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Function of knowledge culture in the effectiveness of knowledge management procedures: A case study of a knowledge-based organization

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Abstract

Effective aspects and factors on knowledge culture are identified. A model for explaining the relationship between knowledge culture and effectiveness of knowledge management procedures in a knowledge-based organization is presented. The study used a mixture of library and documentary studies, and exploratory mixed methods. First, the literature was reviewed to extract the effective aspects and factors on knowledge culture and the conceptual model was developed. Then, a questionnaire which was validated through eliciting the comments of experts and examining the status of knowledge management in the organization was distributed to the researchers who were randomly selected to be included in the sample. The collected data were examined through AMOS and SPSS software. The possible relationship between the components of the model was investigated through posing five hypotheses and correlation coefficient test. The results of structural equation modeling demonstrated a significant positive relationship between contextual factors and aspects of knowledge culture and between knowledge culture and

the knowledge management effectiveness. Evaluating the variables of the conceptual model revealed that staff members' characteristics, information technology and job characteristics would make a significant positive impact on knowledge creation and knowledge sharing. However, these factors had no significant influence on knowledge cooperation and knowledge learning.

Keywords

Knowledge culture; Knowledge management; Knowledge management aspects; Contextual factors; Knowledge creation; Knowledge cooperation; Knowledge learning; Knowledge sharing; Conceptual model

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Introduction

Organizational knowledge and professional staff who enjoy efficient organizational knowledge are conceived of as strategic resources. The assets of enjoying such resources are reflected in "knowledge culture". In Debowski's (2006) terms, knowledge management is influenced by every individual knowledge workers' attitudes towards their own knowledge society and the role they are supposed to play. An organization which enjoys the staff members' strong commitment to appropriate knowledge strategies, can successfully integrate knowledge management. Knowledge management requires wide acceptance of knowledge values and principles by its (user) society. Hence, in such a society which seeks for creating a knowledge culture, each individual recognizes and accepts knowledge sharing as a desirable behavior.

One barrier which is mostly ignored in organizational studies is running and implementing knowledge management regardless of the existent knowledge substructures in organizations. Some studies strived to implement knowledge management just through employing innovative communication and information technologies while overlooking dominant organizational cultures and sub-cultures. However, the basic requirement for creating, developing, and continuing knowledge management and/or any innovative system in organizations is the cooperation and collaboration of the staff members, especially knowledge staff members. As a result, effective collaboration and cooperation and efficacious leadership would lead an organization to enjoy implementing and continuing knowledge management in both an integrative and a uniform way.

According to Offsey (1997), there are two categorizations in knowledge management: "leadership and culture", "technology and evaluation". In other words, knowledge management requires both soft and hard skills. Although technology is, by no means, considered as the only

solution for meeting the requirements of knowledge management, it plays an effective role in facilitating its procedures. In most studies, the success of the knowledge management projects and programs called for changing the organizational behavior and technological substructures. A large bulk of research (e.g. De Long, 1997; Milne, 2001; Fontain & Lesser, 2002; Alazmi & Zairi, 2003; Ackerman, Pepek and Wulf, 2004; Karlson & Gottschalk, 2004; Debowski, 2006; Pasko, 2007; Chang & Chang, 2011) pointed to the role of knowledge-sharing culture, knowledge management culture or knowledge culture as the most common barriers on the way of successful knowledge management in organizations. The current study strived to explore the factors which promote the effectiveness of "knowledge culture" in research and development organizations and to improve the relevant procedures.

Knowledge culture and effective factors

Culture is a word in English language which is complicated to be defined (Williams, 1983). In 2001, UNESCO defined it as follows: "A set of spiritual, mundane, conceptual, and emotional characteristics of a society or a social group which encompasses lifestyles, collective lifestyles, value systems, traditions and beliefs of a society or a social group in addition to their art and literature". In Schine's (1985) terms, organizational culture is a set of implied assumptions accepted by the members of a group which determines their behavior and reactions to the surrounding environment. In another definition, Schein (1990) describes culture as 1) a pattern of fundamental assumptions, 2) which is created, received and developed by a certain group, 3) and is learned by individuals in order to fulfill the internal cohesion and external compatibility, 4) it should be considered as valid in order to be fruitful, and hence, 5) it is learned and 6) taught to new members as a correct way of understanding, thinking and feeling considering the upcoming issues and problems. According to Ajmal and Koskinen (2008), it entails fundamental and accepted assumptions and deep patterns of meaning which are shared through organizational cooperation and the reflections of these assumptions. Due to few definitions of knowledge culture in literature (some used it interchangeably with knowledge sharing, knowledge management culture, etc.), Table 1 provides the prevailing ones.

