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## Measuring Corporate Intranet Effectiveness: A Conceptual Framework

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### Abstract

*While research on Intranet effectiveness has been greatly reported in the literature, gaps still exist particularly in the development of a theoretical framework from a user-based perspective. This paper attempts to discuss at a conceptual level on the concept of Intranet effectiveness and further analyze the effectiveness framework with several contributing factors grouped as organizational, technological and individual. Through in-depth review of relevant literature in the information systems and the knowledge management fields the paper proposes a conceptual framework for a study to be conducted on the corporate Intranet effectiveness.*

**Keywords:** Intranet effectiveness, organizational factors, technological factors, individual factors

### 1. Introduction

Fueled by the overwhelming media attention to the Internet and the explosive growth in World Wide Web usage in the mid 1990s, many organizations began to establish their own Internet presence that ran entirely within an organization call corporate portals or the Intranet (Scheepers 1999). Muller (2002) defined Intranet as “a private TCP/IP network that usually supports the same protocols and services as the public Internet including e-mails, news, chat rooms and web pages”. According to Muller (2002) companies adopt portals or Intranet to improve internal communications, distribute information and enable more employees to access legacy systems. Among other reasons were platform flexibility, cost effectiveness, improved organizational information and resource sharing. At present, portal technologies have significantly matured. Growing number of research publications embracing different aspects of the topic such as development, implementation as well as measurement of its effectiveness can also be observed.

While research on Intranet effectiveness has been greatly reported in the literature, gaps still exist in a number of areas such as its effectiveness and success factors. This paper attempts to provide a conceptual understanding of the intranet portal effectiveness through the proposed effectiveness framework and the factors that contribute to its success. Based on several research frameworks built through past research, the authors attempt to propose a framework for studying corporate Intranet effectiveness, which is based on three perspectives i.e. effective usage, service quality and impact on user. In addition, three groups of antecedent variables namely

organizational, technological and individual are explored in the literature. The following section further explains the proposed framework.

## **2. The Proposed Framework**

In our attempt to propose a study on the use of Intranet in the corporate environment, we developed a framework below (Figure 1) from an extensive review of literature and a few preliminary case studies conducted at several organizations in Malaysia. The extensive review of literature leads us to conceptualize the variables proposed and the corresponding paths drawn to indicate the relationship between them. The framework comprised of three independent variables (IV) representing the contributing factors of Intranet effectiveness (organizational, technological and individual factors), and three effectiveness variables (DV) conceptualize as effective usage, Intranet service quality and individual impact. Each of the constructs conceptualized is represented by many other observable variables to be discussed later.

