User Adoption and Acceptance of Enterprise Resource Planning (ERP)

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This paper explains a planned study of variables and their relationships in the adoption and acceptance of Enterprise Resource Planning (ERP) systems. This potential research would then investigate the role of culture, resistance, involvement, satisfaction, software quality and acceptance of ERP, where user perception is the means to gain in-depth understanding of the role of these variables. This study would also look into factors influencing the process of ERP acceptance among users as a model to assess the role of each variable which is proposed.

JEL Codes: Managing People and Organisation

1. Introduction

1.1 Enterprise Resource Planning (ERP)

ERP plays an important role in integrating an organization’s resources; ERP systems are associated with integrating various business processes into a central respiratory (Davenport, 1998; Beheshhti, 2006; Nah et al., 2004). They support major organizational activities such as manufacturing and logistics, finance and accounting, sales and marketing, and human resources. They also provide a tool to share data and knowledge among various departments of an organization (Mohamed and Fadlalla, 2005; Møller, 2005). They reduce cost and also enhance the accuracy of business processes. Therefore, when ERP systems successfully implemented, ERP will have positive effects on an employee’s efficiency and then influence positively an organization’s productivity (Shang and Seddon, 2000).

Beheshti (2006:184) defines ERP systems as “a set of business applications or modules, which links various business units of an organization such as financial, accounting, manufacturing and human resources into a tightly integrated single system with a common platform for flow of information across the entire business”. Therefore, the integration is a means to make available a flow of all information through the company (Davenport, 1998:1). ERP systems are not like any other Information Technology (IT) adoption because ERP systems enforce their way of doing business (Davenport, 1998:2). ERP systems also require organisational changes associated with technological, operational, managerial, and strategic and component related organizations (Ifinedo, 2007:272). Therefore, ERP systems are

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complex projects that require careful investment in terms of money, time and expertise.

ERP implementation has witnessed a high rate of failure in developed and developing countries. This failure has been associated with cost and time overruns (Nagi et al., 2008). According to Aladwani (2001:266), "many ERP systems still face resistance, and ultimately, failure". This point of view is also supported by other researchers. Rasmy et al. (2005:1) believed that more than a half of ERP projects would be considered failures and therefore many ERP projects would end disastrously. Wang et al., (2007:200) indicated that 70 percent of ERP implementations could not deliver required benefits. This implies what Muscatello and Parente (2006:61) found: "failure rate estimated to be as high as 50 percent of all ERP implementation."

ERP failures seem to be universal because developed or developing countries would face the same fear of failure of ERP implementation (Aldammas and Al-Mudimigh, 2011). ERP failures do not seem to distinguish between the size of organisations (small or large) or the reputation of organisations. When failures happen, they would cost billions of dollars.

We are particularly interested in ERP implementations in developing countries as we use Saudi Arabia as a case study. Apparently, there are few studies associated with the adoption of Information Technology (IT) in Arab and Gulf States because of the late adoption of technology (Al-Turki, 2011:4). Arab and Gulf States adopted IT in 1990s while this implies that social and cultural factors (Baker et al., 2007:353) seem to play a major role in shaping the perception of adoption and acceptance of IT that is built to Western specificaitons like ERP (Yavas et al 1992; Abul-Gader 1997; Al-Turki, 2011). Therefore, it is worth investigating what success factors would influence the perception of user adoption and acceptance of ERP.

Saudi Arabia might be different from other developing countries with regard to IT adoption. The Saudi government has played a role in enforcing IT adoption because of the government’s awareness of IT adoption’s role in enhancing the productivity of national organizations (Baker et al., 2007:355). For instance, in 2004, the Saudi Crown Prince issued a decree to the Saudi Computer Society to provide a National IT Plan for Saudi Arabia in order to support economic development throughout the kingdom. This would also minimise the digital gap between Saudi Arabia and other developed countries since Saudi’s government does not face financial limitations like other developing countries.

Studies (Davis et al., 1989; Igaria, 1993) indicate that IT adoption plays a major role in increasing organisational productivity, cost reduction and gaining a competitive advantage over other organisations. This view might be contrary to the Saudi Arabian perception of IT adoption as productivity gain has not been the only reason for IT adoption (Al-Gahtani, 2003:58). Saudi Arabia has adopted IT to restrict the demand for workers or semi-skilled workers because social and economic problems have arisen from the flow of foreign labor. This is to say that the way IT adoption is perceived might be different from Western countries.
2. Literature Review

Studies like Huang and Palvia (2001), Al-Gahtani (2003) and Rajapakse and Seddon (2005) showed that ERP implementation is influenced by a number of factors such as a country’s infrastructure, the readiness of organisations and the actual process of ERP implementation. Below is a brief discussion of these factors in industrialised countries and developing countries.

