

## **ORGANIZATIONAL ADOPTION OF INFORMATION TECHNOLOGIES: A LITERATURE REVIEW**

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### **—Abstract—**

Adoption of Information Technologies (ITs) is a crucial decision for the growth, productivity, competitiveness, and even survival in a competitive market. Organizations adopt IT innovations to sustain their competitive position as well as to create competitive advantage. Tornatzky and Fleischer (1990) developed a framework named TOE that comprises three key determinants that affect organizational adoption: technology, organization, and environment. This framework has been used successfully in the study of adoption within organizations. Based on this framework, the purpose of this paper is to conduct a systematic review of the literature to understand important adoption factors of Information Technologies in organizations.

**Key Words:** Organizational Adoption, Adoption of Information Technologies, TOE Framework

**JEL Classification:** O32

## **1. INTRODUCTION**

The purpose of this paper is to conduct a literature review to identify important adoption factors of Information Technologies in organizations. The significance of the study lies in the fact that it reviews the studies have been conducted regarding IT adoption at the organizational level. Based on Technology-Organization-Environment (TOE) framework, this study aims for identifying important adoption factors of Information Technologies at organizational level.

## **2. LITERATURE REVIEW**

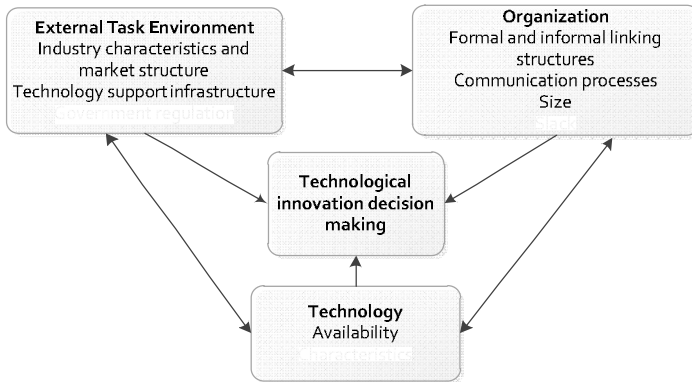
Extensive review of the literature on Information Technology (IT) adoption indicates that there are several studies at the individual level. In addition there are many theories and models used for IT adoption at the individual level such as Technology Acceptance Model (TAM) (Davis, 1986; Davis, 1989; Davis et al., 1989), Theory of Planned Behaviour (TPB) (Ajzen, 1985; Ajzen, 1991), TAM 2 (Venkatesh and Davis, 2000), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). However, there are fewer studies at the organizational level. This study aims to fill this gap. For the purposes of the study, we are interested only in theories and models at the organizational level. In this part of the study, we will systematically review the information systems literature for adoption models at the organizational level. We will mainly focus on prominent models such as, Technology-Organization-Environment (TOE) framework, Diffusion of Innovation (DOI) Theory and Institutional Theory.

### **2.1. TOE Framework**

Tornatzky and Fleischer (1990) developed a framework for organizational adoption based on Contingency Theory of Organizations. The former theory postulates that an effective organization should have a structure which is consistent with its environmental needs (Lawrence and Lorsch, 1967). The effectiveness of an organization is based upon its fitness towards both internal and external factors such as environment, organization size, and organization strategy (Donaldson, 2001). Therefore, decision makers should take in to account environmental, organizational and technological factors to make a decision. In this framework, three key determinants were identified that affect organizational adoption: technology, organization, and environment (See Figure 1). Hence, this

framework was named as “TOE” framework and used successfully in the study of adoption within organizations.

**Figure-1: TOE Framework**



**Source: Tornatzky and Fleischer, 1990**

In this framework, the technological context relates to the technologies available to an organization. Its main focus is on how technology characteristics themselves can influence the adoption process. The organizational context describes the characteristics of an organization. Common organization characteristics include firm size, degree of centralization, formalization, complexity of its managerial structure, the quality of its human resources, and the amount of slack resources available internally. The external environmental context is the arena in which an organization conducts its business. This includes the industry, competitors, regulations, and relationships with the government. These are factors external to an organization that present constraints and opportunities for technological innovations (DePietro et al., 1990).

## **2.2. The Systematic Review of the Empirical Literature on TOE Framework**

TOE framework is utilized by several studies to explain various IT adoptions such as e-commerce, e-business, Enterprise Resource Planning, Electronic Data Interchange, open systems, Knowledge Management Systems etc. (See Table 1).

**Table 1: The Studies that use the TOE Framework**

| <b>Author(s)</b>                              | <b>Domain</b>           |
|---|-------------------------|
| Ifinedo (2011)                                | Internet/E-Business     |
| Troshani et al. (2011)                        | HRIS                    |
| Bose and Luo (2011)                           | Green IT Initialization |
| Oliveira and Martins (2010)                   | E-Business              |
| Lee et al. (2009)                             | KMS                     |
| Ramdani et al. (2009)                         | Enterprise Systems      |
| Doolin and Al Haj Ali (2008)                  | Mobile Commerce         |
| Lin and Lin (2008)                            | E-Business              |
| Pan and Jang (2008)                           | ERP                     |
| Bellaaj et al. (2008)                         | Web Site                |
| Liu (2008); Sparling et al. (2007)            | E-Commerce              |
| Zhang et al. (2007)                           | IT                      |
| Chang et al. (2007)                           | E-Signature             |
| Hong and Zhu (2006); Teo et al. (2006)        | E-Commerce              |
| Zhu et al. (2006)                             | E-Business              |
| Raymond et al. (2005); Zhu and Kraemer (2005) | E-Business              |
| Xu et al. (2004)                              | Internet                |
| Zhu et al. (2004); Zhu et al. (2003)          | E-Business              |
| Lertwongsatien and Wongpinunwatana (2003)     | E-Commerce              |
| Premkumar and Roberts (1999)                  | IT                      |
| Chau and Tam (1997)                           | Open System             |