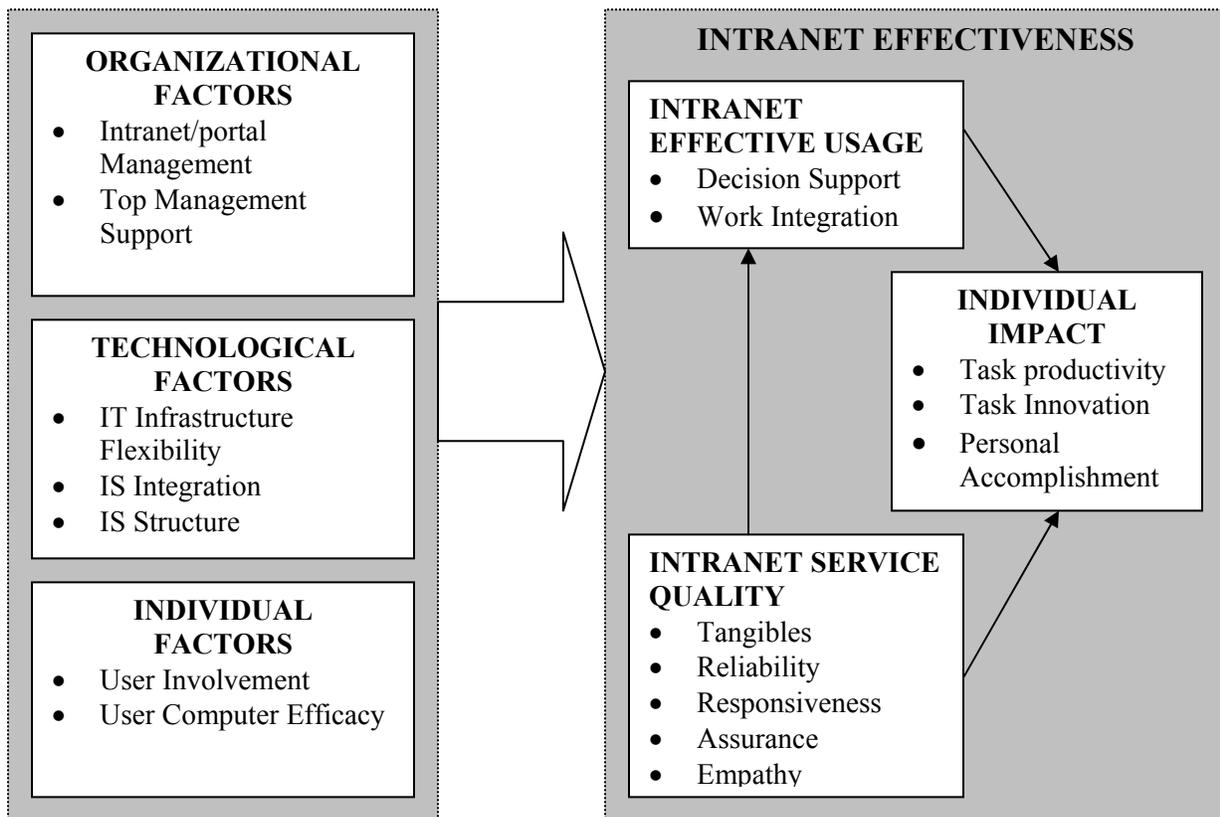
### **2.1 *Intranet Effectiveness***

In order to understand the effectiveness of the Intranet systems and services provided by the organizations it is found that the model developed by DeLone and McLean (1992; 2003) to be the best guide in our conceptualization process. Based on the model, Intranet effectiveness can be defined as a composite of Intranet effective usage, Intranet service quality and individual impact. The following sections further elaborate on each of these constructs.

#### **2.1.1 *Intranet Effective Usage***

System usage has been used by DeLone and McLean (2003) to indicate success or effectiveness, by considering the extent, nature, quality, and appropriateness of the system use. Hence, measuring effectiveness from the perspective of use should mean informed and effective use. The measure of use in the context of the Intranet environment is considered significant due to its voluntary nature. In other words, unlike other types of IS, which usage is considered non-voluntary, the use of Intranet highly depends on whether people use it or not, and how they use it to become effective. Doll and Torkzadeh (1998) included decision support and work integration to indicate effective use in their proposed measure of effective information technology usage. Decision support is defined as the extent the Intranet is used to make sense out of data and to improve the decision making processes or justify the reasons for the decision. On the other hand, work integration is defined as the extent that Intranet is used to coordinate work activities with other's in one group and to plan one's own work, monitor performance and communicate vertically to coordinate one's work with superiors and subordinates. The positive findings lead us to believe that these two constructs would fulfill DeLone and McLean's requirements in the conceptualization of effective use.

