Knowledge network modelling to support decision making for strategic intervention in IT project-oriented change management

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Abstract

This paper focuses on knowledge management to enhance decision support systems for strategic intervention in IT project-oriented change management. It proposes a model of change management knowledge networks (CMKNM) to support decision by tackling three existing issues: insufficient knowledge traceability based on the relationships between knowledge elements and key factors; lack of procedural knowledge to provide adequate policies to guide changes; and lack of "lessons learned" documentation in knowledge-bases. A qualitative method was used to investigate issues surrounding knowledge mobilisation and knowledge networks. Empirical study was undertaken with industries to test the CMKNM. Results are presented from the empirical study on the key factors influencing knowledge mobilisation in IT project-oriented change management, knowledge networks and connections. The CMKNM model allows key knowledge mobilisation factors to be aligned with each other; it also defines the connections between knowledge networks allowing knowledge to be mobilised by tracing knowledge channels to support decision.

Keywords: Knowledge networks; knowledge mobilisation; strategic decision making; project-oriented change management; organisational change knowledge and IT projects.

1. Introduction

Knowledge management and change management concepts are widely described in the literature as being interwoven (Bloodgood & Salisbury, 2001). They are multidisciplinary fields which seek to enhance the utilisation of organisational assets for competitive advantage (Birasnav, Rangenekar & Dalpati, 2011; Wiig, 2000). However, many organisations usually consider knowledge management as a complementary concept, subsequently failing to address its value within change management strategies to support effective decision making throughout all processes and phases of change. In fact, not only knowledge is a pre-requisite to the ability to influence outcomes; knowledge motives for change also assist in lessening uncertainty and generating readiness for change (Terry & Jimmieson, 1999). Knowledge management can provide the key power in influencing change at various levels, including the processing of change, designing the change project, spear-heading organisational readiness, supporting

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decision-making processes, dealing with cultural issues, and eventually enhancing the success of change (Van Donk & Riezebos, 2005). This is because knowledge management is able to facilitate a variety of organisational functionalities including work performance, decision making, social cognition and strategic management (Van Donk & Riezebos, 2005). Some scholars believe that the key competencies of organisations are built upon employees' experiences and skills, thus highlighting the need to find ways of tapping into such knowledge to develop and maintain core capabilities (Gareis & Hueman, 2000). Therefore, one of the most critical failure factors related to inadequate decision-making systems is a result of the poor selection of change management strategies; this can be attributed to a lack of knowledge and poor knowledge management (Bloodgood & Salisbury, 2001; Burnes, 2004). Knowledge management and Change management strategies always call for new approaches to supporting decision making in order to deal with on-going organisational issues (Cao & McHugh, 2005).

Most of the existing change management work discusses the specific characteristics of project oriented companies and their transformation (Keegan et al., 2012; Rebecca, 2013); change models and approaches, and the relation between change processes, projects and programmes (Gareis, 2010); and the role of human resources. A small amount of the work makes brief statements about knowledge management and the role of project managers as a strategic core resource in project oriented companies (Huemann et al., 2007; Keegan et al, 2012). Three epistemological knowledge management perspectives were identified in project-oriented organisations: (1) examining the interaction between tacit and explicit knowledge for managerial practices (Christensen & Bang, 2003); (2) identifying and examining factors that influence the success or failure of knowledge management initiatives in project-based companies (Ajmal, Helo & Kekäle, 2010); and (3) examining the key problems in embedding new management knowledge within processes of change (Bresnen, Goussevskaia & Swan, 2004). Most research in project based change management has been conducted in Europe, so there is a need to conduct research in different parts of the world in order to offer new insights and to strengthen existing findings. Additionally, most of the existing work considers organisational learning as a type of change with two processes: acquiring new knowledge and stabilising new knowledge. The phases in each process have their own supporting tools and mechanisms. Furthermore, organisational learning can undergo continuous improvement through daily business activities to promote innovation in an organisation (Gareis, 2010). More work is needed on employing a systematic approach to project oriented change management that is driven by applying knowledge management, which could accompany the existing change management strategy to support better decision-making processes. Little research exists on the use of knowledge management in project oriented organisations which considers the creation, sharing and application of knowledge in relation to optimising performance in project management (Love, Fong & Irani, 2005). However, such work does not view projects as permanent organisations nor considers issues regarding decision-making support mechanisms.

To address the previously relatively unexplored and undeveloped issues, this paper aims to contribute to the development of an understanding of knowledge management mobilisation and knowledge networks by proposing a Change Management Knowledge Network Model (CMKNM) in order to provide traceability and the connection of procedural knowledge to

"lessons learned", to ultimately enhance decision support for strategic intervention in IT project-oriented change management. In particular, this paper focuses on:

- Establishing a new "practical" insight into knowledge management mobilisation in supporting decision-making.

- Identifying a new knowledge layer of "know who" in addition to the already existing layers of "know how", "know what", "know why" and "know with".

- Identifying the key knowledge mobilisation issues in IT project change that have an impact on decision support, as well as determining key knowledge mobilisation factors in project-oriented change management for structural knowledge networks.