### **2.3. The Studies that used the TOE Framework with other Theories**

TOE framework can be combined with other theories to better explain IT adoption. Diffusion of Innovation (DOI) theory is one of the main theories that are combined with TOE framework. Thong (1999) develops an integrated model combining TOE framework with DOI theory. The model specifies contextual

variables such as decision-maker characteristics, IS characteristics, organizational characteristics, and environmental characteristics as primary determinants of IS adoption in small businesses. Moreover, Zhu et al. (2006a) and Wang et al. (2010) combined DOI theory with the TOE framework to better understand IT adoption decisions.

Institutional theory is another theory that is combined with TOE framework to explain IT adoption within different domains. According to the institutional theory, in order to make organizational decisions social and cultural factors should also be taken in to account. In order to survive, organizations must conform to the rules and belief systems prevailing in the environment (Scott, 2004). The institutional theory adds to the environmental context of the TOE framework external pressures including pressure from competitors and trading partners (Oliveira and Martins, 2011). Gibbs and Kraemer (2004) and Soares-Aguiar and Palma-Dos-Reis (2008) are examples of the studies that combined Institutional Theory with TOE framework. Li (2008) combines TOE framework with DOI and Institutional Theory in order to explain organizational adoption of e-procurement.

Iacovou et al. (1995) develop a new model for EDI adoption in the small organizations that is based on three factors; perceived benefits, organizational readiness, and external pressure. The external pressure in the model includes two variables; competitive pressure and trading partner power. Oliveira and Martins (2010) use this model with the TOE framework to explain adoption of e-business. Table 2 chronologically presents some studies that combine TOE framework with other theoretical models.

**Table 2: The Studies that Combine TOE Framework with Other Theoretical Models**

| <b>Model</b>                             | <b>Author(s)</b>                       | <b>Domain</b>                |
|--|--|------------------------------|
| TOE and DOI                              | Wang et al. (2010)                     | RFID                         |
| TOE and DOI                              | Chong et al. (2009)                    | Collaborative Commerce       |
| TOE, DOI and Institutional Theory        | Li (2008)                              | E-procurement                |
| TOE and Institutional Theory             | Soares-Aguiar and PalmaDos-Reis (2008) | E-procurement                |
| TOE and DOI                              | Zhu et al. (2006)                      | E-business                   |
| DOI, TOE and Iacovou et al. (1995) Model | Hsu et al. (2006)                      | E-business                   |
| TOE and DOI                              | Zhu et al. (2006)                      | E-business                   |
| TOE and DOI                              | Vaidya and Nandy (2004)                | E-business                   |
| TOE and Institutional Theory             | Gibbs and Kraemer (2004)               | E-commerce                   |
| TOE and Iacovou et al. Model             | Kuan and Chau (2001)                   | EDI                          |
| TOE and DOI                              | Thong (1999)                           | Software Applications        |
| TOE and DOI                              | Lee (1998)                             | Internet-Based Financial EDI |
| TOE and DOI                              | Higa et al. (1997)                     | Telemedicine                 |

### 3. DISCUSSION

Review of the literature shows that in order to study organizational adoption of an IT we should consider technological, organizational and environmental contexts. We recognize that some studies use TOE framework combining with other theories to better explain IT adoption. DOI theory is one of the main theories that are combined with TOE framework. Institutional theory is another theory that is combined with TOE framework to explain IT adoption within different domains.

DOI theory has been a popular theoretical basis for researchers investigating the adoption of Information Technology (IT) in organizations (Rai, 1995; Grover, 1993; Grover and Goslar, 1993; Huff and Munro, 1985; Zmud, 1982, 1984). Perceptions about innovation characteristics have important influences on adoption decision (Agarwal and Prasad, 1997). These perceptions have been used to explain both system usage as well as usage intentions (Moore and Benbasat, 1991; Wynkoop et. al., 1992; Adams et al., 1992; Davis, 1993). According to this theory there are five technological characteristics that affect adoption including relative advantage, complexity, compatibility, observability, and trialability.

Institutional theory states that organizations are affected by the environment in which they operate and that this comprises both technology and the institutional

environment (DiMaggio and Powell 1983). The central premise of institutional theory is that organizations adopt structures and practices that are “isomorphic” to those of the other organizations as a result of their quest to attain legitimacy. Several factors have been identified that give rise to isomorphic pressures. Scott (1995) suggested that there are three pillars of the institutional environment: the regulative pillar refers to rules and laws that exist to ensure stability and order in societies, the normative pillar refers to the domain of social values, cultures, and norms, the cognitive pillar refers to the established cognitive structures in society that are taken for granted.

This paper provides an overview of the literature and an in-depth look at IT adoption identifying not only models, theories and frameworks but also variables and constructs significant at the organizational level.

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