New Technology Acceptance in Europe and Arabic Cultures: Comparative Study

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Abstract

Many of the empirical researches have been done in western society and fewer researches have been done in Asia societies, especially Arab culture, where values differ significantly. In this paper, we compare Yemen (from Asian Arab countries) with Portugal (from Western Europe) in terms of new technology acceptance, related to ATM machine authentication mechanisms. We distributed the same questionnaire at the same time. The results support the previous studies concerning the relation between perceive of ease to use and intention to use. However, perceived usefulness has not significant effect over intention to use. In addition results suggest that security issues should be embedded within any technology acceptance model. Portuguese citizens showed more receptive to new technologies. However, Yemenis are more sensible to perceived usefulness.

Keywords: technology acceptance, intention to use, culture, Technology Acceptance Model, information security

Introduction

Technologies are designed to make our life easier. However user culture affects the acceptance and the effective utilization of those technologies. One of the reasons is that security systems (safe utilization) depend largely on human misbehavior, and this depends largely on cultural aspects (Dhamija, 2000).

To illustrate the cultural differences, we use the example narrated by Yeo (2009): "In the United States, the owl is a symbol of knowledge but in Central America, the owl is a symbol of witchcraft and black magic".

Culture is an important topic of research for global information systems (Myers, 2002) and among other aspects its effects should be considered on user behavioral patterns (Triandis, 1994). Moreover, it has an impact on the externalities of person's personality, the life and the life satisfaction (Genkova, 2009). National culture also plays a significant role on the relative levels of satisfaction and consensus across nations. To understand feelings and people behavior when faced with problems, we have to know the characteristics of their culture (Samarah, 2002). Culture is defined as the set of shared attitudes, values, goals, and prac-

tices that characterizes an institution, organization or group (Belshek, 2006).

Over the past decade it is noticed an increasing interest of IS (information Systems) research literature over the impact of cultural differences on the development and use of information and communications technologies (Myers, 2002). Many of the empirical researches have been carried out in western society but fewer researches have been done in Asia especially in Arab society, where culture and values differ significantly from the West (Quaddus, 2002).

Concerning biometrics adoption for the mainstream of authentication technologies, user acceptance is not yet resolved (Coventry, 2004). Many people think that new technologies will be easily adopted (Tibenderana, 2008). However, some illustrative cases challenge that assumption - as an example, the first mechanical cash issuer was deployed, but removed after six months due to the lack of customer acceptance (Rashed, 2010a). Therefore many studies have been carried out to discover the boundary of acceptance in different cultures especially the western culture. Arabic culture lacks these kinds of studies with few publications in this field.

TAM and other similar models are used to measure the technology acceptance level. It focuses on the perceived usefulness and ease of use to measure the intention to use the technology, as shown in figure 1.

Figure 1: Technology Acceptance Model (Rashed, 2010b)

Many people who have access to technology find the experiences of their interactions difficult and unhappy due to the complexity of such technology. Within certain cultures this is enough to motivate resistance against change. But technology can be accepted using certain sociological and economic conditions (Beekhuyzen, 2005). This is the case with biometrics and its application to ATM.

Several biometric technologies have the characteristics needed for acceptance such as ease to use and usefulness that formulate the essential pillars of TAM (Rashed, 2010b). Concerning application domain, financial services are considered a key market for the biometrics industry (Coventry, 2004).

This paper validates and studies the acceptance of biometrics for ATM, in Europe and Arab countries. The study was supported by the responses to a questionnaire that we distributed via a web site. Participation was promoted by direct calls to university environments, and so the results are only valid within that population.

The rest of the paper is organised as follows. In section 2; we overview the previous studies as literature review and address the problem statement. In section 3 we demonstrate our methodology and present the discussion. We conclude and present future work in section 4.

Literature Review

Johnston classified the Internet as a virtual cultural region. He believed that with millions of users from all over the world, the Internet had developed its own culture. He also mapped the Internet culture using Hofstede's cultural (Rashed, 2010a).

Kersten et al. have produced a number of research reports on the influence of culture in international business negotiations. They also used Hofstede's cultural dimensions in their experiments.

