System Characteristic Facilitates the Acceptance of Information Technology in Middle East culture

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Abstract

Purpose: *In order for the organizations to realize the full benefits of the application of IT, it is important for those who have to use the technology to accept it. This study aims to investigate the factors influencing the acceptance of technology in public sector such as System characteristics (information quality) in the theory of technology acceptance in order to provide better understanding for the factors influencing the acceptance of information technology among the individual perceptions. In addition, The study is to test the success of the technology acceptance model in Yemen culture. Knowing what makes employees accept or resist to some technology is important so that the investment made on the IT application yields a good and satisfactory return. The study also aimed to highlight the role of System characteristics such as information quality in facilitating information transaction between top management and government.*

Methodology: *survey questionnaire was distributed to 53 government utilities and 357 cases were used in the analysis. Structural Equition Modeling AMOS 18 was used for the analysis of the proposed model.*

Findings *the study has provided empirical evidence for the positive effect of System characteristics such as information quality on preceved usefulness and ease of use wich in turn has positive effect on the intention behaviour to use towards the actual usage for the technology. the study confirmed the theory of TAM and showed its potential capability in the Middle East, particularly in Yemen. Empirical evidence has shown that the employees and managers have the capability to use the technology.*

Significance: *This study has provided empirical evidence for the effects of new technology determinants in the government sector. In particular, it has successfully revealed that System characteristics such as information quality is important determinants in influencing the adoption of technologies. Also for the practicul usage, the study contributed to the empirical knowledge to increase the success rate for accepting or adopting the information technology in the government sector.*

Keywords: Technology Acceptance Model, System characteristics, information quality, Structural Equition Modeling, Yemen

Literature Review

Importance of the Information Technology (IT)

Information and communication technology (ICT) offers more opportunities for economic development and plays a very important role in international competitiveness, rapid economic change, and productive capacity of improvements for developing countries. ICTs offer the developing countries many opportunities, as it has done in the developed world when it created unprecedented possibilities for them. Studies have emphasized that there is evidence of a strong linkage between GDP growth and ICT investment showing the importance of ICT investment for development Seo, Lee, Oh, (2009).

Acquiring IT to support business needs is clearly a crucial prerequisite to exploiting the potential of IT. Unfortunately acquiring appropriate IT is a necessary but not a sufficient condition for utilizing it effectively. Organizations (i.e. leaders and managers) make primary adoption decisions, yet it is individuals within the firm who are the ultimate users and consumers of IT. Thus, it is evident that true business value from any IT would derive only through appropriate use by its target user group. In other words, systems that are not utilized will not deliver the returns anticipated by managers.

Evidence suggests that individual users can exhibit a variety of different behaviors when confronted with a new IT: they may completely reject it and engage in sabotage or active resistance, they may only partially utilize its functionality, or they may wholeheartedly embrace the technology and the opportunities it offers (Agarwal, 2000). Obviously, each behavior has some consequential outcomes both negative and positive for managers (Robey, Boudreau, 1999).

System Characteristics

According to the study conducted by Agarwal (2002), individual characteristics, institutional characteristics and social characteristics are not the only factors that interact with each other to influence technology acceptance. But they even interact with technology (system) characteristics to influence technology acceptance. This proposition was supported by Park et al. (2006), who found that individual characteristics interacted with technology characteristics to influence technology acceptance.

Various technology characteristics have been studied that could affect technology acceptance such as relative advantage, result demonstrability, the ability for trial ability trial (trialability), visibility, image, compatibility, voluntariness (Venkatesh, Morris, Davis, & Davis, 2003) and information quality. The present study considers information quality as a determinant of the system characteristics as it theoretically affects technology acceptance thought its interaction with individual characteristics, institutional characteristics and social characteristics.

