User Acceptance of Information Technology: A Field Study of an E-Mail System Adoption from the Individual Students' Perspective

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Abstract

Today, students have adopted information technology in terms of emails through they are conveying their information from one place to another. This study has examined that how a set of constructs shape the information technology adoption. Depending on UTAUT model, the study has tested the effects of five constructs including the computer anxiety, performance expectancy, social influence, effort expectancy, and attitude towards the application and adoption of technology. It helped in examining the usage intention of electronic mail system (Outlook) among potential users. For this purpose, five hypotheses have been developed that were empirically validated using manually administered survey e-mail system at Dhofar University. To analyze the results, multiple linear regression analysis has been used. Data which has been collected from Dhofar university students is used, and the UTAUT model explicated 41% of the variance in students' intention to use the e-mail system. The study has found that only three out of five constructs (effort expectancy, computer anxiety, and performance expectancy) have considerable effect on usage intentions of e-mail system of the students. Implications, suggestions, and limitations of study are also discussed.

Keywords: *E-mail system, outlook, information technology adoption, UTAUT, performance expectancy.*

1. Introduction

Huge investments have been made by organizations, which have focused on information technology (IT). It is due to the fact that organizations are increasingly depending on IT to perform many tasks (Jasperson, Carter, & Zmud, 2005). There is a positive relation between the large investments in IT and greater efficiency in the organization (Pang *et al*, 2014). Therefore, in educational sector, the use of IT has become very important (Fichman *et al*, 2014). It is the major sector which has enhanced the scope of research in IT adoption. Thus, it has become a prominent research stream in the field of information systems (Hess *et al*, 2014). Several studies on the adoption of IT, which have been implemented outside the Sultanate of Oman, provides an opportunity for new research because of many reasons. Sultanate of Oman is a developing country, and this is one of the major reasons. Additionally, another reason is that the Sultanate of Oman has some extent of good wealth. Moreover, there is support from Omani government for using IT, especially from the ministry of higher education, which is another major reason for carrying out research on IT. This study has selected Dhofar University (DU) as the focal context to study IT adoption. DU has been selected because it is one of the important Universities of Sultanate of Oman.

Additionally, students of DU have come from all the states of the Sultanate of Oman. Moreover, DU is equipped with modern technology and last but not the least, every registered student in DU has two different accounts (outlook account and student information system account). The students can use both accounts within or outside of the campus premises. In addition to this, this study has adopted AUAUT model or carrying out this study with reference to Carter *et al* (2011) study, which was conducted in USA for testing intentions of using e-file system. The same processes are followed to test the overall impact of the effort and performance expectancy, computer anxiety, social influence, and attitude for the technological usage of information. It helped in analyzing the usage intention of electronic mail system. In this research, following main objective has been strived to achieve:

> *"To empirically determine if all or any constructs (computer anxiety, social influence, effort expectancy, performance expectancy, and attitude towards technology implementation) have effect on the usage intention of the electronic mail system."*

2. Literature Background and Research Hypotheses

2.1 Information Technology Adoption

If people perceive that information technology is trustworthy and useful, then, they will have positive attitudes towards its use (Hung *et al*, 2014). The knowledge of factors behind the information technology adoption presents advantages (Kaba and Touré, 2014). There is different effect of unified theory of information technology acceptance and use, when it is applied to different cultures (Teo and Noyes, 2014).There is a positive relation between attitudes of using information technology and different variables such as self-efficiency, challenges and threats of using information technology as well as previous experience of using computers (Gonen *et al*, 2014).

There is an important effect of emotional awareness on behavioral issues and beliefs connected with the use of information technology (Guinea *et al*, 2014). Each one of the cognitive intentions and behavioral outcomes are influenced by different types of factors. On the other hand, cognition is subjected by technological factors, and behavioral outcomes are linked with the social as well as personal factors (Carter *et al*, 2012). The benefit and expected enjoyment of network may directly and indirectly affect the users' intention of using information technology (Lin and Bhattacherjee, 2008). Self-efficacy of using information technology has been increased with more exposure to technology (Brown, 2012). In general, even if the attitudes are positive to use information technology, some challenges still exist (Pierce and Ball, 2009).