It is possible to say that North America and Europe have been the largest ERP markets (Huang and Palvia, 2001:279; Al-Gahtani, 2003:58) because these countries have the necessary infrastructures to effectively ease IT diffusion. This implies other factors associated with national and environmental aspects, such as having a strong economic base and growth, are required for implementing new technology. From an organizational perspective, companies in developed countries have high IT maturity and also favorable computer cultures that apparently enable them to adopt complex technology faster than developing countries.

Huang and Palvia (2001:283) suggest the reasons above as a hindrance for ERP adoption in developing countries. For example, developing countries appear to have a poor record in infrastructure and suffer from the consequences (Rajapakse and Seddon, 2005:2). This indicates that developing countries still suffer from the lack of skills to implement ERP systems and a lack of telecommunication infrastructure. Infrastructure is supposed to be aligned with other factors, such as governmental policy encouraging foreign investment and fair competition.

From the organisational perspectives, the low IT maturity and small firms also seem to be reasons preventing companies in developing countries from adopting ERP. Small firms play a major role in the national economy of developing countries; as a result, this could create problems associated with the affordability and availability of ERP implementation. Small firms might also be afraid of changing their business processes since ERP imposes its way of doing business.

Rajapakse and Seddon (2005:2) indicated that most Asian countries could not afford the high cost of ERP systems (hardware, software and support) due to the national per-capita incomes. As a result, high costs might lead organizations to seek lower demands. Another issue within developing countries is that individuals and organisations might not be prepared for the complex level of ERP integration and this might lower the rate of ERP adoption as well. National and organizational culture might also prevent ERP adoption since developing countries have different cultural and business practices.

Technology adoption is believed to happen in a social level context rather than in a cultural vacuum (Steers et al., 2008:256). It entails values and beliefs that innovation might bring along with changes. It is not a straightforward process; otherwise, most nations would have adopted new technologies regardless of cultural differences. Different nations would raise an issue of how the new adoption of technology would affect their local culture, where the new technology could then be abandoned. The problem would rest with some Western scholars, who might use their own
perceptions about new products and new technologies to identify reasons that might prevent a particular technology from being adopted in a country other than theirs.

### 2.1 Critical Success Factors (CSFs) of ERP Implementation

Rochtart (1979) was the pioneer as he was the first person trying to identify CSFs in the Information System (IS) realm (Moohbateh and Jazi, 2010:99). CSFs are defined as “Factors which, if addressed, significantly improve project implementation chances” (Pinto et al., 1987). CSFs would then receive a great deal of attention from the management perspective if IT projects are under implementation. Therefore, not addressing CSFs while implementing an IT project might give inadequate results because ERP systems are complex and integrated in nature, require large investments of money and time, and have high-implementation failure rates (Al-Mudimigh, 2007:867). Organisations implementing ERP systems would then be encouraged to examine other organisations' experience in learning from their practices and success factors in ERP implementation.

Bruno and Leidecker (1984) also define CSFs as “those characteristic, conditions or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in a particular industry”. CSFs would then enable organisations to have competitive advantages such as increasing organisational productivity and cost reduction because of ensuring the success of IT projects (Davis et al., 1989; Igaria, 1993). Rasmy et al. (2005) define CSFs of ERP implementation as “factors needed to ensure a successful ERP project”. Apparently, the CSFs of ERP projects are an interesting area of study because they would be associated with the term success that is related to technical and organisational levels. There are a wide range of CSFs of ERP systems, but the question remains about the reasons for the diversity of CSFs of ERP implementation (Zhang et al., 2002:237). This phenomena could be explained within the context of different samples used and research settings; besides, researchers would undertake their researches in different countries, from which arise different challenges and issues because of differences in culture, government regulation and economic growth (Nagi et al., 2008). For example, Sheu et al. (2004) suggest that language, culture, politics, government regulations, management style, and labor skills impact various ERP implementation practices in different countries. Within the context of culture, Sheu et al. (2004:367) point out that national culture has a significant influence on ERP implementation because of its influences on training programs important for ERP system success. They also claim that cultural perceptions about information format could also affect the ERP implementation.

3. Aims

The main focus of this study is to investigate users’ perception of ERP implementation. This planned research would then aim at understanding the formation process of ERP adoption and acceptance from user’s perspectives. The ongoing research does not assume to be a psychological explanation of ERP adoption and acceptance; rather, it provides an in-depth understanding of how system users perceive some influential factors in relation to their adoption and acceptance of ERP such as the role of power distance or uncertainty avoidance during the implementation of ERP. Another focus of this study is to draw a relationship, if any, between the cultural context of Saudi Arabia and some potential success factors of ERP implementation.

4. Significant

This proposed study is in hope to enable researchers to gain more understanding of Saudi’ context with ERP adoption because Saudi Arabia has not fallen far from Western countries in ERP adoption (Al-Turki, 2011). Therefore, investigating some factors would bridge the gap, if any, of how a developing country or individuals would adopt ERP in comparison to Western countries.

