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Development of a Critical Factors Model for the Knowledge Economy in Saudi Arabia

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Abstract

If knowledge-based economic systems are to be adopted, succeed and be disseminated, many significant barriers must be overcome regardless of how advanced a country is in terms of its infrastructure and domestic production. This paper describes an investigation of the critical factors associated with the adoption and dissemination of a knowledge economy initiative. The focus of the research is on knowledge management, national culture and other country-specific factors and how they are influencing Saudi Arabia's efforts to develop a knowledge economy.

Keywords

Knowledge economy, national culture, knowledge management, Saudi Arabia, critical factors model

INTRODUCTION

The information revolution is already changing the way Saudi Arabians work, learn, live and relate to the rest of the world. The Kingdom of Saudi Arabia aspires to become a developed country by the year 2025; this aim will be achieved through four 5-year strategic plans (Office of the King 2007; Ministry of Economy and Planning 2008). Transforming Saudi Arabia from a production-based economy into a knowledge-based economy, or knowledge economy, is a crucial part of the plan.

This paper describes the theoretical foundations and methods of a planned investigation of the critical factors associated with the adoption and dissemination of a knowledge economy initiative in Saudi Arabia. The focus will be on Knowledge Management (KM) and National Culture (NC) as well as other country-specific factors. The focus of the research is on Saudi Arabia's efforts to implement a knowledge economy system by integrating frameworks which help users identify various issues with the Knowledge Economy (KE) system as well as making use of knowledge management and acknowledging cultural factors.

LITERATURE REVIEW

Overview of Saudi Arabia

Saudi Arabia is the largest economy in the Middle East, producing 25% of the Arab world's gross domestic product (USSABC 2008); it is the world's leading oil exporter, possessing one-fourth of the world's proven oil reserves. Oil prices have an enormous impact on the Saudi's fiscal health, as nearly 90% of the government's return is derived from petroleum industry (SABB 2007; SAMBA 2008). The high prices of recent decades suggest that Saudi Arabia will continue to enjoy large profits from exporting oil. 60% of the Saudi population of 27 million are within the range of age 20-25 years and 40% of this population is under 15 years, also there is a requirement for knowledge facilities like education (El-Rashidi 2007). For these reasons and the inevitable future decline in oil production, the Saudi government has a keen interest in transforming the economy from a production-based system to a knowledge-intensive system (Ministry of Economy and Planning, 2008).

Saudi Arabia's eighth and current five-year plan (2006-2010) focuses mainly on privatisation and economic diversification in sectors such as tourism, but also provides increasing support for the inclusion of Saudi women in society and improving education. The plan calls for building new universities and colleges, with specific specialisations in technology and research which can help Arabia's transformation into a knowledge-based economy. Several previous strategic plans similarly demonstrated the Arabian Government's resolve to realise its vision of becoming a 'developed' country. In the current plan, Information and Communication Technology (ICT) is clearly identified as the basis for Saudi Arabia's economic revolution. (Office of the King, 2007)

In the global knowledge economy, wealth is measured not just by industrial and energy products, but by new value created through the resourceful application of knowledge. In order to compete and be relevant in the new economic environment, the Kingdom must adapt and change the structure of its economy and its skills base. To make these changes, the Kingdom needs research on the status and progress of other countries striving towards a similar goal, which

is to say to identify strategies that are successful in transforming developing countries into knowledge economies (King Abdullah Foundation, 2007; Office of the King, 2007)

Overview of Knowledge Economy

The literature contains several definitions of the term ‘knowledge economy’ (KE). Most definitions of KE involve the concept of an economy based on the creation, distribution and implementation of knowledge, which comprises the primary engine of growth and wealth development (Dahlman and Thomas, 2000; Dahlman and Jean-Eric, 2001; Dahlman and Anuja, 2005; WBI, 2007). Chen and Dahlman (2005) for example note that the World Bank defines a KE as an economy that uses knowledge as the main product stimulating growth in the economy.