Their results confirmed that considerable cultural differences exist in both negotiation expectations and process (Kersten, 2011).

Quaddus et al. (2002) studied culture factors that affect the decisions among groups. They found that culture plays a significant role in decision making and the type of technologies used in decision support. They found that people with different values, preferences and beliefs, tend to view and use decision conference differently. They considered the issue of cultural differences as one potential source of explanation for differences in studies' results.

Myers criticized the concept of national culture and argued that it ignores the facts of history and has little explanatory power. He stated that IS researchers interested in conducting research on culture and globalization should adopt a more dynamic view of culture. He believed that the concept of national culture is problematic as there is no necessary alignment between culture and the nation-state. He stated that the nation-state is a relatively recent invention and had changed in its form and makeup. Moreover, he thought that many nation-states do not have a common basis in race, culture or language (Myers, 2002).

Mao extended a US based research model and applied it on Chinese culture. He compared his findings with the existing studies and found that his findings supported previous North America studies. Moreover, he confirmed the suitability and applicability of TAM, TRA (Theory of Reasoned Action) and IDT (Innovation Diffusion Theory) to study IT acceptance in Chinese culture (Rashed, 2010b).

Twati studied the cultural norms and beliefs within multi-national organizations in two regions: Arab countries on South Africa (Libya) and Arab countries on the Persian Gulf (Kuwait, Oman, Saudi Arabia, and United Arab Emirates). The study revealed that the two regions were not homogeneous. In addition, the study showed that age, gender, and education levels are factors contributing to the success of MIS (Management Information Systems) adoption in the two regions. Furthermore, the study showed differences in organizational cultures that impact upon MIS adoption in both regions. The Persian Gulf region was dominated by an adhocracy culture that values the adoption of MIS, whereas the North Africa region was dominated by the hierarchy culture type that favors a centralized management style, which impacts negatively MIS adoption. The Persian Gulf region did not show any significant effect on technology acceptance variables. However, in the North Africa region, technology acceptance played a vital role in MIS adoption (Twati, 2009).

Rose and Straub examined technology acceptance in five Arab cultures, three Asian (Jordan, Saudi Arabia, and Lebanon), two African countries (Egypt and the Sudan). They examined the ease of use and perceptions of usefulness. They studied the role of the two factors in actual usage decision and perception of usefulness (Rose, 1998). Their findings were consistent with the majority of TAM findings in the US.

Kripanont (2007) studied the Internet usage behaviour and behaviour intention to use. The survey included 927 academics within business schools in 20 public universities in Thailand and yielded 455 usable questionnaires, with a response rate of 49%. The presented model is expected to have the power to explain and predict user behaviour in a Thai business school environment and might help practitioners to analyze the reasons for resistance toward the technology and also help them to take efficient measures to improve user acceptance and usage of the technology.

Ramayah et. al., studied and examined the intention to use an online bill payment among part time MBA students in Malaysia University of Sciences, Penang. They developed and modified the extended technology acceptance model and social cognitive theory, to identify factors that would determine and influence the intention to use an online bill payment system. They conducted a survey that involved 120 students. They found that perceived ease of use and

perceived usefulness are the significant drivers of intention to use the online bill payment system. Furthermore, they found that subjective norm, image, result, demonstrability and perceived ease of use were the key determinants of perceived usefulness, whereas perceived risk was found to have a negative impact on usefulness level. Moreover, computer self-efficacy played a significant role in influencing the perceived ease of use of the online bill payment system (Ramayah, 2010).

Rashed et. al. wondered about using new biometric technologies (namely odour) as an authentication tool. They discussed its usage, advantages, disadvantages and user acceptance. They applied and tested TAM on the Arab culture and their findings were consistent with previous studies (Rashed, 2010b).

Discussion

The questionnaire used in this study included two parts. The first part looks for general information about the participants' background, like education and age. Respondents of the two groups (Portugal and Yemen) are young and educated. Figure 2 shows that the most frequent ages of both groups was within the interval [20-30], which represents young people. In both groups most of the respondents were IT connoisseurs. Most of the Portuguese respondents were master students whereas most Yemenis are at a BSc level.