**Figure1: Conceptual framework**



### 2.1.2 Intranet Service Quality

Service quality is considered an important component of the Intranet effectiveness due to strong empirical supports from the literature. Many researchers concurred that service quality is applicable to the IS functions including the Intranet, since the systems are considered service functions that serve the information as well as the information technology needs of the organizations (Myers et al. 1998; Cody and Hope 1999; Quinonez 2002; DeLone and McLean 2003; Miller 2004)

The service quality instrument (SERVQUAL) developed by Parasuraman, Berry and Zeithaml (1988; 1991) is seen as the most reliable indicators used for assessing information system service quality. Despite being originally introduced in the marketing field, this instrument is widely utilized in evaluating information system performance (Grover, Cheon and Teng 1996; Devaraj, Fan and Kohli 2002; Jiang, Klein and Carr 2002; Kang and Bradley 2002). The instrument consists of five constructs namely reliability, responsiveness, assurance, empathy and tangible. A study conducted by Hope (2001) indicates the suitability of this construct to be applied in the Intranet environment. This justifies the presence of these constructs in the conceptualization of the service quality variable.

### **2.1.3 Individual Impact**

The individual impact is conceptualized as the impact of the Intranet on individual performance particularly in supporting work task and individual sense of accomplishment. Evidences from a number of empirical works have pointed to the important contributions of individual impact in evaluating IS effectiveness (DeLone and McLean 1992; Myers, Keppleman and Prybutok 1998; Torkzadeh and Doll 1999). The performance of Intranet service provided can only be considered successful or effective if it gives positive impact to the users in enhancing their personal development and work productivity. It is therefore proposed that individual impact should be made as one of the Intranet effectiveness dimension in our proposed Intranet effectiveness framework (as illustrated in Figure 1).

In conceptualizing individual impact, four factors were found to be the most commonly adopted in measuring the impact of information technology on work (Myers, Keppleman and Prybutok 1998; Torkzadeh and Doll 1999). These are task productivity, task innovation, customer satisfaction and management control. However, due to the nature and context of the Intranet environment, we have dropped the customer satisfaction and management control. Our rationale is that these two measures are irrelevant since the focus of the proposed framework is only meant for internal users i.e. enterprise employee and does not involve any external customers or users. Moreover, we expect that users at all job levels should be involved in evaluating the Intranet effectiveness. Task productivity is defined as the extent that an Intranet improves the user's output per unit of time. On the other hand, task innovation is defined as the extent that an Intranet helps the user create and try out new ideas in their work.

In addition, based on the work of Staples, Wong and Seddon (2002), another variable called personal accomplishment is found to be relevant as one of the measures of personal impact. Personal accomplishment is defined as personal sense of accomplishment as the user feelings of self-esteem as the results of using Intranet. Marler and Dulebohn (2005) used the term intrinsic outcome to include positive feelings of accomplishment and conceptualized that this factor will positively relate to Employee Self Service system (Intranet portal) acceptance (use). In our proposed framework we would like to investigate the impact of the effective usage and service quality on personal sense of accomplishment.

## **2.2 Antecedent Factors**

The antecedent factors are the factors that may contribute to the effectiveness of the Intranet systems and services provided. Based on the framework, these factors are considered the independent variables or according to the path analysis, the exogenous variables. Three variables were identified and proposed to be the antecedent factors of the Intranet effectiveness. These are organizational, technological and individual related factors. The organizational factors of our framework consist of Intranet management and top management support. The technological factors include IT infrastructure flexibility, IS integration and IS structure. Individual factors comprise of user involvement and user computer competencies. The following sections present discussion on each of these constructs.

### *2.2.1 Intranet Management*

According to Schmmid, Kaiser, Bach and Osterle (1999) Intranet management is the task of keeping an enterprise Intranet running and to ensure that the Intranet supports the users' tasks within the business processes. The Intranet management comprises of highly heterogeneous activities including content generations and updates, user supports, user accounts management, hardware and software maintenance, and many more. Terplan (2000) advocated that Intranet management is critical to the success of the Intranet. According to the author, 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. Due to the importance of Intranet management in guaranteeing Intranet success many authors have suggested different models of Intranet management (Wachter and Gupta 1997; Schmmid et al. 1999, Terplan 2000; Stoddart 2001; Duane and Finnegan 2000; White 2003). Duane and Finnegan (2000) conducted a case study focusing on Intranet management control at Hewlett Packard Ireland and found that both managers and users of the Intranet believed that the implementation of Intranet management control activities had caused tremendous growth in Intranet usage. Based on these discussions, Intranet management is included as one of the components of the organizational factors that may influence Intranet success or effectiveness.

