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Designing an integrated methodology for knowledge management strategic planning: the roadmap toward strategic alignment

Abstract

Purpose – Today knowledge extraction and sharing in the organizations have been positioned as one of the most significant managers' priorities. However, despite huge investments in KM (Knowledge Management) area, the failure rates of these projects are high. One of the main reasons for this failures is the lack of a roadmap and a methodology for KM strategic planning which assist organizations to develop an integrated and aligned plan with business strategies which eventually reduces project's failure rate. Yet, despite the extension of KM domain, little studies were conducted on strategic topics and especially KM strategic planning. Therefore, the aim of this study is to offer an integrated methodology for KM strategic planning.

Design/methodology/approach – This paper introduces a methodology for KM strategic planning by using the mixed methods. At the first stage, along with a comprehensive literature review, some semi-structured interviews with KM experts were conducted and the obtained data have been analyzed using the thematic analysis. After that, a survey is conducted to validate the extracted dimensions and activities of the proposed methodology via expert s' viewpoints.

Findings – The results indicate that the main phases of the KM strategic planning methodology are as follows: Strategic review, strategic orientation, implementation, and evaluation. In the proposed methodology, main phases along with their related activities and their implementation order are presented as a roadmap for applying KM initiatives strategically.

Research implications (if applicable) – In KM planning strategically, all phases of strategic management along with their related activities must be considered simultaneously. The proposed methodology can assist KM

policymakers to identify and guide KM initiatives as well as to perform appropriate actions for progress. This paper tries to develop a coherent roadmap for knowledge initiatives by a strategic approach.

Originality/value – One of the major reasons for the failure of many KM projects is the absence of a strategic planning methodology. A review of the KM literature shows that there are few studies, which adequately integrate strategic KM planning process; yet, most researchers view KM planning as the most difficult and complex part of KM implementation process. This paper aims to introduce a novel methodology to KM strategic planning comprehensively. The main contribution of this study is to develop a new integrated methodology for strategic planning that considers the strategy formulation aspects along with strategy execution and control aspects, synchronously.

Keyword: knowledge management (KM), KM strategy, KM strategic planning, strategic alignment

1. Introduction

KM has been viewed as a strategic issue for the practitioners and academicians in recent years (Martinsons et al., 2017; Wang et al., 2016; Chen & Huang, 2012), and the importance of its implementation is dramatically increased for getting sustainable competitive advantage and innovation (Abu Bakar et al., 2016; Donate & de Pablo, 2015; Chen & Huang, 2010). Since the success of organizations is largely related to how effectively they manage their knowledge, the necessity of KM implementation is increasingly highlighted more than before (Wang et al., 2016). According to a report by APQC, which was conducted to examine the KM investments and to prioritize KM initiatives, of the 524 companies surveyed, 93% devoted a specific budget to KM projects

(APQC, 2015), and the investments in the field of KM were increased in the studied organizations (Rhem, 2015).

In spite of huge investments dedicated to KM projects, most of KM projects fail (Ale et al., 2014; Shankar et al., 2003; López-Nicolás & Meroño-Cerdán, 2011). The majority of investments in the field of KM do not meet organizations' knowledge needs and expected benefits, and therefore, it leads to loss of investments (Ale et al., 2014). Some of the important reasons for failure of KM projects are the lack of an appropriate roadmap or methodology to implement KM initiatives (Kim et al., 2003; Wiig, 1998; Bolisani & Scarso, 2015), the lack of clear distinction between data, information and knowledge, ignorance of unique features of knowledge and knowledge workers (Kim et al., 2003), lack of clear KM strategies and vision (Beiryaei & Jamporazmay, 2010; Martinsons et al., 2017), lack of KM strategic alignment (Martinsons et al., 2017), ignorance of consequences of KM (López-Nicolás & Meroño-Cerdán, 2011).Many organizations use IT planning techniques to identify the core knowledge, design KM procedures and implement KM, while KM cannot rely solely on technical approaches due to the multi-dimensional nature of KM (Akram et al, 2015). This challenge reveals the necessity of a specialized strategic planning methodology for KM (Kim et al., 2003; López-Nicolás & Meroño-Cerdán, 2011), which has been less studied in previous literature (Bolisani & Scarso, 2015). As APQC Community Calls program (2018) discussed limited works and practices are conducted about KM strategic planning, and this program called for sharing the best practices of KM strategic planning. The aim of this call is identifying the necessary activities of KM strategic planning. Thus, it can be argued that KM strategic planning is still considered as a top concern and theoretical gap for KM experts and practitioners.