Information Quality

According to the study conducted by Ahn, Ryu, and Han (2007), information quality (output quality) is considered an important determinant of technology (system) characteristics which can provide an in-depth understanding of technology acceptance. Information quality has been defined as the type, level of detail and variety of information which are determined during the system design and development phase while the timeliness, accuracy, and reliability result from the system operations (Ahn et al, 2007). Information quality also refers to the report content which is considered as a measurement of user perceived effectiveness for the quality of the information (Srinivasan, 1985; Ahn et al, 2007). The information content includes accuracy, relevance, adequacy, and understandability of report contents, while form includes quality of format, timeliness of reports, manner of presentation, and result of information (Srinivasan, 1985).

Most of the studies conducted regarding technology acceptance found that information quality is an important factor of technology acceptance. But some studies considered information quality as being important from the vendor's perspective while other studies considered information quality as being important from the user's perspective. Among the studies which considered information quality as being important to facilitate the acceptance of the technology from the vendor's perspective are the one conducted in Malaysia by Mohd, Syed Mohamad, and Zaini (2005). They examined the relation between information quality and the acceptance of doctors of Electronic Medical Record System (EMR) in one Malaysian hospital. The study found that information quality has a significant impact on perceived usefulness and perceived ease of use toward using the system. The study concluded that it is important for system designers to communicate effectively with the end users about the information quality factors.

From the user's perspective, by Chismar and Patton (2002) conducted a study among physicians to examine their intention to adopt Internet-based health applications by using the applicability of the TAM2 in Hawaii. The study found that the important factor for predicting the intention to use the system is the usefulness of the technology and the sufficiency of the output quality for their daily work. Similar result was reported by Algahtani (2004), who aimed to enhance understanding of the acceptance of technology in different cultures. The study found that information quality, relative advantage, compatibility, observed ability and trial ability have a positive significant relation with the end user's acceptance while complexity was to have a negative effect on computer acceptance.

Ahn, Ryu, and Han (2007) conducted a study that aimed at testing the relationship between Web quality factors and user acceptance behavior with a focus on service quality. They also investigated the effect of playfulness on user acceptance of online retailing. This study supported the result of previous studies (Chismar & Patton, 2002; Mohd, Syed Mohamad, & Zaini, 2005) in which information quality has a positive impact on perceived ease of use and usefulness of a website. Information quality refers to as having these characteristics: various, complete, detailed, accurate, timely, relevant, and reliable. The same study found that system quality, information quality and service quality had significant effects on playfulness, ease of use, and usefulness, and this effect increases when mediated by ease of use.

Even service quality, system quality and information quality were found to have significant effects on intention of behavior to use. The quality of the Web has a significant effect on intention behavior to use, mediated by playfulness, ease of use, usefulness and attitude which are considered as user substantial beliefs.

Similar result was reported by Bani-Ali & Money (2005), who examined the relationships among computer self-efficacy, ease of use, project complexity, system functionality, information quality, performance impact, organization size, project size, user education, training, and experience level. The study found that system characteristics are the determinant factors affecting the new software usage. Information quality, system functionality, and ease of use have strong positive and direct relationships with using the new software. Also, information quality provided good explanatory power for the new software usage. Their result was confirmed by Staples, Wong, and Seddon (2002), who examined the effects of the implementation of a new system on its users, with a focus on the relationship between pre-implementation expectations and their perceived benefits based on post-implementation experience. The study's finding confirmed that system usefulness, ease of use and information quality have strong relations to information system success and user satisfaction. Saeed and Helm (2008) found that system integration and information quality are significant predictors of user perceptions regarding information system usefulness. Moreover, there is a significant effect of information quality on extended usage and system integration on exploratory usage which was only partially supported.

In sum, information system characteristics such as information quality offer critical motivation that influences the user's perceptions about the value of the information system and its importance. In other words, if users are convinced that the information system affects and supports their work at the post adoption stage, they will extend the usage and also experiment with how to apply the information system in various settings (Saeed & Helm, 2008).

Due to the fact that there was agreement in the previous studies concern the important of the effect of information quality on the usage of the technology. Based on the existing empirical evidence, this study considers information quality as an important determinant of the user's acceptance of the IT. Therefore, there is a need to investigate the effect of information quality on perceived ease of use and perceived usefulness towards the intention to use technology in different cultural and organizational settings, especially in the public sector.

