

# Organisational Culture and the Use of Knowledge-Based Engineering Systems in Saudi Industrial Firms

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## Abstract

The main aim of this study to investigate what is required to achieve in the effective use of knowledge management system, such as: knowledge assets, knowledge sharing, learning, leadership, and the use of technologies. In order to benefit from these main pillars of knowledge management we need to identify each one and understand its main use in the evaluation of the knowledge based engineering system in Saudi context. In order to succeed it, the organisation and its key compensations are the most distinguished drivers of knowledge management. The main determination is to cultivate a conceptual model, which comprehends the influence of organisational culture on the main pillars of knowledge management towards the effective use of knowledge based engineering system in Saudi industrial firms.

## 1 Introduction

Today, economies are gradually created on knowledge, which is now known in Saudi firms, growing into a knowledge-based economy, which offers an emphasis on the role of information, technology and learning in economic performance. The Kingdom of Saudi Arabia is widely known with its unique culture and heritage, which has been preserved since the inception of the culture (Eid 2011). The cultural setting of Saudis is actually an Arab and Muslim culture. Today, Saudi Arabia visitors are subjected to the same rigorous Islamic law as Saudis. In this regard, different enterprises in Saudi Arabia are being subjected to a greater extent influenced by the cultural aspects of the Islamic community. Hiring employees in a local enterprise consider a clear stipulation that employees, whether of Saudi origin or otherwise, must be governed by similar policies and follow comparable requirements for their enterprises. That must be subjective by Saudis religion law, which is Islam. Where Islam plays a vital role in persuading the business community in Saudi Arabia.

The significance of the organisation culture is increasingly essential for managers to understand the Saudi context, which is often problematic (Al-Adaileh and Al-Atawi 2011, Eid and Nuhu 2011, Adlan and ten Have 2012). In addition, information systems are increasingly imperative for the organisation (MacDonald 1996, Liu 2003, Liu, Dai et al. 2007). Organisation's around the world have been able to gain a substantial amount of independence, due to the information systems that can transport a competitive advantage for the organisation. An organisation needs to be grounded in a way that can continually grow and increase their efficiency and effectiveness; they need to ensure the most robust system in place, which can ensure the long-term survival of the competitiveness of the organisation. Today,

information systems have become a fundamental enhancement for storing employee's information as well as other aspects of the company. The utilization of information systems has completely transformed the performance of responsibilities within the work environment into a digital manner (Alhaqbani 2013).

The purpose of this study is to examine the influence of organisational culture on the main pillars of knowledge management towards the effective use of knowledge-based engineering system in Saudi firms. In particular, the research question is: What are the main factors that influence the use of knowledge-based engineering systems in Saudi firms?

## **2 Literature Review and Theoretical Background**

This section describes the related studies to provide a foundation for developing a conceptual model.

### **2.1 Organisational Culture**

Culture is represented everywhere in the surrounding of an organisation, that is created by interactions with people and shaped by leadership behavior, and set of structures, practices, rules and norms that guide and constrain behavior to a certain direction. Culture exists in different levels, which is created and manipulated to form small level of teams or group members or to a big level such as nations. Culture is also a significant element that grows an energetic organisation (Schein, 2010).

A number of scholars have developed integrative frameworks of organisational culture; since culture is a complex phenomenon ranging from underlying beliefs and assumptions to visible structures and practices, dynamic doubt also exists as to whether organisational culture can actually be "measured" in a comparative sense (Denison, D., Haaland, S. & Goelzer, P., 2004,p.99). Thus "organisational cultures, like other cultures, develop as groups of people struggle to make sense of and cope with their worlds" (Trice and Beyer, 1993, p.4).

How then we should think about the "essence" of culture and how should we formally define it? The most useful way to arrive at a definition of something as abstract as culture is to think in dynamic evolutionary terms. If we can understand where culture comes from and how it evolves, then we can grasp something that is abstract; that exists in a group's unconscious, yet that has powerful influences on group's behavior.