2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

There are different theoretical models, designed to explain users' intention for use and acceptance of the technology, which are based on the sociological and psychological theories. For example, and not as a limitation, innovation diffusion theory IDT (Rogers, 1983),theory of resoned actions TRA (Davis, Bagozzi, & Warshaw, 1989),technology acceptance model TAM (Davis, 1989), expectancy theory (Thompson, Higgins, & Howell, 1991), theory of planned behaviour TPB (Taylor & Todd, 1995), and unified theory of acceptance and use technology UTAUT (Venkatesh, Morris, Davis, & Davis, 2003). Understanding the users' acceptance and use of IT has been a prominent feature of IT research. UTAUT has been synthesized using eight models of technology use. UTAUT specifically distilled the critical behavioral factors in organizational context; however, it has been implemented to both organizational and non-organizational settings. Although, application as well as replication of the UTAUT model fortifies its generalizability, the model can be extended into three main broad types. The first type is to examine new technologies, in context of health information systems, healthcare consumers and professionals, and new cultural settings.

The second type is for the expansion of the UTAUT scope based on its theoretical mechanism and it is implemented for the addition of new constructs. The third type is integrated for inclusive implementation of the UTAUT variables to identify its exogenous predictors. This application is valuable in developing the understanding of technological integration in the organization within the limits of theoretical boundaries. In this study, third type of UTAUT model expansion has been integrated. Depending on the components of UTAUT model, this study has adopted five constructs and proposed that they may have a major impact on the users' intention to utilize information technology. The factors of social influence, effort expectancy, performance expectancy, computer anxiety, and approach towards technological use have been analyzed. Figure 1 represents the research model, in which every construct being used in the study has been defined.

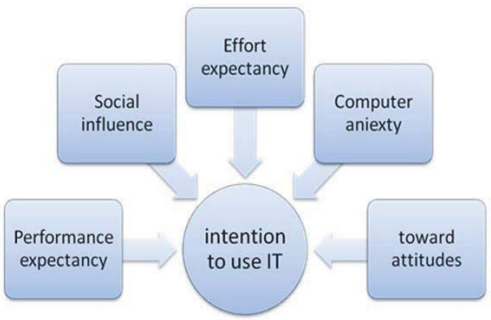

Figure 1: Research Model

2.3 Research Hypotheses

2.3.1 Performance Expectancy (PE)

This variable represents the degree to which people may believe that they can use the technology and it may help them in their work performance (Venkatesh *et al*, 2003). Venkatesh *et al* (2003) found that performance plays a powerful role to influence the students' intentions for using the e-mail system. Carter *et al* (2011) found considerable outcomes of performance expectancy on the users' intention for an e-file use. Benbasat and Barki (2007) suggested that the performance expectancy is the stronger factor that can have effect on the information technology adoption. As it relates to e-mail system, students who believe that this system will help them by keeping them in touch with their instructors and administration, then, they will be more likely to use outlook. Thus, the students believe that they will get greater performance outcomes if they use email system because they may require less time and other resources.

H_1: Performance expectancy has significant effect on the students' intention for using e-mail system.

2.3.2 Effort Expectancy (EE)

This variable is explained by the extent to which it is ease for the users to associate their experiences with the use of system. In other words, it is referred to ones' awareness of the level of cognitive energy, needed to use the system (Carter *et al*, 2011). Venkatesh *et al* (2003) and the studies that reviewed the variable Effort Expectancy, found that the prevalence of this factor is only significant in the initial stages of information technology adoption. Carter *et al* (2011) examined that the effort expectancy has no positive impact considering the users' intention for the technological adoption. Thus, with regards to e-mail system, students should believe that it is easier to interact with university electronic system.

H_2: Effort expectancy has a major influence on the students' intentions for using e-mailing system.

2.3.3 Social Influence (SI)

This variable describes the extent to which one expects that other individuals believe that he should use the new system, specifically individuals who are important to him/her (venkatesh *et al*, 2003; Carter *et al*, 2011). Venkatesh *et al* (2003) found that intention to use new system is affected by social influence. Additionally, the study of Cartar *et al* (2011) analyzed that the social influence has a dominating factor to assess users' intention for using e-file. The adopter of e-mail system will be more likely to use outlook, if the peers or instructors of the individual have adopted the same technology.

H_3: Social influence has a major effect on the students' intention for using e-mail system.

2.3.4 Computer Anxiety (CA)

It is referred as fear or uneasiness, which occurs when someone may use a technology (Simonson *et al*., 1987). It is revealed that majority of technology users may face anxiety issues within initial periods of using this technology (Ganzel, 1998). The assessment scale for computer anxiety was extended by Heinssen *et al* (1987). Thus, among the e-mail system students, those having lower degree of computer anxiety will be more likely to adopt information technology.