Methodology

System Characteristics of Information Quality

Information quality is the type, level of detail and variety of information which are determined by the system's design and development phase while timeliness, accuracy, and reliability result from the system operations. In other words, information quality refers to the content and form of report. While content includes accuracy, relevance, adequacy, and understandability of report contents, form includes quality of format, timeliness of reports, manner of presentation, and result of information (Ahn, Ryu & Han, 2007; Staples, Wong, & Seddon, 2002).

Information quality has a positive impact on perceived ease of use and usefulness of a Website. A study was conducted in Malaysia by Mohd, Syed Mohamad, and Zaini (2005) to identify the relation between information quality and the acceptance of doctors of the Electronic Medical Record System (EMR) in a Malaysian hospital. The study found that information quality has a significant impact on perceived usefulness and perceived ease of use toward using the system. The study concluded that it is important for system designers to effectively communicate with the end users to make sure that the system requirement to provide information quality is developed; a notion supported in the study conducted by Bani-Ali and Money (2005).

Information quality provided good explanatory power for the new software usage. Their result was confirmed by Staples, Wong, and Seddon (2002), who examined the effects of the implementation of a new system on its users, with a focus on the relationship between pre-implementation expectations and their perceived benefits based on post-implementation experience. The study's finding confirmed that system usefulness, ease of use and information quality have strong relations to information system success and user satisfaction. So the hypothesis is:

H: Information quality has a positive relationship with perceived ease of use of the system.
H: Information quality has a positive relationship with perceived usefulness of the system.

The information quality instrument was adopted from Ahn, Ryu, and Han (2007) which consists of seven items. These items were adopted in many previous studies such as Aladwani and Palvia, Barnes and Vidgen, Jarvenpaa and Todd, and Palmer. Four IS experts were asked to evaluate these items and make changes to eliminate any repetitive. Besides that, these items scored high factor loading in those previous study. These items are measured on a five-point scale with '1' "Strongly Disagree," '2' "Disagree," '3' "Neither Agree or Disagree," '4' "Agree," and '5' "Strongly Agree." The items are as follows:

1. Has a sufficient content where I expect to find information.
2. Provides complete information.
3. Provides site-specific information.
4. Provides accurate information.
5. Provides timely information.
6. Provides reliable information.
7. Communicates information in an appropriate format.

Hypotheses Evaluation

Information quality has a positive relationship with perceived ease of use toward the system usage.

As expected, the result supports the hypothesis and information quality was found to have a significant positive effect on perceived ease of use (Y = .429, T-value = 6.228, p < .002). For every increase in information quality by one, the intention of use increases by .429 standard point. This result is consistent with that reported in previous studies (e.g. Algahtani, 2004; Ahn, Ryu, & Han, 2007; Mohd, Syed Mohamad, & Zaini, 2005; Saeed & Helm, 2008) which found that information quality has a significant impact on perceived usefulness and perceived ease of use toward using the system.

H7: Information quality has a positive relationship with perceived usefulness toward the system usage.

The result supports the hypothesis and information quality was found to have a significant positive effect on perceived usefulness (Y = .402, T-value = 5.41, p < .002). For every increase in information quality by one, the intention of use increases by .429 standard points. This result is consistent with that in previous studies (e.g. Algahtani, 2004; Ahn, Ryu, & Han, 2007; Mohd, Syed Mohamad, & Zaini, 2005; Saeed & Helm, 2008) which found that information quality has a significant impact on perceived usefulness and perceived ease of use toward using the system. The study found that information quality has more effect on perceived ease of use (Y = .429, T value = 6.228) than perceived usefulness (Y = .402, T-value = 5.41).