As Kaiser et al. (2018) stated that despite the emphasis the recent literature of KM puts on the convergence between KM and strategic planning, but there are still some ambiguities about how the strategic

planning of KM is performed, therefore, this emerging field of KM needs further studies (Kaiser et al., 2018; Shujahat et al., 2017; Bolisani, 2015). One of the main concerns in regard to this emerging discussion of linking strategic planning and KM is "How can the firms strategically plan the development and implementation of KM initiatives?" (Kaiser et al., 2018). Pasher and Ronen (2011) asserted that a well-planned KM can serve business strategy and there is a need for systematic and comprehensive planning processes for KM strategic planning. Without KM strategic planning, the managers will not design a clear answer to what firms require to know and therefore, they cannot guide KM investment toward the organizational value (Pasher & Ronen, 2011; Shankar et al., 2003).

As it is obvious, one of the most cited KM failure reasons is the lack of strategic planning and poor strategic alignment of these initiatives (Shankar et al., 2003; Ale et al., 2014; Patil & Kant, 2014; Bolisani, 2015).Considering that strategic alignment and strategic planning are regarded as the primary requirements of successful KM implementation (Ale et al., 2014; Beiryaei & Jamporazmay, 2010), the main purpose of this paper is to develop a new integrated methodology for KM strategic planning which could be applied as a roadmap for implementation of knowledge initiatives with a strategic approach.

2. Literature Review
2.1. Knowledge Management and Knowledge Management Strategy

In today's knowledge economy, the success of the organizations is significantly rooted in their ability to manage their knowledge know-how (Kargaran et al., 2017; Mládková, 2014; Zhao et al., 2012). KM enables organizations to identify, promote and disseminate best practices while enhancing organizational performance measures (Martinsons et al., 2017). KM is defined as the process of identifying, creating, absorbing, and

applying organizational knowledge to exploit new opportunities and enhance productivity (Abu Bakar et al., 2016). Despite the importance of KM, some KM researchers have estimated that the failure rate of knowledge management projects ranges from 50% to 70% (Lu, 2017). Therefore, many researches explore KM success factors and barriers. Perçin (2010) stated that various critical factors influence the success of a KM project, such as people, organizational structure and processes, strategy, culture, resources, training and education, measurement, and technology.

Lin et al. (2012) categorized KM barriers regarding KM maturity levels. They found that KM barriers were grouped in five categories including knowledge characteristics, knowledge source, knowledge receiver, contextual factor, and mechanisms. Patil and Kant (2014) believed that KM barriers can be grouped in strategic barriers, organizational barriers, technological barriers, cultural barriers, and individual barriers. They found that strategic barriers were the most important barriers to KM adaptation.

By reviewing KM barrier studies, it is revealed that the lack of detailed planning and strategy for KM initiatives are one of the most important KM failure reasons (Liebowitz, 2016; Akhavan & Pezeshkan, 2014).

Appropriate KM strategy is vital to ensure that the alignment of business strategy, process, and the KM-related Information Systems (IS) provide effective knowledge creation, sharing, and utilization (Choi et al., 2008; Parlby & Taylor, 2000; Oluikpe, 2012). KM strategy is the high-level plan which identifies KM processes, tools and infrastructures and guarantees the effective circulation of knowledge in the organizations (Zack, 2002). A recent analysis of the published list of research keywords in the field of KM reveals that KM strategy has the seventh rank among forty original keywords in the published studies which clarifies the necessity to focus on it (Donate & Canales, 2012; Ribiere & Walter, 2013; Bolisani & Scarso, 2015). KM strategy illistrates the programs and

guidelines for shaping knowledge resources of the organization, and as a result, leads to appropriate KM implementation (Bolisani & Scarso, 2015).

By the synthesis of KM strategy researches, Choi et al. (2008) suggest that KM strategies can be primarily categorized based on two key dimensions: (1). KM focus and (2). KM source. On the KM focus dimension, KM strategies can be grouped as explicit-oriented and tacit-oriented. On the other dimension, KM strategies can be categorized as internal-orientation and external-orientation. Kim et al. (2014) categorized KM strategies as four group: External codification, internal codification, external personalization, and internal personalization. Selecting the appropriate KM strategy by considering organizational conditions and business knowledge requirements is a core concern of KM strategic planning methodologies.

