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Managing knowledge-based projects

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Managing knowledge-based projects

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Abstract

In knowledge-based projects, many risks can be resulted due to lack of knowledge applied in the project. To avoid these risks, project based companies need to implement a convenient mechanism to develop knowledge management strategies. In this article, this mechanism is addressed as a KM strategic planning model, which is inherently a process model. This model helps to build a bridge between PMBOK processes and knowledge management strategy development. The foundation of this bridge is made on two pillars. First, the spiral of knowledge introduced by Nonaka [1] and, second, PMBOK processes. To develop the KM strategic planning model, the author is used his experiences acquired in applying knowledge management in managing projects in a consulting company.

Key words: Knowledge Management Strategy, Project Management, PMBOK

1. Introduction

Many research projects in various areas such as aero space, biology, business, management, and etc are inherently knowledge-based. In management view, two aspects are common among them. First, they are project, having restricted resources including time, money, facilities, and experts. Second, they are fundamentally knowledge-based; there are lots of knowledge and information needed to be processed to produce new knowledge and information to achieve the objectives of the project and keep away from risks.

There have been developed many models and tools in project management and knowledge management separately, but they have not been integrated well as yet. Functions to manage resources in projects have been focal points in all project management models and tools. On the other hand, knowledge management has many applicable models and tools to manage knowledge as a critical resource in organizations. Each of these two areas has its own potential to help managers to conduct projects more efficiently; however, there is much achievable potential by integrating them. By considering knowledge as a critical resource in project-based organizations, we can emerge knowledge management models and tools in project management models and tools, the main purpose of this article.

In this article, the intent is to apply KM strategy models in PM processes introduced by PMBOK in project life cycle. To do that, a KM strategic planning model is developed by using the experiences

achieved in consulting area in Saman Tadbir CO. where I worked there about ten years, and experienced using KM strategies to gather, organize, share, and use in various projects regard to apply systems engineering to develop managerial systems in corporate and industry levels.

2. Literature Review

To find and review literatures relating to this paper's subject, these keywords were used: "project life cycle", "project environments", "project management", "knowledge management", "knowledge management strategies". Regarding project life cycle, PMBOK is considered foundation to discuss project management processes. Among articles found, I concentrated on papers addressing applying KM strategies in project management.

According to PMBOK standard, project life cycle comprises these stages: initiation, planning, execution, controlling, and closing[2]. Each of project life cycle stages, shown in Figure 1, has several activities. In this paper, initiation just will be discussed, as an example. Initiation consists of those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase [2]. The activities in initiation phase are mostly: defining initial scope, committing initial financial resources, identifying internal and external stakeholders, selecting project manager, and preparing project charter. Activities related to initiation, elicited from PMBOK, are shown in table Table 1.

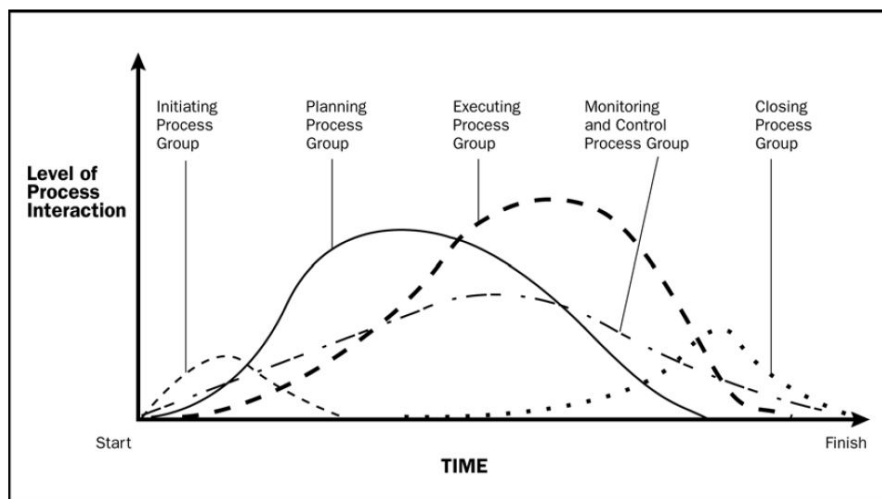


Figure 1: Main stages in project life cycle [2]

The most common approaches to KM seem to be technology-oriented; they emphasize the explicit nature of knowledge, and tend to interpret it as an object that can be stored in repositories, manipulated, and transferred via information and communication technologies[3]. Of among renowned frameworks to develop KM strategies, Nonaka, and Takeuchi's is the most famous, spiral of knowledge[1]. They introduced a quadruplet cycle including four stages: individualization, socialization, externalization, and combination, shown in Figure 2. Hansen, Nohria, and Tierny developed a classification of knowledge strategies: personalization, and codification[4]. The codification strategy focuses on extracting knowledge from people, and codifying it through documents and databases. This

strategy allows access to knowledge without having contact to people. The personalization strategy is a person to person approach accomplished in either face-to-face or group.

