2	3,64	0,89	0,63		
INN3	3,82	1,150	0,68		
INN5	4,14	0,98	0,79		
INN6	4,26	0,92	0,67		
INN7	3,75	0,82	0,84		
Optimism				,820	3,285 (13,80%)
OPT1	3,13	,960	0,64		
OPT2	3,89	1,110	0,78		
OPT4	4,84	1,280	0,52		
OPT6	4,01	1,070	0,59		
OPT7	4,16	0,88	0,68		
OPT8	3,82	1,16	0,54		
OPT9	3,08	1,21	0,71		
OPT10	3,94	0,87	0,76		
Discomfort				,840	2,532 (9,12%)
DIS2	3,46	0,94	0,61		
DIS3	3,95	0,93	0,82		
DIS6	4,57	1,040	0,76		
DIS7	3,05	1,09	0,89		
DIS10	4,56	1,13	0,63		
Insecurity				,670	1,687 (6,7%)
INS1	4,28	1,28	0,61		
INS3	4,08	1,32	0,72		
INS5	3,92	1,01	0,59		
INS7	3,88	0,85	0,67		
INS9	3,25	0,87	0,76		
Suspiciouness				0,76	1,237 (5,10%)
DIS8	3,94	1,14	0,87		
DIS9	4,58	0,99	0,76		

The factor that was second in significance was Optimism. It explained 13.80 of the total variance and it includes eight elements that are refer to the level of optimism that people show towards technology-based services. The third factor, called Discomfort, explained 9.12 of the total variance and it is consisted of five elements that are related to the discomfort that people show towards technology-based services.

The fourth factor, named Insecurity, explained 6.7 of the total variance and is consisted of five elements that are related to the feelings of insecurity that people have towards technology-based services. The last factor, called suspiciousness, explained 5.10 of the total variance and is consisted of two elements that are related with the feelings of suspiciousness that people show towards technology-based services . All factor loadings were greater than 0.40 and the cronbach alphas are greater than 0.69, while the total scale reliability is 0.67

According to the ANOVA and t-tests results on the demographics in respect each technology readiness factor, it was found that insecurity, in terms of gender, was the one that was significantly different from the other factors. Concerning the year of study, none of the factors of technology readiness were found to be statistically different. Discomfort and insecurity were statistically different according to the types of study.

Table 4. Demographics and factors of technology readiness

Factors	**Gender**		**Year of study**		**Type of studies**	
Innovativeness	1.954	.028	0.358	0.742	1.715	0.107
Optimism	0.513	.487	0.323	0.861	2.304	0.049

Discomfort	0.832	.692	1.102	0.289	4.998	.000**
Insecurity	-2.712	.000**	1.080	0.379	4.237	.009**
Suspiciousness	0.089	.924	0.053	0.887	2.017	.112
						*p<0.05, **p<0.01

V. CONCLUSIONS

In this research, as stated above, the technology readiness index is tested within Greek culture and particularly higher education students. The aim of this study was to find whether there are differences between the technology readiness index as it is and the technology readiness of Greek consumers.

The survey results showed clearly that insecurity, in terms of gender, is the only factor of technology readiness that was found to be statistically different. This means that gender affects the feelings of security that people have towards new technology based services. Discomfort and insecurity are statistically different, in terms of type of study. In this case feelings of discomfort and insecurity towards technology based services are affected by the field of each students' study.

VI. . LIMITATIONS AND FURTHER RESEARCH

The study is limited on a special sector of consumers that is university students. University students belong in a specific age range and may have different behaviors from people older people. Further research on a more diversified sample could provide more detailed results about the connection of technology readiness and the perception and adoption of technology based services.

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