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Antecedents and Impact of Intranet Utilization: A Conceptual Framework

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Abstract

Intranet is a term used to describe the use of Internet technologies internally within an organization rather than externally to connect to the global Internet. While the advancement and the sophistication of the intranet is progressing tremendously, research on intranet utilization is still very scant. This paper is an attempt to provide a conceptual understanding of the intranet utilization and the corresponding antecedents and impacts through the proposed conceptual model. Based on several research frameworks built through past research, the authors attempt to propose a framework for studying intranet utilization that is based on three constructs i.e. mode of utilizations, decision support and knowledge sharing. Three groups of antecedent variables namely intranet, organizational and individual characteristics are explored to determine their possible contribution to intranet utilization. In addition, the impacts of intranet utilization are also examined in terms of task productivity, task innovation and individual sense of accomplishments. Based on the proposed model, several propositions are formulated as a basis for the study that will follow.

Keywords: Technological factors, organizational factors, individual factors, individual impact.

Introduction

Intranet is a term used to describe the use of internet technologies internally within an organization rather than externally to connect to the global internet. Today, intranet adoption has been very widespread that almost every business enterprise and public organizations have embraced it. It is no longer considered as a lavish technological investment but rather treated as technological need and necessity critical to the well being of the organizations. With intranet being equipped in most corporate workplace environment, questions regarding users' utilization behavior still remain unanswered. Not much is really known as to what extent do user exploits intranet technology for the purpose of enhancing their performance and productivity. Likewise, little is really known on the factors that shape utilization behavior from the users' perspectives. Against this background, this paper is an attempt to provide a conceptual understanding on utilization behavior of users in an intranet-computing environment through the proposed theoretical model. Based on the proposed model, several propositions are formulated as a basis for the study that will follow.

The Proposed Model

A good number of literature in the information systems (IS) field has contributed a great deal to the development of the conceptual framework. Among them are Ali & Money (2005); Trice & Treacy (1988); Delone & Mclean (1992); Goodhue & Thompson (1995); Agarwal (2000) and Jeyaraj, Rottman & Lacity (2006). Building upon these theories, models and frameworks, we developed the research model that involves input, process and output. In this model, intranet utilization (the process) is considered central in our attempt to explore the intranet utilization phenomena, followed by its determinants and impact. Three determinants of the intranet are found worth exploring namely intranet characteristics, organizational characteristics and individual characteristics. The proposed model also places much interest in understanding the impact of intranet utilization on individual performance.

Individual Impact

Studying the impact of IT on individual performance has become an important factor in determining the value of information systems. Previous studies on IT adoption have recognized the contribution of IT in enhancing individual performance especially in terms of productivity, efficiency and effectiveness (e.g. Jiang & Klein, 1999; and Iivari, 2005). In light of this study, individual impact of intranet utilization is assessed in terms of task productivity, task innovation and individual sense of accomplishment. Task productivity refers to the extent that an intranet improves the user's output per unit of time. Past researches have shown the contribution of intranet in improving employee productivity and effectiveness (Lai & Mahapatra, 1998; Knight *et al.* 2005). According to Torkzadeh & Doll (1999) when studying the impact of IS, we cannot just study what workers do, but rather how innovative they are in what they have to do. To this effect, the proposed model will also include task innovation as one of the construct for individual impact and is defined as the extent that an intranet helps the user create and try out new ideas in their work. Recent study by Batista, Backhouse & Canhoto (2006) discovered that intranet created a sense of closeness and togetherness as well as promoting sense of belongings and accomplishments. To describe this situation we use the term personal sense of accomplishment (Staples, Wong & Seddon, 2002) that is defined as the user feelings of self-esteem as the results of using intranet.

Intranet Utilization

Within the IS domain, IS utilization construct has been one of the longest standing construct in IS research. However, Delone & Mclean (2002) cautioned that when utilization is adopted as measure in IS studies, researchers must consider the extent, nature, quality, and appropriateness of the system utilization and hence system utilization should evaluate full functionalities as its intended purpose. To this effect, the proposed model will evaluate intranet utilization as an aggregate of (i) mode of utilization and (ii) purpose of utilization. The mode of intranet utilizations depends upon the complexities and maturity of the intranet and the combination of these different modes of utilization should determine the purpose of utilization. Two most commonly found purposes of utilizations are decision support and knowledge sharing. Table 1 depicts the different modes of intranet utilization and the corresponding studies that have