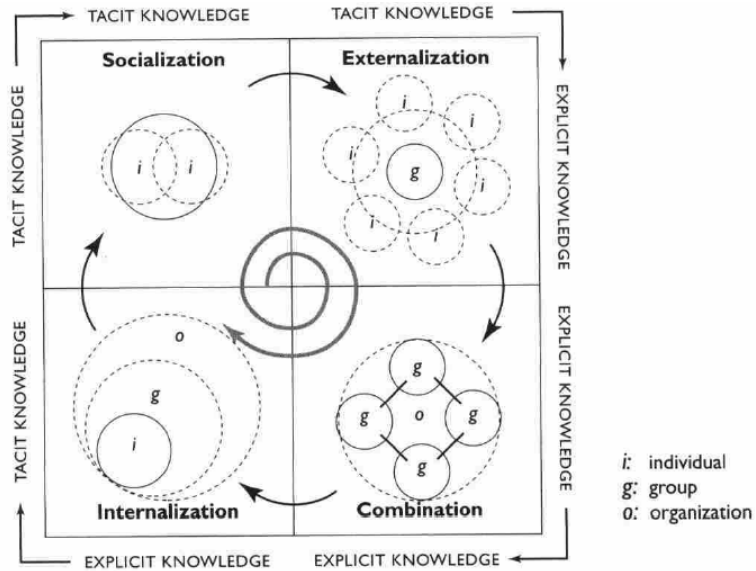


Figure 2: The spiral of knowledge (SECI Cycle)

There are few articles concerning to apply KM in PM. The most relevant article is written by Vaghefi, and Beiryaei [5]. In this article, they tried to implement Knowledge Life Cycle (KLC) to the body of Project Life Cycle (PLC) which is shown in figure 1. Perrot has developed a tentative knowledge process model based on his experience in a healthcare company[6]. In this process model, a senior knowledge management panel set down knowledge management policies, and make up senior executives about benefits and costs of how knowledge is maintained, stored, transferred, and leveraged on an ongoing basis.

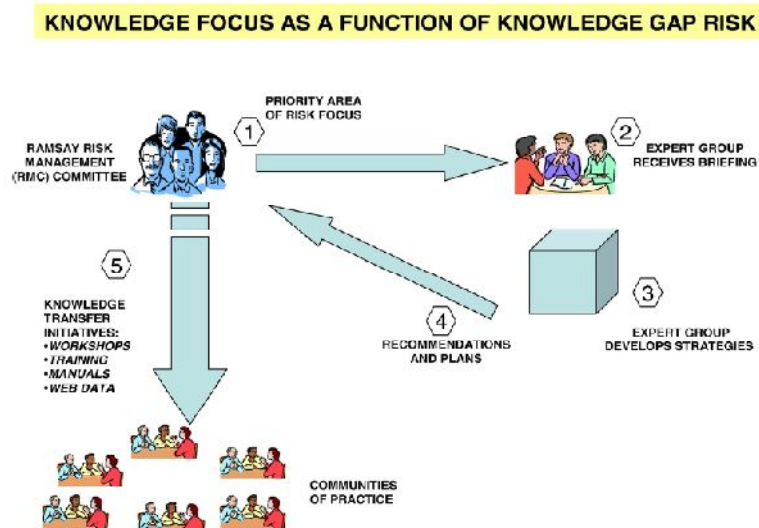


Figure 3: Knowledge process model[6]

Ambos and Schlegelmilch accomplished a research around managing knowledge in consulting firm [7]. They talked about challenges for embedding knowledge management in consulting firms and the role of people and systems to cope with. Also they talked about KM strategies in consulting project cycle. Hui Liu and Zhouwei Liu have developed a framework of knowledge management in project management for projected based companies. The framework consists of four essential parts, including project planning, organizational management, tools, and techniques. They introduce project planning, organizational management, tools and techniques, and operational management are four essential parts of project management based on KM [8]. Disterer discussed about knowledge transfer between projects and its barrier. He proponed some steps to foster the transfer of knowledge and experiences between projects [9]. Sanchez and his colleagues are talking about what kind of instruments are useful to codification strategies [10]. In another research, to harvest projects learning, Schindler and Eppler have focused on debriefing methods[11]. They integrated debriefing methods into project phase, and project goals to build a permanent, conscious and systematic gathering, analysis, and communication of project experiences.