### *2.2.2 Management Support*

The importance of top management support in the context of IS success has been theorized in the literature since the early 1960s and became more widespread throughout the 1970s and 1980s (Ragu-Nathan, Apigian, Ragu-Nathan and Tu 2004). Today, studies on the effect of management support on IT implementation success are too many and inestimable. Many researchers found that top management support is a very critical factor in ensuring IS success implementation. For instance, Bajwa, Rai and Brennan (1998) found that high levels of top management support indirectly influence the success of executive information systems by creating a supportive context for the IS organization and vendors/consultant undertakings in a firm's systems efforts. Weill (1992) discovered that for the same level of IS investment, strong top management commitment can lead to superior conversion effectiveness and thus improve IS performance. Likewise a study by Hussien et al. (2005b) in selected Malaysian government agencies revealed that top management support contributes significantly towards the success of IS implementation in an e-government computing environment. The aforementioned studies and many other studies provide sound evidence and strong justification on the role of top management support in ensuring IS success implementation effort. In the context of Intranet, researchers consistently found that top management support is a strong determinant of Intranet success (Al-Garbi and Al-Turki 2001; Eder and Igbaria 2001; Young 2001; Zolla 1998; Tang 2000; Scheepers 1999; Bajwa and Ross 2002). According to Eder and Igbaria (2001), top management support for the spread of Intranet usage can be operationalized by the communication by top management to organizational members to use the technology. Study by Cook and Verma (2002) also found a positive relationship between management support (leadership) and four aspects of the service quality i.e. tangibles,

reliability, responsiveness and assurance. Hence top management support is included in our framework as a factor that may positively influence Intranet effectiveness.

### *2.2.3 IT Infrastructure Flexibility*

According to Xia and King (2004) IT infrastructure is generally considered to be the foundation of shared IT capabilities that enable the development of IT applications and the support of business processes. Hence, they defined IT infrastructure as a set of IT resources and organizational capabilities that are shared across the organization and that provide the foundation on which IT applications are developed and business processes are supported. On the other hand, flexibility has been defined by most of the literatures, including information systems, organization theory, strategic management, and operations management, as the capability to respond to environmental changes (Lee and Xia 2003). Byrd and Turner (2000) have defined IT infrastructure flexibility as the organizational capability to support a variety of information technologies and information services. Eder and Igarria (2001) noted that an existing IT infrastructure that is flexible should provide a foundation that is less complex, making it easier for departments to implement Intranet applications. Further, they pointed out that it should also hold valid that a more flexible IT infrastructure will result in greater service offerings of the Intranet; that is, higher levels of infusion among the Intranet applications deployed. Thus, their study discovered positive association between more flexible IT infrastructures and Intranet infusion.

### *2.2.4 Information Systems Integration*

According to Ragu-Nathan et al. (2004) IS integration refers to how well IS activities are integrated with organizational and functional activities, such as marketing, manufacturing, human resources, etc. The authors pointed further that the extent of strategic alignment between business and IS is a measure of the integration of IS. Study by Tang (2000) indicated that information systems integration is strongly related with successful Intranet adoption. However, study by Bajwa and Ross (2002) on Intranet adoption and implementation in a university environment revealed that integration was not a contributing factor. They believed that universities, by design, have colleges and schools that operate somewhat independently catering to students with specializations in different fields. Nevertheless, the authors proposed that integration may be an important antecedent of Intranet adoption and implementation in corporate business environments.