However, culture is hard to define, it is an abstraction. Each person may have his or her own understanding of culture. There are hundreds origin of culture, each of them is point of view, an outlook. (Aliferuke and Bodewyn's, 1970:54) A study of hundreds definitions of culture by Kroeber, Kluckhohn, & Untereiner (1952) even shown that there are 164 meaning of culture and the definition of culture has changed over times. There is no fixed, universal definition or understanding for culture, and neither for organisational culture, there is no single definition for it. In

general, Culture has been defined in many ways, according to Kluckhohn (1951a: 86, 5) quotes as a consensus of anthropological definitions; “Culture covers patterned ways of thinking, feeling and responding, acquired and conveyed mainly by symbols, establishing the characteristic achievements of human groups, including their expressions in artifacts the critical core of culture consists of traditional (i.e. historically derived and selected) ideas and particularly their attached values”. In the other hand, Kroeber and Parsons (1958;583) arrive at a cross-disciplinary definition of culture as “conveyed and created content and outlines of values, ideas, and other representative meaningful systems as features in determining of human behavior and the artifacts formed through behavior.” Triandis (1972;4) differentiates “subjective” culture from its appearance in “objective: artifacts and defines the former as “a cultural groups features way of perceiving the man-made part of its environments.” Culture, in this sense, includes organizations of values; and values are among the construction of culture.

Culture is to human collectivity what personality is to an individual. Personality has been defined by Guilford (1959) as “the collaborating cumulative of personal characteristics that affect the individual’s response to the environment.” Culture could be defined as the communicating combination of common characteristics that influence a human group’s reaction to its environment. Culture determines the individuality of a human group in the same way as personality regulates the identity of an individual. Moreover, the two interact; “culture and personality” use a classic name for psychological anthropology (Bohannon, 1969: 3; Barniow, 19973). Cultural traits sometimes can be measured by personality tests (Hofstede, G., 1980,p.25,26).

According to Hofstede definition of culture as a combined encoding of the human mind, the word is kept for relating entire societies; for groups within societies, “subculture” is also used. And how culture outlines are ingrained in value organizations of major groups of the population and how they are stabilized over long stages in history (Hofstede, G., 1980,p.13) (Hofstede 1980). Moreover, culture includes the acquaintance that people need to have in order to utilize effectively in a social setting. Much of culture is reproduced in the products of the mind, such as language, myth, art, kinship, norms, values, and shared meanings about social behavior (Keesing, 1981). Some fundamentals of culture are objective (e.g. tools) and some are subjective (e.g., beliefs, attitudes) according to (Gannon, M. & Newman, K., 2002) main definitions.

In the other hand, Schein has defined organisational culture as a characterized attitudes, beliefs, experiences, and values of people in a given organisation. Organisational culture has long been emphasized as vital for organisation performance, organisation development, and human resource development (Barney, 1986a; Egan et al.,2004). Schein (1985) also emphasized organisational culture as: the deepest level of basic assumptions and beliefs that are shared by members of an organisation, that operate unconsciously, and that define in a basic “taken-for-granted” fashion an organisation’s view of it and its environment. These

assumptions are learned responses to a group's problems of survival in its external environment and its problems of internal integration [p.6] (Egan, 2008, p.301-302).

In result, Hofstede's main definition of culture is considered a high relevance for many researchers on the emphasis of culture and its effect of human mind programming towards groups within societies; where culture patterns are origin from value systems of groups within the population of similar societies. However, Schein has focused more on the definition of organisational culture in which it holds certain characteristics of attitudes, beliefs, experiences, and values of people in a given organisation.

Therefore, the role of both culture and organisational culture depends highly on the behavior background of people who are the main members of the society. Behavior influence and generates a competitive advantage for employee's performance within the organisation. First, a strong culture within any organisation helps group members to understand problems, evaluate the situation, share values and unite people to behave and in the correct and proper manner. Secondly, identifying the problem and evaluating a suitable solution will help narrow down the decision making process. Third, a strong culture will develop a decent relationship among members of the group; improve the working environment to be successful within the organisation.

## **2.2 Types of Culture**

### **2.2.1 Vertical & Horizontal Cultures**

According to Triandis, cultures are defined in both: vertical cultures which accept hierarchy as a given; people are different from each other. Hierarchy is a nature state were whoever is on the top "naturally" had further power and privilege than those of the bottom of the hierarchy. In the other hand, horizontal cultures accept equality as a given and people are essentially alike, and if one is to split any resource it should be done equally (Triandis, 1980, p.18-19).

One of the basic qualities of cultures differentiation is the way people sample information of a particular type, the behavior that is suitable for the information gets to be involuntary, so that people don't have to think how they are hypothetically to behave (Triandis, 1980, p.20). Perhaps the most motivating feature about culture is that basic expectations are not interrogated; they influence thinking, emotions, and actions deprived of people noticing that they do (Triandis, 1995).