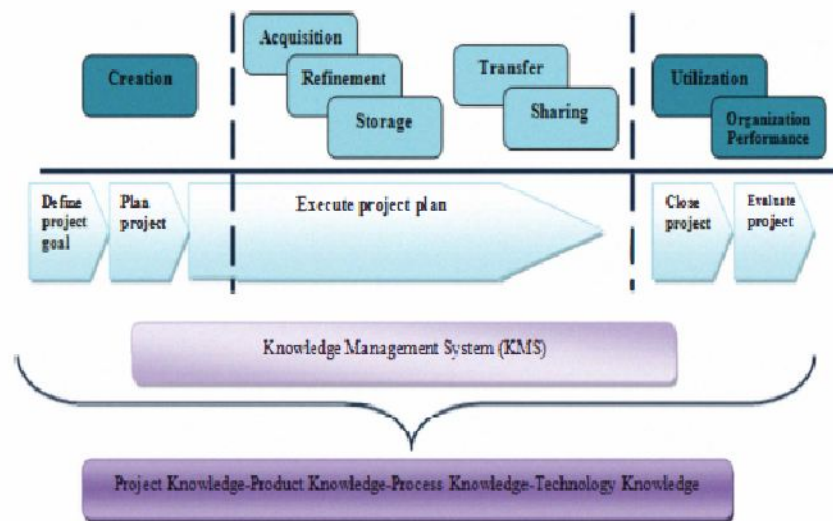


Figure 4: KLC and PLC relationship [5]

3. Research Methodology

The main question in this research is what kinds of KM strategies are convenient in each stage of projects life cycle. To find the answer, after a comprehensive literature review by using key words such as knowledge management, managing knowledge, project life cycle, project knowledge management, and project environment, I developed a project knowledge planning model by integrating main models of both PM and KM areas by using systems engineering approach. The accomplished process in this study is shown in Figure 5.

In project management perspective, since project life cycle is a set of phases which each includes activities, we needed to find a process model describing project life cycle. Process models in project management are mature enough so we chose the process model of PMBOK as a proxy of project life cycle. Then all activities regarding to each stage extracted from PMBOK. To recognize knowledge of each stage of project life cycle, all knowledge were categorized to six groups comprising technical, business, project Management, communication, administrative, and personal.

In knowledge management perspective, we needed a process model to develop KM strategy. Among KM strategy models, just Nonaka's has a process approach and other models are descriptive and they just introduce special classifications of strategies based on their inherent or tools.

In systems engineering perspective, to match Nonaka's spiral to project management processes, the model must address these requirements:

- Effective: According to lack of time and resources in projects, the mechanism must just focus on priorities of projects.
- Comprehensive: The mechanism must consider all stages in knowledge life cycle. This was provided by SECI cycle.
- Supportive: The mechanism must support KM strategies by acquiring enablers such as information systems, culture, and administrative systems.
- Manageable: The mechanism must have this ability to pursue the effectiveness of the KM strategies.

