*International Journal of Advanced Computer Research (ISSN (print): 2249-7277 ISSN (online): 2277-7970)*
*Volume-3 Number-4 Issue-13 December-2013*

# Predicting E-Business Adoption through Integrating the Constructs of the Rogers's Diffusion of Innovation Theory Combined with Technology-Organization-Environment Model

**Mohammad Issa Al-Zoubi**

## Abstract

***Purpose– The purpose of this paper is to predict e-business adoption through integrating the constructs of the Rogers's DOI theory combined with TOE model. Design/methodology/approach– A structural equation modeling is conducted through the analysis of 113firms usable questionnaires. Findings– The results show that the existence of significant relationship between the TOE factors and the businesses e-business adoption. It is found that higher explicitness and accumulation of technology can help the transfer of technological knowledge within the organization and can raise the capability to adopt innovative technologies. Practical implications–for the theory under study is the notion that adoption of e-business can lead to improvements in firms' performance. It has been revealed that positive influences generally increase with the increase of e-business penetration. Originality/value– The paper is the recently study that examines e-business adoption in the Jordan. Also, the findings allow us to understand the importance of both technology-related aspects and social influence in e-procurement adoption.***

## Keywords Procurement

***E-business; E-Commerce; E-Business; Businesses; SMEs; Literature Review; Hierarchical Cluster***

## 1. Introduction

Jordan's commitment to e-business necessitates the development of an e-business adoption model that will assist government agencies to collaborate, share information and redesign overlapping responsibilities, to improve the efficiency of the services offered to the general public. The e-business adoption model is used by the agencies as a mechanism and guideline to deploy e-business and realize the benefits that can be gained through the adoption of the best e-business practices that this model can offer. Without a model, the government agencies will not be able to change existing practices, which contribute to the inadequacies and imbalances in the provision of public services [37].

The adoption of e-business is based on businesses rather than individuals; hence the adoption behavior could differ and warrant an organization's appropriate adoption model. Innovation-related theories dominated most previous works such as technology acceptance models (TAM) and unified theory of acceptance and use of technology (UTAUT).

A range of models and theories are used to evaluate and test individual level acceptance of technologies. One of the most commonly employed models is TAM developed by Davis (1989) to explain and predict an individual's acceptance behavior toward a new technology, independent of the user population and the technology being introduced [10]. While this theory is useful for understanding why individuals accept particular technologies across a range of populations, the model is not suited for investigation of organizational level of e-business adoption. Therefore, there is a need to employ an organizational theory to explain and predict a business's adoption of e-business.

Many of the studies that investigate firm level adoption employ Diffusion of Innovation (DOI) Theory (Rogers, 1995), which suggests that diffusion of an innovation is principally based on the characteristics of the technology and users' perceptions of the system. Research based on the DOI Theory assumes that the adoption decision is undertaken to improve operational efficiency [23, 19]. However, the organizational decision to adopt e-business may also be influenced by external factors of the organization (e.g. competition pressure and government support) that provide barriers and incentives to e-business adoption. Since widespread adoption of e-business across businesses has not yet occurred, it is plausible that the institutional external factors of the firm will play a large role in the organizational adoption decision along with the

**Mohammad Issa Al-Zoubi** Irbid National University, Faculty of Administrative and Financial Sciences, Department of MIS.

characteristics of the technology [23, 19,]. As such, it is appropriate to ground this study in a model that considers the influence of the technology, the organization, and the external factors to account for broader external factors likely to influence the scope and degree of e-business adoption. Therefore, the use of Tornatzky and Fleischer's (1990) technology-organization-external (TOE) framework can enable the consideration and proposed investigation of specialized factors likely to influence e-business adoption.

Deploying other theoretical perspectives such as diffusion of innovations (DOI) theory with combination of TOE framework could provide alternative model. Hence, using Rogers's theory of DOI combined with TOE framework could provide a useful model to explain the organization adoption of e-initiatives in general, and e-business among business organizations, in particular [3, 4, 23, 19].

However, studies have highlighted that the level of e-business usage is relatively low in even the most advanced countries [31, 32]. Hence, effort is needed to develop a comprehensive model for assessing e-business adoption in general [3, 4]. New theoretical perspectives and concepts to enhance our understanding of e-business processes have to be explored [37].

## 2. Theoretical Framework

The foundation of many previous information system and innovation adoption studies was based on the theoretical frameworks derived from Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA); Ajzen's (1985) Theory of Planned Behaviors (TPB); Davis' (1989) TAM; Rogers's (1983,1995) DOI theory; and Tornatzky and Fleischer's (1990) TOE model (see Figure 1). While some of these theories are able to explain the organization level of innovation adoption, others focused on the individual acceptance of new technology (see Table 1).