Vertical relations are most shared in societies that are high in (Hofstede's,1980a) power distance, however horizontal relations are most common in societies that are low in power distance. The vital point is that vertical or horizontal, collectivist or individualist's cognitions become noticeable depending on the situation. Also, there is a tendency for the vertical collectivist and horizontal individualist cultures to be more abundant than the other two forms.

### 2.2.2 Individualism & Collectivism

The custom dominant in a given society as to the degree of individualism/collectivism expected from its members will strongly affect the nature of the relationship between a person and the organisation to which he or she belongs. More organisations; in a society in equilibrium, the organizations should in return assume a broad accountability for their members. Whenever organisations terminate to do that as in the emerging capitalism in nineteenth-century Europe, and today in many less-developed countries there is conflict between people's values and the social order, this will lead to either a change in values toward more individualism, or force toward a different, more collectivist social order (such as state socialism), or both (Hofstede, G., 1980,p.217).

The level of individualism/collectivism in a society will affect the organisation's members' motives for obeying with organisational requirements. Following the terminology presented by Etzioni (1975), we can undertake more "moral" involvement with the organisation where collectivist values overcome and more "calculative" involvement where individualist values succeed. Etzioni discriminates between "pure" and "social" more involvement' "Pure" more involvement tends to develop in vertical relationships, such as those between teachers and students, priests and parishioners, leads and followers. 'Social' participation tends to mature a horizontal relationship like those various types of primary groups. Both pure moral and social orientations might be found in the same relationships, but as a rule, one orientation predominates" (1975:11). We can release pure more involvement to the orientation predominates in a high power distance society and social involvements to values of the organisation member in a collectivist society.

The level of individualism/collectivism in society will also affect what type of persons will be admitted into positions of special influence in an organisation. A useful distinction in this case is Merton's "locals" versus "cosmopolitans" (Merton, 1968:447), first published in 1949: the terms originate from a translation of Tonnies' work). The local type is largely preoccupied with problems inside the organisations; this type is likely to become influential in a more collectivist climate. The cosmopolitan type must maintain a minimum set of relations within the organisation; but he or she considers him or herself as integral part of the world outside it. We would rather find cosmopolitans in positions of influence in organisations where a more individualist norm prevails.

The degree of individualism is organisations obviously will depend on many other factors beside a societal norm: We can expect effects of employee educational level and of the organisation's own history and subculture. Also predictable is a relationship with organisation size (Hofstede, G., 1980,p.218).

### 2.3 Saudi Arabia Organizational Culture

The success of the business systems and the literature related to this identifies there is a need for organisations to continually improve their efficiency and effectiveness,

which can lead to the development and improvement of organisations. The culture of employees is one of the defining factors for organisations as the different factors can influence the uptake of the success of business organisations (Ryan, Chan et al. 1999, Raghuram, London et al. 2001, Crow and Hartman 2002). The cultural setting of Saudis is actually Arab and Muslim. It is widely known that the Saudi setting has a unique culture and heritage, which has been preserved since the inception of the culture (Eid 2011, p.45). Visitors to Saudi, including non-Saudis, are subjected to the same rigorous Islamic law as Saudis. In this regard, different enterprises in Saudi are to a greater extent influenced by the cultural aspects of the Saudi community. When it comes to hiring employees in the enterprises, there will be a clear stipulation that employees, whether of Saudi origin or otherwise, will be governed by similar policies and will follow similar requirements for their enterprises. This is influenced by the religion that is followed in Saudi, which is Islam (Al Mizjali 2001, p.6). The Muslim life thus plays a big role in influencing the business community in Saudi Arabia.

## **2.4 Success Factors of Knowledge Management Systems**

### **2.4.1 Knowledge Assets**

According to Green (2004), successful organisational performance measurement is in need of a methodology and system that enables managers to identify knowledge, document knowledge, and value knowledge. Knowledge assets are the major aspects of invention in the 21st century economy, whether their origin is in the services, manufacturing or agricultural sectors. Examples of knowledge assets are: ideas, processes, technologies, intellectual property, skills, competencies, education, customer relationships, professional networks, lessons learned, best practices, methodologies, and techniques (Beames 2003). Tangible assets of labour, physical capital, and raw materials are far less indicative of company's value. In this knowledge era, intangible assets like innovation, relationships, and expertise are far more indicative of a company's value. (Green 2004). The term 'intellectual capital' is analogous for knowledge assets (Castro et al. 2013), Intellectual capital is a two-level concept, such as human capital (knowledge created by and stored in a firm's employees-human resource) and structural capital (the embodiment, empowerment, and supportive infrastructure of human capital) (Castro et al. 2013).