Table 1. Definitions related to Knowledge culture

Construct	Author	Definition
Knowledge-enabled culture (knowledge-based)	Leonard-Barton (1995)	It is the culture which spread the knowledge distribution so that the staff members perceive the importance and value of the knowledge.
Knowledge-friendly organizational culture	Davenport and Prusak (1998)	Knowledge-friendly organizational knowledge is one of the most important requirements for reaching innovations in organizational knowledge management successfully.
Knowledge culture	Abell and Oxbrow (1999)	From their perspective, accessing knowledge culture requires the support of managers in order to prepare the organization, directing the knowledge capital of the institutions and activities including information technologies, promoting all types of knowledge for the sake of strategies.
Knowledge culture	Holsapple and Jushi (2001)	It is an appropriate culture in the corporation which can persuade individuals to create and share knowledge.
Knowledge culture	Nahm, Vonderembe, and Koufteros (2004)	Since knowledge culture reflects the senior leaders' commitment to innovations in knowledge management and developing the knowledge creation and sharing in organizations, its presence is vital for implementing organizational innovations successfully.
Knowledge culture	Walczck (2005)	In his terms, knowledge management is not that much related to directing knowledge. It is more related to directing and creating knowledge culture which facilitates and promotes knowledge creation, sharing, transmission, and effective application for making decisions, strategic planning and measurable development of economic assets.
Knowledge-based culture	English and Baker (2006)	In their viewpoints, knowledge management entails a system of policies for human resources, skills, procedures and convergent operation (to ensure that acquired, created, shared knowledge is used and reused) in order to reach desired outcomes as a consistent asset. Organizational leaders should change the existing culture and beliefs in order to prepare the committed staff members for embracing and supporting the organizational knowledge management principles.
Knowledge culture	Oliver and Kandadi (2006)	Knowledge culture is an organizational lifestyle which empowers individuals and motivates them to create, share, and apply knowledge in order to reach consistent organizational success and benefits.
Knowledge culture	Debowski (2006)	Knowledge management requires wide acceptance of knowledge principles and values by a society. Hence, knowledge management seeks to create knowledge culture so as each and every member of the organization accepts knowledge sharing as an appropriate behavior. Knowledge culture is a kind of organizational culture which persuades individuals to identify and apply knowledge sharing as an appropriate behavior.
Knowledge management culture	Wu et al. (2011)	Positive cooperation of the leaders and creating knowledge culture are of utmost significance for desired performance of knowledge management in an organization. On the other hand, the appropriate application of information technology contributes to the formation of knowledge culture. This culture can result in directing and guiding the organization. The leaders' behavior plays a key role in creating the excellent knowledge culture.
Knowledge culture	Chang and Chang (2011)	Knowledge-based culture describes the extent to which the organizational culture supports knowledge as a valuable capital and source.

Hypothesis model and Research methodology

The current study was an applied one due to its purpose and nature. Considering the data collection method, a mixture of library, document and exploratory studies were used. Regarding time duration, it was a cross-sectional study which used causal correlation data analysis methods. Taking the research subject into account, the organizational scope of the study was a knowledge-based organization which participates in various education, research, service, and productive areas in electronics, telecommunications and information technology.

In qualitative phase, the statistical population consisted of all the instructors and experts in the field of knowledge management chosen through snowball sampling. In order to extract the factors and components and confirm the primary conceptual model, the comments of this group were elicited. In quantitative phase, taking into account the organizational scope and spatial area of the study, the statistical population included all staff members in this corporation who were working as researchers. The required sample was randomly chosen. The variables under the study and the conceptual model were as follows:

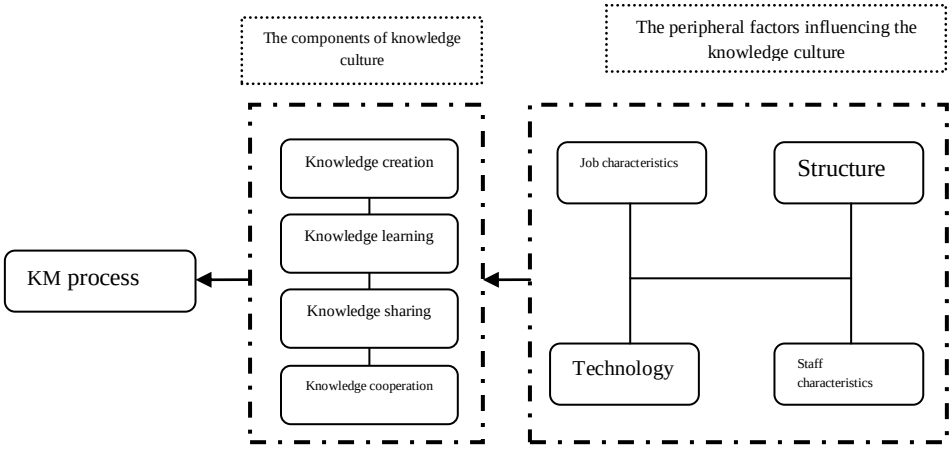

Figure 1. The conceptual model of the study

The current study utilized both quantitative and qualitative methods for collecting the required data. In the library study phase, a list of all hard and soft sources was prepared. After studying the literature, the intended sections were chosen and utilized in theoretical principles and extracting the factors and components. In addition to library sources, the relevant documents to the status of knowledge management were examined in the organization. In the qualitative phase of the study, after designing the primary conceptual model and extracting the factors and components, direct interview technique was used to elicit and analyze the comments of the instructors and experts in the field of knowledge management. Finally, in the quantitative phase, a questionnaire was administered to collect the required data. The validity of the questionnaire was examined through content validity analysis (eliciting the comments and confirmation of the

experts and scholars in the field of knowledge management to the number of scholars in the country and abroad). Confirmatory factor analysis was also conducted. The results of the confirmatory factor analysis revealed that 15 given factors would account for70% of all variation. Following that, simple random sampling was used and the sample size was determined according to the formula (the least sample size was calculated as 174 participants which increased to 180 ones). Having collected the data, the items were coded and the data were fed into SPSS (version 15). The descriptive and inferential outputs were extracted. The validity and reliability of the model were assessed through Amos Graphics. The results of this part are presented below.