In investigating the individual-level adoption and acceptance of new technologies, several models and theories were used in the literature, but more importantly the TRA (Fishbein & Ajzen, 1975) and the TAM by Davis (1989). According to this stream of research, individual characteristics are mediated by beliefs, which affect attitude, which in turn affect intentions and behaviors. Influenced by the TRA theory, and identified in the literature as the most commonly used model in order to predict an individual's acceptance behavior toward a new technology, TAM model suggests that individual's acceptance is anticipated by two elements. These are "perceived usefulness" which refer to the degree to which a person believes that using a particular system would enhance his or her job performance, and "perceived ease of use" which is the degree to which a person believes that using a particular system would be free from effort. Even though both TRA and TAM model are considered as useful ground in understanding user's acceptance of new technology across a range of populations, they are not suited for investigation into organizational-level acceptance of technologies [38]. Since the decision to adopt e-business among business is generated as a strategic firm-level initiative, therefore, there is a need to employ an organizational-level theory to explain and predict a firm's acceptance behavior of e-business [35, 5].

Several previous studies that investigated e-business adoption employ the DOI theory by Rogers 1983 (e.g. Sang et al., 2009; Lean et al., 2009). DOI describes the process by which an innovation is communicated through certain channels over time between the members of a social society. As the innovation diffusion theory suggests, diffusion occurs as individuals, groups, organizations, or subsystems accept and use new ideas such as technologies [19].
DOI was developed with the goal of analyzing the characteristics of innovation adopters. These characteristics include relative advantage, complexity, image, visibility, compatibility, results from demonstrability, and voluntariness of use of the innovation. DOI theory suggests that innovation diffusion is basically based on two factors, the perception of the characteristics of the technology, and the user's perception of the system. Its main concern is about how innovations are adopted as well as the reasons behind different rates of innovation adoption.

However, bearing in mind the business uptake of e-business, one common criticism about DOI theory is that it does not take into consideration the environmental factors where the organization conducts business, such as competition, which could work as a barrier or a motivation to technology acceptance and adoption [19]. Based on that, researchers continue to search other contexts influencing organizational innovativeness and

combine them with Rogers's theory to explain the models [25].

Tornatzky and Fleisher (1990) used a framework similar and consistent with the theory of innovation diffusion in organizations by Rogers (1983) in developing a model to add the environment factor to their framework. It explained a firm's technological innovation decision making behavior, and the environment presents both constraints and opportunities for technological innovation [32]. According to Tornatsky and Fleischer (1990), TOE contexts of a firm can influence the diffusion process. The TOE framework makes Rogers's innovation diffusion theory able to explain firm innovation diffusion [34, 15].

According to the TOE model, there are three areas that an organization uses to determine how to take advantage of the new technology relating to e-business, which can influence the process of adopting, implementing and using technological innovations [32]. These are technological factors, organizational factors and environmental factors. The first refers to the existing as well as new technologies relevant to the firm. These factors play a significant role in the firm's adoption decision as it determines the ability of the firm to benefit from e-business initiative. Examples are prior technology usage, and number of computers in the firm. Organizational factors refer to descriptive measures related to organization structure, financial support, managerial beliefs and top management support. The environmental context focuses on the external factors that drive firms to adopt new technology such as competition and government incentives and regulations.

An individual's acceptance and adoption of innovation differ from organization innovation adoption in terms of the factors that influence such adoption [24, 17, 28]. An organizational innovation is defined as a new process, system, or service that is either internally developed or purchased from an external source [9, 8]. As the definition suggests, organization replaces an exciting process with a new one (innovation) in the hope of improving the effectiveness as well as the efficiency of the organization performance [21, 20]. One major reason for such innovation is the environment where the firms operate. The pressures that drive firms to adopt innovation are caused by competitive actions and the firm's struggle to have the competitive advantage [19]. Therefore, Rogers's theory of DOI coupled with TOE framework would provide a useful theoretical framework to explain the organization's adoption of IS in general and e-business among business organizations, in particular [3, 4, 19]. Such approach could provide a strong empirical support to e-business adoption research and account for the technological, organizational, and external factors influencing e-business adoption among business organizations [4].

As indicated in Table 2, diversifying the research approaches or deploying multiple approaches in a single study is highly commendable to ensure richer findings. Hence, deploying other theoretical perspectives such as DOI combined with TOE in the future researches promise a useful outcome. As such, in order to drive a new model for e-business adoption and implementation among business organizations in Jordan, the present study is based on Rogers's DOI theory combined with TOE model. The reasons for using DOI theory in combination with the TOE model is that the latter can describe the organization adoption of innovation among business firms by considering the external factors while DOI is used as it considers the organizational and the technological factors.

## 3. Research Framework

The proposed framework of this research consists of two parts. The first part is the e-business's antecedent factors which are the technological, organizational, and external factors. The second part is the e-business adoption among businesses in Jordan, which is operationalized in general as the firm's uptake and use of the various available functions and services provided by the Jordanian e-business which ranges from getting information to conducting transactions with government online. Table 3 shows the operational definitions of the variables used in this study. However, these variables are discussed in the articles alzoubi, 2011[4, 5].