Overview of Knowledge Management

Definitions of Knowledge Management (KM) range from the technical to the theoretical to the philosophical, and from the narrow to broad in range (Pathirage et al., 2007). The difficulty in defining KM is similar to the challenge of categorising “knowledge” itself (Metaxiotis et al., 2005). KM is a new concept which is usually defined from two main perspectives, namely the *process* perspective and the *outcome* perspective; in both, knowledge is regarded as a valuable asset and that handling knowledge plays a important role in developing organisational performance (Al-Ghassani et al., 2004). Various definitions of KM appear in the literature. Nonaka and Takeuchi (1995) wrote that KM is essentially related to human activity and (unlike information) is concerned with dedication and beliefs. DeJarnett (2006) holds that within KM, knowledge is created, interpreted, disseminated, used, retained and refined, while Quintas et al. (1997) described KM as a process of managing critical knowledge to fulfil existing needs which may involve identifying and exploiting existing and gained knowledge resources as well as developing new opportunities. Viewed in another way, KM entails the exploitation and development process of an organisation’s knowledge base to achieve the organisation’s strategic objectives and can be described as a socio-technical system which can encompass various forms of knowledge creation, storage, reuse and sharing (Ardichvili et al., 2006). As knowledge comprises the core product of KE, considering the cultural aspects is an important task to sustain the KE initiatives.

Overview of National Culture (NC)

‘Culture’ can refer to organisational culture or national culture (Torun, 2004). According to Hofstede (1980), culture is defined as “the collective programming of the mind which distinguishes the members of one human group from another”. In other words, members of a certain culture will have similar sets of preferences with regard to how they view the world. Torun (2004) wrote that “culture is the means by which people communicate, perpetuate and develop their knowledge about and attitudes toward, life”.

Ignorance of cultural differences is a common and serious cause of confusion (Finestone and Snyman 2005). Organisational culture was generally considered to be independent of national culture (NC) until Hofstede (1984) showed that it is a critical part of NC, because an organisation’s culture is built within an NC; thus, NC influences human practices and organisational behaviours. While cross-cultural studies show that the processes of management may not be common between - nor applicable to - every culture or country, there has been limited research on the diffusion of culture on KM processes (Ang and Massingham, 2007).

National Culture and Knowledge Management

A knowledge-friendly culture in an organisation has the following features. Firstly, the employees are inventive and have an optimistic attitude towards knowledge. Second, they feel safe in distributing their knowledge, rather than being anxious. Third, the organisation’s culture fits within the firm’s needs for managing its knowledge (Ang and Massingham, 2007). Furthermore, specific features and functions of knowledge management services are based on assumptions, being in turn based on cultural backgrounds and may hinder knowledge creation and dissemination (Ardichvili et al., 2006). Understanding the different KM strategies inherent within the NC represented throughout the organisation, will guarantee a successful KM system (Ardichvili et al., 2006). According to Ardichvili et al. (2006), few recent researchers have explicitly investigated how cultural factors influence knowledge management processes. Certainly many KM plans tend to neglect human issues, giving cultural and human issues minor attention (Oltra, 2005).

Although there is a schism in the literature over the question of culture affecting KM services; there is little evidence that differences in NC influence KM practices (Ang and Massingham 2007). Nevertheless, Pauleen and Murphy (2005) conclude that KM frameworks that exclude the influence of national and regional culture seriously underestimate their strength. Moreover, it is stated that cultural bias exists in databases, business and innovations. As western analytical assumptions about knowledge and information management dominate research and development in these fields, it is naïve to believe that NC will have no affect on KM (Ang and Massingham 2007).

Recent research on organisational learning and knowledge creation shows that knowledge learning and sharing in organisations are directly affected by the cultural characteristics of employees (Ardichvili et al., 2006). Studies outline

cross-cultural knowledge sharing obstacles based on NC, but there are very few empirical studies that investigate the impact of NC on KM practices (Riege, 2005; Voelpel and Han, 2005). Nevertheless, as stated by Riege (2005), some studies were conducted by Ford and Chan (2003), Michailova and Husted (2003) as well as Moller and Svahn (2004). Research to date has focused on international companies practising KM globally in more developed countries; yet little is known about the particularities of practising KM in specific country contexts (Voelpel and Han, 2005). The effect of NC on KM within a developing country like Saudi Arabia thus presents an ideal topic for research.

The Knowledge Economy Framework and Saudi Arabia

The World Bank Institute (WBI), through its *Knowledge for Development Program*, helps all member countries build capacity to access, create and use knowledge in order to strengthen their competitiveness and raise their economic incentives. The WBI has found that a successful transformation to a knowledge-based economy typically involves elements such as an economic environment that is supportive to market needs in continuing investments, lifelong education, developing innovation competence and sound information and communication infrastructure. The WBI terms these elements, the pillars of the knowledge economy framework (WBI, 2008).