The paper is organised as follows. The following section reviews relevant literature, while Section 3 explains the research method. Section 4 presents the proposed CMKNM model and Section 5 discusses the findings of the empirical study. Section 6 concludes the study and suggests future work.

2. Literature Review

This section reviews related work addressing knowledge mobilisation to support decision-making in IT project oriented change management. This review particularly focuses on knowledge mobilisation networks, and how they are used in supporting decision making in project oriented change management.

Interests in knowledge mobilisation have grown rapidly over the last decade. Scholars from different disciplines have had different views on knowledge mobilisation. So far, there has not been a single definition that can be agreed by all scholars. The main reasons for this diversity can be resulting from a lack of consensus concerning knowledge management terminology; a lack of agreement regarding knowledge management issues, resulting in variety of conceptual frameworks; and because knowledge management itself is multidisciplinary, stretching across a range of academic fields and sectors. The three main perspectives on knowledge mobilisation are developed from education, health and business. Education perspective takes an epistemological standpoint towards the role of knowledge mobilisation in supporting education (Levin, 2008). Knowledge mobilisation is viewed as comprising the transfer, dissemination and translation of knowledge (Cooper, Levin & Campbell, 2009). Knowledge mobilisation is further defined as influencing decision making by transferring the right information to the right people by the right means at the right time (Levin, 2008). There is still some ambiguity in this definition. It assumes that knowledge mobilisation concerns "transfer", "disseminate" and even "translate", all of which are related to knowledge sharing in knowledge management literature (Gould & Powell, 2004; Huang, Newell, Pan & Poulson, 2001).This illustrates the overlapping concepts in the literature that cause confusion regarding knowledge management. A second view is from the health sector which refers to knowledge translation as a continual dynamic process consisting of the synthesis, diffusion and exchange of knowledge to create effective healthcare systems (Gagnon, 2011). A third view builds upon the role of knowledge brokering from a business perspective but is more concerned with innovation in a corporate business

environment other than on understanding the concept of knowledge mobilisation (Cooper, 2012).

On the contrary, there has been some consistency in the literature on the importance of knowledge mobilisation in support of decision making. Three definitions are offered here in order to discuss issues surrounding knowledge mobilisation, along with their relation to decision support. The first is that of Levesque and Works (2010) who views Knowledge mobilisation as a complex process encompassing collective knowledge, ideas and concepts used to take action to meet certain objectives. This definition, though sounding generic, highlights some important elements in Knowledge mobilisation which support decision-making: for instance, the knowledge gathering process regarding a specific issue as an input, the process of analysing and making decisions, and finally the evaluation of outputs. The second definition concerns how Knowledge mobilisation addresses knowledge outside the organisation, combining this with the knowledge already existing inside the organisation to create and then utilise new knowledge (Creech, 2004). This highlights the connections among organisations, stakeholders, people, systems, etc. The third view indirectly offers the term "knowledge mobilisation" from the connection of people, the organisation, resources, culture and the community of practice (Jashapara, 2011). This appears to avoid giving a clear definition of knowledge mobilisation. However, the author seemingly classified knowledge mobilisation as an organisation's network of intellectual assets.

From examining previous studies, the Knowledge mobilisation literature implicitly highlights terms such as networks (Jashapara, 2011), connections (Creech, 2004), actions (Levesque, 2010), linkages (Levin, 2008), brokering and intermediaries (Cooper, 2010) as existing between contents, contexts, systems and groups. These are driving forces when attempting to achieve comprehensive insights into the meaning of knowledge mobilisation. In this light, some of the logical factors and issues included in knowledge mobilisation activities have been identified. For instance, Jashapra (2011) pointed out a variety of aspects involved in knowledge mobilisation or knowledge networks, including the differences between organisational culture and organisational climate, issues regarding building communities of practice, embedding knowledge management technology to achieve a desired culture, cultural typologies and their impact on knowledge sharing (techniques and strategies), the role of management in cultivating a community of practice, concerns with regard to intellectual capital, knowledge management strategies based on culture and communities of practice, and implementing certain aspects of knowledge management into change processes. Likewise, Hislop et al., (2000) suggested certain factors that influence change in knowledge networks, focussing on, for example, the type of structure, and the power of authority and political involvement in supporting decision-making. Keen (1981) based the fundamental concept of networking within the notion of leading change where many issues must be considered. These issues include knowledge and experience, lessons learnt, authority and political involvement, change champions (teams, leaders, change agents and management), processes and structure, resistance to change and its cultural, technological, political and structural issues, and the size and scope of any change. These may be highly associated with tacit knowledge (or "know how") since, as Hislop et al., (2000) point out, "know how" and networks are inextricably inter-related. However, Carud (1997) put

forward a clear distinction between "know how", "know why" and "know what". The term "know how" deals with only one component of intellectual capital in knowledge management although it is widely used. "Know why", however, represents an insight into the roots of issues and reasons why some things could happen (wisdom level) whilst "know what" represents "an appreciation of the kind of phenomena worth pursuing" (p.81). Taking this into consideration, two case studies conducted by Hislop et al. (2000) are of interest in introducing ERP and IM systems. They highlighted the problems that could occur when key knowledge holders were not involved in decision-making processes. The failures, in both cases, pinpointed concerns regarding the relationships and connections in a sophisticated culture when political considerations were involved. This may point attention to "know who" in Knowledge mobilisation which plays the central role in connecting different parties and resources together. Additionally, this reinforces the work of Jashapara (2011), based on Handy (1985), who outlined four types of organisational culture (power culture, role culture, task culture and personal culture) with particular characteristics and distinctive functionalities. Findings regarding these types suggest their impact on networks or mobilisation. Thus, understanding an organisation's culture is a basis for decision makers to suggest Knowledge mobilisation strategies as well as other factors which might be involved (Gould & Powell, 2004).