## 4. Data Collection and Data Analysis

The survey was conducted on 260 firms. A total of 113 responses were received representing 43.4% response rate. Statistical Package for Social Science (SPSS) was used to determine the causal relationship among the variables as proposed in the framework. The results of data analysis used for the purpose of this study. The use of a framework to

measure and characterize e-business adoption based on a cluster analysis method. The hierarchical cluster worked fairly well in identifying different adoption groups that were present in the sample. Firms were subsequently grouped based on similar adoption groups. The finding indicated two distinct groups which emerged, which reflected the adoption of e-business among the businesses. To enable further analysis on e-business adoption, two groups of adopters are labeled as basic-adopters and advance-adopters. The results from logistic regression analysis that were meant to identify factors that were perceived to be associated with e-business adoption. Drawing upon technological diffusion theory, a mode was developed for assessing e-business adoption, incorporating seven factors related to firm adoption of e-business. Two of the four technological factors (relative advantages and IT infrastructure) were found to influence businesses' adoption of e-business. Three of the five organizational factors (organization adaptability and mission, organization involvement and consistency, and financial resources) were found to influence businesses' adoption of e-business. In addition, external factors (competition and government support) were found to influence businesses' adoption of e-business (see Table 4).

## 5. Factors Associated With E-business Adoption

One of the objectives of this study is to identify factors model that are associated with e-business adoption. This section discusses the results based on the findings from the analysis. The binary logistic regression was used to examine the association of TOE factors as independent variables against the two adoption groups. The findings from this study indicate that seven of the eleven factors are significantly associated with various stages of e-business adoption. Among the independent variables, relative advantage, IT Infrastructure, organization adaptability and mission, organization involvement and consistency, financial resources, competition, and government support were found to be significant determinants of business's adoption of e-business. It is found that higher explicitness and accumulation of technology can help the transfer of technological knowledge within the organization and can raise the capability to adopt innovative technologies. Jordanian firms can increase their technological innovation capabilities by encouraging or supporting their employees to adopt e-business and by training and educating their employees. Not surprisingly, TOE factors were found to be significant. The finding from this study confirmed the important roles played by TOE in e-business adoption, and are consistent with findings from previous information system studies conducted by Alawneh (2009), Thompson et al. (2009), Salwani (2008), Lin (2008), and Al-Qirim (2007) [6, 43, 39, 49].

Previous innovation diffusion research also identified relative advantage to be one of the important factors for the adoption of new innovation. Participants of this research recognized the importance of the adoption of e-business initiatives and believed that firms would realize the benefits of adopting e-business. The benefits include reducing the time and cost of providing service to the general public, empowering employees, reducing bureaucracy and increasing the efficiency and effectiveness of businesses. Similarly, IT infrastructure was also significantly linked to e-business adoption. This is consistent with the results of prior studies that have found it to be a significant variable for initiating innovation's adoption (e.g. [44, 41]). However, the findings indicate that basic-adopters were less ready to adopt e-business compared to advanced-adopters because they perceived lack of IT infrastructure as a barrier. Organization adaptability and mission, and organization involvement and consistency were found to be significant factors influencing businesses adoption of e-business. Our results showed that the mission had a significant impact on e-business adoption, and two traits: mission and adaptability had a significant influence on e-business adoption among businesses. In short, results show that organizational culture influences e-business adoption which supports the existing literature in the area of culture and IS [12, 42, 14, 13].

Another significant organizational factor is financial resources, suggesting that without sufficient financial resources, businesses will not be able to adopt e-business. This is consistent with previous studies (e.g. [27, 36, 23]. Financial resource refers to the firm's readiness to pay for the development, implementation and usage of e-business adoption.

External variables were found to influence businesses' adoption of e-business. The variables were competition and government support. Hence, external pressure is recognized to have an effect on e-business adoption. This finding is consistent with the results from Iacovou et al. (1995), Grandon and

Pearson (2004), and Tung and Rieck, (2005). Competition is one of the main factors, which facilitates innovation adoption. This is consistent with the results of prior studies that have found it to be a significant variable for initiating innovations adoption [18, 49, 47, 46].

Similarly, government support to businesses was also significantly linked to E-business adoption. This is consistent with the results from prior studies that found it to be a significant variable for initiating many innovations adoption among businesses (e.g. [39, 29]. Based in the findings advanced-adopters and basic-adopters perceive that government support is one important factor that influences their decision to adopt e-business (see Figure 2).

## 6. Theoretical Contributions

From the theoretical standpoint, the results gained from this study were consistent with the theories and previous literature. The empirical evidence from this study contributes to the body of knowledge in the fields of IS and e-business adoption. This study was undertaken with various underpinning theories. Therefore, this study could contribute to each of these theories by means of supporting the theories.

This study hopes to contribute to knowledge on the implementation and adoption of e-business among businesses in Jordon, in particular, and the e-business literature in general. Generally, it gives indication of how businesses can build, enhance and strengthen these factors with the aim of increasing the willingness to adopt e-business. This study helps in providing the alternative approach toward measuring e-business.