2. 2. KM Strategic Planning

IS strategic planning has been viewed as one of the most important issues in the field of IS and it is recognized as one of the top ten CIOs' concerns (Amrollahi et al., 2014; Hoque et al., 2016). IS strategic planning has many benefits and opportunities for businesses such as achieving competitive advantage, improving productivity, aligning IT-business strategies, increasing business performance, empowering launch of the new business model (Altameemet al., 2014). As IS strategic planning is regarded as a prerequisite for successful IS implementation , KM strategic planning is also essential for successful implementation of KM projects and its systems (Beiryaei & Jamporazmay, 2010; Bolisani & Scarso, 2015). KM strategic planning leads to a comprehensive and effective strategy which guides organizations to apply knowledge strategically in order to meet the business needs and goals (Hashim et al., 2015). Strategic planning of KMS has been important for the following reasons:

1. Better support for business objects; 2. enhancement of integration and consolidation of KMS; 3. appropriate use of KMS to get competitive advantage; 4. prioritization of KMS development projects; 5. better executive supports of KMS operations; 6. decision making facilitation related to KMS investments; 7. improvement of resource allocation in KM area; 8. prediction of needed resources; 9. improvement of the communication with top managers; 10. identification of key problematic areas (Beiryaei & Jamporazmay, 2010). In other definition, KM strategic planning is described as a process of creating the outlook of organizational knowledge, making a strategy for knowledge management, designing KM architecture and organizing a series of activities and resources for implementing selected strategies (Sherif, 2006). There is a common opinion among KM researchers that the success of KM projects requires the planning approach which identifies and formulates the KM objectives, directs resource allocation activities, and finally creates appropriate executive programs (Bolisani & Scarso, 2015; Hashim et al., 2015).

Many KM researchers defined and categorized KM strategies via various perspectives (Ribiere & Walter, 2013), but few researchers have paid attention to develop a strategic planning methodology for formulating the KM strategies (Bolisani & Scarso, 2015), which is the main concern of this paper.

Due to the critical role of IT in KM implementation (Alavi & Leidner, 2001; Greiner et al., 2007; Al-Shammari, 2008; Akram et al., 2015), many years IS strategic methodologies have been applied for KM domain (Nazim & Mukherje, 2011; Beiryaei & Jamporazmay, 2010), which was not satisfactory. The difference between IS/IT strategic planning and KM strategic planning are summarized in Table 1.

Table 1. *Knowledge Strategy Planning Versus Information Systems Planning (Kim et al., 2003)*

By considering the mentioned differences, IS strategic planning methodologies cannot adequately cover all KM aspects and therefore, KM requires a distinct methodology for strategic planning. Despite the importance of KM strategic planning, fewer studies have been conducted in this area. According to APQC's KM strategic planning methodology, there are seven steps to KM strategic planning success: 1. Establish organizational goals and strategic objectives for KM; 2. identify KM strategies (that support those goals and objectives); 3. identify KM priorities; 4. confirm the scope for each strategy; 5. identify the roles needed and skill requirements for those roles; 6. define measures and expectations; 7. assess critical success factors, gaps, and potential risks (APQC, 2018). Becerra-Fernandez and Sabherwal (2015) employed BSC for implementing KM strategies and aligning them with business objectives. They suggested the cycle which begins with translating the KM vision (why are the firm managing knowledge, and what is its desired future for KM?). In the second stage, defined vision is communicated to the firm with motivational system related to knowledge use and contribution. The third stage focuses on business planning to set goals and establish alignment of measures with them. In the fourth step, learning and feedback are performing on whether KM is working appropriately and whether it can be improved. The four dimensions of the BSC including financial, customer, internal process, and learning and growth are used during each stage of the cycle.

Table 2. *Some Related Studies of KM Strategic Planning*

Regarding the crucial role of KM strategic alignment in KM initiatives (Ale et al., 2014), many researchers have pointed out the necessity of KM strategic planning to gain it (Zack, 2000; Beiryaei & Jamporazmay, 2010; Patil & Kant, 2014; Bolisani & Scarso, 2015). However, despite the

importance of KM strategic planning, few studies have been done in this field fragmentally and this research area is somewhat neglected in the KM literature.

By examining previous studies, some limitations are revealed. First, proposed methodologies or frameworks are mainly focused on one of the strategic planning phases and ignored other phases. For instance, Hashim et al. (2015) stated that majority of the previous studies focused on KM strategy formulating and ignored the KM strategy implementation and execution which are considered as the significant part of the strategic planning process (Hashim et al, 2015). Second, another critique regarding previous studies is that the proposed methodologies or frameworks mainly encompassed general phases or processes and the detailed activities related to each phase have not been identified obviously. In fact, the majority of the reviewed studies developed only the conceptual framework which its applicability was rather difficult due to the absence of defined related activities in each phase. Third, in the previous literature, strategic thinking and tradition of strategic management are not considered well as a source of developing KM strategic planning; they mostly developed their approaches based on information systems' perspectives and information requirements (Aidemark, 2007). Therefore, the majority of them do not develop a KM strategic planning methodology based on the whole strategic planning processes, strategy formulation, strategy execution and strategy control, concentrated in the strategic management field. Thus, this paper tried to explore the strategic planning phases with related activities of each phase comprehensively. The proposed KM strategic planning methodology can be used as a clear roadmap for implementation of knowledge initiatives strategically.

