

IMPACT OF NATIONAL CULTURE ON ERP SYSTEMS SUCCESS

Mehmood Ahmad Chadhar¹, Nasrin Rahmati¹

¹School of Business Systems,
Monash University

ABSTRACT: While Implementing an ERP system is still the aim of some organizations, because of limitations associated with these systems, this trend is slowing. The literature suggests that culture is one of the important factors influencing the success of ERP systems. The studies explore the national cultural influence on ERP system, according to our knowledge; most are from developed countries and focus on the implementation stage. Consequently, this paper provides an overview of ongoing research designed to explore the influence of national culture on ERP systems acceptance in two organizations across two countries, Australia has been selected as a representative of the Western world and Saudi Arabia as a representative of Arab world. User satisfaction has been used as surrogate measure of information system's success and for this study it is also used as a measure of ERP systems success by dividing it into three categories: technological, organizational and personal. Cultural theory from Hall (1976) and Hofstede (1980) have been reviewed in general but for this study cultural dimensions of power distance, uncertainty avoidance, individualism and collectivism and high versus low context, have been viewed in depth.

INTRODUCTION

Enterprise resource planning (ERP) systems is an industry term covering a variety of activities with the help of software that assist businesses in managing different functions like product planning, purchasing, inventories, supplier, customer service and order tracking [KRG00], [LSH03]. ERP businesses have been very profitable in last ten years with investments of nearly three hundred billions dollars and it is predicted that this margin will increase by seventy nine billion dollars by the end of 2004 [CNN00] A good number of studies have been carried to investigate the influence of national culture on various technologies. National culture influence has been explored in studies about Total Quality Management [Ngo00], consumer behaviour about online buying across four countries Britain, Germany, Taiwan and Japan [SD04], on software piracy [Hus00] and the adoption behaviour of frame relay [PTW01] This paper includes a literature review, research questions, research approach, data collection and analysis and the significance of the research followed by the conclusion.

LITERATURE REVIEW

ERP System

Drivers: For the last decade organizations around the world have been spending a large amount of money to adopt ERP systems. There were six main reasons that emphasized the need for ERP systems. Firstly, companies require a common database; secondly, they want to improve and standardise their process; thirdly, they require ongoing monitoring; fourthly, cutting down the operating cost; fifthly, improving relations with customers and suppliers and finally, improving their decision-making capability [RV00]. However Cooke et al [CP98] and Davenport [Dav00] state that standardise of business process and integrating the softwares are the main motive behind ERP innovation. Davenport [Dav00] concludes that businesses need something to make decisions in a real time environment was one of the main objectives of ERP implementation.

Characteristics: ERP systems have many characteristics that are encourage organizations to implement it: For example, standardizing the business process [CP98] , [Dav98] and [LSH03], keeping track of goods [GG00] and [GG04], availability of unproblematic data base [LSH03], easy and fast tracking of errors [STSB02], accessibility of real time information [RV00] and [Zyg99] , sharing the information throughout the organization and empowering individuals in the organization [STSB02], the ability to provide solutions for problems associated with a legacy system [HL99], having less

development risks [KHL99], integration with existing software systems [SC03], providing support in decision making [Lon98] and [WP03], keeping customers competent in the market [Lon98], and cutting short the production costs [WP03].

Limitation: A survey from a Swedish base research group has revealed that ERP projects normally cost two times more than the expected and also take 2.5 times longer. However in response, they fulfil only 30% of organizational requirements. Most of these pitfalls are not technical but because organizational and individual issues were not covered during the implementation stage. In other words a system is combination of people and technology and to get maximum output from it, people have to use it in an appropriate way. [AWC02]. Some limitations associated with ERP systems have been reported in the literature: expensive implementation [GG04], integration [Dav98], [TIM01], complexity [Dav98], [GG04] and [Kra00], internal focus [Hay00], [LSH03], [MPA00] and [STSB02], upgrading and modification [MG00], mismatching with existing business processes [GG04] and [TIM04], inadequate support for decision making [GG04] and inadequate support from management [GG04], [RV00]. Along with mentioned limitations, national culture has been reported by many researchers, as an important factor influencing on ERP systems implementation [ASA02], [Dav02], [EW03], [FO01], [MNN00], [SCY04], [SYK03] and [YS04].