Chen and Dahlman (2005) state that the four pillars of the knowledge economy (KE) framework are:

- An economic and institutional regime which provides incentives, good economic policies and standards that permit effective mobilization and allocation of resources and inspire creativity and incentives for the efficient creation, dissemination, and use of existing knowledge.
- An educated and skilled population, who can continuously upgrade and adapt their skills to efficiently create, share and use knowledge.
- An effective innovation system of firms, research centres, universities, consultants and other organisations that can keep up with the knowledge revolution and tap into the growing stock of global knowledge and assimilate and adapt it to local needs.
- A dynamic and modern information infrastructure that can facilitate the effective communication, dissemination, and processing of information and knowledge (Chen and Dahlman, 2005).

Saudi Arabia set group of initiatives by investing in the four knowledge economy pillars which support the creation, sharing, adaptation and use of knowledge, can help to increase the value added in goods, services and level of Saudi economic development (Ministry of Economy and Planning, 2008).

METHODS

The aim of the study is to identify major KE critical factors from KM and NC perspectives in the Saudi context. The research will begin by developing an exploratory pilot study. The second stage entails conducting a case study in which questionnaires and qualitative interviews will be used. The questionnaires will collect quantitative data on the impact of KE critical factors in the Saudi context. Interviews with supporting organisational records and documents (a qualitative research approach) will be used to investigate critical factors affecting the adoption of a KE framework and reconfirm the quantitative findings in more detail. Figure 2 illustrates this research design.

A survey can be used to find common patterns and relationships in a large number of organisations, providing generalisable results (Gable 1994; Jick 1979). In the proposed research, survey data will enable comparisons between sectors (government, quasi-government and private) and industries (information technology (IT), finance, insurance, manufacturing, construction, education). Thus, the planned survey will help to uncover the relationships among KM and NC factors and the KE system in Saudi sectors and industries which match the WBI's definition and framework.

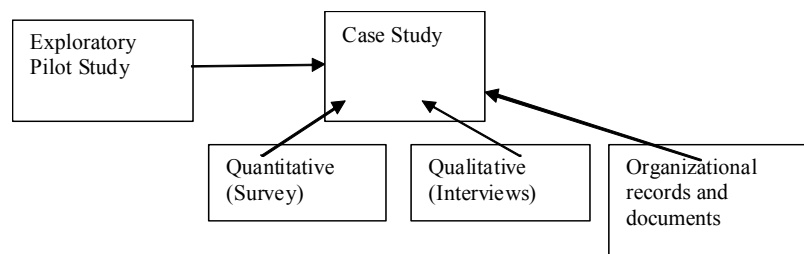


Figure 1 - The overall research design

Qualitative research is a widely used method in information systems research (Benbasat et al., 1987; Walsham, 1995; Walsham, 2006). The case study approach may consist of a single case or multiple cases. Case study research is generally descriptive, explanatory or exploratory (Gable, 1994; Yin, 2003). A case study is a well-suited research strategy for capturing the knowledge of practitioners and deriving theoretical propositions from it (Benbasat and Zmud, 1999). In the

proposed research, an exploratory case study method will be implemented using qualitative research in which qualitative questions will be asked of the participants in semi-structured interviews; this will ensure richness of data by giving participants time to explain their views on KE status and development in the Saudi context. This research approach is a typical of an exploratory case study in which complex domains need to be addressed (Yin, 2003).

Research questions

As previously noted, the proposed exploratory study aims to identify the major factors associated with the development of a knowledge economy system in Saudi Arabia. The research will address the following questions:

General research question

- What are the major barriers to and enablers of the development of a knowledge economy in Saudi Arabia?

Specific research questions

- How might KM factors (KM strategy, knowledge creation, knowledge dissemination and reuse) hinder the adoption of a knowledge economy system in Saudi Arabia?
- How might national cultural or country-specific factors influence the adoption and dissemination of a knowledge economy system in Saudi Arabia?