For the second research question which was about the relationship between the factors that drive the adoption of e-business among businesses, this study provided empirical evidence to support the diffusion of innovation framework (Rogers, 1995) as well as the TOE framework [32, 31, 4o]. The results support using both theories, i.e., Rogers's DOI framework coupled with TOE framework which can provide a useful theoretical framework to explain the organization adoption of IS in general and e-business among business organizations in particular [19, 23, 4, 20]. Such approach could provide a strong empirical input to e-business adoption research [49, 30]. IS innovations are highly differentiated technologies for which there is not necessarily a single adoption model [20]. TOE factors have been found to be significant. The findings from this study confirmed the importance of TOE factors in e-business adoption. This is consistent with findings from previous IS studies by Alawneh (2009), Thompson et al. (2009), Salwani (2008), Lin (2008), and Al-Qirim (2007). These findings asserted further that factors influencing the adoption of e-business are different from factors influencing businesses' adoption of IS innovations. The major contribution of this study is statistically validating the factors influencing businesses' adoption of e-business. Thus, it can be assumed that businesses with a greater perceived relative advantage, a greater IT infrastructure with e-business before adoption, greater financial resource, greater organization adaptability and mission, greater organization involvement and consistency, greater government support and competition are more likely to adopt e-business.

## 7. Future Research and Conclusions

The research model of the current study has integrated two theoretical research streams, which are TOE and the literature on DOI. Hence, this research can be a starting point for further research focusing on the adoption decisions of other technologies such as technology competence, image, and technology readiness. In addition, the previous theoretical framework of innovation diffusion has been less effective at the adoption decision of e-business services. On the other hand, it is believed that this framework could be used to explain the adoption of other technologies (delivered via World Wide Web and others). In terms of the obstacles of adoption, the factors referred to the organizational perspective have been found to be insignificant in this study although still a sufficient theory for understanding successful technology adoption. However, it is important to continue to explore other model factors in future studies.

## References

[1] Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behaviour: in J. Kuhl, J. Beckmann (eds), Action Control from Cognition to Behavior, Springer Verlag, New York.

[2] Aboelmaged, M. G. (2010). Predicting E-Procurement Adoption in a Developing Country an Empirical Integration of Technology Acceptance Model and Theory of Planned Behaviour. Industrial Management and Data Systems, 110(3), 392-414.

[3] Al-Zoubi, M., Thi, L. S., & Lim, H. E. (2011). E-Government Adoption among Businesses in Jordan. Academic Research International, 1(1).
[4] Al-Zoubi, M., Thi, L. S., & Lim, H. E. (2011). E-Government Adoption and Organization Performance in the Jordan Businesses Sector: Empirical Analysis. Academic Research International, 1(1).
[5] Awan, M. A. (2007). Dubai e-Government: An Evaluation of G2B Websites. Internet Commerce, 6(3), 115-129.
[6] Alawneh, A., & Hattab, E. (2009). An Empirical Study of Sources Affecting E-Business Value Creation in Jordanian Banking Services Sector. International Arab Journal of e-Technology, 1(2), 1-8.
[7] Gumussoy, C. A., & Calisir, F. (2009). Understanding Factors Affecting E-Reverse Auction Use: An Integrative Approach. Computers in Human Behavior, 25, 975-988.
[8] Carter, L. (2008). E-Government Diffusion: A Comparison of Adoption Constructs. Transforming Government: People, Process and Transforming Government: People, Process and Policy, 2(3), 146-161.
[9] Chen, Y. N., Chen, H. M., Huang, W., and Ching, R. K. H. (2006). E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study. Journal of Global Information Management, 14(1), 46.
[10] Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 318-340.
[11] Al-Shafi, S., & Weerakkody, V. (2008). Understanding Citizens' Behavioural Intention in the Adoption of E-Government Services in the State of Qatar. Paper presented at the Information Systems.
[12] Dasgupta, S., & Guptay, B. (2009). Espoused Organizational Culture Traits and Internet Technology Adoption. Americas Conference on Information Systems.
[13] Denison, D. R., & Mishra, A. K. (1995). Toward a Theory of Organizational Culture and Effectiveness. Organization Science, 6(2), 204-223.
[14] Doherty, N. F., & Doig, G. (2003). An Analysis of the Anticipated Cultural Impacts of the Implementation of Data Warehouses. IEEE Transactions on Engineering Management, 50(1), 78.
[15] Fishbein, M., & AjzeN, I. (1975). Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research: Addison-Wesley, Reading, MA.
[16] Lau, T. Y., Aboulhoson, M., Lin, C., and Atkin, D. J. (2006). Adoption of E-Government in Three Latin American Countries: Argentina, Brazil and Mexico. Telecommunications Policy 32, 88-100.
[17] Layne, K, and Lee. (2001). Developing a Fully Functional E-Government: A Four Stage Model. Government Information Quarterly, 18(2), 122-136.
[18] Grandon, E. E., & Pearson, J. M. (2003). Perceived Strategic Value and Adoption of Electronic Commerce: An Empirical Study of Small and Medium Sized Businesses.
[19] Lippert, S. K., and Govindarajulu, C. (2006). Technological, Organizational, and Environmental Antecedents to Web Services Adoption. Communications of the IIMA, 6(1), 146-158.
[20] Mohama, R., and Ismaild, N. A. (2009). Electronic Commerce Adoption in SME: The Trend of Prior Studies. Journal of Internet Banking and Commerce, 14(2).
[21] Nikam, K., Ganesh, A. C., & Tamizhchelvan, M. (2004). The Changing Face of Lndia. Part I: bridging the Digital Divide. Library Review, 53(4), 213-219.
[22] Hung, S.-Y., Hung, W.-H., Tsai, C.-A., & Jiang, S.-C. (2010). Critical Factors of Hospital Adoption on CRM System: Organizational and Information System Perspectives. Decision Support Systems, 48, 592–603.
[23] Ramdani, B., Kawalek, P., and Lorenzo, O. (2009). Predicting SMEs' Adoption of Enterprise Systems. Enterprise Information Management, 22(1/2), 10-24.
[24] Raus, M., Liu, J., & Kipp, A. (2010). Evaluating IT Innovations in A Business-to-Government Context: A Framework and its Applications. Government Information Quarterly, 27, 122–133.
[25] Rogers, E. M. (1995). Diffusion of Innovation: New York: Free Press.
[26] Rogers, P. (1983). Capillary Patency and Permeability in the Endometrial Surrounding the Implanting Rat Blastocyst. International Journal of Microcirculation and Clinical Experiments 2, 241–249.
[27] Iacovou, C., Benbasat, I., & Dexter, A. (1995). Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology. MIS Quarterly, 19(4), 465-485.
[28] Seifert, J., and Bonham, G. (2004). The Transformative Potential of E-Government in Transitional Democracies. Review of Reviewed Item.
[29] Kouki, R., Poulin, D., & Pellerin, R. (2006). ERP Assimilation Challenge: An Integrative Framework for a Better Post-Implementation Assimilation. Interuniversity Research Center on Enterprise Networks, Logistics and Transportation (CIRRELT), 1-41.
[30] Kuan, K., & Chau, P. (2001). A Perception-Based Model for EDI Adoption in Small Business Using