Findings

First, the status of knowledge management was examined in the organization. Considering the prospective document and its implementation in relevant departments (the establishment of a knowledge management unit in all research centers, the presence of formal and informal communication systems such as thinking rooms, brainstorming sessions, co-thinking sessions, appropriate motivational system (both mundane and spiritual), several types of knowledge software for collecting and distributing knowledge, establishing the knowledge system, emphasizing on creativity, innovation and human resources as important organizational capital, winning the national award of knowledge management in 1390 and 1391) indicated the appropriate attention of the senior management of the organization to the issue of knowledge and knowledge management in promoting the performance and improvement of the status of human resources in general and organizational knowledge staff members in particular.

Second, the status of knowledge culture and the contextual factors which would influence it and the knowledge management procedures were examined. According to the collected data, the staff members were mostly men (women accounted for 11%), in young age group (78%). 84 % of the participants held BA or MA degree. More than half of the participants (68.4%) were working in technical and research sections. Almost half of the participants (71.9%) had no difficulty in using technologies at the workplace. The supervisors could use the systems without needing their subordinates. They mostly used the systems at the workplace. Most of the colleagues (71.7%) and influential individuals (62.3%) believed that computers should be used at the workplace. Half of the participants (52.1%) deemed that the systems were enough while 29% pointed to the inadequacy of the systems. The results pointed to the appropriate familiarity with and access to the systems and existing hardware in different sections. Evaluating the components constituting the information technology factor revealed that only 25.4% would make little or a little use of information technology. Almost 66.3% of the participants referred to the necessity of using technology while few (7%) point to it as insignificant.

The appropriate level of skills among the staff members is considered as an asset for taking knowledge actions. Although technology is, by no means, the only solution for meeting the knowledge management demands, it still plays an effective role in facilitating knowledge management procedures. The population had an optimal level of technological skill and access to it (%12 of the participants deemed that their access to the technology was low).

With regard to organizational structure, almost 40% of the population believed that sharing ideas with colleagues would lead to an increase in salary and receiving awards. This way of thinking would definitely decrease the staff members' motivation to present new ideas and share them with their colleagues. On the other hand, half of the population (50.4%) deemed that sharing ideas with colleagues would lead to remaining in the job and 66% of the participants maintained that this would probably lead to job promotion. These results were in line with those of Hurely and Green (2005). This way of thinking could result from an appropriate education and knowledge-culture building regarding sharing and knowledge. As O'Reilly and Pfeffer (2000) who pointed to the significance of appropriate management operations in motivating the staff members to accept knowledge culture. They concluded that motivational strategies should be appreciated in knowledge teams so that the staff members are motivated to share knowledge more. In addition, the results were in line with those of Raja, Kumar, and Krishnavani (2007). They maintained that organizations should take advantage of extrinsic rewards for knowledge staff members in order to spread the knowledge culture.

With regard to persuading the staff members to make decisions in the organization, to have no need to referring to others, and staff members' need to ask their bosses some of their questions, almost 44%, 20.5% (almost 57% disagreed), and less than 30% agreed (almost 50% disagreed), respectively and about 60% disagreed or completely disagreed.

An appropriate environment for creating and sharing organizational knowledge can be considered as an important factor in developing knowledge culture. It is achieved through the presence and active role of effective and efficient leaders, appropriate working condition in which individuals are provided with some options to play their roles without direct supervision of senior managers and staff members. In Sharratt and Usoro's (2003) terms, decentralized and flexible organization structures motivate knowledge-sharing and allows the staff members to make decisions at any levels. As a result, as Hurely and Green (2005) asserted, lack of centralization is conceived of as a vital factor in explicit knowledge-sharing. From their perspective, decentralized and flexible structures motivate knowledge-sharing and allows the staff members to make decisions at any organizational levels. Leavitt (1967) also referred to lack of centralization as an important structural factor in sharing knowledge and facilitating it. Debowski (2006) maintained that organizational clarity, persuading the staff members to solve the problems and make innovations and valuing the staff members as the organizational capital

would lead to job promotion and enhancement of the performance in an organization. A large number of scholars also pointed to the significance of cooperative decision-making and authorizing (e.g., Gary & Dansten, 2005; Abili et al., 2011).

Considering 15% of the participants' strong agreement with decentralization in the organization, it seems that it needs revising its authority levels and delegating it to efficient staff members. With regard to decentralization, the respondents deemed that few of them (%38.2) could work without having bosses. 44% of them were motivated to make decisions and few of them (20.5%) needed no reference to others. Only28.8% of the participants stated that they could continue their job without inquiring their boss. On the other hand, the large number of participants (almost 66%) who referred to knowledge-sharing as an underlying reason of job promotion confirmed the view of Delong and Fahy (2002), Draker (1999), Gupta and Guyenderajan (2000), Wenger et al. (2002), Hall (2001), Nonaka (1994), Sharratt & Usoro (2003), Connelly & Kelloway (2003), and Hurely & Green (2005). They maintained that appropriate award systems, supportive organizational structure and working procedures are as vital and important components of both creation and development of knowledge culture.