3. Research Methodology

3.1. Research Method and Procedure

One of the most cited success factors for KM implementations is developing clear KM strategy and strategic alignment (Perçin, 2010; Ale et al., 2014). The main aim of the study is to develop a new methodology for KM strategic planning to navigate KM projects strategically. The mixed-method approach was used to develop KM strategic planning methodology. The paper was conducted in two steps. In the first step, to develop the methodology, in addition to a comprehensive literature review, some semi-structured interviews were conducted with twelve KM experts and strategic planning experts. The interview is the instrument of qualitative research method which is exploratory in nature. Each interview lasted 90 minutes by average and all of the interviewees' viewpoints are documented. To analyze the interview data, a thematic analysis method was used and the main phases and related activities are extracted.

In the next step, a quantitative survey method was used to evaluate the proposed methodology via bigger body of experts. The research questionnaire was generated based on the developed KM strategic planning methodology in the previous step. In this step, the gathered data via questionnaire were analyzed using Sign test.

3.2. Research Population and Sample

In the first step, the statistical population consists of KM experts who had more than 10 years' experience in KM planning and implementation or academics who had more than 5 published scientific researches related to the research subject and specially agreed to participate in interviews. In this step, twelve interviews were performed and this step took about one month. In the next step, participants were KM experts in KM strategic planning who agreed to participate in the survey and fill the questionnaire. In this step, sampling method was the snowball method and each participant was asked to introduce the experts in this subject.

The research questionnaire was disseminated among 67 experts in KM strategic planning`, finally, after continuous contacts, 32 questionnaires were gathered and analyzed (response rate was 0.47).

3.3. Validity and Reliability

To assess the reliability of the interview, the intercoder reliability is used. The independent coder encoded four interviews and the results indicated a substantial inter-rater agreement (Cohen Kappa = 0.81).

In the second step, to assess the validity of the questionnaire, five experts including KM practitioners and academics, were asked to evaluate the content of the questionnaire. This process led to some minor corrections. To assess the reliability of the questionnaire, Cronbach's alpha method was used. The reliability of each construct was found to be higher than the acceptable level of 0.7 as follows: KM strategic review = 0.861; KM strategic orientation = 0.894; KM strategy implementation=0.85 and KM strategic control=0.887.

4. Findings

4.1. Profiles of Research Participants

In the procedure of semi-structured interviews, seven academics in strategic planning of KM and five KM officers with more than 10 years' experience participated in interviews which four were female and eight were male.

In the survey among 32 participants, 66% were male and 34% were female. About 53% were 31 to 40 years old, 41% were 41 to 50 years old and 6% were 50 years old and above. Around 48% of participants were graduates of KM and related fields (like IS and IT management) and 39% had studied in the strategic management field and 13% of them had other academic degrees but worked in strategic KM planning more than 5 years.

4.2. The proposed KM strategic planning methodology

Step 1: KM strategic planning phases and activities are extracted from literature of KM, strategic planning, IS strategic planning as well as semi-structured interviews with KM professionals. In the first step of the research, as mentioned before, twelve experts of KM strategic planning were interviewed. The interviews' contents were analyzed using the thematic analysis and classified. Tables 3 indicates an example of codes and illustrative quotes extracted from interviews for one of the processes of the KM strategic planning methodology.

Table3. *Example of Illustrative Quotes and Codes Extracted from Interviews for "Strategic Orientation"*

All findings from the interviews were analyzed by using thematic analysis and after extracting codes from oral evidences, they were classified as phases of the KM strategic planning methodology. Table 4 contains all phases and the related activities obtained from the literature and semi-structured interviews. In references column, the previous studies that have pointed out these phases and dimensions are stated.

Table 4. *KM Strategic Planning Phases and Sub-Phases (Extracted from Semi-Interviews and Previous Studies)*

Step 2: In the next step, to validate the proposed methodology, extracted phases, and sub-phases of KM strategic planning were reviewed by KM experts and specialists. The gathered data from survey method were analyzed using Sign test due to the abnormality of the data . Table 5 indicates the results of Sign test for all phases and sub-phases as an example.

Table 5. *Results of Sign Test for the Phases and Sub-Phases*

The results showed that all phases and related activities as sub-phases are important and necessary in the KM strategic planning methodology. The result of this research can be summarized in Figure 1. This proposed methodology helps the organizations to develop a KM strategic roadmap.

Figure 1. KM strategic planning methodology

5. Discussion and Conclusion

The paper discusses the importance of KM strategic planning for deploying KM process. Despite the attention to strategic issues in KM, like KM strategic alignment, KM studies have been less focused on developing a methodology as a roadmap for progressing and implementing KM projects strategically to gain the strategic alignment. The paper aims to develop the methodology of KM strategic planning which encompasses KM strategic planning processes and related activities. After a comprehensive review of literature along with semi-structured interviews as a qualitative method, the proposed methodology was extracted and in the next step was validated by more KM experts. Based on the findings of these two steps, the KM strategic planning methodology contains the following main phases: KM strategic review, KM strategic orientation, KM strategy implementation, and KM strategic control.