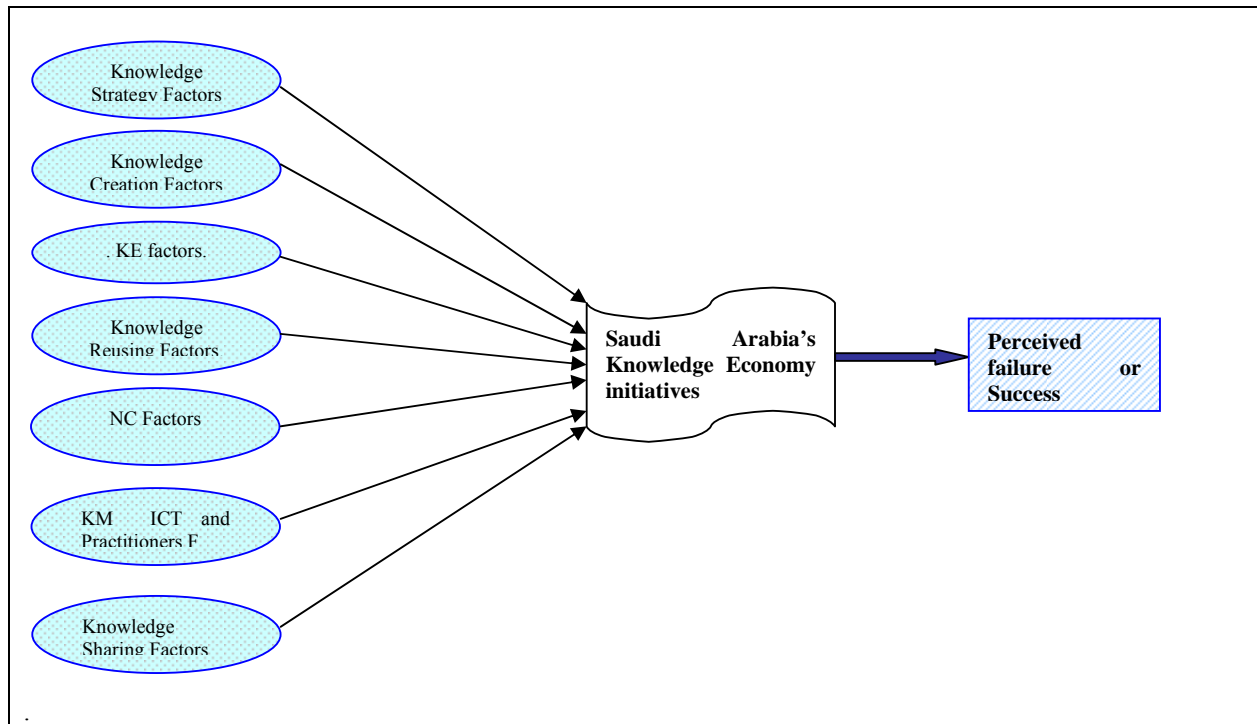
DEFINING THE FACTORS OF THE EXPLORATORY MODEL

Seven critical factors for the development of knowledge economies have been derived from the literature. These seven factors are hypothesised to have negative influence on the development of a KE system in the Saudi context. The purpose of the model (see Figure 3) is to put together a collective set of frameworks which would help a user analyse various situations and factors with the KE system and the influence of KM and NC.

How to measure the adoption of a knowledge economy system?

The most common information systems (IS) measurement dimensions identified and tested in past IS/IT studies namely - *user satisfaction* (Delone and McLean, 1992 see k-11-p102; Gable, 1991), *user acceptance* (Benbasat and Dexter 1996, see k-11), *system usage* (Lucas, 1975 and 1985; Robey, 1979; King and Rodrigues, 1978; Baroud et al., 1986), and *systems performance* (Lucas, 1979; King and Rodrigues, 1978) - do not fit the context of this study. Dimensions such as user dissatisfaction or satisfaction and user acceptance are inappropriate because these dimensions capture the perceptions of a third party - the individual - who is unlikely to have significant knowledge about major factors. Lack of appropriate measurement dimensions makes it difficult to collect data about the factors, their influence on the adoption of a knowledge economy system in Saudi Arabia, and their interrelations and correlations (the main objective of the proposed study). Similarly, dimensions such as systems usage and systems performance are not appropriate measures, as it is almost impossible to generate the required data (i.e., what are the major factors enabling or preventing the uptake of a knowledge economy in Saudi Arabia? What are the possible solutions to measuring these constructs in developing a Saudi KE project?).