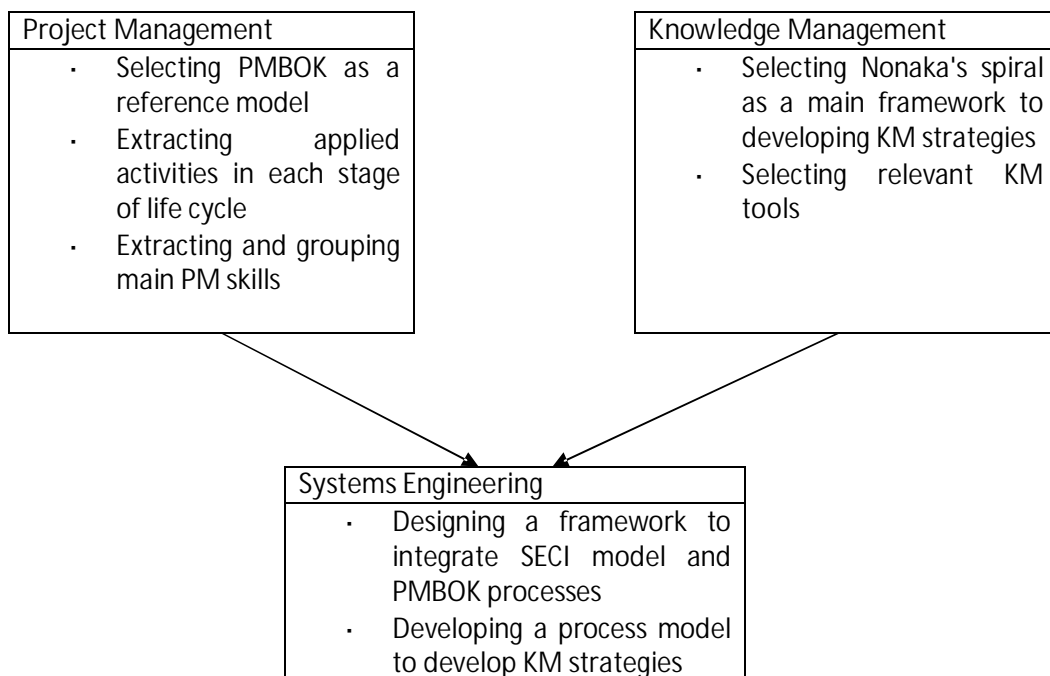


Figure 5: Three perspectives used in the methodology

Regarding to each of these quadruplet features, the components of KM strategic planning models were developed, shown in Figure 6.

4. KM strategic planning Model

To develop KM strategy in project environment, we need a mechanism supporting features mentioned in systems engineering perspective. Since every project has a restricted time and resources, project managers need to concentrate on parts of project knowledge which are vital for project success. These parts are recognized by intersection of project management knowledge and processes, shown in Table 1. Prioritizing each segment and focusing on just critical knowledge guarantee that the team spends its time and resources for vital issues and that the project avoids probable risks. All these goal are covered in "KM strategic targeting" activity.

Comprehensiveness is met by applying SECI in KM strategies development. After determining KM strategic areas in prior step, like what is shown in Table 1, strategic action plans are developed based on the conditions of project, organization, and environment through translating quadruplet stages in SECI cycle to action plans. An example will be discussed in next part.

KM strategies need to be supported by enabler plans. Enablers are usually regarding to information technology, culture, organization, and people. According to the situation of the project, proportionate enabler plans are developed.

Giving feedback is a fundamental principle to navigate managerial plans like we are discussing. Generating useful measures and determining targets based on the measures help managers to follow the success of the plans.

Therefore, the main deliverables of KM strategic planning would be: KM strategies, Enabler plans, and KM target and measures, illustrated in Figure 7