In general, the results indicated that half of the participants believed that development of the ideas in the area of experience and expertise would lead to an increase in the salary and awards and would result in job promotion (almost 64%) and job security (57.3%). The findings were in line with those of Brand (1998) and Hickins (1999). As a result, given that the staff members in an organization are awarded according to their personal performance, if inappropriate norms like storing knowledge is blamed (Young, 2004) and self-confidence in minimized (Sharratt & Usoru, 2003) and organizational culture persuades the staff members to share and distribute knowledge, individuals would have job security. In addition, they would be no longer worried about disrespect or inaccuracy of their ideas (Ardichvili, Page, & Wentling, 2002). Accordingly, they would be involved in knowledge activities more comfortably. The significance of cooperative decision-making and organizational flexibility was also pinpointed in Gary and Densten (2005). In other words, when Meritocracy is appreciated and the staff members' professional future depends on their skill and expertise (Von Krogh, 1998), individuals would try their best for enriching their knowledge.

Regarding job characteristics, the results demonstrated that 35% of the participants were not free in fulfilling their tasks while 38.5% of them were allowed for being creative (while 34.9% disagreed). 43% of the participants were allowed to finish what they had started and 41.5% of them had the opportunity to work independently. Almost 50% of the participants deemed that they had received appropriate feedback from their bosses while 25.6% did not have such an opportunity. Considering the formal award, only 32% of them were given awards while35%

believed in appropriate job evaluation (while 32% disagreed). In this regard, job characteristics were pointed as an effective factor on knowledge culture in Hurely and Green (2005).

With regard to the awards, except for 28% of the participants who had no opinion, 38.9% agreed and 48.2% believed that they received appropriate feedback from their boss. However, considering the performance evaluation, 33% of the participants had no opinion and 34.9% deemed that it was appropriate. Taking into account the relatively low values considering the evaluation of the organization performance and feedback, the findings confirmed those of other studies (e.g., Szulanski, 1996; Fontain & Leeser, 2003; Aakhus, 2004; Debowski, 2006, etc.) in which failure of knowledge management was attributed to the organizations themselves.

Examining the staff members' characteristics showed that more than half of the respondents (56%) would share their ideas and opinions willingly in order to increase their professional credibility. On the other hand, 64% of the participants expressed their content with developing the ideas and opinions in their own special field. More than 60% of them also referred to it as a means to develop their credibility. From their close colleagues, they should develop their ideas and opinions in their own special (55%) and professional (more than 56%) field. The same results were obtained considered those who were dominant (58%) and influential (61%). According to the findings, almost 46% and 41% of the respondents evaluated the extent of inner rewards resulting from creating and sharing knowledge as being high and moderate, respectively. 58% of the participants agreed that the staff members' characteristics were at appropriate level and 52% of them referred to the appropriate context for sharing knowledge.

The findings pointed to the significance of spreading knowledge culture, cooperation and promoting knowledge behaviors. These were mentioned in a large number of studies (Skyrman & Amidon, 1997; Junnakarand Brown, 1997; Brand, 1998; Hickins, 1999; De Long & Fahy, 2000; Rastogi, 2000; Taloy, 2001; Pemberton, Stonehouse, & Francis, 2002; Chen et al., 2002; Yang, 2004; Aakhus, 2004; Debowski, 2006; Pasko, 2007).

Examining the knowledge culture in four components of knowledge creation demonstrated that 62.5% of the participants took advantage of their colleagues' written works and documented ideas in order to create and improve new knowledge. 57.5% of them documented their ideas and more than 75% of them took advantage of others' comments for increasing and enhancing their ideas and more than 50% uploaded their documented information in knowledge bases (20.5% did not upload anything). As we know, one of the main applications of knowledge management is the possibility of reusing (implicitly or explicitly) acquired knowledge. Hence, according to Wu and Wang (2006), supporting the knowledge reuse procedure is one of the main reasons underlying current investments in knowledge management and information systems. It was

shown that knowledge-creation culture was at appropriate level among the participants. Further, appropriate knowledge behaviors were observed considering creating and reusing knowledge.

Examining the knowledge learning components showed that 30% and 35% of the respondents deemed that the organizations persuaded them to learn in order to attend the seminars and successfully fulfill their duties, respectively. 39% of them believed in formal educational programs and 33% of them believed in transferring knowledge and experience to novice members and only 33% of them preferred informal education to formal one. The findings suggest that the organization should revisit learning and persuasion procedures. Although one of the knowledge management goals is persuading to learn, the organization was not successful in this regard. In this regard, Stoel and Muhanna (2008) highlighted the learning culture.

Considering knowledge cooperation, the results demonstrated that 32.5% of the participants believed in sharing knowledge and information in knowledge bases and 39% were involved in sharing their knowledge and information through written documents. As regards the knowledge-sharing culture, the findings indicated that 50% of the staff members documented what they had learned in order to improve it. More than half of them used their colleagues' documents in order to improve their idea and knowledge.

The instruments of knowledge-management system play a significant role in sharing, creating, cooperating knowledge in general and its reuse in particular. Markus (2001) also pointed to the significance of reusing knowledge. From his perspective, knowledge managements systems should support the reuse of knowledge. Nevertheless, several authors highlighted the role of knowledge management systems in their studies. In this sense, Malhurta (2002) and Ackerman, Pipek, and Wulf (2003) maintained that losing knowledge is significantly prevented through storing and documenting information.

On the other hand, the presence of several types of knowledge management software has led to appropriate culture of storing and documenting knowledge in this organization. However, it was expected to obtain higher percent.