ERP and National Culture: Despite the importance of the topic, very little empirical research has been reported about relation of ERP system and national culture. One STUDY conducted by Sheu et al. [SCY04] used case study and secondary data collection approaches with reference to companies in U.S.A, Taiwan, Europe and China. It points out that national culture has a significant influence on ERP implementation. Their results indicate that culture influences the training programme which is an important factor for ERP system success. They claim that cultural perceptions about information format could also effect the ERP implementation.

Another study by Everdingen et al [EW03] which used the survey approach, investigated the influence of nation culture on ERP adoption across 10 countries in Europe. Using Hofstede [Hof01] and Hall [Hal76] cultural theories, their results showed a positive relationship between Individualism and long term orientation in ERP adoption but masculinity, power distance, uncertainty avoidance, monochronic and low context were found to exhibit a negative relationship. These findings were based on mid size companies and countries from same continent. The results could be different with large organizations and cultures across a different continent. So before results can be generalised; they must be empirically tested with large organizations and across a different continent.

CULTURE AND INFORMATION SYSTEMS: Culture has attracted the attention of many information system researchers who suggest it to be a very important factor in information technology development. Barber et al. [BB98] suggest that, for a successful system interface, it is necessary that the design should consider cultural values. They combine culture and usability into "culturability" and add that cultural values affect the degree of user friendliness of a system because different cultures are having different perceptions about background colours, graphics and animation. In addition, Marcus et al. [MG00] add that as the web is continuously developing, precautions should be taken about user interface design, by keeping in mind national culture. Furthermore they argue that cultural values in interface design are now necessary not optional. A study by Chau et al. [CCP02] explored the influence of national culture on online consumer behaviour. Their study revealed that national culture not only impacts on the usage of internet but also on the user's evaluation of a website.

A study by Watson et al [WHR94] revealed that culture overrides effects of technology. They investigated the role of culture in decision making about a project by comparing a group facilitated with a Group Support System and a manual group and found the same results for both group. They attributed these results to culture and concluded that culture is a more dominant factor than technology and it is very hard for technology to break "culturally well established patterns of group behaviour". Another study by Tan et al [TWWCM98] investigated the influence of Computer mediated Communication (CMC) on majority influence. They found that one of the factors that influence CMC impact on the majority influence is national culture. In addition, their results revealed that, in individualist cultures, CMC is more effective than face to face communication but on the other hand, it is less useful than face-to-face to communication. Along with these finding, they observed that people in individualistic cultures are more like to argue and state their points of view against the majority with the help of technology, while collectivist cultures are less likely to use available technology like CMC to contradict majority opinions. However Teng et al [TCCR99] did not found the influence of national

culture on decision making when using Information technology (IT) in an organizational computing environment. They found that managers from Britain, United States, South Korea and Singapore, have the same perceptions about the usage of information technology for decision making.

USER SATISFACTION: According to Ives et al (1983) as referenced by Ives et al. [IH84] “the extent to which users believe that their information meets their requirements” is called user satisfaction. It can be used to measure system quality and system acceptance. Recently Lindgaard et al. [LD03] defined it as “a complex construct comprising affective components as well as a concern for usability and a priori expectations seem to play a major role in shaping user satisfaction”. It has been widely accepted as a measure of information systems and widely used in information research between 1986 to 1998. It has been published in international journals 45 times [MMJG00] (Mahmood et al. 2000). In addition, Delone et al. [DM92] described three different reasons for the usefulness of user satisfaction measures of system success because of its 1) face validity 2) reliability of measurement tools 3) theoretical weakness with other measures.

Many factors effecting user satisfaction have been reported in the literature. For this paper, some have been organized into technical, personal and organization categories.

Technical

Ease of Use: The literature has revealed that user satisfaction is significantly related to ease of use. According to Radner & Rothschild (1975) as quoted by Davis [Dav89], “the degree to which a person believes that using a particular system would be free of effort” is called ease of use. In addition this study revealed that perceived ease of use does not directly influence user satisfaction but via perceived usefulness, meaning that a system is more useful if it is easy to use.