### **2.4.2 Knowledge Sharing**

Collaboration both within the organisation and with other organisations is often considered to represent a crucial aspect affecting the overall performance of a company (Boehm 2012). Such as knowledge sharing which remains an essential element in the establishment of knowledge-based working environments within a company. Knowledge sharing within a working environment remains essential as it enables employees to increase their working skills (Bock et al. 2005). Teamwork is also critical to knowledge sharing. The nature of problem solving today is structured in a way where teamwork will enable the organisation to gain the level of support and help as part of the organisational culture; therefore delivering the best possible services (Ke and Wei 2008). Knowledge sharing is further into explicit knowledge sharing and tacit knowledge sharing. According to (Shao et al. 2012), "explicit

knowledge is formal and systematic, and can be achieved through readings of project manuals and team discussions, while tacit knowledge is highly personal, context-specific, subjective, and can be represented in the form of metaphors, drawings, non-verbal communications and practical expertise. It is usually difficult to articulate tacit knowledge through a formal use of language since it is expressed in the form of human actions such as evaluations, attitudes, points of view, commitments and motivation”.

### **2.4.3 Learning**

In recent years, measurement tools have been validated and used for assessment of organisation-level learning and development (Holten et al., 2000; Kontoghiorghes, 2004; Yang, Watkins, & Marsick, 2004), all of which have direct to indirect connections to learning-related motivation and transfer. To the extent that a major success factor in organisational learning outcomes is employee utilization or transfer of learning to workplace applications, motivation to transfer is a central consideration for human resource development. However, the focus on learning and learning transfer has been either at organisation level or on training-specific transfer. Additionally, specific characteristics or dimensions of organisational culture (Schein, 1992) and subculture (Saffold, 1998) as potential catalyst for supporting employee motivation to transfer have been largely overlooked.

For some time, the strength of organizational culture has been associated with firm performance and success (Barney, 1986a; Schein, 1992). Similarly, learning aspects of organisational culture have been linked with corporate achievement (Cook & Yanow, 1993; Yuki, 2002) and firm financial performance (Ellinger, Yang, & Howton, 2002), (Egan, 2008,p.303-304).

### **2.4.4 Leadership**

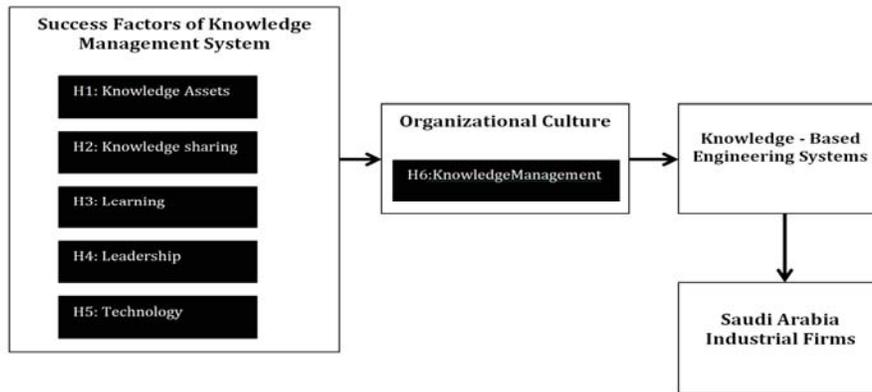
It has been discussed that quality, culture, productivity and good management are all linked (Shao, Feng et al. 2012). One of the arguments is that high productivity is a result of motivation among employees, which further results in a good climate for work (Stock, McFadden et al. 2007). If the management of an organisation is successful enough to provide the required good climate for the organisation, this will lead to a culture that leads to success (Luis Ballesteros-Rodriguez, De Saa-Perez et al. 2012). A good climate that is the result of good management will result in organisational clarity. It will produce a well-defined structure for decision-making, the integration of different organisational parts, and an amalgamation of different cultures into a unified culture, reflecting the leader’s vision. According to Anantatmula (2010), making effective use of knowledge requires intervention of leadership and management because it is associated with incentivizing vision and planned change in direction. The roles of both the leader and the manager are vital at different stages of knowledge management life cycle. Therefore, leadership has a critical role in developing and managing knowledge management systems.

