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## Importance of Knowledge Management Processes in a Project-based organization: a Case Study of Research Enterprise

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### Abstract

Knowledge Management (KM) is vital factor to successfully undertake projects. The temporary nature of projects necessitates employing useful KM practices for tackling issues such as knowledge leakiness and rework. The Project Management Office (PMO) is a unit within organizations to facilitate and oversee organizational projects. Project Management Maturity Models (PMMM) shows the development of PMOs from immature to mature levels. The existing PMMMs have focused on discussing Project Management (PM) practices, however, the management of project knowledge is yet to be addressed, at various levels of maturity. This research project was undertaken to investigate the mentioned gap for addressing KM practices at the existing PMMMs. Due to the exploratory and inductive nature of this research, qualitative methods were chosen as the research methodology. In total, three cases selected from different industries: research; mining and government organizations, to provide broad categories for research and research questions were examined using the developed framework. This paper presents the partial findings of undertaken investigation of the research organisation with the lowest level of maturity. The result shows that knowledge creation and capturing are the most important processes, while knowledge transferring and reusing are not as important as the other two processes. In addition, it was revealed that provision of “knowledge about client” and “project management knowledge” are the most important types of knowledge that are required at this level of maturity. In conclusion, the outcomes of this paper shall provide powerful guidance to PMOs at lowest level of maturity from KM point of view.

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## 1. Introduction

Due to increasing importance of PM practices, numbers of PM methodologies and standards have been developed by academics and practitioners since late 1990 to assist organisations to improve their project performance (Kerzner, 2005; Office of Government Commerce, 2005; Project Management Institute, 2012). The Project Management Office (PMO) is a department within organisations to centrally facilitate, manage and control organisational projects through developing and maintaining suitable processes and practices for PM (Kerzner, 2009). The PMO has a significant role for improving the rate of project success through both establishing appropriate PM practices and, then, facilitating the use of those practices for project team members (Santosus, 2003; Ward & Daniel, 2013).

Knowledge Management (KM) has been recognised as a critical factor for both organizational performance and project success (Alavi & Leidner, 1999; Koskinen & Pihlanto, 2008; Kotnour, 2000; Nonaka & Takeuchi, 1995). Studies of KM in organisations have been undertaken since 1980s, while the investigation of KM in project environments has evolved since early 2000 (Koskinen, 2000; Lytras & Pouloudi, 2003). Due to temporary nature of projects, KM in project-based organisations (PBOs) is not similar to functional enterprises (Kasvi, Vartiainen, & Hailikari, 2003). For instance, project team members are disband or leave after project completion and this imposes numbers of issues such as “reparative activities”, “leaking of project knowledge”, and “reworks” which become as major challenges in projects and project-based organisations (Ajmal, Helo, & Kekale, 2010; Desouza & Evaristo, 2006; Kasvi et al., 2003; Koskinen & Pihlanto, 2008; Kotnour, 2000; Love, Irani, & Edwards, 2003).

There is a significant gap in the existing literature to address knowledge management practices in various maturity levels of PMO. In other words, the existing PMMMs not only do have any criteria to assess the maturity of PMO from KM point of view, but also they do not address KM practices for various maturity level of PMO (Sokhanvar, Trigunarsyah, & Yarlagadda, 2011). Researchers believe that developing an appropriate framework to address KM processes and practices at different levels of PMO, will significantly contribute to development of PMMMs from KM perspective and improvement of PBOs competencies. This framework shall recommend numbers of criteria to both examine the level of maturity and indicate the prerequisites to improve the maturity from KM perspective.

This paper presents the discussion of early findings from a research project that investigates the KM practices employed in a selected PBO, which will be called SCIENCO hereafter. This case study presents project KM in a research organisation which has recently established a PMO to centrally manage the organisational projects. To discuss case study findings, research objectives and questions are discussed followed by research framework to present the result, limitations and conclusion.