a Technology-Organization-Environment Framework. Information and Management, 38(8), 507-512.
[31] Tomatzky, L., & Fleischer, M. (1982). Innovation Characteristics and Innovation Adoption-Implementation: A Meta-Analysis of Findings. IEEE Transactions on Engineering Management, EM-29(1), 28-43.
[32] Tomatzky, L., & Fleischer, M. (1990). The Process of Technology Innovation. Lexington, MA: Lexington Books.
[33] Tornatzky, L. G., & Klein, K. (1982). Innovation Characteristics and Innovation Adoption-Implementation: A Meta-Analysis of Findings. IEEE Transactions on Engineering Management, 29(1), 28-45.
[34] Lane, R. (1997). The Key to Managing Information Technology. The Bankers Magazine, 20-27.
[35] Warrington, T. B., Abgrab, N. J., & Caldwell, H. M. (2000). Building Trust to Develop Competitive Advantage in E-Business Relationships. Competitiveness Review, 10(2), 160-168.
[36] Zhao, J. J., Truell, A. D., & Alexander, M. W. (2006). User-Interface Design Characteristics of Fortune 500 B2C E-Commerce Sites and Industry Differences. The Delta Pi Epsilon Journal, 48(1), 43-55.
[37] Elsheikh, Y., Cullen, A., & Hobbs, D. (2007). E-Government in Jordan: Challenges and Opportunities. eGovernment Workshop '07 (eGOV07), 1-13.
[38] Bwalya, K. J. (2009). Factors Affecting Adoption of E-Government in Zambia. The Electronic Journal on Information Systems in Developing Countries, 38(4), 1-13.
[39] Lin, H.-F., & Lin, S.-M. (2008). Determinants of E-Business Diffusion: A Test of the Technology Diffusion Perspective. Technovation, 28, 135-145.
[40] Pan, M.-J., & Jang, W.-Y. (2008). Determinants of the Adoption of Enterprise Resource Planning Within The Technology Organization Environment Framework: Taiwan's Communications Industry. Computer Information Systems, 46(1), 94-104.
[41] Premkumar, G., Ramamurthy, K., & Nilakanta, S. (1994). Implementation of Electronic Data Interchange: An Innovation Disunion Perspective. Management Information Systems, 11(2), 157-186.
[42] Shaukat, M., & Zafar, J. (2010). Impact of Sociological and Organizational Factors on Information Technology Adoption: An Analysis of Selected Pakistani Companies. European Journal of Social Sciences, 13(2), 305-320.
[43] Thompson, S. H. T., Lin, S., & Lai, K.-h. (2009). Adopters and Non-Adopters of E-Procurement in Singapore: An Empirical Study. Omega 37, 972-987.
[44] Thong., J. (1999). An Integrated Model of Information Systems Adoption in Small Businesses. Management Information Systems, 15(4), 187-214.
[45] Trkman, P., & Turk, T. (2009). A Conceptual Model for the Development of Broadband and E-Government. Government Information Quarterly, 26, 416-421.
[46] Tung, L. L., & Rieck, O. (2005). Adoption of Electronic Government Services Among Business Organizations in Singapore. Strategic Information Systems, 14, 417–440.
[47] Wong, W., & WELCH, E. (2004). Does E-Government Promote Accountability? A Comparative Analysis of Website Openness and Government Accountability. Policy Administration and Institutions, 17(2), 275–297.
[48] Sutanonpaiboon, J., & Pearson, A. M. (2006). E-Commerce Adoption: Perceptions of Managers/Owners of Small- and Medium-Sized Enterprises (SMEs) in Thailand. Internet Commerce, 5(3), 51-82.
[49] Al-Qirim, N. (2007). The adoption of e-Commerce communications and applications technologies in small businesses in New Zealand. Electronic Commerce Research and Applications 6,462–473.