Some inherent critical factors are built into the definitions stated above around KE and KM. Moreover, the factors in Fig.3 simply illustrate how the choice of the dependent variable depends on the perspective from which the research is conducted. It is the selection of these variables that will ultimately be the challenge of the proposed measurement model. The exploratory pilot study will be used to identify potential means of measuring KE critical factors and to justify the variables identified within the model. The survey and interview instruments will be designed to test the validity of these constructs for selected KE organisations.



The knowledge strategy factors

The framework developed by Hansen et al. (2005) illustrates that the choice of a strategic approach depends on how an organisation serves its clients and the economics of the business model. Some companies need to automate knowledge management, whereas others need their employees to share knowledge. Organisations may choose a codification or personalisation strategy approach, or both: these options are described briefly below.

- A *codification strategy* involves explicitly storing knowledge in databases where it can be accessed and reused easily. Codified or explicit knowledge can be transferred rapidly and managing knowledge-creating activities is straightforward.
- A *personalisation strategy* meets the need for personal networks that require rich communications media or face-to-face contacts to allow effective transfer. Technology is primarily used to facilitate the transfer of knowledge rather than to store it.

Hansen et al. (2005) discovered some issues can be studied with respect to KE initiatives which are usually arise due to the flowing factors:

Lack of alignment of KM strategy with the organisation's competitive strategy: An organisation's competitive strategy must drive its knowledge management strategy. The organisation must analyse its competitive strategy before implementing this framework. The following set of questions helps to determine if an organisation's KM and competitive strategies are aligned:

- a. What value do customers perceive and expect from the organisation's services/products?
- b. What level of competitive advantage does knowledge residing in the organisation provide?

Note also that products/services that are standardised in the marketplace hardly vary in their nature and typically need an aggressive pricing strategy.

Lack of identification of the knowledge dependencies of individuals: Organisations must identify and analyse the (tacit or explicit) knowledge dependencies of their employees when solving problems.

- a. If employees need explicit knowledge to perform their tasks, they will require it to be easily available and hence codified. What value do customers perceive and expect from the organisation's services/products?

- b. If staff rely on tacit knowledge such as scientific knowledge or industry insights to solve problems, then they require direct interactions with people who hold such knowledge - hence, a personalisation KM strategy is appropriate (Hansen et al., 2005).

Knowledge creation factors

Knowledge creation is one of the main factors contributing to the process of building a knowledge-oriented organisation. Through creating knowledge, organisations establish a sustainable competitive advantage. Nonaka's framework (1994) addresses the organisational enabling conditions for creating knowledge, and describes the two dimensions of organisational knowledge creation — the epistemological dimension (related to the continuous dialog between tacit and explicit knowledge) and the ontological dimension (related to the social interactions between individuals in an organisational setting and the inducing factors to their commitment).

A necessary first condition (of this research) will be to investigate the two dimensions of knowledge creation within an organisation simultaneously, along with the enabling conditions for individuals' commitment to knowledge creation. In essence, this enables the conceptualisation of a knowledge creation spiral that depicts how the four modes of conversation are interrelated in a social interaction setting. Finally, as an integrative measure, an investigation of organisation-wide enabling conditions for knowledge creation will occur.

- *Lack of investigation of the epistemological dimension:* Tacit knowledge can be defined as the cognitive and technical knowledge that is difficult to transfer, as opposed to explicit knowledge, which refers to codified knowledge that can be transmitted in systematic, formal language.
- *Lack of investigating the ontological dimension:* Organisational knowledge creation should be perceived as a process that “organisationally amplifies the knowledge created by individuals' social interactions, and crystallizes it as part of the knowledge network of organisation” (Nonaka and Konno 2005).

Knowledge transfer factors

Szulanski's (1996) framework addresses the 'distinct experience' of knowledge transfer within organisations in a four-step approach. It focuses on the issue of knowledge stickiness, which can be interpreted as the difficulty of transferring knowledge (e.g. best practices) within organisations. Such a difficulty might be caused by the cost of transfer, the lack of motivational factors, and the emergence of a problem during the transfer. Nevertheless, Szulanski's (1996) research suggests three important factors contribute to knowledge stickiness and these should be addressed by organisations aiming to excel in their knowledge transfer practices: the lack of absorptive capacity of the recipient, causal ambiguity of the knowledge transferred, and the arduous relationship between the source and recipient (Jensen and Szulanski, 2004).