### 2.4.5 Technology

According to Kemp (2010), the right information technology (IT) systems can be essential enablers of the critical insights necessary to keep enterprise viable and successful. These systems inform and remind decision makers of what the enterprise organisation is, where it is in the world, and how prepared it is to cope with expected and unexpected challenges. Company information systems have become fundamental in enhancing the storage of information regarding employees as well as other aspects of the companies. One of the factors, which need to be taken into account, is that organisational factors must ensure they have the best systems in place (Jun and Kim 2010). The arrival of the Internet and the World Wide Web has made unconstrained sources of knowledge accessible for people. Experts are indicating the rise of the Knowledge Age succeeding the industrial Era. Within organisations, different systems can be used to enable the sharing of knowledge through denoting or acquiring knowledge via knowledge bases, where employees share knowledge electronically and access to shared practices becomes available to other staff members (Khorsheed and Al-Fawzan, 2013).

## 3 Conceptual Model

Knowledge Management System (KM) is defined as “the process of applying a systematic approach to the capture, structure, management, and dissemination of knowledge throughout an organisation in order to work faster, reuse best practices, and reduce costly rework from project to project”. Knowledge is the foundation of a firm’s competitive advantage, and, ultimately, the primary driver of a firm’s value (Kraaijenbrink, 2010). Organisational culture is considered as a critical factor promoting collaboration, in particular knowledge sharing (Shao et al. 2012). (Škerlavaj, Song et al. 2010) described organisational learning culture is a complex process that refers to the development of new knowledge and has the potential to change individual and organisational behavior. According to (Škerlavaj, Song et al. 2010) Within the competing values framework (CVF) (McDermott & Stock, 1999), organisation learning culture has four different types of cultures: group, developmental, hierarchical, and rational. Based on the related theories and previous studies, a conceptual framework is developed, as outlined in Figure 1.



**Figure 1: Conceptual model**

The theoretical foundations for the research model needs to be evaluated on the basis of the relationship between the variables, which will help in explaining the ways of effective use of knowledge management system. To answer the research question the following hypotheses will be tested.

H1: Organisational culture positively influences the relationship between knowledge assets and knowledge management in a Saudi firm.

H2: Organisational culture positively influences the relationship between knowledge sharing and knowledge management in a Saudi firm.

H3: Organisational culture positively influences the relationship between learning and knowledge management in a Saudi firm.

H4: Organisational culture positively influences the relationship between leadership and knowledge management in a Saudi firm.

H5: Organisational culture positively influences the relationship between the use of technology and knowledge management in a Saudi firm.

H6: Organisational culture positively influences the relationship between knowledge management and knowledge management system use Saudi in a firm.

According to the conceptual model in Figure 1, the main objective of the thesis is to find the relationship between organizational culture and the success factors of knowledge management system such as: (knowledge assets, knowledge sharing, learning, leadership and technology) in Saudi industrial firms.

#### **4 Research Methodology**

It has been argued that qualitative research approaches clearly have their strengths in developing grounded theory in regard to the issues under investigation. Such an approach is valuable when looking at for example cultural complexity within an organisation, since little knowledge will exist about issues such as multiple cultural membership, cultural context at the organisational level and the impact on performance (Sackmann, 2001).

This research study intends to apply a mixed method that incorporated both

quantitative and qualitative approaches to validate the research model. Phase one of the research studies will employ a quantitative method, based on the collected data from a questionnaire targeting Saudi Arabian firms from different sectors and industries, a qualitative research method will be then carried out as a second phase of the analysis phase, which will supports the validity of the conceptual model.

#### **4.1 Population and Sample**

The population of this study is employees at selected firms in Saudi Arabia. The sample consists of employees who are the users of knowledge management systems.

#### **4.2 Data Analysis Process**

Closed-ended questionnaire will be used for survey and open-ended questionnaire will be used for interviews. Before collecting the data, ethics approval will be obtained from ethics committee. The quantitative data will be analyzed using SPSS software and qualitative data collected will be analyzed using Nvivo qualitative analysis tool.

As in any other qualitative study the data collection and analysis occur concurrently. The type of analysis engaged in will depend on the type of case study. Yin (2003) briefly describes five techniques for analysis: pattern matching, linking data to propositions, explanation building, time-series analysis, logic models, and cross-case synthesis. In contrast, Stake describes categorical aggregation and direct interpretation as types of analysis.