Considering sharing ideas and opinions with the colleagues or work groups, more than half of the respondents (56%) deemed that they would willingly share them in order to increase their professional credibility. On the other hand, 64% of them expressed their satisfaction with developing their ideas and opinions in their own special fields. More than 60% of them believed that it would develop their credibility. The findings were in line with those of Foss et al. (2009). Their study revealed a significant positive relationship between knowledge sharing and inner rewards. Moreover, they found out a significant relationship between independence, professional identity, and appropriate feedback and inner and outer rewards and all had a direct relationship with knowledge-sharing.

With regard to evaluating the effectiveness of knowledge management procedures, the results showed that only 30% of the respondents knew the knowledge management procedures as effective. Moreover, the findings indicated that only 34% would facilitate the organizational structure of acquiring, creating and sharing. 48% of the staff members strongly agreed with the significance of knowledge and in-service education while 45% of them held that the organization enjoyed the required procedures for keeping knowledge. 48% of them agreed that the required technologies for exchanging knowledge were sufficient and accessible. Almost53% of them believed that the organization had developed its capabilities for knowledge management within the last year. In general, 30% of the staff members referred to the knowledge management procedures as effective.

In order to validate the model, confirmatory factor analysis was used. The structural equation modeling encompasses path models (structural relationships) and confirmatory factor analysis (measurement relationships). Each measurement model consists of three types of variables: implicit, observed and error variable. The more the common variance between an implicit variable and an observed variable is, the less the measurement error will be. In this study, at 95% level of certainty, the results of the first-order confirmatory factor analysis for each variable (the effectiveness of knowledge management procedures) showed that the calculated factor loading is significantly different from 0 for each scale and the positive factor loadings are reasonable and acceptable results. Then, second-order confirmatory factor analysis (including four types of internal implicit, external implicit, internal observed variable, and error variable related to internal observed variable) was conducted in order to measure each factor under the study. At95%level of certainty, it showed that the defined factors and variables would make a significant impact on measuring the aforementioned factors.

1. Analyzing the research hypotheses

The model of knowledge culture was presented in two phases. First, the relationship among the components of the conceptual model was examined through posing five hypotheses and conducting a correlation coefficient test. Second, the validity of the conceptual model and the extent of the influence of components on each other were measured through structural equation modeling. The results of the first phase are presented below.

Table 2. Analyzing the hypothesis

Hypothesis 1	There is a positive significant relationship between information technology and knowledge culture (r=0.462). Among the aspects of knowledge culture, knowledge-sharing was more strongly correlated with information technology.
Hypothesis 2	There is a positive significant relationship between organizational structure and knowledge culture (r=0. 599). Among the aspects of knowledge culture, structure was more strongly correlated with knowledge-sharing.
Hypothesis 3	There is a positive significant relationship between information technology and knowledge culture (r=0.599). Job characteristics factor was more strongly correlated with knowledge-sharing.
Hypothesis 4	There is a positive significant relationship between job characteristics and knowledge culture (r=0.611). Among the aspects of knowledge culture among the staff members, knowledge creation had higher correlation coefficient.
Hypothesis 5	There is a positive significant relationship between knowledge management effectiveness and knowledge culture (r=0.755). Among the aspects of knowledge culture, knowledge cooperation was more strongly correlated with effectiveness.

In the first structural equation, the direct influence of four contextual factors (structure, technology, human resources, and job characteristics) on knowledge culture was examined. The results were as follows:

1. The organizational structure would make a significantly positive impact on knowledge culture (=0.271, p=%90) (Hence, the relationship is not significant).
2. Information technology would make no significant impact on knowledge culture. Considering the significance level, the effect size of this factor rejected the significance of its impact.
3. Job characteristics of the staff members would make strongly significant and positive impact on knowledge culture (=0.834, p= 95%).
4. Staff members' characteristics would make significant positive impact on knowledge culture (=.291).

A comparison of the factors and the presented claims in the current study indicated that knowledge culture would make a significant impact on the extent of the effectiveness of organizational knowledge management procedures.

2. Evaluating the theoretical model of the research through structural equations

Following theoretical codifying of the model, in order to explain the phenomenon under the study and to measure implicitly defined variables, constant and free parameters in the model (which entails part of identifying the model), it is necessary to tackle the model estimation or estimation of free parameters in the model and to analyze its general and specific indices. In this way, it is determined whether empirical data totally support the codified theoretical model and where to seek the strengths and weaknesses of the model. The presence of numerous components

in the codified model led the researchers to examine the factors which might make an impact on the effectiveness of knowledge management procedures before examining the codified model in the first phase in order to evaluate the theoretical model based on the results of the survey.

3. Evaluating the model in the first case

In the first case, 16 variables constituting knowledge culture were considered under the category of a single factor, knowledge culture. The results were as follows:

1-1 Staff members' characteristics, information technology and job characteristics would make a significant positive impact on knowledge-sharing (=0.424, 0.323, 0.593, respectively) while organizational culture had no significant influence on knowledge-sharing.

1-2 Staff members' characteristics, information technology and job characteristics would make no significant impact on knowledge cooperation while job characteristics would make a significantly positive influence on knowledge cooperation (=0.536).

1-3 Staff members' characteristics, information technology and organizational structure would make no significant impact on knowledge learning while job characteristics would make a significant positive impact on knowledge learning (=0.598).

1-4 Staff members' characteristics, information technology and organizational structure would make a significant positive impact on knowledge-sharing (=0.424, 0.323, 0.593, respectively) while organizational culture had no significant influence on knowledge-sharing.

1-4 Staff members' characteristics, information technology and job characteristics would make a significantly positive impact on knowledge creation (=0.479, 0.290, 0.296, respectively) while organizational structure had significant influence on knowledge creation.