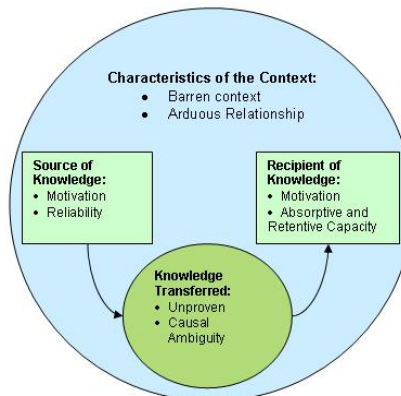


Figure 3 - Components of a knowledge transfer process and their barriers (adapted from Szulanski, 1996)

Knowledge reuse factors

Markus' (2001) framework describes the factors that affect the roles of knowledge re-users, the types of repositories that could be used and the process of knowledge reuse. Furthermore, the framework particularly alerts users to some issues that can affect KE initiatives such as:

- Misunderstanding the roles of the knowledge producer (the originator and documenter of knowledge, the knowledge intermediary (who prepares the knowledge for reuse by eliciting it, indexing it, summarising it, sanitising it and packaging it and is involved in its dissemination and facilitation) and the knowledge consumer (the re-user, who retrieves the knowledge and applies it in a particular way)).

- Inadequate classification of repositories. The types of repositories that could be used in knowledge reuse could be classified as follows;
 - a. repositories of documents and repositories of data
 - b. repositories that store external knowledge (e.g., competitive intelligence), that store structured internal knowledge (data and documents), and repositories of informal information (such as group discussions) (Davenport et al., 1998 in Markus, 2001)
 - c. repositories of general knowledge and specific knowledge (Zack, 1999 in Markus, 2001) and
 - d. repositories of declarative knowledge (about facts) and procedural knowledge (Moorman and Miner, 1998 in Markus, 2001).

National culture factors

The planned research will investigate the influence of national culture of Saudi Arabia on KE development using Hofstede's (2001) framework. While other frameworks have been proposed, Hofstede's cultural dimensions are the most appropriate and comprehensive for Saudi culture, because Hofstede's model has been implemented in most of the developing countries, specifically the Arab regions (Taylor, 2009). Furthermore, recent empirical studies in several Arab countries confirmed Hofstede's findings (Dedoussis, 2004). Hofstede's four-factor classification (individualism/collectivism, uncertainty avoidance, power distance, and masculinity/femininity) was based on his survey of IBM during the 1970s. **Error! Reference source not found.** presents definitions for the selected Hofstede's cultural dimensions the study (Ford & Chan, 2003).

Knowledge Management ICT and practitioner factors

As mentioned in the Knowledge Economy framework mentioned above, Chua (2004) holds that technology is a critical factor in driving knowledge management initiatives; however, the technology gap created between consultants and technologists has received scant attention. While *consultants* apply various KM concepts, which are incorporated into organisational learning and memory, they tend to perceive of technology as a "black box" due to its complexity; at the same time, *technologists* perceive of technology as being the primary solution to KM issues. Their main focus is on product-centric features and functionalities with no regard for the social and cognitive processes related to KM. Chua's (2004) framework's goal is to provide an analysis mechanism for organisations wishing to adopt information technology as an effective medium for conducting KM practices. In doing so, it allows for the exploration and investigation of the right mix of KM concepts and available technology. Chua's three-tier architecture (figure 5) for knowledge management systems (KMS) constitutes the fundamental framework for analysing the supporting technologies for KM and represents an attempt to close the gap between consultants and technologists in the KM community. Nonetheless, organisations are warned about:

- Considering information technology as a definite solution to every KM problem, as it usually acts as a visible and tangible solution
- Using information technology excessively to address KM issues; and

Thinking that technology provides a substitute for face-to-face social interaction (the technology being essential for building a culture of knowledge sharing).