### **5 Conclusion and Significance**

Literature search showed that, to date, no research has been conducted on the role of organisational culture on the main pillars of knowledge management towards the effective use of knowledge-based engineering system in the Saudi Arabian firms. Economies are progressively based on knowledge, which is now recognized in Saudi firms, growing into a knowledge-based economy, which delivers a focus on the role of information, technology and learning in economic performance. In order to accomplish it, the organisation and its key advantages ones must identify the main pillars of knowledge management. This research was explicitly looking at Saudi Arabia, a developing country that is embracing a knowledge-based economy.

The input of organisation culture and the knowledge management enablers (such as knowledge asset, knowledge-sharing, learning, leadership and the use of technology) in Saudi Arabia's enterprise will be of great significance towards the effective use of knowledge management in Saudi context. This research will add a high value to existing knowledge and will be beneficial to firms in Saudi Arabia, who could use the insights analyzed in this study to generate better outcomes.

## 7 References

Adlan, A. A. & Ten, H. A. M. J. 2012. The Dilemma of Revealing Sensitive Information on Paternity Status in Arabian Social and Cultural Contexts. *Journal of Bioethical Inquiry*, 9, 403-409.

Al-Adalieh, R. M. & Al-Atawi, M. S. 2011. Organizational culture impact on knowledge exchange: Saudi Telecom context. *Journal of Knowledge Management*, 15, 212-230.

Beames, C. (2003) "Managing Your Human Capital: The Ultimate Determinant of Organizational Performance?" White Paper, WRDI Institute Pty. Ltd.

Boehm, E. 2012. Improving Efficiency and Effectiveness in an Automotive R&D Organization How a Traditional R&D Division Reshaped Itself Into a High-Performance Organization. *Research-Technology Management*, 55, 18-25.

Bock, G. W., Zmud, R. W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, Social-Psychological Forces, and organizational climate. *MIS Quarterly*, 29(1), 87–111.

Castro, G.M; Delgado-Verde, M; Navas-López, E.S; Cruz-González, J. 2013. The moderating role of innovation culture in the relationship between knowledge assets and product innovation, *Technological Forecasting & Social Change*, Volume 80 pp. 351–363

Eid, M. and Nuhu, N. A. 2011. Impact of learning culture and information technology use on knowledge sharing of Saudi students. *Knowledge Management Research & Practice*, 9, 48-57.

Guo, Y., Feng, Y., Wang, C. 2014. "The impact mechanism of organizational culture on ERP assimilation: a multi-case study," *2014 47th Hawaii International Conference on System Science*

Green, A. (2004) "*Prioritization of Value Drivers of Intangible Assets for use in Enterprise Balance Scorecard Valuation Models of Information Technology Firms*", Doctoral Dissertation, School of Engineering and Applied Science, George Washington University, USA.

Hofstede, G., 1980, 'Culture's Consequences, International Differences in Work-Related Values', p.25-26)

Jun, T. & Kim, J.-Y. 2010. Designing the Efficient Information-Processing Organization. *B E Journal of Theoretical Economics*, 10.

Ke, W., & Wei, K. (2008). Organizational culture and leadership in ERP implementation. *Decision Support Systems*, 45(2), 208–218.

Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, 36(1), 349–372.

Khorsheed, M. S. & Al-Fawzan, M. A. (2013). Fostering University-Industry Collaboration in Saudi Arabia through Technology Innovation Centers. *Innovation: Management, Policy & Practice*, and pp. 3006--3036.

Liu, G., Dai, C. & Alfred, U. 2007. *Path diagram analysis of organizational shared knowledge effects on organizational performance*.

Lusi Ballesteros-Rodriguez, J., De Saa-Perez, P. & Dominguez-Falcon, C. 2012. The role of organizational culture and HRM on training success: evidence from the Canarian restaurant industry. *International Journal of Human Resource Management*, 23, 3225-3242

McDermott, C.M. and Stock, G.N. "Organizational culture and advanced manufacturing technology

implementation”, *Journal of Operations Management*, 17(5), 1999, pp 521-533.

Shao, Z., Feng, Y. & Liu L. 2012. The mediating effect of organizational culture and knowledge sharing on transformational leadership and Enterprise Resource Planning

Škerlavaj, M., Song, J. H. & Lee, Y. 2010. Organizational learning culture, innovative culture and innovations in South Korean firms. *Expert Systems with Applications*, 37, 6390-6403.

Stock, G. N., McGadden, K. L. and Gowen, C. R., III 2007. Organizational culture, critical success factors, and the reduction of hospital errors. *International Journal of Production Economics*, 106, 368-392.