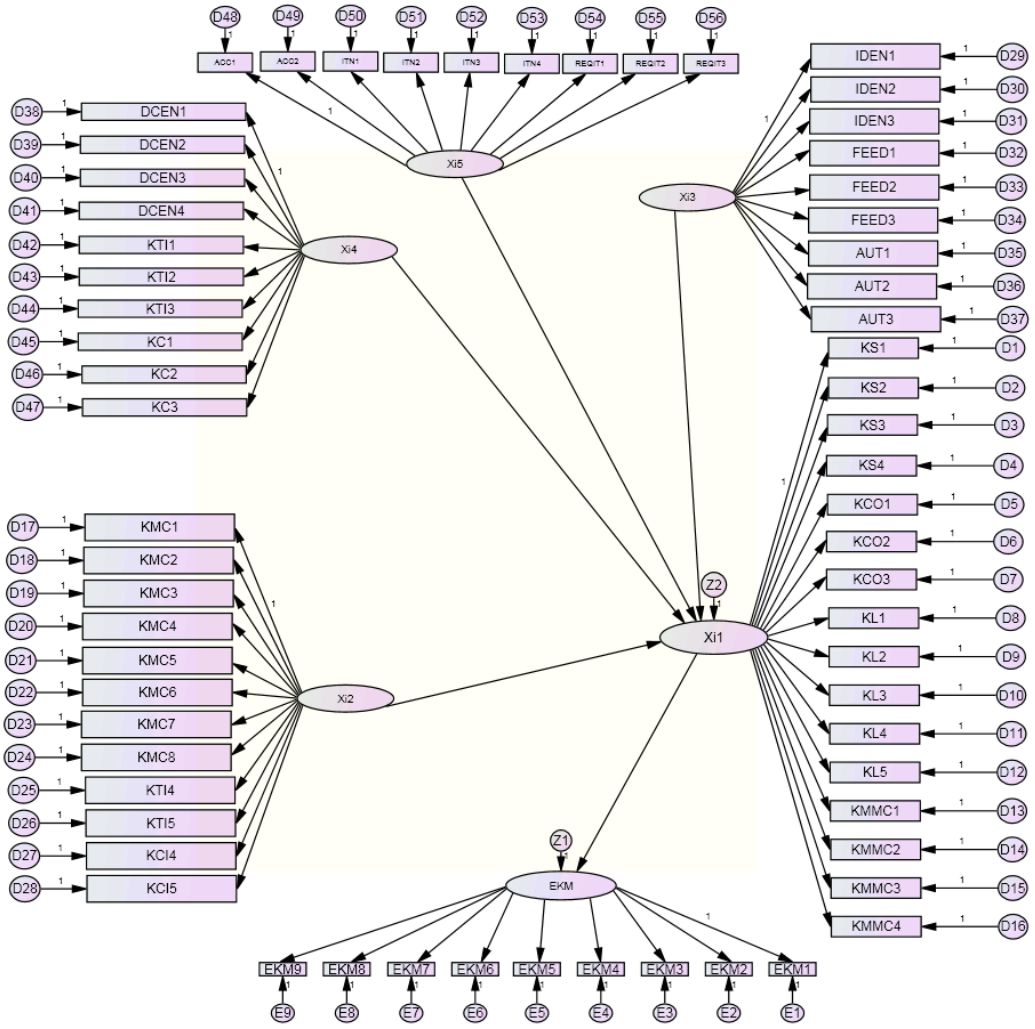

Figure 2. The primary empirical model implemented based on the theoretical model of the study in the first case

4. Evaluating the model in the second case

In this case, after dividing the knowledge culture factor into four components including knowledge creation, knowledge learning, knowledge cooperation and knowledge sharing, the influence of four contextual factors (information technology, staff members' characteristics, job characteristics, and organizational structure) were directly examined. Moreover, the influence of each component on the effectiveness of knowledge management was investigated.