**Dr. Mohammad** Issa AL-Zoubi Assistant Professor of Management Information System (MIS) specifically Electronic Government (E-G), Department of Management Information Systems, College of of Administrative and Financial Sciences, Irbid National University.

# Appendix

## Table 1: Applicable Theories

| Theories (Author) | Factors | Usage | Selected Articles Using the Theory |
|---|---|---|---|
| Diffusion of innovation (DOI) (Rogers, 1995) [25, 26] | Relative Advantage<br>Compatibility<br>Complexity<br>Trialability<br>Observability | Acceptance of any new innovation Such as e-initiative, computer, internet | Korteland and Bekkers, 2007; Carter and Belanger, 2005; Fu et al., 2006; Schaupp and Carter, 2005; Hussin et al., 2008 |
| Technology-Organization-Environment (TOE) (Tornatsky and Fleischer, 1990) [32, 33] | Technology<br>Organization<br>Environment | Adoption of a technology or innovation such as e-business , mobile, PDA, e-commerce, internet banking | Al-Qirim et al., 2007; Mohamad and Ismail, 2009; Ramdani et al., 2009; Wang and Ahmed, 2009 |
| Technology Acceptance Model (TAM) (Davis, 1989) [10] | Perceived Usefulness (PU)<br><br>Perceived Easy Of Use (PEOU) | Acceptance of innovation of technology such as mobile, e-initiative, PDA, e-commerce, internet banking | Trkman and Turk, 2009; Colesca 2008; Carter and Belanger, 2005; Dimitrova and Chen, 2006; Gilbert et al., 2004; Horst et al., 2007; Lau et al., 2008; Carter, 2008. Walczuch et al., 2007; Wang et al., 2006 |
| Theory of Planned Behaviors (TPB) (Ajzen's, 1985) [1] | Attitude toward Using (A)<br>Subjective Norm (SN)<br>Perceived Behavioral Control (BC) | Improved the predictability of intention in various health-related fields such as condom use, leisure, exercise, diet | Horst et al., 2007; Warkentin et al., 2002. |
| Theory of Reasoned Action (TRA) (Fishbein and Ajzen's, 1975) [15] | Attitude Toward Behavior (A)<br>Subjective Norm (SN) | Most use in medical innovation such as dieting, condom, limiting sun exposure | Trkman and Turk, 2009; Napoli and Ewing, 2000; |

## Table 2: Theories Used by Previous Studies of E-business

| Authors | Usage and Country | Theory Used | Finding |
|---|---|---|---|
| Aboelmaged, 2010 [2] | e-procurement<br><br>(United Arab Emirates) | TPB<br>TAM | The results show that the proposed model has good explanatory power and confirms its robustness, with a reasonably strong empirical support, in predicting users' intentions to use e-procurement technology. |
| Bwalya, 2009 [38] | E-business<br><br>(Zambia) | TRA<br>TAM<br>DOI | The government should play a leading role in developing the ICT infrastructure as this is a requirement for successful e government implementation (as identified in the model by 'Adequate and inexpensive IT infrastructure'). |
| Trkman and Turk, 2009 [45] | E-business<br><br>(Slovenia) | TRA<br>TAM<br>DOI<br>TPB | Conceptual paper |
| Lean et al., 2009 [34] | E-business<br><br>(Malaysia) | TAM<br>DOI | Comparing the explanatory power of the entire intention based model (TAM, DOI and Trust) with the studied model, it has been found that the DOI model has a better explanatory power. |