H_4: Computer anxiety has a major effect on the students' intention for using the e-mail system.

2.3.5 Attitude towards the Use of Technology ATU

It is referred as the affective reaction when an individual uses a system. Venkatesh *et al* (2003) established in their research that the constructs of attitude towards the technological usage is an interesting case. In some studies, the construct of attitude was significant and the strongest predictor of intention, while in other studies, it was found to have no significance. Therefore, Venkatesh *et al* (2003) considered observing correlation between users' attitude and their intentions for using information technology is spurious.

H_5: Attitude towards the technological usage has a major effect on the students' intention to use outlook.

3. Methodology

In order to collect the data, this study has distributed the survey manually to examine participants, who are final year bachelor students at management, accounting and management information systems departments, during the fall

semester. The goal of the survey questionnaire was to assess the extent to which the participants are aware of the research variables. The results were analyzed using multiple linear regression tests.

3.1 Sample

The number of valid questionnairs for analysis was 139. This was completed by the final year students in management, accounting and management information systems departments. 79% of the respondents were female, respondents' age ranged from 18 - 36. Approximately, 77.7% of them were within 18-24 age-group. According to the sample distribution majority, which is 41%, belongs to the management information systems and 35.3 % belonged to the accounting department. All students who participated used the Students' Information System through the website of the University. Only 10.8% of respondents used their own outlook, which was created by university for its own students.

3.2 Instrument Development

The distributed survey contain 24 items, were compiled from many validated instruments (venkatesh *et al* 2003; Carter *et al*, 2011; Raaij & Schepers, 2008; Heinssen *et al*, 1987). This research has made some modifications to fit with the e-mail system content. After that for each construct, randomly, the study has ordered result items. On the survey instrument, the 5-point likert-type is used to measure survey questions, ranging from 1 (strongly disagree) to 5(strongly agree). For reliability, all items were tested using chroubach's alpha (see table 1).

Table (1). Reliability Analysis

Constructs	# Items	Reliability
PE-Performance expectancy	4	0.803
EE-Effort expectancy	4	0.732
SI-Social influence	5	0.715
CA-Computer anxiety	4	0.822
ATU-Attitude toward using technology	3	0.722
USE-Intentions to use of information technology	4	0.716

4. Analysis of Data

This study has used multiple linear regression analysis to test our research model. The model is composed of five independent variables (Computer anxiety, Effort expectancy, Social influence, Performance expectancy, and Attitude for the technological use) and one dependent variable (usage intention of information technology). The research aims to determine the extent to which respondents' perception of e-mail system (independent variable) affects their intentions to use the information technology (dependent variable).

4.1 Results of Study

Table (2). Multiple Linear Regression Analysis Result

Adjusted R Square	F	Sig.
0.410	20.171	0.000

Predictors: (Constant), ATU, PE, CA, EE, SI
Dependent Variable: USE

Table (2) is clearly depicting the results of multiple linear regression analysis. The adjusted R square = 0.41, which reflects the model interpretation to be 41% of the variance in students' intention for the adoption of e-mail system. In spite of the whole, model was significant (F= 20.171, P= 0.00). It is due to the fact that each variable was tested for its individual significance. Depending on this test, only three out of five hypotheses are supported. Table (3) shows the significant and insignificant constructs, as well as supported and unsupported hypotheses.

Table (3). Hypotheses Test

Hypotheses	Coefficients	T value	Sig.	Supported
H1 (EP)	0.465	6.33	0.000	YES
H2 (EE)	0.231	3.14	0.002	YES
H3 (SI)	-0.157	-1.33	0.185	**NO**
H4 (CA)	0.213	3.20	0.002	YES
H5 (ATU)	0.160	1.35	0.179	**NO**

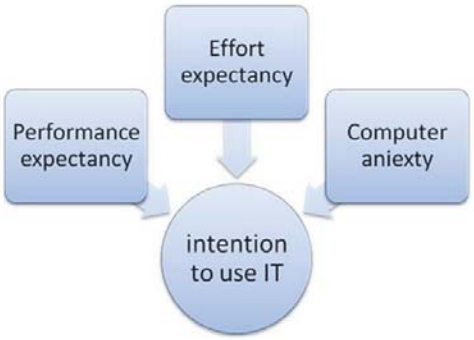

Figure 2: Significant Results

5. Discussion and Conclusion

Only three out of five constructs of the adopted model are significant. These three constructs include performance expectancy, effort expectancy, and computer anxiety. It means that the majority of students believed that e-mail system will help them to be in touch with their instructors and administration. Therefore, students will be more likely to use outlook to interact with the university e-mail system, as they believed that it is much easier. Furthermore, it was assumed that they support the idea that students having lower degree of computer anxiety are expected to adopt information technology.