addressed the issues. Based on the combination of these utilization modes, intranets are also utilized for the purpose of individual decision support and knowledge sharing. Compared to traditional forms of information access, intranet-based information access provides (i) more variety i.e. various types of information in different formats and levels of details (ii) larger volume i.e. more information can be accessed in the same time (iii) greater rich i.e. information distributed in different parts of the organization can be assessed from any location linked to the intranet (Sridhar, 1998). These advantages have clearly made the intranet as an effective tool for decision support purpose. Studies such as Ba, Lang & Whinston (1997); Ba, Kalakota & Whinston (1997); and Denton (2005) have empirically demonstrated how the intranets are being utilized for decision support.
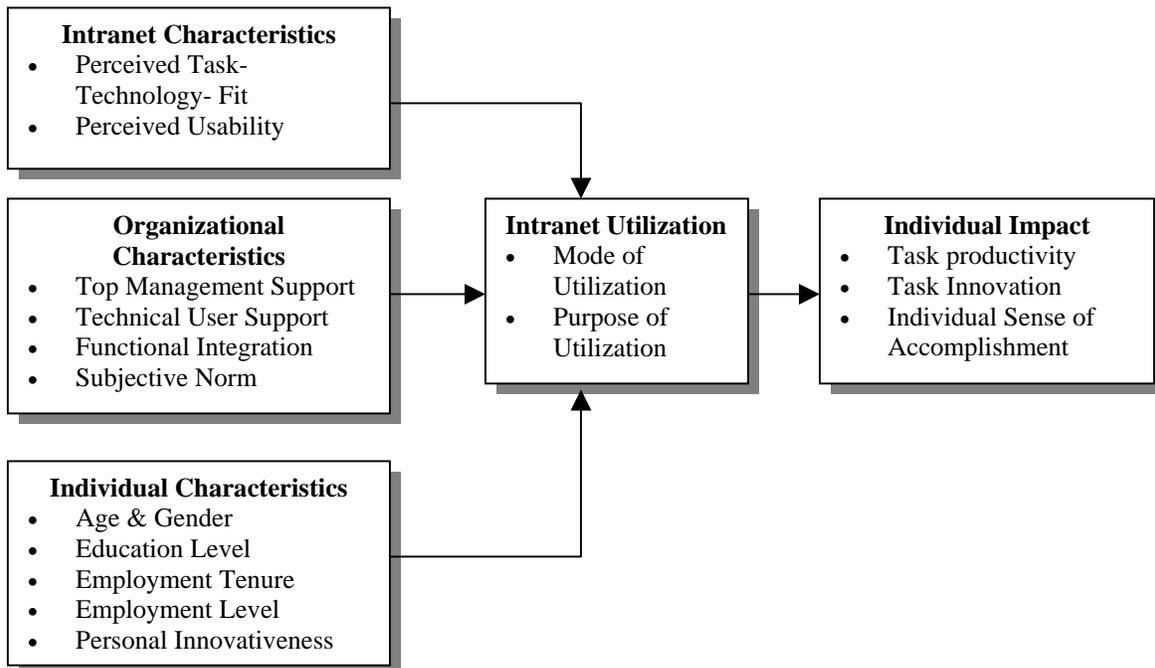

Figure 1. The proposed model

Realizing the importance of knowledge sharing, many organizations have also deployed or exploited intranet as part of their knowledge management initiative programs. The literature indicates that there exist diverse studies that specifically address the role of intranet in facilitating knowledge sharing (Lichtenstein, Hunter & Mustard, 2004; Ruppel & Harrington, 2001; Stoddart, 2001; Panteli, Tsiourva & Modelly, 2005; Stenmark, 2005a; Holden, 2003; Newell *et al.,* 1999; Hall, 2004). Based on the aforementioned discussion, we argue that the five modes of intranet utilization plus the purpose of utilization which consists of decision support and knowledge sharing fulfilled Mclean & Delone's (2002) requirements of measuring effective IS utilization. Study such as Deltour (2005) for instance, showed that intranet utilization strongly influence individual impact. Hence in consistent with Deltour's findings and in accordance to Delone & Mclean's (1992) Information Systems Success Model (ISSM) and Goodhue and Thompson's (1995) Technology Performance Chain Model (TPCM) that IS utilization predicts individual impact, it is hypothesized that intranet utilization is significantly related to individual impact.