Despite the importance of Knowledge mobilisation in knowledge management activities, there is a lack of practical research in this area so clear evidence concerning issues surrounding it is weak. From 81 papers on knowledge transfer and exchange in health, Mitton et al. (2007) found that only 18 were conducted empirically while the rest demonstrated certain barriers and constraints. Levin (2008) claims that Knowledge mobilisation research still lacks evidence while the literature of knowledge management lacks evidence of a practical nature; many studies have been built on a separate framework rather than building on previous to offer new insight into Knowledge mobilisation issues. Thus, while some research has been conducted in the area of knowledge mobilisation, most of it focuses on enhancing the education or health sectors in only one part of the world. Organisational issues regarding Knowledge mobilisation have been relatively unexplored although Gould and Powell (2004) attempted to understand the nature of organisational knowledge in supporting decision-making systems. Useful work on Knowledge mobilisation and decision making was carried out by Lavis et al. (2003) who surveyed 265 directors in health and economic/social sectors. This study found a strong relationship between research organisations that targeted more samples across different industries and professions, with KM scholars understanding best how such activities should be undertaken in this regard. Lavis et al. (2003) argue that having a more targeted audience increases commitment to Knowledge mobilisation and so more resources are made available. Additionally, many knowledge management strategies will be applied according to their consistency with the evidentiary base, increasing the likelihood of knowledge management being understood among organisations with multiple target audiences. The framework of this study focuses on three key elements: the type of message transferred by mediators; targeted people; and tools and process supporting knowledge management. This framework also highlights the important role played by knowledge networks, particularly in decision making and Knowledge mobilisation processes.

Based on the above, there has been a clear gap in the literature in addressing the knowledge mobilisation networks for decision support with sufficient empirical evidence. This paper aims to fill the gap in literature. The following section presents a conceptual model first followed by empirical study in Sections 4 and 5.

3. A Conceptual Framework for decision support - CMKNM

Given the lack of literature surrounding knowledge mobilisation networks, particularly in IT project-oriented change management, four interrelated problems, identified in the literature regarding decision support from a knowledge management and change management context, set the stage for this study:

- A lack of top management support in identifying knowledge management channels in change management processes to support decision-making (Gareis, 2010).
- A lack of project documentation and a lack of procedural knowledge in change management regarding lessons learnt (Ajmal, Helo & Kekäle, 2010; Gareis, 2010; Gould & Powell, 2004; Smith, Burstein & Sowunmi, 1999).
- A lack of coordination of collective knowledge, enhanced in DSS, among parties (Garcia-Lorenzo, 2008).
- A lack of employees' involvement in Knowledge mobilisation & change management processes in terms of planning, decision making and creating a vision (Ajmal, Helo & Kekäle, 2010; Hossain & Shakir, 2001; Rebecca, 2013).

A conceptual framework is built upon previous research, integrating change management and knowledge management approaches, drawing, for example, from a number of reviews of factors that influence KM in organisations (Ajmal, Helo & Kekäle, 2010; Ward, House & Hamer, 2009a). The conceptual framework is named CMKNM. In project-based change in an IT intervention, most identity dimensions of an organisation have to be considered, including strategies, structures, policies, cultures, decision processes, patterns and connections, and the relevant external environment (Gareis, 2010). The alignment between information technology and business visions, objectives, demands and strategy is key in influencing decision-making processes to determine the capacity for change of an organisation when pre-selecting an appropriate change strategy, and at the implementation and post-implementation stages (Lutz et al., 2013; Thomas, 2012). This CMKNM framework addresses the alignment between key factors of project-oriented change management and Knowledge mobilisation to achieve a long-term strategic vision which includes the organisation's culture and strategy, its capacity and its knowledge infrastructure, as shown in Figure 1.