For practitioners, investigating user perceptions will provide organisations with a tool to manage ERP users better during ERP implementation. Highlighting these differences, if any, will bring in new strategies that enable organisations to overcome difficulties during different stages such as stabilising, improvement and post-implementation of ERP.

5. Theories Studied and Adopted

There are three theories forming the foundation of the intended study and the model’s constructs. These theories are the Technology Acceptance Model (TAM), Diffusion of Innovation Theory and the Hofstede’s Theory.

First of all, this study is associated with users’ perceptions and factors influencing their perceptions to adopt and then accept ERP. For this reason, TAM contributes to providing a precise understanding of how user perceptions can play a role in promoting adoption and acceptance of a particular system such as ERP.

Users’ attitudes towards accepting technology have been an important realm of study over two decades now (Chuttur, 2009, Bagozzi, 2007). In the 1970’s, there was a great emphasis on predicting system use because of growing technology needs and increasing failure of system adoption in organizations (Davis, 1989). Most studies failed to explain how users would accept a system, where TAM came out as a reaction to explain these difficulties in relation to system design before users would experience them (Dillon and Morris, 1996:online). TAM has played an important role since TAM was introduced to the information system field in the late 80’s (Silvo, 2007, King and He, 2006).

TAM is derived from the Reason Action Theory (TRA) developed by Fishbein and Ajzen (1975), where two factors are assumed to predict user acceptance of any technology, namely perceived usefulness and perceived ease of use. Davis (1989:
defined perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance”. On the other hand, Davis defined perceived ease of use as “the degree to which a person believes that a particular system would be free of effort”. This definition is related to whether a system user would be free from difficulty or great effort.

Secondly, Diffusion of Innovation Theory (DoI) will also form a base of the potential study because it will increase the awareness of factors influencing user adoption behaviour of technology. Diffusion is defined as “the process by which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system” (Rogers and Scott, 1997:para. 12). Diffusion represents a unique type of communication associated with spreading messages that are perceived as new ideas. As a result, the diffusion of new ideas includes four main aspects/elements: innovation, communication channels, time and the social system.

Finally, this study will also consider culture theories like Hofstede’s theory of culture. Since the potential study will investigate ERP adoption and acceptance, the role of culture during the implementation will also be highlighted within the context of power distance, uncertainty avoidance and individualism vs collectivism (Hofstede, 2001). Hofstede (2001) defines culture as “A collective programming of the mind which distinguishes one group from another”. Culture is associated with learning values, partaking of rituals, modelling against heroes and understanding symbols (Jones 2007). As a result, it is a slow process of growing into a society where different factors influence people’s cultures.

6. Research Model

The research model (see figure 1) is constructed to answer the ongoing research question: what success factors would influence the perception of user acceptance of ERP. Therefore, investigating differences among different ERP users could answer the above question. This research model is derived from intensive literature reviews, where the model of Delone and Mclean (1992) has been the trigger idea of constructing the following model. It is true that the following model does not measure ERP success as the model of Delone and Mclean (1992, 2003); rather, it provides in-depth understanding of users’ perception of ERP acceptance during the implementation stage of ERP life cycle. The implementation stage of ERP seems to be a critical stage because ERP users would interact with the system and then describing differences, if any, would be taken into account.

The developed model is a tool to explain factors influencing users’ acceptance of ERP throughout the recognition of different users’ perspectives. The model's variables and success factors during the implementation stage are assumed to be interrelated because adoption and acceptance of ERP during the implementation stage are mediated by success factors that ensure the success of ERP implementation in technical, organisational and cultural levels.
6.1 Hypotheses Testing

The hypotheses that will be tested in this research are discussed below:

The cultural dimensions identified by Hofstede’s theory such as power distance, uncertainty avoidance and individualism are measured on a scale of 0 to 100 (Mooij, 2000). The scores for cultural dimensions differ from country to country. For example, Saudi Arabia has higher power distance and lower individualism, whereas Australia and the United State have lower power distance and higher individualism values. Since the level of ERP acceptance in different parts of the world is not uniform (Agouram, 2009; Davison, 2002; Chadhar and Rahmati, 2004; Sheu et al., 2004), it is possible to hypothesise that culture has an influence on the perceived user resistance to ERP.

H1: Perceived cultural dimensions (VAR1) are related to perceived user resistance to ERP software (VAR3).

When users are involved in implementing ERP systems from the start, they will be able to perceive their important roles in participating in the ERP implementation. This assists users in understanding the benefits gained from such involvement and therefore users will perceive such benefits while interacting with the ERP system (Wu & Wang, 2006). Additionally, user involvement assists users to develop realistic expectations about ERP systems, to resolve conflict about design issues and to decrease their resistance to change (Ives et al., 1983; William et al., 1989). As a result, users will be satisfied because their potential requirements are likely to be met. Based on such an argument, it is possible to hypothesise that user involvement has a positive influence on the perceived user satisfaction with ERP systems.