On one hand, the construct attitude toward using technology was not significant and compatible with Venkatesh *et al* (2003), who considered any observed relationship of users' attitude with their intention for using information technology is spurious. On the other hand, surprisingly social pressure was not significant may be because of the two reasons. Firstly, students prefer to get all information about their study progress through the student information system using their own smart phones. Secondly, there is a culture that students do not trust in electronic transactions. Thus, if they have any transaction, they prefer to use the method of face to face to complete their transaction, personally. Future research should continue to assess the relationship of social influence on the individuals with their IT usage intention, using more focus to culture and trust in electronic transaction.

In this study, the five major constructs (effort expectancy, social influence, computer anxiety, performance expectancy, and user attitude for the technological usage) are used to investigate individuals' perceptions about IT. The study shows that performance expectancy can be considered salient indicator on IT adoption. This construct has helped in explaining the reasons why the students need to adopt the e-mail system. It must be taken into consideration that this study implemented in developed country having small population. So far, the country is in its initial stages of IT adoption. Also, the data was collected using survey, so that there is a potential of self-report bias. For future studies, it is recommended that there should be an attempt to validate the findings of this study by the implementation of its model in different environment. Moreover, all the constructs must also be moderated by other factors like age, gender, culture or by adding new constructs like trust in electronic transactions. However, it is even better to use multiple methods to collect data in the future research studies.

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Appendix 1 - Descriptive Statistics of Survey Items

#	Items	N	Mean	Std. Deviation
PE1	Use the outlook will decrease the waste of time.	139	4.0791	.45148
PE2	Use the outlook will enhance my effectiveness.	139	4.1367	.45367
PE3	Using the outlook makes it easier to track my transactions.	139	4.0432	.31555
PE4	I think outlook is useful tool to accomplish my tasks electronically	139	4.0288	.33928
EE1	Learning how to use an outlook would be easy for me.	139	4.1439	.54588
EE2	For me it would be easy to be skillful at using outlook.	139	4.0863	.53136
EE3	I would find the outlook to be flexible to interact with.	139	4.0719	.54693
EE4	Overall, I think that the outlook is easy to use.	139	4.2014	.66135
SI1	People who influence my behavior think that I have to use outlook.	139	2.3381	.68687
SI2	My peers think that I should use outlook.	139	2.2230	.43478
SI3	My supervisor is very supportive for the use of outlook.	139	2.2374	.57209
SI4	I use outlook to accomplish my tasks because of the number of the people around me who use it.	139	2.4101	.78770
SI5	The people that I know who use outlook have more prestige than those who don't do.	139	2.4101	.85815
CA1	I feel apprehensive about using outlook to accomplish my tasks.	139	3.9784	.65350
CA2	I feel it is difficult to some extent to go through Outlook folders.	139	3.9353	.66167
CA3	I prefer to use other communication channels for the fear of making mistakes I cannot correct when sending the message.	139	3.9712	.66966
CA4	I don't like to use EMS for the doubt of receiving my message.	139	3.9424	.57445
ATU1	Using the outlook is a good idea.	139	2.3237	.46959
ATU2	I have fun using outlook.	139	2.4173	.71119
ATU3	The outlook is okay for some tasks but not the kind of tasks I want.	139	2.4748	.82822
USE1	I predict that I will use an outlook in the future.	139	4.0935	.47992
USE2	Electronic messaging via outlook is something that I would do.	139	4.0863	.40793
USE3	I would use the electronic messaging to complete my transactions.	139	4.0576	.50748
USE4	I will experiment with an outlook service and then decide whether or not to use it in the future.	139	4.1655	.51916
PE	Performance expectancy	139	4.0719	.31313
EE	Effort expectancy	139	4.1259	.42709
SI	Social influence	139	2.3237	.46836
CA	Computer anxiety	139	3.9568	.51774
ATU	Attitude toward using technology	139	2.4053	.54987
USE	Intention to use	139	4.1007	.35319