| | | | |
|---|---|---|---|
| Hung et al., 2009 [22] | E-business services (Taiwan) | TPB | The findings indicate that perceived usefulness, perceived ease of use, training, compatibility, external influence, interpersonal influence, self-efficacy, and facilitating conditions are significant predictors of users' intention to utilize EDMS. |
| Sang et al., 2009 [42] | E-business (Cambodia) | TAM DOI | The findings show that the determinants of the research model (perceived usefulness, relative advantage, and trust) are support. At the same time, the important determinants of perceived usefulness include image and output quality. |
| Ramdani et al., 2009 [23] | E-procurement (UK) | TPB TRA TAM DOI UTAUT TOE | The results reveal that the factors influencing SMEs' adoption of e-procurement are different from the factors influencing SMEs' adoption of other previously studied information systems (IS) innovations. |
| Al-Shafi and Weerakkody, 2008 [11] | e-business (Qatar) | TRA TAM | The findings are encouraging from a practical perspective for the Qatari government, from a theoretical perspective these results reconfirm that technology acceptance is influenced by key constructs such as Performance Expectancy, Effort Expectancy, and Social influence aspects of the e government services used. |
| Lau et al., 2008 [16] | E-business (American) | DOI | Study findings can shed some light on each nation as a model for successful development as well as the implementation of e - government in a non-industrialized, developing nation. |
| Gumussoy and Calisir, 2009 [7] | E-reverse (40 different countries) | TPB TAM DOI | Results indicated that, 76% of employees' intention to use e reverse auction is explained by subjective norms, perceived behavioral control, and perceived usefulness. Among them, subjective norms have the strongest effect. |
| Hung et al., 2009 [22] | E-business services (Taiwan) | TPB | The findings indicate that perceived usefulness, perceived ease of use, training, compatibility, external influence, interpersonal influence, self-efficacy, and facilitating conditions are significant predictors of users' intention to utilize EDMS. |
| Kouki et al., 2006 [29] | EDI (Canada) | TOE DOI | Conceptual paper |
| Scupola, 2009 [13] | E-commerce (Denmark and Australia) | TOE DOI | The results of the empirical research provide indication to SMEs interested to adopt B2B e-commerce, large firms interested to conduct e-commerce transactions with small and medium-size firms and policy makers. |
| Wang and Ahmed, 2009 [47] | E-commerce (UK) | DOI TOE | Results of logistic regression analyses proffer support that external pressure and perceived benefits are predictors of e-commerce adoption. |

**Table 3: Research Variables and Operational Definitions**

| Variables | Operationalization | Number of Items | Items Source |
|---|---|---|---|

| | | | |
|---|---|---|---|
| E-business Adoption | The firm's uptake and use of the various available functions and services provided by the Jordanian e-business which range from getting information to conducting transactions with government online. | 4 items and 16 applications matrix | Zhao et al., 2008; alzoubi, 2011 [3, 4, 36] |
| Relative Advantage | The degree to which an innovation is perceived as being better than the idea it supersedes. | 4 | alzoubi, 2011; Moore, 1991 [3, 4] |
| Compatibility | The degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters. | 4 | alzoubi, 2011; Premkumar, 2003 |
| IT Infrastructure | Hardware and software that enable users to do secure internet related business. | 5 | alzoubi, 2011; Ramamurthy, 1999 |
| Security | Perception and fear of safeguarding mechanisms for the movement and storage of information through electronic databases and transmission media. | 3 | Jones and Beatty, 1998; Fulford and Doherty, 2003 |
| Organizational Culture | Second order construct that consisted of four traits. These are adaptability, mission, involvement and consistency. | 8 | alzoubi, 2011; Denison et at., 1995 |
| Top Management Support | The extent of commitment and resource support from organization's top management for e-business adoption. | 4 | Sutanonpaiboon and Pearson, 2006 [48] |
| Resource | Allocation and spending of the amount of money required to support activities and obtain the necessary human and other resources such as hardware and software licenses. | 6 | Sutanonpaiboon and Pearson, 2006 [48] |
| Competitive Pressure | Pressure derived from the advantages that competitors enjoy when they adoption new technology, in which a firm has to consider whether or not to follow its competitors, or threat of losing competitive advantage, forcing firms to adopt e-business. | 5 | Sutanonpaiboon and Pearson, 2006 [47] |
| Government Support | The government support and promotion of e-business adoption among business. | 5 | Sutanonpaiboon and Pearson, 2006 [47] |