Variable		Portuguese	Yemenis
Age	15-20	0,17	0,11
	21-30	0,46	0,69
	31-40	0,35	0,17
	More than 41	0,02	0,03
Specialization	IT	0,83	0,72
	Engineering	0,13	0,17
	Medicine	0,00	0,05
	social sciences	0,02	0,05
	Others	0,02	0,00

Figure 2: Sample profile

Figure 3 shows that 41% of the Yemenis respondent group and 36% of Portuguese respondent group think the idea of using odour in ATM would be easy to use (extremely or slight likely), whereas 35% of Portuguese group did not have an opinion. 25% of the Portuguese group reported that it would not be easy to use odour for authentication systems, against about 12% of the Yemenis that have the same opinion.

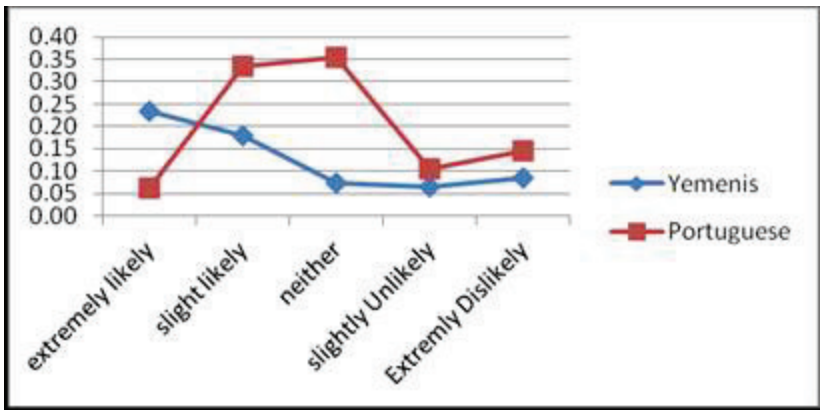

Figure 3: Perceived ease of use

Figure 4 shows that 46% of Yemenis and 26% of Portuguese thought that odour would improve the performance of their lives. 31% of Portuguese respondents did not think that odour would improve their lives performance. However, 43% of Yemenis and 40% Portuguese respondents did not have an opinion.

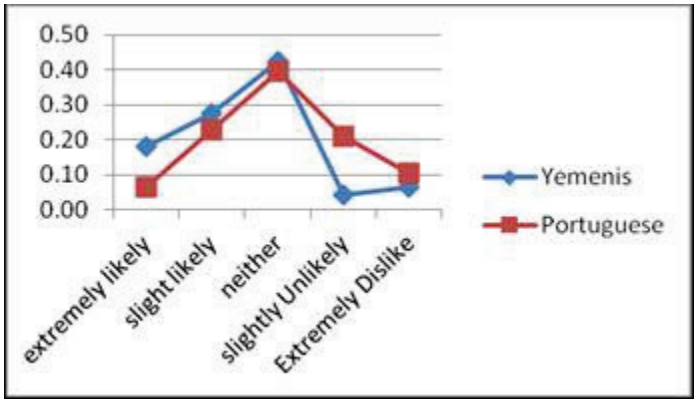

Figure 4: Odour and life performance

Concerning intention to use odour in ATM machines; 27% of Yemenis and 43% of Portuguese reported that they would use odour in ATM as an authentication method, if it is available. 26% of Portuguese and 33% of Yemenis reported that they would not use odour as an authentication tool. 39% of Yemenis and 31% of Portuguese did not have an opinion (see Figure 5).

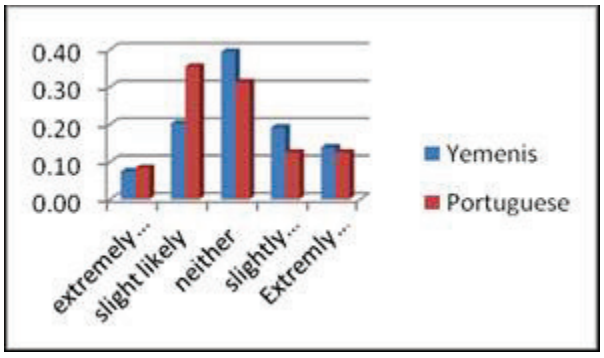

Figure 5: Intention of use

45% of the Portuguese and 21% of Yemenis respondents reported that they liked the idea and 27% of Portuguese and 54% of Yemenis did not like the idea. 26% of Yemenis and 27% of Portuguese did not have an opinion (see Figures 6 and 7).