The first phases of the integrated methodology include internal and external environment analysis of business and KM, which these strategic practices were emphasized by Kim et al. (2003), Beiryaei and Jamporazmay (2010), and Martinsons et al. (2017).

The second main phase is KM strategic orientation which is mentioned by strategic researchers in strategic management and IS strategic planning (Hoque et al., 2016). This phase encompasses activities such as setting KM vision, setting KM mission, identifying strategic knowledge gap, prioritizing knowledge-oriented processes, and identifying KM strategy.

The third main phase is KM strategy implementation which is an important phase in strategic planning approaches (Hashim et al., 2015). In this phase, some activities like allocating the KM resources, identifying appropriate KM mechanism, identifying KM processes, and developing detailed action plan must be performed to implement strategic formulation in the previous stage.

The last phase of the KM strategic planning methodology is KM strategic control which is considered as the vital phase of the most strategic model (Wiig, 1998). This phase encompasses activities such as identifying Key Performance Indicators (KPIs), evaluation scheduling, reviewing strategic priorities regarding the emerging changes, and taking corrective actions.

In comparison to APQC's KM strategic planning process, the proposed methodology encompasses strategic planning phases and related activities, while APQC's KM strategic planning process only contains general steps without related activities in each step. In APQC's KM strategic planning process, the changing environment and required activities related to them are not considered as well, and it also ignores the strategic analysis for starting strategic planning which is emphasized in most strategic planning approaches (Wheelen, 2011; David and David, 2015). In its process, just "define roles and skills requirements" step is related to KM strategic execution and required activities such as identifying KM mechanism, KM processes and detailed action plan which are not seen clearly. The main focus of the proposed methodology is KM strategic alignment by considering internal and external environment of

business and adopting a top-down approach in strategic planning which was less seen in the previous studies.

6. Practical and Theoretical Implications

One of the most important items for the effective KM is a clear and conscious KM strategy (Shankar et al., 2003; Dalkir & Beaulieu, 2017; Bolisani & Bratianu, 2017). Liebowitz (2016) believed that for organizations that are new to KM, their focus must be on strategy formulation and strategic planning. Therefore, there is a growing realization that firms require a robust KM strategic planning methodology to guide them in formulating, executing, and controlling KM strategy. The proposed methodology helps organizations to know what processes and activities must be emphasized in KM project adoption. Application of the proposed integrated methodology assists organizations to gain strategic alignment and fit KM investment with a business requirement. By using this methodology, it is expected that organization will be able to manage KM efficiently, benefit from KM investment, achieve organizational goals, facilitate KM implementation process, and reduce potential risks.

Summarily, the main contributions of this paper can be stated as follows: First, no previous research has introduced a methodology which comprehensively integrates all aspects of KM strategic planning. Second, with respect to the mixed methodology utilized in this research (i.e., literature review, interview, and survey), the proposed methodology has taken advantage of the most successful experts' experiences in the area of KM strategic planning as well as the international best practices in this area. Third, the proposed methodology is prescriptive in nature and clarifies the roadmap for implementing KM strategically (Figure 1).

Although this research has valuable practical and theoretical contributions in strategic KM domain, it is not without limitations. First, the research proposes an integrated model including a variety of phases and related activities of KM strategic planning; it might not be comprehensive due to the limitations of time and resources used. It is recommended to apply systematic research methods such as Meta synthesis and systematic literature review. Second, the proposed methodology is general in nature, it is recommended to develop customized KM strategic methodologies in specific domains, for example public organization, SCM and virtual organization. Third, the quantitative phase, survey method, is limited to a few experts, although this does not reduce the overall value of the work similar to previous studies (Ajmal et al., 2010; Rouhani & Savoji, 2016; Akhavan et al., 2014; Farzaneh & Shamizanjani, 2014), but it is better to invite future researchers to evaluate the opinions of more experts from other countries.