H2: Perceived user involvement with ERP software (VAR2) is related to perceived user satisfaction with ERP software (VAR4).

If user satisfaction is positively perceived, such a positive perception would affect Perceived User Resistance to ERP software (Hassenzahl, 2001)

H3: Perceived user satisfaction (VAR4) affects perceived user resistance (VAR3) to ERP software.
When users perceive ERP systems as unfriendly systems in terms of ease of use, their perception will influence their psychological will to use ERP systems (Lin, 1994). The same scenario might also arise when ERP users suspect the accuracy of data and the consistency of ERP systems. Additionally, ERP users are likely to form a negative attitude when ERP systems are delivered over budget or later than expected. If user resistance is associated with a negative attitude towards ERP systems, such an attitude would prevent users from perceiving benefits of ERP systems, and consequently from perceiving Software Quality. As a result, it is possible to hypothesise that perceived user resistance to ERP software influences perceived software quality of ERP software.

H4: Perceived user resistance (VAR3) to ERP software influences perceived software quality of ERP software (VAR5).

User satisfaction with ERP software is enhanced by closing the gap between user requirements and the quality of ERP software (Lin, 1994). When users are involved in ERP implementation, their involvement will enhance their satisfaction with ERP software. Therefore, user satisfaction is improved because they perceive the quality of ERP software as compatible and task relevant to their use (Holsapple et al., 2005)

H5: Perceived user satisfaction with ERP Software (VAR4) has a positive influence on perceived software quality of ERP software (VAR5).

If users perceive the good qualities of ERP systems, they will be more open to adopting and then to accepting ERP systems. As a result, users will develop a positive attitude toward the software quality since they accept the use of ERP systems.

H6: Perceived software quality of ERP software (VAR5) influences user acceptance (VAR6) of ERP systems.

7. Research Methodology

Social context is a complex subject to the extent where values, beliefs and customs play a role in influencing social phenomena and also in distinguishing a society from others. Social science research, therefore, is about people done by people, where qualitative approaches like case studies could handle a cultural context better. This research is not only concerned with the repetition of the exact condition of a previous study but with understanding human contexts (Metcalfe, 1996:18-19). Thus, human behaviors cannot be treated as physics isolated from the influence of the environment around. Since studying perception and acceptance require more involvement with people in order to realize their views through a dialogue, the emphasis is associated with understanding people’s perception not with the measurement as physics would do.

A case study will be a technique used to gain data that provides an in-depth understanding of the model's variables (Saunders et al., 2007). Therefore, this research intends to examine a case study to understand how ERP users perceive
their adoption and acceptance of ERP. A case study is also meant to verify the proposed model's variables.

Survey research is concerned with understanding the relationship between variables within a model or projecting findings descriptively to a predefined population. Using survey means using quantitative analysis to meet the purpose of the research. It is understood that the subjects studied could be individuals, organisations or communities. Subjects can also be projects, applications or systems (Pinsonneault and Kraemer, 1993:5).

Surveys are considered to be an important tool to investigate people's past behavioural experience. This is why using a survey is an effective means to ask users about their experience with ERP system, where their attitudes can be compared to draw a deep analytical understanding. This will help in tracing changes of users' attitudes over time.

7.1 Sampling

The population for sampling will be different organizations that have implemented ERP systems in Saudi Arabia in the last five years. The potential participants will be from 250 to 300 participants. People involved in ERP systems from top management and users are the focus of the sample.

7.2 Data collection

The first stage is a preliminary stage. This stage aims at developing questions to interview people from different organizational levels such as executive managers, operational managers and users in general. These interviews being a part of a case study, might be formal or informal ones. The preliminary stage helps in providing broad ideas about ERP implementation and adoption. The preliminary stage will also assist in understanding early and later stages of ERP implementations and adoptions. In other words, the preliminary stage will help in understanding the process of ERP implementation and adoption and also difficulties that are associated with the implementation stage of ERP.

The Final stage is to develop a questionnaire based on the findings from the previous stage. The study can be tested and validated as the questionnaire can target a bigger sample of the proposed population.

8. Conclusions

This paper described a planned study on the relationship between cultural variables and ERP acceptance in a developing economy. ERP systems are often built to Western specifications and when they are implemented in developing countries, extraneous factors can influence their acceptance. Cultural differences, we believe, is one potentially important factor. We have developed a model and associated hypotheses based on the Technology Acceptance model (TAM) Diffusion of Innovation (DoI), and Hofstede’s cultural dimensions. Details of an appropriate research method to conduct the study are also provided.
References