Knowledge infrastructure is integrated into change management strategies to facilitate knowledge mobilisation; this is important in establishing knowledge networks and in providing traceability and the connection of procedural knowledge to "lessons learned", resulting in the ability to support decision making. However, to address factors such as interoperability, coordination, cooperation and regulations to support DS, a few Knowledge mobilisation studies have highlighted the role of knowledge brokering and knowledge intermediaries in educational sectors (CHSRF, 2003; Cooper, 2010; Hossain & Shakir, 2001; Ward et al., 2009b). In line with the aims of this study, the role of knowledge brokering is adopted into the

knowledge network processes in order to understand the full scope of the efforts required in DS processes to ensure the success of IT projects. In the business sector, knowledge brokers are considered to be key players in innovation processes, acting as facilitators, enhancing the combination of knowledge and skills needed in problem-solving innovation, and acting as a channel or bridge in connecting suppliers with seekers (Cooper, 2010; Sousa, 2008; Hossain & Shakir, 2001). Knowledge brokers might be an organisation, individuals, third parties or change agents who facilitate collaboration and innovation by connecting different organisational activities both internally and externally (Cillo, 2005). This is relevant since IT intervention project-based change management consists mostly of outsourcing, especially in large implementation projects. The CMKNM model suggests that knowledge transfer is a dynamic process centred around the classic SECI (socialization, externalization, combination and internalization) model proposed by Nonaka & Takeuchi (1995). This is because of the increasing complexity of the business environment, as well as the dynamic nature of organisational change. Thus, CMKNM defines Knowledge mobilisation as a dynamic process of continuous knowledge transfer, consisting of knowledge networks to connect knowledge brokering, knowledge bases, effective knowledge and knowledge seekers while aligning key organisational factors to support decision making. Investigating issues regarding Knowledge mobilisation for decision support is particularly important when organisations are going through the further developing or transforming types of changes which result in changes in structure, culture, strategies and functionalities. Such change needs an appropriate mechanism to enhance the sharing, acquisition and documentation of knowledge. Key factors that affect knowledge mobilisation include organisational culture (Jashapara, 2011), organisational strategy (Kezar, 2001), organisational capacity (Stulgienė & Čiutienė, 2012), and knowledge infrastructure while Knowledge mobilisation is enabled by establishing knowledge networks (Manning & Sydow, 2011). In order to align key Knowledge mobilisation organisational factors, it is important to define connections between four types of knowledge network: these are the knowledge networks of interaction, of interpretation and translation, of influence, and institutional knowledge networks (i.e. the knowledge base). Defining the connections between knowledge networks potentially provides knowledge traceability and thus creating decision gates to align key Knowledge mobilisation organisational factors.

Issues concerning decision making processes are a focus for many change management scholars (Gareis, 2010; Garcia-Lorenzo, 2008) and change management theory offers a variety of models and strategies to manage change. One of the foremost theories which has strongly influenced academics and practitioners is Lewin's Planned Change Theory (1947). It consists of the following three stages: unfreezing the current state, taking action, and refreezing from the past state. Several models have been subsequently developed in attempts to understand why change management efforts end in failure. Kotter (1995), after examining 100 global companies undergoing a number of change phases, proposed the following approach: establishing a sense of urgency, developing a guiding coalition, creating a vision, communicating the vision, empowering action towards the vision, planning for and creating a short-terms win, consolidating improvements, producing more change, and institutionalising the new approach. Kotter (1995) argues that a single poor succession decision at the top of an organisation can undermine years of hard work. He attributes poor succession decisions to the

ignorance of key decision people who are not integral to the change process. Similarly, Hislop et al., (2000) suggests that factors influenced knowledge networks involved in change, such as the type of structure, the power of authority and political involvement. Likewise, Yeo (2002) and Lutz et al., (2013) claim that poor decision making in IT intervention occurs because of the lack of alignment between information technology systems and business objectives as a result of missing key details. These missing details will influence decision-making processes which determine the capacity to change of an organisation in terms of pre-selecting an appropriate change strategy, at the implementation stages and during the post-implementation period (Shipton, Budhwar & Crawshaw, 2012; Judge & Elenkov, 2005).

The development model introduced by Levy and Merry (1986) differentiates between first and second order change. The former refers to changes in functional processes such as organisational structures, decision making processes, communication systems, pattern recognition, and rewards systems. This is based on the existing paradigm of an organisation and involves shaping perceptions, procedures and behaviours. However, the second order of change considers multi-dimensional step leading to radical organisational change and a new identity; it involves restructuring and very significant culture change (Gareis, 2010). Gareis (2010) conducted four case studies of change managed by projects or programmes in different industries based in Europe, suggests a new approach to decision-making support in the change process. He highlights the need to define the change process using chains, boundaries and measurable objectives since the change management literature does not distinguish change processes by defining types of change. Defining change processes into sets of chains offers decision gates at the end of every process. This is claimed to be effective in managing the dynamics of change when managing each process using projects or programmes. Thus, each process is managed in terms of change with its own boundaries and objectives.