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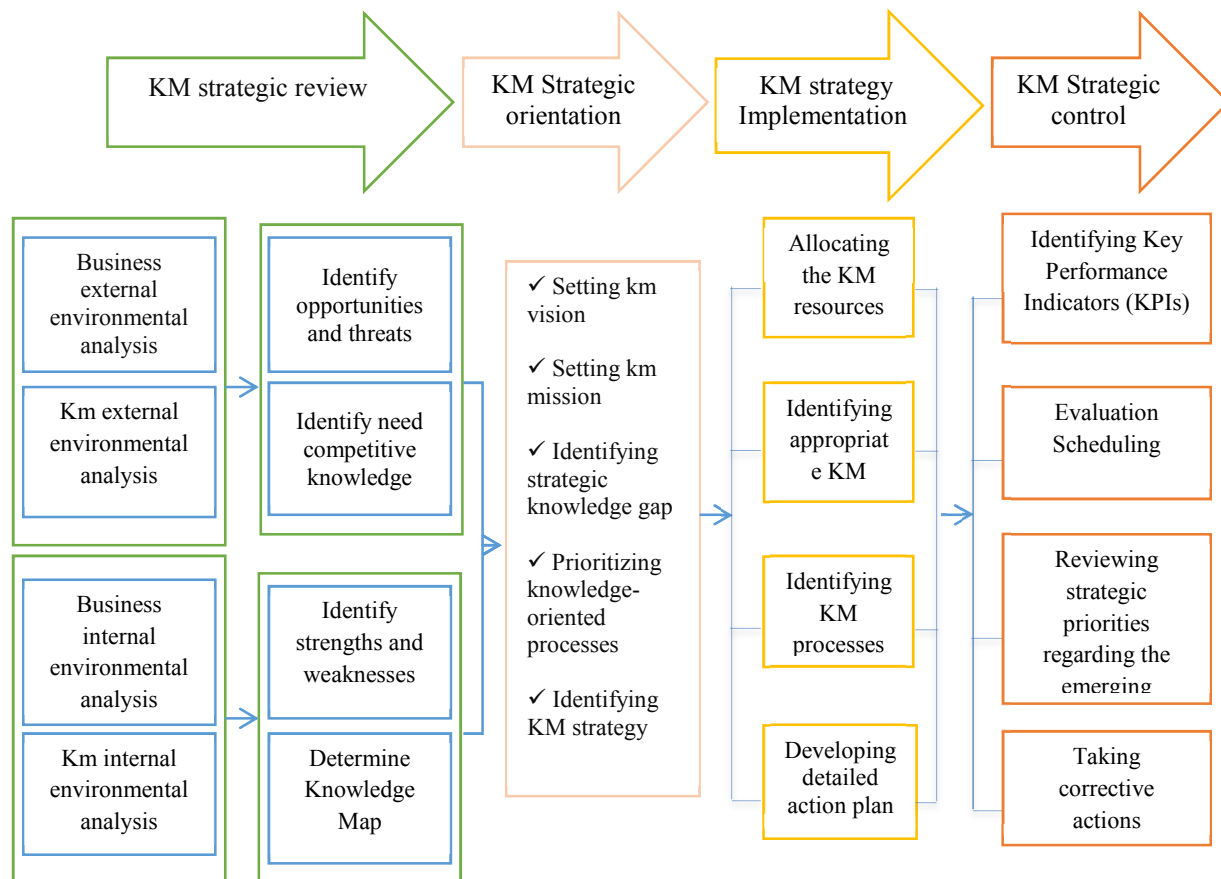
Fig. 1. KM Strategic Planning Methodology

Table 1. *Knowledge Strategy Planning Versus Information Systems Planning (Kim et al., 2003)*

Dimensions	KM strategic planning	IS strategic planning
Target	Knowledge (semi or un-structured, dynamic)	Information, data (structured, static)
Focus	Creation, sharing	Identification, analysis
Mechanism	Culture, organizational structure, information technology, process, employees' social interaction	information technology, process
scope	Knowledge-intensive area	Enterprise-wide or functional area

Table 2. *Some Related Studies of KM Strategic Planning*

Author(s)	Main KM strategic planning process/phases
Wiig (1998)	1. Acquiring management support; 2. developing knowledge vision; 3. formulating knowledge strategy; 4. creating and defining potential knowledge-based alternatives for implementation; 5. describing expectations and profit of KM initiatives; 6. identifying KM priorities; 7. recognizing key knowledge needs; 8. gathering core knowledge; 9. creating comprehensive transfer plans toward KM; 10. transfer, disseminate and use of knowledge assets; 11. develop and update KM infrastructure; 12. management of knowledge assets; 13, developing incentive programs; 14,coordinating KM activities and performance; 15, facilitating knowledge-based management; 16. supervising KM.
Kamara et al. (2002)	1. Defining the problem regarding KM or describing as-is situation; 2. creating an appropriate solution or defining a to-be situation; 3. identifying migration paths; 4. selecting the appropriate KM processes.
Shankar et al. (2003)	1. Vision statement; 2. KM strategy formulation; 3. developing plans; 4. setting objectives; 5. identifying tactics.
Kim et al. (2003)	1. Business environment analysis; 2. knowledge requirement analysis; 3. KM strategy formulation; 4. KM architecture design; 5. KM implementation planning.
Beiryaei & Jamporazmay (2010)	1.Strategic awareness; 2. situational analysis; 3. strategic conception; 4. strategy formulation; 5. strategic implementation planning.
Yosua & Tjakraatmadja (2015)	1. Business situation analysis; 2. KM Assessment [identifying KM gaps and KM Challenges]; 3. setting KM objectives; 4. KM strategy formulation; 5. KM implementation plan [governance plans, determined knowledge flows] and develop KM roadmap.
Hashim et al. (2015)	1. Strategic awareness; 2. situational analysis; 3. strategy conception; 4. strategy formulation; 5. strategy implementation planning.