Table 1: Definitions of selected Hofstede's cultural dimensions (in Saudi Arabia's context) (Ford & Chan, 2003)

Cultural dimensions	Definitions
Individualism/Collectivism	<p>Individualism: ties between persons are loose; they value personal time and accomplishments (Hofstede, 1980).</p> <p>Collectivism: individuals integrated into cohesive groups, value group's well-being more than personal needs; belief is best if the group is solid (cf. Ford et al., 2003).</p> <p>Saudi Arabia is a collectivist society with a long-term obligation to the group, like family, extended family or relationships (Taylor, 2009).</p>
Uncertainty Avoidance	<p>Extent to which the individual of a culture tolerates the unknown or uncertain, measured from weak to strong (Hofstede, 1980).</p> <p>Cultures with High Uncertainty Avoidance shows <i>rule orientation, stability in employment</i>, stress exhibited as members of society try to explain, alleviate, and reduce uncertainty levels inherent in life (cf. Ford et al. 2003).</p> <p>Saudi society's low level of tolerance for uncertainty with efforts of Saudi policy makers to reduce the level of uncertainty, strict policies and regulations. Main objective of Saudi's society is to control everything to eliminate or avoid the unpredicted. Consequently, High Uncertainty Avoidance attribute, reflects avoidance of change, Saudi culture tends to be risk adverse (Taylor, 2009).</p>
Power Distance	<p>Extent to which less powerful individuals of society or organisations accept that power is distributed unequally. Societies/organisations with High Power Distance shown by decisions being made by leaders without consultation. Organisations with Low Power Distance more participative/egalitarian relationship between managers and employees (cf. Ford, 2003). Saudi culture has a High Power Distance: accepts that leaders will make decisions to be accepted by the others; acceptance is inherent in Saudi cultural heritage (Taylor, 2009).</p>

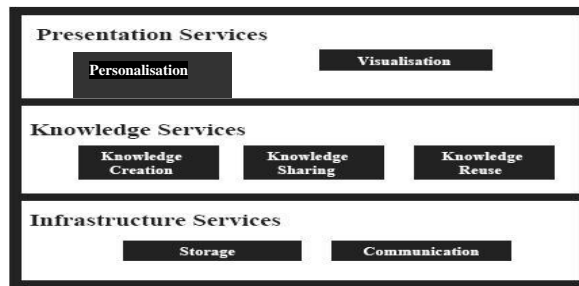


Figure 4 - Three-tier architecture framework for KMS (Source: Chua, 2004)

DISCUSSION

This paper described above the theoretical foundations and methods of investigation of the critical factors associated with the adoption and dissemination of a knowledge economy initiative in Saudi Arabia. The focus was on KM and NC as well as other country-specific factors with a focus on Saudi Arabia's efforts to implement a knowledge economy system. Moreover, a wide range of frameworks have been crystallised in a very practical manner to help address: core concepts of KM, knowledge creation, knowledge transfer, knowledge reuse, NC and soft and technical issues pertinent to this initiative. However, the criticality of the constructs in the preliminary model necessitates the fact that a proactive adoption approach should be implemented. Waiting for problems to occur does not make it any easier to resolve them. In addition, Linking these factors and concepts suggested with the overall Saudi strategies is a key to the productive adoption and use of KE system in Saudi Arabia context.

The research study has future aims for knowledge for developing as well as developed countries such as:

- Defining potential knowledge (strategy, creation, dissemination and reusing) obstacles/factors that might delay the development of knowledge economy initiatives in developing countries.
- Addressing barriers to knowledge economy systems using the learned experiences from empirical studies of Arabian KE projects and their relation to WBI's KE framework.
- Examining the cultural aspects and other country's factors against the commitment and competence of people willing to accept a knowledge economy or knowledge society concepts and the role of every one to successfully fulfil Saudi Arabia's KE initiatives.
- Provide assistance to academia and the global knowledge economy project of the World Bank by developing a socio-cultural and theoretical critical factors framework, which will be based on the preliminary developed model of critical factors (as illustrated in figure.3) as well as engage in future empirical studies enabling the adoption of a KE system in the Saudi context.

CONCLUSION

The planned research will be significant because many developing countries are not paying sufficient attention to the critical factors that affect the adoption of knowledge economy systems. The objective here is to contribute to theory and practice in developing a model that can measure the factors affecting the Saudi Knowledge Economy system. The approach taken will involve Knowledge Management and National Culture perspectives based on the Knowledge Economy framework and definitions of the World Bank Institute. The comprehensiveness of the developed model necessitates a proactive approach; waiting for problems to occur does not make it any easier to resolve them. In addition, linking those factors and concepts suggested, with the overall national Saudi strategies is a key to the productive adoption and dissemination of a successful Knowledge Economy system. This paper describes a critical factors model of a Knowledge Economy system developed from the existing literature. Empirical research will be conducted to validate the model involving Saudi Arabia, which will incorporate quantitative and qualitative methods to understand the trends of adopting a Knowledge Economy system.

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