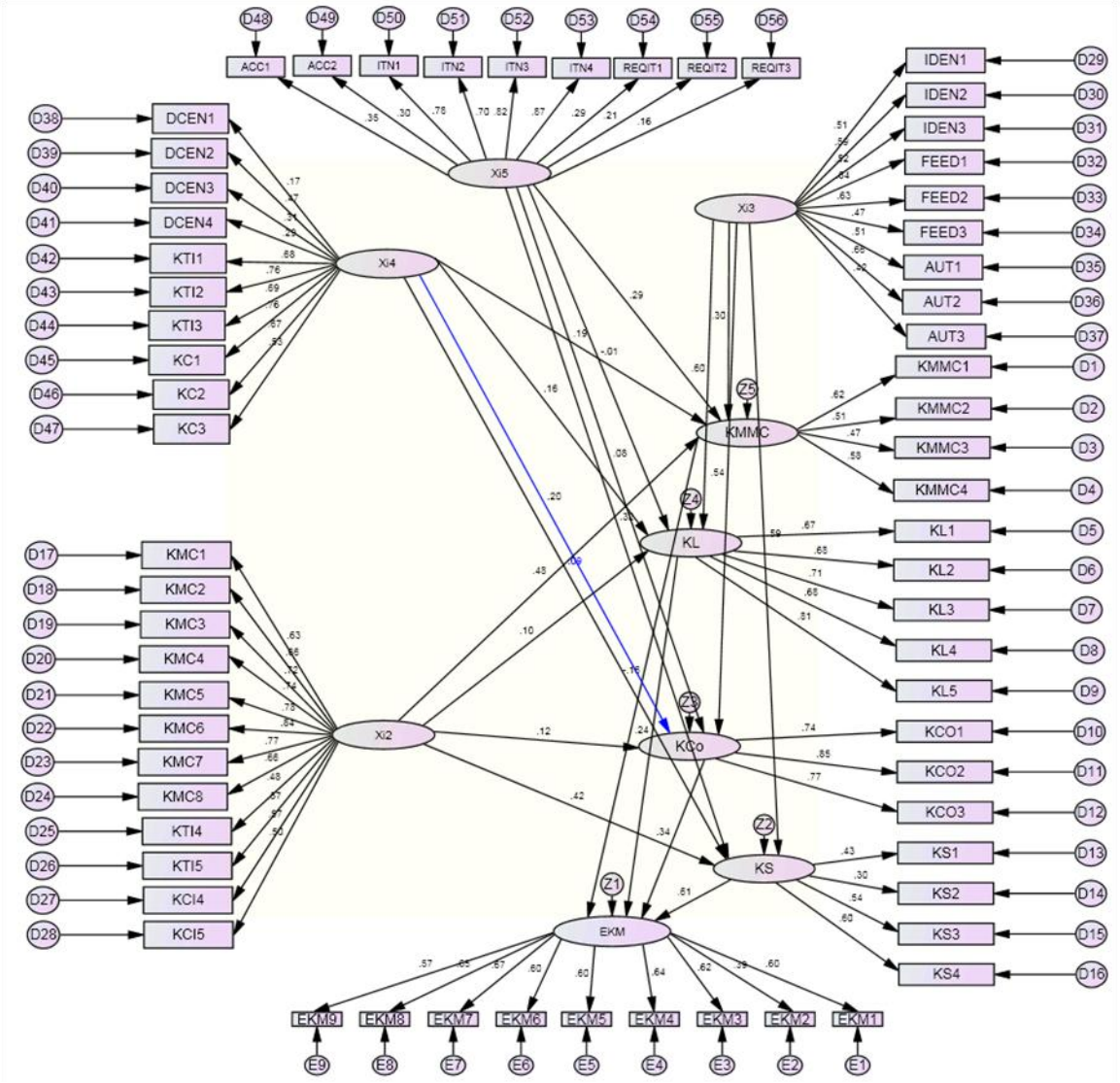

Figure 3. The primary empirical model implemented based on theoretical model of the study in the second phase

Finally, it is observed that at 95% level of certainty, knowledge learning, knowledge cooperation and knowledge sharing significantly influenced the effectiveness of knowledge management procedures with regression coefficients of 0.598, 0.536, 0.598, respectively while the influence of knowledge creation on knowledge management was rejected. The analysis of the obtained data showed that:

Organizational structure would make no significant impact on knowledge culture factors including knowledge creation, knowledge learning, knowledge cooperation and knowledge sharing. Staff members' characteristics would make a significant impact on knowledge creation

(=0.479) and knowledge sharing (=0.424) while it had no significant influence on knowledge cooperation and learning. Information technology would make a significant impact on knowledge creation (=0.290) and knowledge sharing (=0.323) while it had no significant influence on knowledge creation and knowledge learning. Staff members' job characteristics would make a significant impact on all components of knowledge culture. It had the most significant influence on knowledge learning (=0.598), followed by knowledge sharing (=593), knowledge cooperation (=0.536) and knowledge creation (0.296).

Finally, at 95% level of certainty, the components of knowledge learning, knowledge cooperation, and knowledge sharing would make a significant impact on the effectiveness of knowledge management with regression coefficients of 0.598, 0.536, 0.598, respectively while the influence of knowledge creation on the effectiveness of knowledge management was not confirmed.

Accordingly, the explanatory pattern of the effect of knowledge culture on the effectiveness of knowledge management procedures can be drawn as follows. Hence, the influence of information technology on knowledge culture was n**ot c**onfirmed.

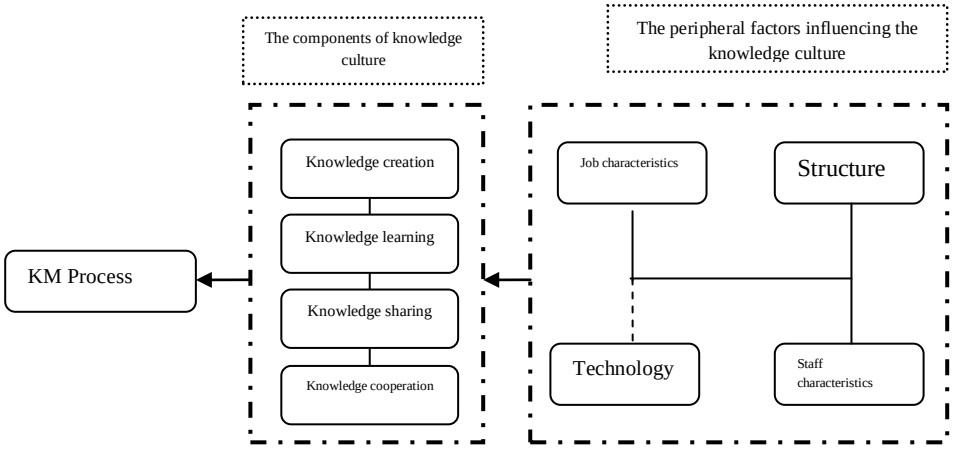

Figure 4. The explanatory model for the relationship between knowledge culture and the effectiveness of knowledge management procedures