## 2. Research Framework

Knowledge is a crucial organisational asset which comes from individual’s mind, belief or values and it creates value for improving competitive advantages (Drucker, 1993; Hoegl & Schulze, 2005). It is a judgment based on individual beliefs, hence, it varies from one person to another and could not be easily transferred (Nonaka, 1994). According to Alavi and Leidner (2001) KM is “a systemic and organizationally specified process for acquiring, organizing and communicating both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work”. People, technology and process are core components of KM at both functional and project-based organisation (Brown & Duguid, 1998; Davenport & Prusak, 2000; Wiig, 1997). From a process perspective, a model has been developed to address KM processes for in the project environment which comprises of following interconnected processes: Creating; Capturing; Transfer/Sharing; and Reusing (Owen & Burstein, 2005). This processes have been examined in number of studies at various project management contexts and it is claimed as valid framework to be considered in project environments (Morales-Arroyo, Chang, & De las Nieves Sánchez-Guero, 2010). These processes were adopted for this study then developed by adding numbers of associated sub processes, as shown at Fig. 1.

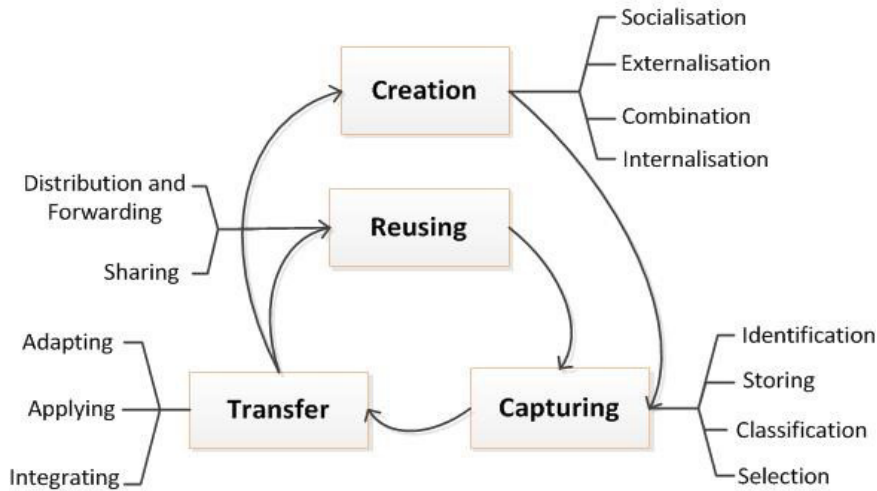


Fig. 1-Framework for KM processes & sub-processes (developed from Owen et al. for this paper)

According to Owen and Burstein (2005) knowledge management activities should be undertaken at initiation, planning, and execution & monitoring phases, while at the closing phase only knowledge capturing is required. In other words, project managers are advised to only focus on capturing projects knowledge, at the closing phase (Owen & Burstein, 2005). From PM point of view, there are two other types of knowledge in project-based environments: 1) knowledge of project management, and 2) knowledge of application area or domain knowledge (Kasvi et al., 2003; Project Management Institute, 2012).

The maturity level of SCIENCO’s PMO was assessed and it was found that it has the lowest level of maturity. This means that the PMO has the basic operation of PM and from KM point of view followings have been found.

**3. Importance of type of required knowledge**

According to the research framework, eight types of knowledge are critical in PBOs. To rate the importance of each knowledge type, survey forms were distributed among the eight participants and, eventually, 7 completed forms were returned. In the survey, respondents were asked to rank following eight types of knowledge from 1, the least, to 8, the most important ones, during four phases of project life cycle. After collecting data and entering to MS Excel sheets, an Analytical Hierarchy Process (AHP) was employed to analyse survey responses. This technique is a process that uses hierarchical decomposition through a weighted matrix to analyse complex information in multi-criterion decision (Ghodsypour & O’Brien, 1998).

After analysing the rank of each type of knowledge at various phases, another investigation was carried out to determine the overall rank of eight types of knowledge, without considering the project lifecycle phases. Similarly, the AHP technique was used to assign right weights for each entity, then, their weighted percentage were calculated and ranked, as depicted at Table 1.