System usefulness: Studies carried about user satisfaction have reported that system usage is related to user satisfaction. According to Pfeffer (1982); Schein (1980) and Vroom (1964) as referenced by Davis [Dav89] system usefulness refers to “the degree to which a person believes that using a particular system would enhance his or her job performance”. A recent study by Calisir et al. [CC04] investigated end user satisfaction with enterprise resource planning system (ERP). They found that perceived usefulness, along with learnability, directly influences user satisfaction

Systems Usage: System usage and user satisfaction are related as well. A study by Simmers et al [SA01] claimed that system usage contributes to user satisfaction. This study was based on 445 valid responses from an internet-anchored workplace. It contradicts the argument by Lawrence et al [LL93] that system usage is not related to user satisfaction. Their study was based on 96 users. The differences in the results could be because of the different sample size.

Training: The literature reports that training is positive relationship and achieves user satisfaction. Chen et al [CSMF00] surveyed 42 users of data warehouse and found a significant relationship between Information Centre support (training and explanation about system) and user satisfaction. The same relation has been reported by Simmers et al [SA01] and Aiman-Smith et al [AG02] also supported the findings of the above study by investigating 157 users from 500 manufacturing corporations. Results from three different studies confirm that the relationship between user satisfaction and user training is positively significant.

Personal

Age group: Age group has its own influence on user satisfaction. Palvia et al [PP99] argue that user satisfaction is negatively related to user age group. Simmers et al. [SA01] supported this argument in their study about Internet influence by surveying 300 university graduates and found that user satisfaction has a significant negative relationship between age groups that users under 25 years are more satisfied as compared to 35-49 years olds. Their study contradicts the finding of Ang et al. [AK97] who argue that user satisfaction is positively related to age which means that older users are more satisfied as compare to younger. A recent study by Zviran [Zvi03] about an ERP system has shown that age group does not have any influence on user satisfaction. This result contradicts the findings of both Ang et al. [AK97] and Palvia et al. [PP99]. The reason could be that ERP has standard business processes [Zvi03]. Although the results of the above three studies contradict each other, but it is difficult to establish which finding is more appropriate. The difference in the findings could be because of different sample sizes and systems.

Organizational

User Involvement: According to Doll et al [DT89], this refers to user engagement in system analysis activities. It could improve the quality of design decisions and the resultant technology, enhance user skills by neutralizing the system, enable a user to define a set of requirements and boost the acceptance chances of technology. By using a sample of 618 respondents from 44 firms, study revealed that user involvement has a positive relationship with end user satisfaction. This relation also supported by other studies [Cho96], [LL93].

User Participation: According to McKeen et al [MGW94], User satisfaction is positively related to user participation. They confirmed this relation by investigating 151 end users and managers from eight different organizations. Their study revealed that the user satisfaction on user participation is related to the complexity of the project. The more complex and ambiguous the project, the more participation from users is required for its success. On the other hand, in well-structured and organised projects it is not necessarily the case that user participation leads to user satisfaction [MG97].

Management Support: Benard et al. [BS93] investigated user satisfaction with an executive information system. They argue that the initiation of the information system personnel in to the Executive Information system (IS) does not significantly make any difference in user satisfaction. They found that management support has a positive relation with user satisfaction. That is more support from management during implementation, increases the chance of users being satisfied with the system. These results have been supported by Lawrence et al [LL93] who investigated users in user-led environment.

THEORITICAL FRAMEWORK

Cultural theories from Hofstede and Hall have been used to explore the influence of national culture. Hofstede [Hof01] defined culture as a collective programming of mind that differentiates members of one group from other. Herbig et al [HD98] defines it as "an inclusive system of communication which incorporates the biological and technical behaviours of human beings with their verbal and nonverbal systems of expressive behaviours". Hall [Hal79] sees culture as a screen which lies between a person and his environment and enables him to decide what is more important for him.

The countries selected (Australia and Saudi Arabia) for this study, are opposite to each other in each cultural dimension described below. The purpose behind this selection is to find out, user using the same system, working for same kind of company, working for same functional area and the same job responsibilities but who different in power distance, uncertainty avoidance, individualism verses collectivism, and low verses high context and determine how they are interact with the system.

Hofstede Cultural theory

Power Distance: This refers to people belief's about unequal distributions of power and status, and their acceptance of this inequality by declaring it a precise way of keeping social system balance. In high power distance cultures, individuals with positions in a hierarchy inherit considerable power [Hof01]. Employees in these cultures tend to accept centralised power and heavily depend on their superiors for initiation [Rod98]. Furthermore they are less likely to be involved in any decision making process [RP98]. On the other, in lower power distance cultures, individuals are less likely to accept centralised power and expect to be consulted in decision making [Rod98]. Therefore employee participation is more likely to be acceptable in lower power distance culture [RP98].