Three types of change are considered in this study. According to Gareis (2010), the types of change which involve further developing and transformation often deal with the implementation of change during the pre-implementation, implementation and post implementation stages; this is consistent with the aim of this study to propose the CMKNM model to support decision making in strategic IT interventions. Emerging objectives are also to develop/enhance business value by implementing, in other relevant environments, the main innovations in different business activities including products, markets, services, infrastructure or networks. Transformational changes focus on major changes affecting all identities and dimensions, including organisational strategies, structures, cultures and their relationship to the other environments. Therefore, managing this type of change demands a top-down beginning for strategic orientation, necessarily focusing on redesigning the organisation and on fostering new core competences. A number of phases are included in this type of change: interrupting routines, planning and creating a vision, making decisions, implementation, and establishing a new identity. In order to interrupt routine, awareness has to be raised using appropriate media or communication tools while, in terms of planning and creating a vision, objectives have to be defined and strategies must be built and documented. Decisions will be based on these plans for the later transformation processes (Gareis, 2010). The third type of change considered in this study is organisational learning; this focuses on two processes. The first is "acquiring new

knowledge" and involves identifying new knowledge, securing it, providing the new knowledge for employees, and refreezing old knowledge. The second process is "stabilising new knowledge" which has specific objectives, approaches and roles (Gareis, 2010). This has influenced the conceptual framework of this study with regard to the term "knowledge" although knowledge management approaches and strategies, in terms of knowledge creation, sharing, acquisition, application and storing, are not addressed.

Thus, the conceptual framework CMKNM has adopted this concept from a change management perspective as a type of change that demands knowledge management approaches, strategies and applications to be implemented alongside change management strategies. This is because knowledge management is perceived to be the key power in influencing change at various levels including processing change, designing the change projects, leading organisational readiness, supporting decision-making processes, dealing with cultural issues, and eventually enhancing the success of change (Van & Riezebos, 2005).
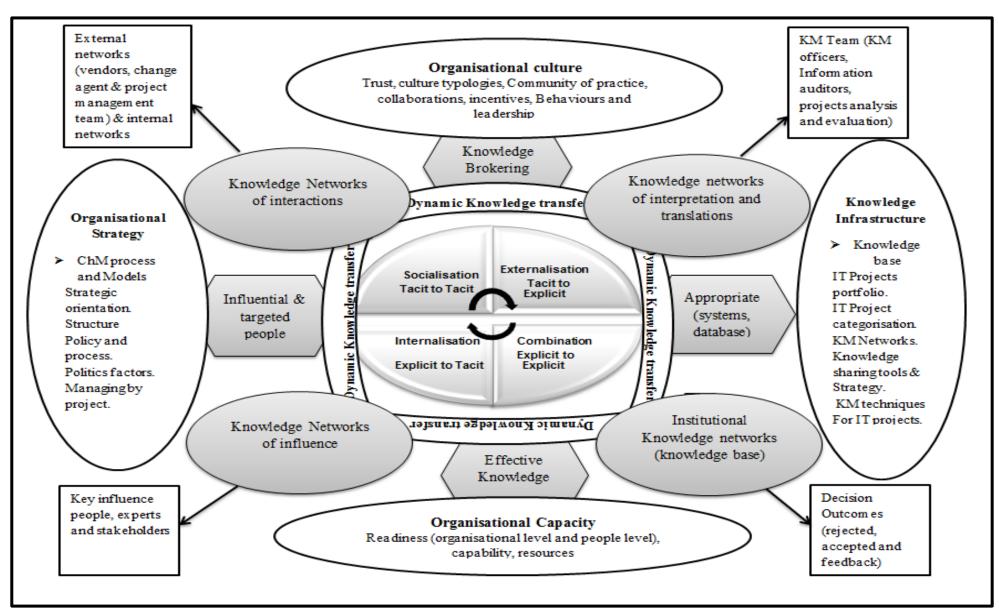
Figure 1: The conceptual framework CMKNM

4. Method to evaluate the conceptual framework

A qualitative approach was used in this preliminary study to investigate issues concerning knowledge network modelling to support decision making in IT project-oriented change management. A qualitative approach was chosen since organisational decisions are generally idiosyncratic that are driven and managed by circumstances that pertain to a particular organisation (Themistocleous, 2002). This research was therefore constructed in three phases, as shown in Table 1. In the first phase a semi-structured interview was prepared, revised and then conducted to validate the constructed model. The first interview was conducted in the main E-government centre (called the Yesser Programme) in Saudi Arabia with three experts, who had more than five years' work experience, in the areas of knowledge management and PM. This allowed for an in-depth investigation since experienced managers are less likely to be influenced by the interviewer, thus reducing bias in the collected data. As recommended by the experts, the interview was then conducted within one of the world's largest professional services firms (PwC) which has 776 offices in cities across 159 countries and employs over 180,000 people. The five interviewees here, none with less than five years' experience, ranged from IT-PM managers to an organisational consultant and a structural consultant, as suggested by the experts from Yesser. PwC is considered to be one of the main service suppliers and vendors of IT solutions in the public sector in Saudi Arabia. The details of the interviewees are summarised in Table 2.

In order to understand patterns and relations between various concepts, a thematic approach was implemented and manual coding technique was used since the number of interviews was small. Also, to enhance the overall validity and reliability of the proposed model, three phases were explored:

1- Secondary data were gathered from the normative literature to identify the issues and scope of the research;
2- Brainstorming sessions were undertaken on subjects with two expert's academic and knowledge management manager in organisation; this includes the relevance of the tree topic technique and the topics' categorisation technique for issues and challenges.
3- Data from the empirical interviews were analysed to test the applicability of the proposed model (validation stage). This is explained further in Section 4.