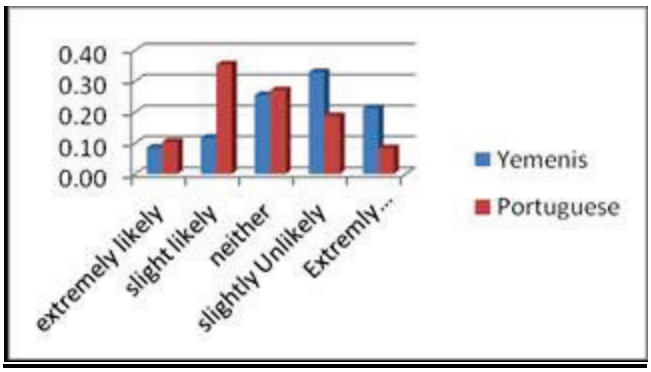

Figure 6: Idea of using odour

	Standard Deviation	
	Yemenis	Portuguese
Perceive ease of use	0.76	0.13
Perceive usefulness	0.16	0.13
Intention to use	0.11	0.12

Figure 7: Descriptive Analysis

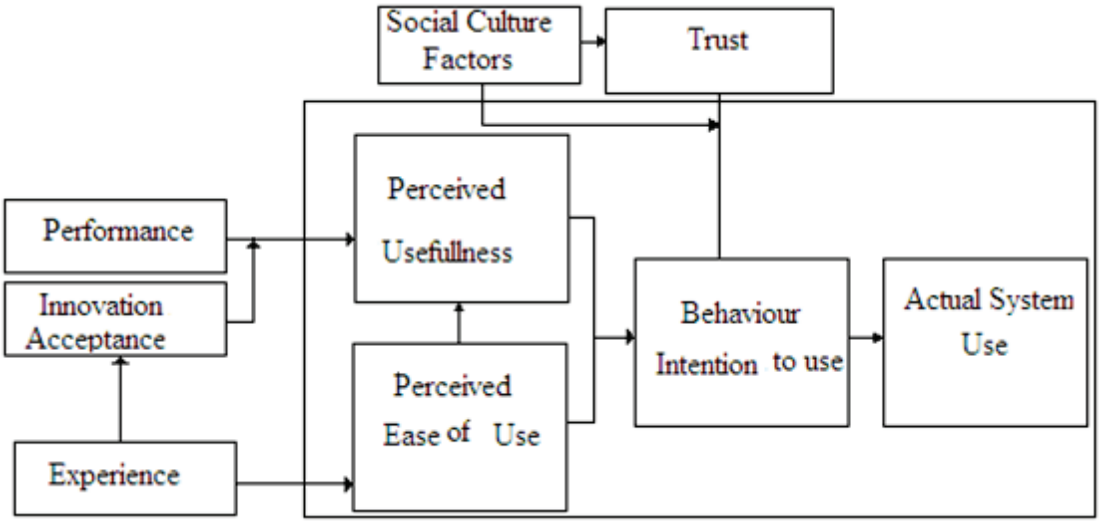

Figure 8: Proposed Model

Figure 8 shows that security issues should be embedded within any technology acceptance model. We believe that perceive usefulness depends on the perceived performance innovation and experience.

Conclusion

Yemenis perceived the ease of use and perceived usefulness more than Portuguese. However, Portuguese showed more receptive to new technologies. Portuguese showed more consistency in correlation between the perceived usefulness and ease of use, and intention to use. Finally, Portuguese group in their comments showed more worries about risk that might affect the users; security is still the first issue for the users, so we suggest adding user concerns to the model. The reason is that user would prefer difficult tool if it is secure.

Acknowledgement

This work was funded by FEDER through Programa Operacional Fatores de Competitividade – COMPETE, and by national founds through FCT – Fundação para a Ciência e Tecnologia, under project: FCOMP-01-0124-FEDER-022674.

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