Table 1- Types of knowledge and their rank

Types of Knowledge \ Project Phase	Individual Rank				Total weighted Rank	
	Initiation	Planning	Execution	Closing	Rank	Percentage
<b>Project Management Knowledge</b>	4	4	7	7	6	14.86%
<b>Knowledge about Procedures</b>	2	2	1	8	3	8.78%
<b>Technical Knowledge</b>	1	5	6	1	3	8.78%
<b>Knowledge about Clients</b>	8	7	8	5	8	18.92%
<b>Costing Knowledge</b>	7	6	4	3	5	13.51%
<b>Legal and statutory Knowledge</b>	4	1	5	3	3	8.78%
<b>Knowledge about suppliers</b>	5	4	3	4	4	10.81%
<b>Knowledge of who knows what</b>	6	8	3	6	7	15.54%

#### 4. The importance of knowledge processes

In another survey, participants were asked to rank the importance of *four KM processes; Creation; Capturing; Transferring and Reusing at project life cycle, i.e. Initiation; Planning; Execution& monitoring; and Closing*. After collecting the answers they were entered to numbers of sheets at MS Excel to be analysed. Similar to other survey, AHP technique was used to find the accurate ranking in order answer the second research question. After finalising the analysis, findings showed that respondents believed that knowledge capturing and then transferring are the most important processes, while the knowledge reusing is the less important knowledge at this stage.

As discussed earlier, knowledge capturing should be the only KM process to be managed at closing. This assumption was confirmed through data analysis findings. Therefore it was expected to be seen it as the first priority. As discussed knowledge capturing was ranked by respondents as the most important KM process at closing phase. This means that SCIENCO's employees believe that, at current situation, the first priority is to develop a KM system to support knowledge capturing and creation. In addition, knowledge transferring and reusing have the third and fourth level of importance. It should be reminded that this ranking has been obtained through conducting the survey therefore for validation purposes, it needs to be compared to previous findings.

#### 5. Conclusion Remarks

According to the research findings, the first four important types of knowledge at first maturity level are: knowledge about client, knowledge of who knows what, project management knowledge, and costing knowledge. The last two types could be addressed at this level, since it is assumed that PMO should develop a PM framework for establishing a common language among in project environments. However, PMOs with the first level maturity are advised to develop a system to facilitate both provision and access of the two important types of knowledge, knowledge about client, and knowledge of who knows what.

At the first level of maturity it was revealed that the importance of KM processes could be ordered as following: 1) Knowledge Capturing 2) Knowledge Creation 3) Knowledge Transferring and 4) Knowledge Reusing. In other word, after raising the importance of KM as a critical factor for improving project performance, firstly the knowledge capturing should be developed alongside the knowledge creation process. Since transferring and reusing are dependent on two-mentioned KM process that, it is not necessary to develop these processes. However, it is recommended to initiate the bases for them from cultural and procedural point of view. Other research which could be conducted in the future is to investigate KM processes at various organisations with the first level of maturity to examine these findings in order to develop a generic KM process model.

In summary, at the first level of maturity, KM awareness should be raised by PMO, and the first priority should be on improving knowledge capturing practices and processes. It is recommended to choose knowledge creation as the second priority by developing adequate practices. The third importance knowledge process at first level of maturity is knowledge transferring which could be managed by developing some basic practices such as training and mentoring, however, the improvement of this process depends on knowledge capturing. Since PMO as this level has none or an abstract PM methodology, therefore it is recommended to integrate both PM and KM practices from the beginning to prevent any inefficiency. In addition, the PMO is responsible for providing useful systems and practices to assist project team members with providing subsequent types of knowledge: 1) Knowledge of project management through providing PM methodology, 2) Knowledge about client through developing proper KM practices, and 3) Knowledge of who know what through addressing appropriate KM practices. Finally, we recommend that the PMO should focus on understanding the current PM systems in order to properly integrate them for PM and KM purposes.

#### 6. Limitations

This study has numbers of limitations that might impact on the presented findings. First of all the selected case study was a scientific research organisation therefore, the findings from this type of knowledge creating company might not be a good benchmark for other types of organisations. In addition, the developed research framework as yet has not been previously examined in any other PMOs. Since the study subject is relatively new, this research faced with some issues such as lack of KM studies in PMOs and problems to find the similar research for comparing the research findings. Hence, the findings need to be examined in future studies for develop a robust framework for addressing KM at the five levels of PMMMs.

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