Discussion and Conclusion

Organizations are investing in the information technology and providing all the necessary requirements such as hardware, software, system and the infrastructure support in order to improve the efficiency and productivity of the organization. However, if individuals under or over estimate available resources, they might take poor usage decision of the information technology. Therefore, in order for organizations to address these issues, it is important to measure the usage level of the acceptance of the information technology. The level of usage, however, could be explained by the level of perceptions and believes such as ease of use, usefulness and the intention to use towards the actual usage.

In sammary, the findings in this study provide explanation for the usage of the new information technology among employees and managers in the Yemeni government sector by using the information technology acceptance theory and united theories (TAM2 and UTAUT). Based on the analyses, the model showed good of fitness of the measurements. It was also found that the structural and causal model can explain the employee's and manager's usage and adoption of information technology.

The present study also showed that system characteristics (information quality) has a strong, significant, and positive effect on both perceived usefulnes and ease of use towards the acceptance of the information technology. This finding is consistent with previous studies that demonstrate similar result (e.g. Algahtani, 2004; Ahn, Ryu, & Han, 2007; Mohd, Syed Mohamad, & Zaini, 2005; Saeed & Helm, 2008), This offers more support for the employees and managers to use and adopt the information technology despite the non-integrity among the sub-systems. In other ward, the employees and managers perceived that it is easy to get good, quality and useful information for their daily work. Therefore,when they are satisfied with the result obtained from using the technology, this will encourage them to use the information technology.

Theoretical Contribution

The contribution of this research, in the theoretical prospective, lies in identifying some factors such as organization culture and government support that could be important in their influence on the acceptance for new information technology, particularly in the public sector of the republic of Yemen.

This study was conducted to find empirical support for the model of technology acceptance (TAM2) and the unified theory of acceptance and use of technology (UTAUT) within the public sector of the republic of Yemen, to examine technology acceptance and utilization issues among public employees to improve the success of IS implementation in this arena, and to explore organization culture and the government role in supporting the adoption of information technology within the public utilities employees either as a strategy or as logistic support.

From the managerial perspective, this research not only contributes to the theoretical grounds. Its also contributes to the empirical knowledge to increase the success rate for accepting or adopting the information technology in the government sector in the Republic of Yemen. This research validates the importance of organization culture, subjective norms, government support, top management support, information quality and self-efficacy in influencing the behaviour intention to use towards the actual usage for the information technology. The existance of government support, subjectives norms, and self-efficacy factors are essencial to drive the managers and employees preceptions and believe to use the technology more than other factors. This research proved that these factors hold true in the Republic of Yemen. This prove, therefore, it support the notion that technology acceptance model could be generalized in middle east settings and hence the reliance to the effors that testing western finding in the local organizations with local samples.

Recommendation for Future Studies

With regards to future studies, the following recommendations are proposed:
This study has shown some important factors that could influence an individual's intention towards the usage of the new information technology. However, it is possible that other factors, such as training that was not considered in this study, may also be responsible in determining technology acceptance. By doing so, our knowledge on the factors that influence technology acceptance could be widened.

Conclusion

This research represents an effort to understand the factors affecting the usage of the information technology from the perspective of Yemen public sector. The findings successfully answered the research objectives The effect of system features such as information quality on the acceptance of technology.

The capability of technology acceptance model (TAM2) and the unified theory of acceptance and use of technology (UTAUT) to explain the intention to use the information technology among the government employees in the Republic of Yemen. The study has provided empirical evidence for the positive effect of preceived usefulness and preceived ease of use on the intention behaviour to use towards the actual usage for the technology. Empirical evidence has shown that the employees and managers increase their usage for the technology when they preceived the technology is useful and ease to use, that inhance their intention to use or adopt the technology.

The relationship between system features such as information quality on the acceptance of technology. The study has provided empirical evidence for the positive effect of information quality on the intention behaviour to use towards the actual usage for the technology throughout the positive effect on preceived usefulness and ease of use. Empirical evidence has shown that information quality could inhance the employee's and manager's intention to use or adopt the technology when they preceived this informatin is usefulness, ease of use and it helps them to achieve the organization goals.

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