Table 1. Mode of intranet utilization

Mode	Description	Studies
Publishing	The utilization of intranet for publishing information e.g. home pages, memos, newsletters, manual, technical documents etc	Daamgaard & Scheepers, (1999); Azzone & Bianchi (2000); Ruppel & Harrington (2001); Kefos & Reid (2005)
Transacting	The utilization of intranet for transacting with functionality on intranet pages and other web-based forms of organizational information systems such Human Resource, Finance, Customer Relationship etc.	Daamgaard & Scheepers, (1999); Azzone & Bianchi (2000); Ruppel & Harrington (2001); Kefos & Reid (2005)
Interacting	The utilization of intranet for interacting with other individuals and groups in the organizations via forum room, discussion room, e-group, e-mail	Daamgaard & Scheepers, (1999); Buchanan-Oliver *et al*., (200l); Vaast (2001).
Searching	The utilization of intranet for searching organizational information such staff info, forms, manuals, newsletter, technical documents etc. via staff directory or search engines	Daamgaard & Scheepers (1999); Azzone & Biachi, (2000); Stenmark (2005b); & Stoddart (2001)
Recording	The utilization of intranet for recording organizational memory such as best practices, business processes, frequently asked questions (FAQ) etc.	Jennex & Olfman (1997) Huang (1998); Daamgaard & Scheepers (1999)

Determinants of Utilization

As shown in Figure 1, three groups of determinants will be investigated. Within the intranet characteristics, two variables will be explored. Within the organizational characteristics, four variables will be investigated. Within the individual characteristics, six variables will be studied. Altogether, a total of twelve determinants will be investigated.

Perceived Task-Technology-Fit

Task technology fit relates on how well the functionalities of the technology fits the needs and requirements of the users in executing their work task. Mathieson & Keil's (1998) study demonstrated that perceived ease of use, a construct that is heavily adopted by researchers, is also a function of task-technology fit. The importance of task-technology fit has been widely advocated in IS literature. Diverse studies have shown its contribution in ensuring user utilization of IS (Wells & Palmer, 2004; Dishaw & Strong, 2005). Within the intranet domain, studies recognizing the importance and role of perceived task-technology-fit can be traced from the work

of Wilkie (2005); Batista *et al.* (2006). Based on this justification, it is hypothesized that perceived task-technology-fit is significantly related with intranet utilization.

Perceived Usability

Previous studies have recognized the importance of usability aspect in ensuring successful intranet utilization (Stoney, 2003; Hill, Acton & Scott, 2005). Aladwani & Palivia (2002) asserted that there are differences in opinion regarding the particular components to use. Hill *et al*. (2005) argued that intranet are derivations of closed systems, hence usability aspects are associated with web-based systems. Kuan, Bock & Vathanophas (2005) adapted the construct of Delone & Mclean's (2002) ISSM and classified usability attributes into three quality dimensions i.e. information quality, systems quality and service quality. Within the domain of intranet studies, information quality was addressed by Welch & Pandey (2005); Tang (2000); Phelps & Mok (1999); Deltour (2005); and Fong (2003). On the other hand, intranet studies that deal with systems quality include Phelps & Mok (1999); Weerakody (2004); Wagner, Chung & Baratz (2002) and Deltour (2005). Issue of service quality was addressed by Cody & Hope (1999) and Miller (2004). Defining usability as the combination of information quality, systems quality and service quality it is hypothesized that perceived usability is significantly associated with intranet utilization

Top Management Support

Top management support of information systems refers to the degree to which top management understands the importance of the IS function and the extent to which it is involved in IS activities. In the context of intranet, researchers consistently found that top management support is a strong determinant of intranet implementation success (Al-Garbi & Al-Turki, 2001; Eder & Igbaria, 2001; Tang, 2000; Bajwa & Ross, 2002). High degree of managerial support for the intranet implementation will not only demonstrate commitment and continuous support for the project but also develop conducive implementation environment by providing necessary resources such as time, space, equipment and people. Thus, in light of the above discussion it is hypothesized that top management support is significantly related with intranet utilization.

Technical User Support

Technical user support deals with the technical support and help given to users in terms of operating the intranet in the organization. Schmmid *et al.* (1999) used the term intranet management to describe the task of keeping an enterprise intranet running and to ensure that the intranet supports the users' tasks within the business processes. Terplan (2000) also advocates that in managing intranets, those critical success factors include (i) management processes that may involved fault, configuration, performance, security and accounting management, (ii) management tools that will be utilized for supporting management process and are usually assigned to human resources, and (iii) human resources of the management team that would embrace their skills and network management experiences. Based on this discussion, it is hypothesized that technical user support is significantly related with intranet utilization.

Functional Integration

In any organization, functional integration is required because (i) functional units often depend on each other for inputs (sequential or reciprocal dependence) (ii) functional units often need to cooperate to execute distinct parts of a process (iii) integration can mean more efficient sharing of resources and the development of organizational standards (iv) functional integration helps support process integration because the functional or departmental managers are better able to coordinate their decisions with respect to process execution (Stohr & Nickerson, 2003). Among the mechanism of which functional integration can be achieved is through the use of intranet, e-mail and other collaborative software. Past studies on intranet recognized the importance of functional integration in ensuring successful intranet implementation (Tang, 2000; Bajwa & Ross, 2002). Based on the aforementioned arguments, it is hypothesized that functional integration is significantly related with intranet utilization.