This allowed the main themes to be elicited in order to build a solid approach and develop a model for the later phases (section 5). The second phase, a survey based questionnaire, was piloted and then distributed to around 200 IT managers and policy makers in both private and public sectors in Saudi Arabia in order, first, to trace knowledge management activities within IT project interventions and then to determine and select cases when the opportunity arises (opportunistic sampling). The management of the Yesser programme and the researcher worked cooperatively to achieve this and it was done to allow the researcher to gain a deep understanding of real practice before insightfully moving on to Phase three. Depending on the survey results in determining the level of knowledge management activities and IT intervention projects, the third phase, semi-structured and structured interviews, will then be conducted. At

this stage, the data will be coded, analysed, reviewed and examined to develop a model of reference for a change management knowledge network to support decision-making processes.

Table 1: Research method phases for CMKNM

Phases No	Phases 'denomination	Purpose & Achievement
Phase (1)	Semi-structured interviews Face to face	✓ To evaluate the finding from the literature review. ✓ To construct and validate CMKNM ✓ To raise issues those have not been considered.
Phase (2)	a survey based questionnaire	✓ The purpose is to explore further knowledge management activities within IT project interventions across IT managers and policy makers across the country. ✓ To achieve opportunistic sampling for conducting further interviews to strength the findings.
Phase (3)	Both Semi-structured and structured interviews will be conducted where the opportunity arises	✓ The purpose is to explore comprehensive views and gain insightful understanding. ✓ To further examine the reliability and validity of CMKNM to support decision-making by further investigating representative and generalizable sampling.

Table 2: The details of interviewees from Yesser and PWC

No	Name of Organisation	Interview and Interviewees' Details				
		Coded Name	Interviewee's Position	Interview Date	Duration Time	Years of Experience
1	Yesser	Participant 1	IT project Manager	15-7-2013	1:15 h	5 Years
		Participant 2	IKM Manager	22-7-2013	2 h	7 Years
		Participant 3	IT manager	15-7-2013	45 min	5 Years
2	PwC	Participant 1	Organisational Consultant	15-8-2013	1.30	6 Years
		Participant 2	Structural Consultant	16-7-2013	1:30	5 Years
		Participant 3	IT Project Manager	17-7-2013	2 h	14 Yeas
		Participant 4	Expert In Project Management	18-7-2013	1 h	5 Years
		Participant 5	Project Manager	18-7-2013	1:15h	10 Years

5. Empirical Study of CMKNM for Decision Support

This section presents empirical findings on the three themes: factors influencing Knowledge mobilisation in IT project-oriented change management, knowledge networks to align key factors in strategic decision making, and knowledge network connections.

5.1 Key factors influencing Knowledge mobilisation in IT project-oriented Change Management

Owing to limitations in the literature concerning studies on IT interventions in project-oriented change management and the role of Knowledge mobilisation in supporting decision making in this regard, the researcher investigated the literature related to knowledge management and change management at a broad level and project-oriented s and Knowledge mobilisation from a related context. Four main factors (the culture, strategy, capacity and knowledge infrastructure of an organisation) were considered from the literature and the researcher's assumptions with regard to the influence of Knowledge mobilisation through transformation or when an organisation goes into change. The results are as follows:

5.1.1 Organisational culture

The study's results indicate a strong relationship between cultural aspects and their influence on decision making (Gould & Powell, 2004; Syed-Ikhsan & Rowland, 2004) through the selection of appropriate change strategies. For example, cultural typologies and organisational maturity have to be considered as a foundation when making decisions about the selection of change strategies. Silo's culture is seen to be an obstacle in all change processes since it results in a lack of transparency in decision making. In order to build a central knowledge base for IT projects to enhance procedural knowledge for lessons learnt, cooperation among public sector organisations needs to be enhanced with high levels of trust and transparency by building a community of practice. Two interviewees who are Organisational and Structural Consultants state that:

"Competitive and silo's culture are very common in organisations, so we need to understand the type of culture in terms of diversity, maturity and power. We cannot really start to suggest change strategy for the development before solving cultural aspects. One of the hardest sides of change project is dealing with cultural aspects so it our main concerns. There is no usually such encouragement to take initiatives to solve problems. People do not share and talk freely about their Errors and mistakes so they can't learn from mistakes. We have to work cooperatively with customers to find supporting mechanism that suits their organisations. We need to build corporate culture to support the whole process of change"

For instance, conferences, seminars and training sessions are essential to identify key knowledge holders, influential people and to solve political issues within organisations. Interoperability issues have to be solved through knowledge-sharing mechanisms such as incentives and rewards since knowledge holders are the key to decision support. The typologies of culture define an organisation's structure and thus form decision-making processes.