Table3. *Example of Illustrative Quotes and Codes Extracted from Interviews for "Strategic Orientation"*

Codes	Example of illustrative quotes
External business environmental	*The industry in which business operates must be analyzed in terms of the level of competition and knowledge intensity. We should determine who our customer is and which major trends (social, economic, technological and political) are very important for our future operation. Identifying external knowledge sources (customer, suppliers, government, and competitors) and how to extract the knowledge from those resources should be considered as critical practices for formulating the KM strategy.*
Internal business environment	*Considering the organizational resources (including financial, time and labor resources) of KM and resource organizational limitations are very vital factors in KM planning and successful implementation. The key business processes should be examined. Determining knowledge needs regarding business processes and business strategies is one of the main activities in KM strategic planning. The culture and structure of the organization are influential factors in strategic planning of KM and determining the appropriate strategy.*
External KM environment	*The trends of KM domain (such as social media, big data…) can affect planning dynamics. The news in the field of KM systems must be followed up. Knowledge of competitors, how they use KM systems and general awareness of the statue of competitors regarding KM application are important for KM strategic planning.*
Internal KM environment	*Internal organizational knowledge, knowledge areas, knowledge workers, knowledge-based processes should be identified and analyzed. On the other hand, the current state of KM infrastructure (like databases, electronic document management, communication networks) should be thoroughly investigated.*

Table 4. *KM Strategic Planning Phases and Sub-Phases (Extracted from Semi-Interviews and Previous Studies)*

Main phases	Sub-phases	References
KM strategic review	External environment analysis (business external analysis, KM external analysis)	Kim et al. (2003), Yosua & Tjakraatmadja(2015), Ekionea & Swain (2008), Hashim et al. (2015)
	Internal environment analysis (business internal analysis, KM internal analysis)	Kim et al. (2003), Yosua & Tjakraatmadja (2015), Ekionea & Swain(2008)
KM strategic orientation	Setting KM vision	Wiig (1998), Shankar et al. (2003)
	Setting KM mission	Shankar et al. (2003), Yosua & Tjakraatmadja (2015)

	Identifying strategic knowledge gap	Zack (2000), Kim et al. (2003)
	Prioritizing knowledge-oriented processes	Wiig (1998)
	Identifying KM strategy	Shankar et al. (2003), Kim et al. (2003), Yosua & Tjakraatmadja (2015)
KM strategy Implementation	Allocating the KM resources	Hashim et al. (2015)
	Identifying appropriate KM mechanism	Chen et al. (2012), Abou-Zeid (2009)
	Identifying KM processes	Kamara et al. (2002)
	Developing detailed action plan	Shankar et al. (2003), Kim et al. (2003), Yosua & Tjakraatmadja (2015)
KM Strategic control	Identifying key performance indicators (KPIs)	Dickel & de Moura (2016)
	Evaluation scheduling	Hashim et al. (2015)
	Reviewing strategic priorities regarding the emerging changes	Chen et al. (2012), Abou-Zeid (2009)
	Taking corrective actions	Wiig (1998), Dickel & de Moura (2016), Hashim et al. (2015)

Table 5. *Results of Sign Test for the Phases and Sub-Phases*

Phases/sub-phases	Mean	variance	Positive differences	Z values	Sig.	results
KM strategic review	4/546	0/975	29	5.199	0.000	Accepted
Business external environment analysis	5/978	0/845	26	4.234	0.000	Accepted
KM external environment analysis	5/897	0/835	24	5.388	0.000	Accepted
Business internal environment analysis	4/211	0/798	22	3.512	0.000	Accepted
KM internal environment analysis	5/03	0/92	26	4.619	0.001	Accepted
KM strategic orientation	4/879	0/762	25	3.654	0.000	Accepted
Setting KM vision	4/745	0/769	26	3.104	0.000	Accepted
Setting KM mission	4/345	0/871	28	4.903	0.000	Accepted
Identifying strategic knowledge gap	4/119	0/801	26	4.347	0.000	Accepted
Prioritizing knowledge-oriented processes	5/864	0/922	28	4.828	0.001	Accepted
Identifying KM strategy	6/312	0/739	30	3.834	0.000	Accepted