Subjective Norm

Studies across diverse IS implementation settings have recognized the role of social influence in determining individual's technology utilization. In fact, in the updated version of the infamous and parsimonious Technology Acceptance Model or TAM (Davis, 1989) i.e. TAM2 and Unified Theory of Acceptance and Use of Technology or UTAUT (Venkatesh *et al.*, 2003), the subjective norm construct is explicitly added into the models. This construct originates from the Theory of Reasoned Action (TRA) and is defined as a person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein & Ajzen, 1975). In the context of intranet studies empirical evidence on the influence of subjective norms can be traced from the work of Chang (2003); Chang (2004) and Batista *et al.* (2006). To this effect, it is hypothesized that subjective norm is significantly related with intranet utilization.

Age and Gender

The influence of age has been demonstrated in many technology adoption studies (Gefen & Sraub, 1997; Venkatesh *et al.*, 2003; Jones & Hubona, 2005; Guerrero, Egea &Gonzalez, 2005; Knutsen, 2005). Study by Yi, Wu &Tung (2005) indicated that age may influence technology use in multiple ways i.e. (i) directly affecting technology use (ii) indirectly influencing technology use through perceptions and (iii) moderating the relationships between perceptions and technology use. Statistics on internet access and use across countries also reveal gender as one of the most important factors influencing internet adoption and utilization (Cheong, 2002; Dholakia, Dholakia & Kshetri*,* 2003; Rhee & Kim, 2004). Dholakia *et al*. (2003) noted that 'men and women have different cultures, are specialized in different tasks, and have different preferences. Such differences tend to interact with the features found in the Internet and other modern ICTs in ways that intensify their perceived usefulness and the perceived ease of use in favor of men rather than women'. Considering that internet and intranet utilizations are equivalent in many respects, it is therefore hypothesized that age and gender are significantly related with intranet utilization.

Education Level

Studies have shown that individuals having higher level of education are generally more aware of technology benefits; suggesting better possibility of embracing technology (Jones & Hubona, 2005; Ali & Money, 2005). In the context of intranet, we also argue that educational level is influential in determining intranet utilization. Our justification is based on the fact that individuals who attended tertiary education are better exposed with the internet or intranet used in the university, implying higher possibility of utilization. Therefore it is hypothesized that education level is significantly related with intranet utilization.

Employment Tenure

Previous researches indicate that employment tenure has mixed results as a predictor of IT usage (Burkhardt, 1994; Liao & Landry, 2000; Robinson, Marshalls & Stamps, 2005). Considering that employee with longer length of service will not only have better understanding of organizational processes and operations, but also better involvement and contribution during the implementation of the intranet, we argue that these employees would also perceive the intranet as being very useful, which in turn heightens utilization level. Hence, it is hypothesized that employment tenure is significantly related with intranet utilization.

Employment Level

Studies investigating the effect of employment category on IT adoption produced mixed results (Mawhinney & Lederer, 1990; Tillquist, 1996; Hubona & Geitz, 1997). With regard to intranet study, Weitzel & Hallahan (2003) found that employment category is influential in determining intranet adoption. Against this background, it is hypothesized that employment level is significantly related with intranet utilization.

Personal Innovativeness

Personal innovativeness is the domain-specific individual trait which reflects the willingness of a person to try out a new information technology. Past studies on IT adoption reveal that personal innovativeness has been diversely used either as antecedents or moderator (Agarwal and Prasad, 1998; Limayem, Khalifa & Frini, 2000; Lee, Kim & Chung, 2002; Schillawaert *et al*. 2000) Following the findings of Schillawaert *et al*.'s (2000), we also argue that personal innovativeness is posited to have direct effect on individual utilization of intranet. Hence it is hypothesized that personal innovativeness is significantly related with intranet utilization.

Conclusion

This paper attempts to propose a conceptual framework for studying intranet utilization and its corresponding determinants and impacts. The model allows us to identify the intranet utilization through evidences gathered from extensive review of literature. In addition, the model also assisted us in building our understanding of the factors that contributes to its successful utilization. Again, the inclusion of most of the constructs in this model was well supported from

past research. However, this model is yet to be further tested and verified from studies conducted in various environments employing Intranet technologies. The proposed model should be of interest to both intranet practitioners and academic community. For the practitioners, the model should enhance their understandings on how to evaluate the intranet performance through its utilization and individual impact measures as well as on how to improve utilizations by looking at the contributing factors. For the academic community, the proposed model provides ample research opportunity to test and validate the model. Findings of such study could be incorporated into the teaching of Intranet implementations in the IS or IT curriculum.

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