5.1.2 Organisational strategy

This refers to the degree to which organisational strategies are consistent with both the change management and knowledge management strategies that have been selected and aligned with business objectives at an early stage of decision making. Many key players, such as stakeholders, vendors, knowledge holders, consultants, executives, IT specialists and ordinary users, will play significant roles in forming change management and knowledge management strategies at all stages of an IT project intervention. Thus, key activities, such as organisational policies, political factors and organisational structures, have to be considered. Participants 5 emphasis:

"In order to understand the requirements of change, you have to choose very skilled team works. Project managers have to have the ability to select right people to accomplish such task. There are many tasks have to be performed by people who know how to deliver the message, to explain and to clarify issues. Many of project failures are due to the ignorance of change strategy so the stakeholders usually are not valuing change strategies. This is because the lack of budget or the lack of awareness about it. So they do not really consider the IT intervention as a change.

The IT Manager (Participant 4) asserts:

Large IT projects implementation effect different dimensions in an organisation so we need to plane change and then propose it as a package including addressing their need for change, readiness to change and their ability to change. We will need clearly to re-address the whole organisational strategy. Decision making has to be delegated further down the hierarchy, so departments can work effectively together to solve organisational barriers. If decision making is delegated further and interdepartmental relationships are improved People will believe that important benefits can be secured".

This study's results confirm the findings of Gareis (2010) in terms of treating change management strategy as a set of processes and phases managed by projects and programmes rather than managing changes within the programmes or projects of IT intervention. The failure of IT system interventions can often be attributed to overlooking aspects of change management strategies to deal with all the phases of the intervention. Participants 1, 2 and 5 claimed that:

"The failure of IT projects is often related to poor decision making in the pre-planning stages as many decision makers overlook change strategy in IT projects".

Poor decision making in selecting appropriate change management and knowledge management strategies to manage change, solve organisational issues, define business objectives (planning and vision), or draw a broad image will very likely lead to delay, discontinuity or failure. Overlooking the interactions between key activities and key players in selecting change management strategies to support decision making at all stages is a key factor in failure.

5.1.3 Organisational Capacity

This study defines organisational capacity as the degree to which an organisation is ready for change at an organisational and people level. This includes the ability of an organisation to absorb, adopt and embrace change at an operational, functional, technical, financial and organisational level. Participant 5 emphasis:

"They need technology for their work to become efficient, but there is no enough information about what they really need and how to perform jobs. In contrast, there are sometimes too many overlapping and conflicting information in different systems which too often cause them poor decision making. We cannot precede projects unless we clearly address their need to write the proposal for the whole change project".

This study's results were consistent with those of previous studies which considered decision making regarding an adopted innovation to be based on promising advantages across organisational, operational, managerial, strategic and technical areas (Themistocleous, 2004; Shang & Seddon, 2002). Defining organisational capacity is a crucial part of managing change and in understanding the full extent of the efforts required in a decision support process. This requires an assessment of an organisation's readiness, including defining the boundaries of changes at a people and organisational level. A lack of systematic knowledge management strategies will have a negative impact on decisions regarding the definition of change boundaries, thus resulting in ambiguity.

5.1.4   Knowledge Infrastructure

The knowledge infrastructure is crucial in supporting decision making in project-oriented change management; it is the main driver and facilitator for Knowledge mobilisation. This concept of knowledge management infrastructure is driven by the notion of IT infrastructure as a key in innovation technology (Bose, 2003). The findings of this study confirm the need for an effective knowledge infrastructure across public sectors in order to create a knowledge-based community to connect stakeholders, decision makers, IT vendors, users, project managers and organisational assets. To manage change by projects, the knowledge management infrastructure is a cornerstone which drives Knowledge mobilisation as it combines IT project portfolios, defines knowledge management networks, and provides a selection of knowledge management strategies and appropriate knowledge-sharing tools. All the participants agreed:

"Serious problems are faced when we have to find important information to precede the change. There are either too many information those are overlapping and conflicting left unmanaged, or there is no enough information. This is sometimes faced even within organisations which are mature in technology. Appropriate communication tools and mechanisms are not supported and high level of performance is not recognised; so much time is wasted to make decision".

Thus, the success of change management depends on the collection of knowledge in supporting decision making in terms of selecting appropriate change strategies by defining the boundaries of change, minimising constraints, setting objectives, and connecting external and internal resources. The knowledge management infrastructure is seen to enhance procedural knowledge, moving to lessons learnt and so informing decision making. In this regard, one of the findings

from the "interviewees" suggests implementing a system of social networks to connect experts, projects managers, vendors, stakeholders and ordinary users. This system is implemented in PwC to support decision making and is linked to a knowledge base for reference in future projects. It is considered to have a significant influence in mobilising knowledge to support decision making.

5.2 Knowledge networks

This study defines knowledge networks based on the classic SECI (socialization, externalization, combination and internalization) to align the factors influencing Knowledge mobilisation in IT project-oriented change management; this alignment supports decision making. The study's results suggest establishing four types of knowledge network: knowledge networks of interaction, knowledge networks of interpretation and translation, knowledge networks of influence, and institutional knowledge networks (i.e. knowledge bases). Previous studies, such as that of Hislop et al. (2000), have highlighted the need to identify knowledge networks in IT project intervention and some have attributed poor decision making in IT implementation to missing key details (Yeo, 2002 and Lutz et al., 2013). Defining knowledge networks is vital, not only to solve organisational issues during the changes, but also to connect a variety of parties, including external experts, change agents, stakeholders, resources, key players and key activities. Participant (3) commented:

> *"Without drawing project maps of key people, resources and activities, building a proper networks and finding connections between different parties, projects cannot proceed."*

This allows decision makers to consider underpinning issues that could play a fundamental role in the planning of changes, thus contributing to the success of IT projects. The role of knowledge networks is to mobilise knowledge; to deliver effective knowledge to the right people in the right systems; to facilitate knowledge sharing, organisational learning and learning in real time; and to commoditise knowledge into a knowledge-base. Knowledge networks are driving forces in the analysis, evaluation and eventually delivery of the right knowledge to knowledge seekers to enhance the consistency, quality and speed of decision making.