### *2.2.5 Information Systems Structure*

According to Hussein et al. (2005a) IS structure refers to the extent to which information systems are structured or dispersed throughout an organization. A study by Ang et al. (2001) found that organizations with a distributed structure of IT facilities influenced IT usage. A study of Hussein et al. (2005a) also indicates strong association between IS structure and IS effectiveness. In the context of Intranet, study by Eder and Igarria (2001) found that hybrid IS structure has no association with Intranet infusion and diffusion. Hybrid IS structures encompasses a mixture of centralized and decentralized computing environment. The authors argued that due to low reliability of IS integration measures coupled with the fact that the study examines early Intranet implementations could be the reasons why their hypotheses were rejected. However, since this framework would use

user as the evaluator of effectiveness, we still believe that IS structure be it centralized, decentralized or hybrid still significant and influential in determining Intranet effectiveness.

### *2.2.6 User Involvement*

It is assumed that strong involvement of future users in the design of IS would lead to successful outcomes in terms of more IS usage, greater user acceptance, and increased user satisfaction (Lin and Shao 2000). In their study, Lin and Shao (2000) confirmed the positive contribution of user participation to successful system outcomes. As for the Intranet computing environment, Tang (2000) found that managers perceived user involvement as one of the important criteria for ensuring successful Intranet adoption. The finding is also consistent with the findings of Al-Garbi and Al-Turki (2001) who discovered that user involvement is among the critical factors in minimizing resistance and motivate employee to use Intranet. Young (2001) discovered that user participation moderates the relationship between top management support and Intranet effectiveness. Based on these arguments we proposed that user involvement is an important positive contributor of Intranet effectiveness. :

### *2.2.7 User Computer Efficacy*

Stephens and Shotick (2002) defined computer self efficacy as an individual belief in his/her ability to use technology in order to solve problems, make decisions, and to gather and disseminate information. Johnson (2001) wrote that individuals having a high level of computer self-efficacy should be more likely to engage in computer tasks and to show persistence in completing computer tasks despite possible difficulties. In contrast, individuals with a low level of computer self-efficacy should be more likely to avoid computer tasks or to give up on a computer task in face of performance obstacles. Many research proved that high level of computer self-efficacy contributes towards high degree of IT acceptance and usage (Cheung 2001; Brown 2002; Hwang and Yi 2003; Thong 2004; Keenan and Lee 2004; Boyle and Ruppel 2004). The influence of computer self-efficacy is also significant in the Intranet computing environment. Study by Tang (2000) discovered that managers perceived that user ability as one of the strong determinants for successful Intranet adoption. In another study, Young (2001) found that computer self-efficacy was among the most critical factors affecting user satisfaction in using the Intranet. Hence, user self-efficacy is included one the components of individual factors in the proposed framework.

## **3. Conclusion**

This paper attempts to propose a conceptual framework for studying Intranet effectiveness and its contributing factors. The framework allows us to identify the Intranet success factors through evidences gathered from extensive review of literature. In addition, the framework also assisted us in building our understanding of the factors that contributes to its success. Again, the inclusion of most of the constructs in this framework was well supported from past research. However, this framework is yet to be further tested and verified from studies conducted in various environments employing Intranet technologies.

The proposed framework should be of interest to both Intranet practitioners and academic community. For the practitioners, the framework should enhance their understandings on how to evaluate the Intranet performance through its success factors as well as on how to improve their existing system by looking at the contributing factors. For the academic community, the proposed framework provides ample research opportunity to test and validate the framework. Findings of such study could be incorporated into the teaching of Intranet implementations in the IS or IT curriculum.

This proposed framework is also subjected to various constraints facing most behavioral research. One such constraint is particularly due to the presence of various intervening variables that may be related with the constructs identified. The conceptualization process may undermine the importance of other constructs that we have not identified. Prospective researchers intending to adopt the framework may also consider incorporating additional variables. For instance, some other antecedent factors such as user job design (Bazwa and Ross, 2002) and other individual characteristics such as age, education level and professional level may be considered for inclusion. Meta-analysis study by Mahmood, Hall and Swanberg (1991) indicated that these factors were influential in promoting IT use. Another constraint may involve reliability in measurement when too many constructs are adopted in the framework.

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