**Table 4: Binary Logistics Regression Model**

| **Current Status** [a] | | **B** | **Std. Error** | **Wald** | **df** | **Sig.** | **Exp(B)** | **95% Confidence Interval for Exp(B)** | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **Lower Bound** | **Upper Bound** |
| Advance | Intercept | 7.649 | 3.585 | 4.552 | 1 | .033 | | | |
| | Relative Advantage | 1.286 | .581 | 4.901 | 1 | **.027** | .276 | .089 | .863 |
| | Compatibility | .253 | .449 | .317 | 1 | .573 | 1.287 | .534 | 3.102 |
| | IT Infrastructure | 1.398 | .598 | 5.466 | 1 | **.019** | 4.045 | 1.253 | 13.054 |
| | Security | .197 | .490 | .161 | 1 | .688 | 1.217 | .466 | 3.181 |
| | Competition | 1.246 | .598 | 4.343 | 1 | **.037** | .288 | .089 | .929 |
| | Government Support | 1.282 | .509 | 6.340 | 1 | **.012** | 3.602 | 1.328 | 9.768 |
| | Adaptability & Mission | .995 | .436 | 5.205 | 1 | **.023** | 2.704 | 1.150 | 6.354 |
| | Involvement &Consistency | 2.006 | .468 | 18.378 | 1 | **.000** | 7.434 | 2.971 | 18.600 |
| | Top Management Support | .598 | .569 | 1.107 | 1 | .293 | 1.819 | .597 | 5.542 |
| | Financial Resources | .919 | .463 | 3.945 | 1 | **.047** | .399 | .161 | .988 |
| | Human Resources | .530 | .510 | 1.081 | 1 | .299 | 1.700 | .625 | 4.622 |
| a. The reference category is: Basic. | | | | | | | | | |

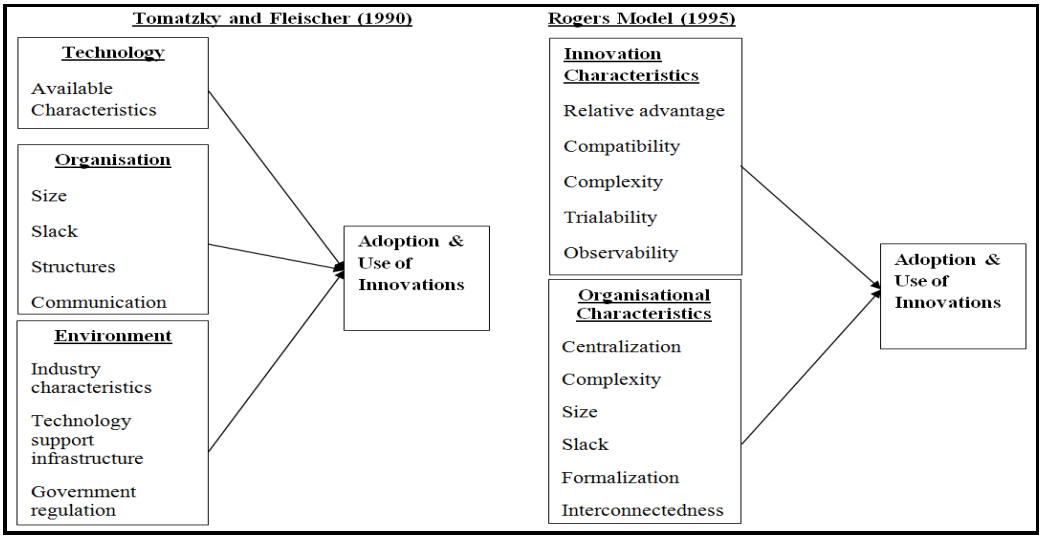


**Figure 1: Previous Innovation Adoption Models [25, 32]**

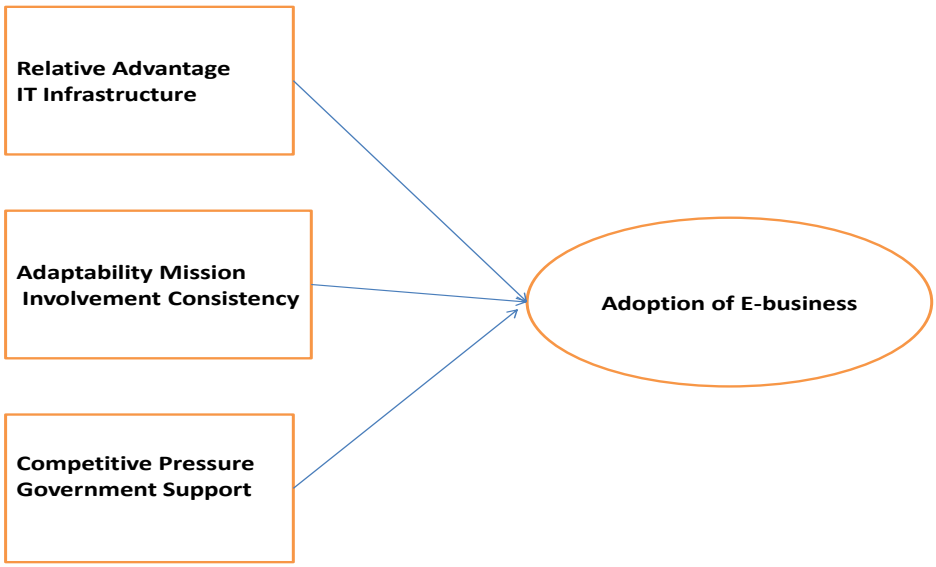


**Figure 2: Proposed Model for Adoption of E-business**