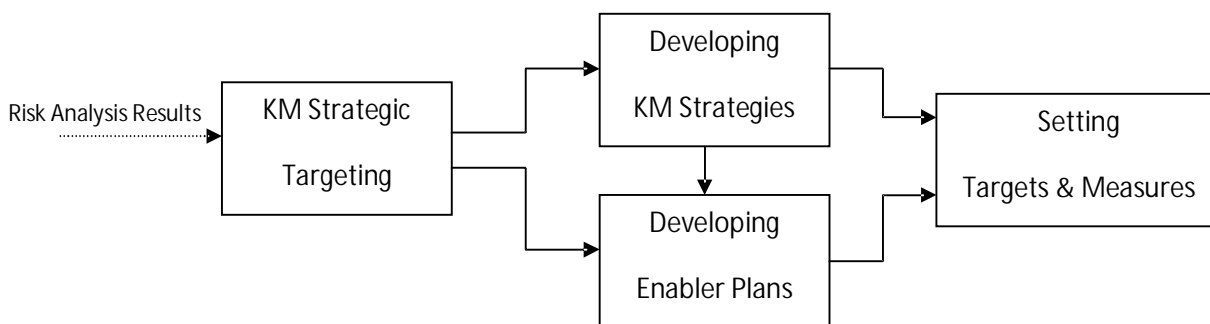


Figure 6: KM strategic planning model

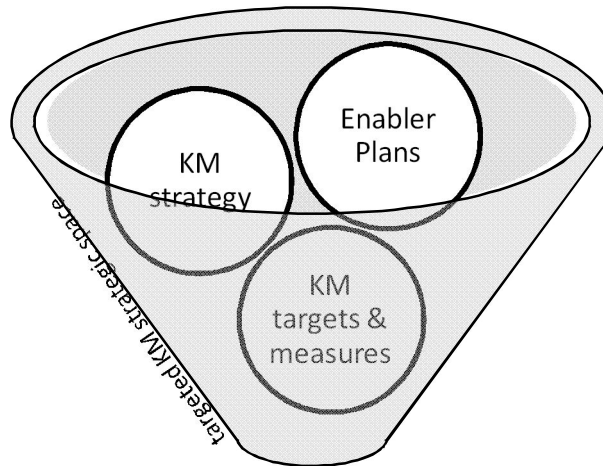


Figure 7: components of KM strategic plan

4.1. KM Strategic targeting

Each stage in project life cycle has its own knowledge so that all KM functions are needed to manage the knowledge in a project and among projects. Although Vaghefi, and Beiryaei tried to make a logical relationship between KLC and PLC frameworks intelligently [5], they simply consider a linear relationship between main functions in the two frameworks whereas KM are repeatable in all PM processes. To dissect this fact, we need a framework to discuss. The framework, shown in table 1, is built based on six main project management skills developed in the company, and project life cycle stages. There are some delicate points in how to use this framework:

- Some cells are strategic.
- SECI cycle is applicable contingently in each cell.

Some cells are strategic, so the company needs to focus on them. In spite the fact that developing KM strategy for each cell is beneficial, each organization and, consequently, each project have limited resources. Therefore, the project managers have to focus on strategic cells by considering these criteria:

- How much is the knowledge established in the organization?
- How much is the knowledge important to overcome project risks and gain objectives?
- Does the company need the knowledge in the future projects?

Targeted cells indicated by SECI model in table 1 are instances so targeted cells can vary from one project to another.

4.2. Developing KM strategies

SECI cycle is contingently applicable in each cell. SECI is a generally conceptual framework which we need to translate its quadruplet strategies to meaningful and applicable actions. Each cell proportionally may have its own translated action plans because conditions in each project vary to other one.

Example: selecting project manager

Selecting a project manager has been a vital decision. According to previous good and bad experiences concerning project managers, the board decided to develop a KM plan to avoid related risks in future projects. A committee comprising experienced project managers was formed and they translated quadruplet SECI strategies to:

Socialization:

For current project managers, socialization had done before, since selected managers had several years' experience in different projects as a project team member and as a project manager. So they had enough sense about who a successful manager is and what his/her features must be. Regarding to future project managers, it was anticipated that either the company must hire experienced managers from outside or must prepare an apprenticeship plan for inter organization alternatives.

Externalization:

- Holding some sessions and interviews and talking about project managers' features affecting on projects success

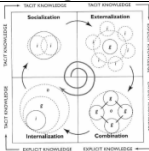
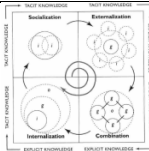
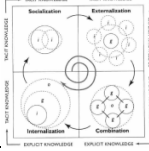
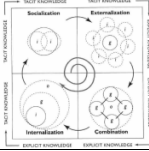
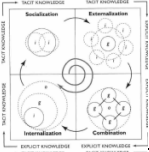
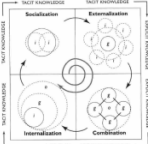
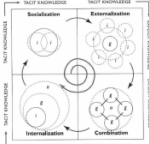
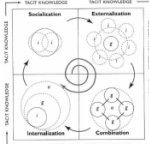
		Technical	Business	Project Management	Communication	Administrative	Personal
Initiation	defining initial scope						
	committing initial financial resources						
	identifying internal and external stakeholders						
	selecting project manager						
	preparing project charter						

Table 1: The framework developed for initiation phase

- Developing a statement including project managers' critical features

Combination:

- Refining some HRM processes including:
 - o Hiring project managers
 - o Education plans for project managers

Internalization:

- Presenting project managers in educational plans
- Mentoring project managers by mentors
- Apprenticeship in projects by hired candidates

4.3. Developing enablers plans

To support KM strategies in the organization, some supportive plans were developed. These concentrate on enablers in KM area like information technology, culture, organization structure, etc, so they call enabler plans.

Enablers plans:

- o Refining project managers payment and compensation system
- o Refining project managers' performance measurement system

4.4. Setting targets and measures

To measure the success of developed plans, some measures need to be developed and the targets which management expected achieved need to be determined.

Measure:

- o The number of minor and major errors discovered in project management audits related to the knowledge of project managers

5. Conclusion

In this article, it's tried to move forward developing more operational models by using fundamental models such as SECI model in a project management framework like PMBOK. Many articles have been published regarding to applying KM issues in PM environment, but there are few articles that they can make a coherent relation to current knowledge of project management like PMBOK. In this article, a basic conceptual framework in KM strategy development, SECI, is applied and joined to PMBOK processes to build an applicable model to develop KM strategy in project management.

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