5.3 Knowledge Network Connections

The results of this study highlight the fundamental role played by knowledge brokering in large IT systems projects. This is because many such projects are outsourced and so a wide variety of parties and resources will be involved in the change strategies, processes and phases. Participants 1, 2 and 3 claim:

"The role of information and knowledge brokering is so important; we are working in this area to enhance the success of IT projects in organisations. We play fundamental role in connecting public sectors with vendors, giving advice, solving problems, giving technical consultant and conducting research to improve the service".

Previous studies in Knowledge mobilisation in education shed light on the role of knowledge intermediaries in educational sectors (Cooper, 2010; CHSRF, 2003; Ward et al., 2009b;

Hossain & Shakir, 2001). This study suggests that knowledge intermediaries play a significant role in connecting knowledge networks to bridge the gap between external and internal resources and to connect knowledge networks of interaction (tacit knowledge) to knowledge networks of interpretation and translation, thus converting it into explicit knowledge. Explicit knowledge then has to be analysed, evaluated and stored in appropriate knowledge systems (knowledge-bases). Knowledge is then institutionalised and used as a commodity (institutional knowledge networks) in order to produce effective knowledge as an output. This knowledge must be utilised by the right people to support decision making across the organisation. The connections between networks are crucially important for several reasons including tracing knowledge channels, uncovering missing details in the IT project, aligning Knowledge mobilisation with project-oriented key factors in order to enhance the selection of change management, selecting appropriate knowledge management strategies for managing changes, solving political issues, involving all the related parties in the IT project in the strategies of change, and leading the process of learning by projects (lessons learnt). Every network plays a fundamental role in supporting decision making throughout all the processes and phases of change; this is how knowledge can be mobilised.

6. Conclusion

This study has discussed the concept of an understanding knowledge management mobilisation and knowledge networks and proposed CMKNM to provide traceability and the connection of procedural knowledge to "lessons learned". This is to ultimately support decision making for strategic intervention in IT project-oriented change management.

This study has contributed to establish new insight into knowledge management mobilisation; Identify a new knowledge layer of "know who"; address key knowledge mobilisation issues in IT project change; and determine key knowledge mobilisation factors in project-oriented change management for structural knowledge networks. The establishment of a CMKNM model is to investigate Knowledge mobilisation issues in IT project-oriented to support decision making. It explores four types of network to mobilise knowledge for the support of decision making: 1) knowledge networks of interaction that are linked to the knowledge networks of interpretation and translation via knowledge brokering; 2) knowledge networks of interpretation and translation which are linked to institutional knowledge networks via knowledge-bases or appropriate systems; 3) when knowledge is institutionalised, the output will be effective when delivered by knowledge networks of influence (fourth networks) to targeted people in order to enhance decision making. Defining knowledge networks and their connections enable key Knowledge mobilisation factors to be aligned, including organisational culture, strategies, capacity and knowledge infrastructure. Furthermore, this allows knowledge channel to be traced in order to connect procedural knowledge to "lessons learned" to enhance decision support for strategic intervention in IT project-oriented change management. The identification of key players (know who) in IT project change management facilitates structural knowledge that is capable of dealing with uncertainties in change strategies for decision making. This result places emphasis of the role of knowledge networks in aligning key Knowledge mobilisation factors in IT project interventions and provides a new mechanism for the

alignments for DSS. Knowledge can only be mobilised by considering the connections between key activities and key players in the decision making processes.

A number of limitations need to be considered. For instance, this preliminary study has considered a limited sample with 8 experts specifically in Saudi Arabia in the area of change management, knowledge management and IT project management although this study does build on the findings of existing work in related areas. Further, this study was qualitatively explored and so the results have been interpreted with regard to how change management and knowledge management strategies are utilised within IT projects in public sector organisations in Saudi Arabia. Thus, the CMKNM model should be further examined with IT managers and policy makers across the country using opportunistic sampling to spotting the opportunity where arises.

The findings of this study have a number of important implications for future research. For example, developing quantitative measures for evaluating knowledge networks in Knowledge mobilisation to support decision making. Further investigation is needed regarding "know who" and its role in enhancing decision making in IT projects based change management. Finally, Exploring a hybrid technique (a combination of qualitative and quantitative approaches) for forecasting demand from both IT vendors and stakeholders to understand the full scope of the efforts required in DS processes for the success of IT projects based on change management and knowledge management.

7. Acknowledgments

8. References

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