Uncertainty Avoidance: It refers to degree of uncomfortable that people feel during imprecision and haziness situation [YT03]. In high UA cultures organizations having characteristics of providing resistance to new technology and are not taking potential risks about technology [Hof01]. This resistance can also be found at individual level, where they show their dissatisfaction with new technology because of getting use to doing things by traditional way [SV96].

Individualism/Collectivism: This cultural dimension describes the degree of relationship between the individual and the group [EW03]. In individualistic countries, relations between individuals are loose and people care more about themselves and their family, while in collectivist cultures, individual are consider himself to be part of society and thinking about overall society rather than personal benefits [YT03]. In other words, collectivist societies are integrated and individuals from these societies think in

“we” terms but in individualist societies, individuals think in “me” terms [Rod98], are more concerned about loyalty and learn to collect for invention [HD98].

Hall Cultural Theory

High vs. low context Culture: Hall [Hal76] divided cultures into high and low context categories. According to him, a high context culture is one in which people are more tightly attached to each other and, because of this strong relationship, a social hierarchy exist that expect individuals to keep their expressions within their control and to communicate information in a simple way but with profound meanings. Compared to high context cultures, Low context culture lies on the other side of the mean. People in these cultures are individualised and less attached to others. When dealing with new technology, high context cultures adopt it only if they fully understood its technical aspects in depth and are assured that there are no risks attached while low context cultures feel comfortable in dealing with new technology. People in these culture feel uncomfortable working with old systems for a long time and prefer to use new things.

RESEARCH QUESTION

Major Question: How does national culture influence ERP systems acceptance?

RESEARCH APPROACH: This research focuses on user satisfaction about an implemented ERP system. As the main aim of this research is to evaluate the overall success of ERP in terms of user satisfaction with respect to national culture users systems are selected from top management to end-users. As with many other technologies, we use user satisfaction as a surrogate measure of ERP system success. So the higher the user satisfaction, the greater the ERP systems acceptance and vice versa

DATA COLLECTION AND ANALYSIS

Considering the scope of research, data is collected in three different phases: Survey, Interview and Post-implementation documents.

- Users from three different levels are interviewed from 45 to 60 minutes.
- A questionnaire containing both open and close end questions is posted to users.
- Documentations regarding post-implementation procedures and policies are analysed.

Once the data is collected, and then it is analysed using SPSS software.

SIGNIFICANCE OF RESEARCH: The major reasons why we believe this study is important are as follows:

- The studies carried out in the field of national culture and ERP systems, according to our knowledge, most have focused on the implementation stage. Our research is based on post implementation stage.
- This study compares Western culture and Arab cultures in regard to ERP systems, by selecting Australia (as a representative of Western Culture), and Saudi Arabia (as a representative of Arab Culture), which according to our knowledge has not been compared investigated before to ERP systems. Hofstede's [Hof01] and Hall's [Hal76] cultural theories suggest that Australian culture is quite different from Saudi Arab culture. In fact in each dimension of these theories, the score for both countries are on opposite sides of the mean.
- In this study, Saudi Arabia has been selected for investigation an ERP systems, which, according to our knowledge has not been reported in the literature. Researchers have also pointed out that very little empirical work about this region as been reported.
- To investigate the post implementation stage ERP system across cultures, we use user satisfaction as a tool to measure success of ERP system
- The vast majority of studies assessing user satisfaction deals with other systems like the Decision Support system and the Executive Information System but only few studies

investigated user satisfaction with an ERP system. While we assume the results for user satisfaction will be the same as in other systems, this assumption must be empirically tested.

CONCLUSION

As described in the beginning, this paper is only a snapshot of an ongoing research so literature regarding ERP system drivers, characteristics, limitations, user satisfaction and culture and information systems. National culture seems to be a very important factor in Information System development. It has been explored with Decision making, Computers mediated communication, Group support system and consume behaviour. Like other technologies, ERP system implementation is also be affected by it. Studies carried in this field pinpoint the implementation stage to explore national cultural influence. But this study has been designed to look beyond this point and has involved Saudi Arabia (Arab world). In addition, user attitude (technological, organizational and personnel) from both countries are evaluated.

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