KM strategy Implementation	6/243	0/862	31	4.828	0.000	Accepted
Allocating the KM resources	4/564	0/729	27	5.029	0.013	Accepted
Identifying appropriate KM mechanism	3/543	0/806	28	4.457	0.000	Accepted
Identifying KM processes	4/245	0/742	22	3.912	0.000	Accepted
Developing detailed action plan	4/32	0/842	24	4.098	0.000	Accepted
KM Strategic control	4/64	0/745	24	3.849	0.000	Accepted
Identifying key performance indicators (KPIs)	4/887	0/89	27	4,624	0.013	Accepted
Evaluation Scheduling	5/123	0/846	28	5.358	0.000	Accepted
Reviewing strategic priorities regarding the emerging changes	5/09	0/826	28	4.564	0.000	Accepted
Taking corrective actions	6/452	0/928	31	5.388	0.012	Accepted

Point-by-point responses to the reviewer's comments on the manuscript

Designing an integrated methodology for knowledge management strategic planning: the roadmap toward strategic alignment

The authors would like to thank Reviewers for careful review of our manuscript and providing us with their comments and suggestions to improve the quality of the manuscript. The following responses have been prepared to address all of the reviewers' comments in a point –by-point fashion. Changes are highlighted in the text.

Comment #	Comments and responses to Reviewer (1)
1	"**Originality**: The paper examines integrated KM strategic planning. In my experience, this area is adequately covered by existing publications and consulting methodologies. I think the authors do not add sufficient new knowledge, although they did interview a number of KM experts and obtain 32 returned surveys. The small number does not justify statistical analysis. The interviews however did provide an opportunity to explore in depth how KM strategists plan, whether it is successful, how they deviate in reality from standard methods etc." **Response:** The necessity of the study is more discussed in pages 3 and 4. According to APQC community call (2018) and other added new references, this area of KM researches need to be further investigated which less attention has been paid. By reviewing related literature, it is revealed that there were some limitations in this area which encourage doing further studies. As the reviewer 1 stated the qualitative stage of the research methodology has appropriate quality. About the sample size of survey, it should be noted that due to the few number of qualified experts and also their limited cooperation in the survey process, only comments from this limited number of participants were used which does not reduce the theoretical value of the study; there are various valuable studies with survey method which the limited number of participants were selected and used. These studies are referred in pages 16.
2	"**Relationship to Literature**: The literature review is quite good, but reference to consulting methods would have been useful. The literature suggests attention has already been directed to the area. What is needed is more knowledge about success and failure." **Response:** It was a very good suggestion. We have added related content to the paper. More and updated studies in KM strategic planning were added to the paper to meet the reviewer 1' valuable comment.
3	"**Methodology**: As mentioned, with this number of respondents, in depth, exploratory interviews to ascertain lived experience and KM manager ontologies would have been preferable." **Response**: In the interview process, authors attempted to extract and ascertain comments and experiences of CKOs in KM strategic planning process and

	simultaneously used the best international practices in literature. In order to get more detailed information about the process, with the coordination of senior KM managers, we also attended some strategic planning meetings. about sample size of participants, some discussions were added to limitation Section.
4	"**Results**: Yes, the results are consistent, but they are not very new or surprising. The authors need to explore the consequences in more detail. There was little that was specifically about KM and its challenges" **Response:** we have tried to better explain the motivation and necessity of the work in both introduction, and the literature review Sections.
5	"**Implications for research, practice and/or society**: There are few implications for further research." **Response:** according to valuable comment of reviewer 1, the limitations and suggestions for further studies were added to pages 15 and 16.
6	"**Quality of Communication**: The English language requires upgrading to native speaker level." **Response:** As mentioned, the entire paper was revised by a professional English editor.

Comment #	Comments and responses to Reviewer (2)
Comment	"The article need little perfection and more analysis and discussion" Response: according to valuable comment of reviewer 2, the revisions was done in main text
1	"Originality: Does the paper contain new and significant information adequate to justify publication?: yes" **Response:** thanks for your careful and valuable comment.
2	"**Relationship to Literature**: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored? exactly" **Response:** Thank you for the accuracy of the your opinion.
3	"**Methodology:** Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: based on theory well designed and appropriate" **Response:** thanks for your careful comment.
4	"**Results:** Are results presented clearly and analyzed appropriately? Do the conclusions adequately tie together the other elements of the paper? quite good." **Response:** thanks for your valuable comment.
5	"**Implications for research, practice and/or society:** Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact

	upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper? acceptable implication" **Response:** thanks for your kindness
6	"**Quality of Communication**: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Is the length of the paper appropriate (this should be no more than 8000 words including references and appendices and allowing 280 words for each figure or table)? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: yes" **Response:** thanks for your kindness