Considering the influence of information technology on knowledge culture, a significant relationship was found in the first step but the results of structural equation rejected its influence on knowledge culture. According to Offsey (1997), Nunoka (1998), Ments et al. (1998), Wig (1999), Mackintosh (1999); Tiwana (2000), Sunassee and Sewry, (2002), Huotari and Livonen (2004), Voon (2007), technology is vital for knowledge management but it, by no means, suffices for supporting knowledge creation and knowledge sharing. However, the significance of technology in implementing successful knowledge management has been highlighted in a large bulk of research (e.g., Alazmi & Zairi, 2003; Grover & Davenport, 2001; Gold et al., 2001; De

Long & Fahy, 2002; Wenger et al., 2002; Karlsen & Gottschalk, 2004; Davenport & Porsak, 1999, 2001; EbelWaxbero, 1997, Drucker, 1999; Gupta & Govindarajan, 2002; Pearlson, 2001; Chen et al., 2002; Holowetzki, 2002; Aakhus 2004; Hurely & Green, 2005; Debowski, 2006; Benbya, 2006; Al-Alawi, Al-Marzooqi, & Mohammad, 2007; Stoel, & Muhanna, 2008; Grass, Wang, & Allen, 2008; Wu et al., 2011). A study by Allame et al., (2012) pointed to the effective relationship between knowledge management procedures and technology. Wu et al. (2011) also demonstrated a significant positive relationship between aspects of knowledge culture and information technology. Hurely and Green (2005) maintained that successful application of information technology requires integrating knowledge behaviors and organizational behavior. They believed that although information technology contributes to knowledge creation, sharing and documenting procedures, it, by no means, suffices. Hence, the procedures should persuade and reward knowledge management behavior through organizational values.

However, the obtained results were in line with those of Afrazeh (2005), Disnorg (2000), Nonaka (2000), Takuchi (1998), Tiwana (2000), Wiig (2000), who maintained that technology would suffice for succeeding in knowledge management innovations per se.

In this way, it seems that organizations need convergence and balance among substructures in order to reach their knowledge management goals. Hence, the results suggest that an organization should allocate more attention to individuals to succeed.

The current study demonstrated that organizational structure would positively influence the knowledge culture. Numerous studies revealed the influence of structure on knowledge-sharing (which was considered as an aspect of knowledge culture in the current study) (e.g., Wiig, 1995; Szulanski, 1996; Drucker, 1999; DeLong & Fahy, 2000; Gupta & Govindarajan, 2000; Martin, 2000; Davenport, 2001; Pearlson, 2001; Chen et al., 2002; Gold et al., 2001; Hasanali, 2002; Wenger et al., 2002; Holowetzki, 2002; Alazmi & Zairi, 2003; SharrattUsoro, 2003; Aakhus, 2004; Hurely & Green, 2005; Debowski, 2006; Al-Alawi, Almazrooqi & Mohammad, 2007). Moreover, the findings of another study (Mills & Smith, 2010) considering the relationship between the structure and knowledge management procedures indicated that organizational structure and procedures of acquiring, using and keeping knowledge are significantly associated with organizational performance. However, organizational knowledge and culture would make no significant impact on organizational performance. The findings were at odd with those of Hurely and Green (2005). In their study, decentralization was a structural factor which would facilitate knowledge-sharing and award system was an important structural factor which would lead the staff members' behaviors to knowledge behaviors (creating and sharing knowledge).

Job characteristics had the most significant influence on knowledge culture and sharing-knowledge culture. The results of previous study also confirmed the findings (Szulanski, 1996;

Deci, Koestner & Ryan, 1999; Fontainand Lesser, 2003; Aakhus & Voon, 2004; Gagne & Deci, 2005; Hurely & Green, 2005; Debowski, 2006; Foss et al., 2009). Finally, the results of structural equation modeling supported the significant influence of knowledge culture on the effectiveness of knowledge management procedures.

Conclusion

The core component of organizational knowledge management is identifying its main capital, i.e. staff members. The issue which receives scant attention in most organizations is knowledge culture. Knowledge management relies on knowledge staff members who believe in learning, creating, cooperating, and sharing knowledge and experience as a desirable behavior. If an organization is willing to share knowledge among its staff members, it should try its best to create knowledge culture. It is obvious that knowledge leaders play a significant role in creating, establishing and developing the required condition for knowledge culture. Despite the useful actions taken in the organization under the study for knowledge management, it is still faced with some challenges for establishing and continuing knowledge management system completely. These challenges are listed below:

1. Creating and developing cooperation culture and trust among the staff members
2. Cooperative decision-making
3. Delegation to qualified staff members
4. Attending to flexible and decentralized structures
5. Revisiting the reward and motivation systems
6. Revisiting the performance evaluation systems
7. Retraining, enhancing the systems and persuading the staff members to use them taking into account various types of existing software for knowledge management
8. Senior managers' more attention to the soft sources and human resources management taking a knowledge-based approach considering the existing technical and technological substructures
9. The correspondence of knowledge strategies to business strategies (business procedures)
10. Revisiting the formal and informal educational systems and polling and promoting the existing systems
11. Analyzing the knowledge management strengths and weaknesses in organizations from the users' perspective
12. Forming a community of practice

The current study can be replicated in other organizations with the same or different nature in order to examine the accuracy of the model and its factors.

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