



KNOWLEDGE MANAGEMENT'S ROLE IN ORGANIZATION MATURITY IN PROJECT MANAGEMENT

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Abstract:

In this paper, we review knowledge management's role in project management (PM). The authors speculate that knowledge management is an indicator of organizational maturity project management. This is as an organization increases its maturity in PM, it uses both informal and formal channels for knowledge transfers between the firm's actors. The researchers used an online survey and telephone interview process to collect data. The data showed that there was a positive relationship between knowledge management and organization maturity in project management.

In immature firms, the project manager uses informal learning channels to increase their own tacit project management knowledge. For example, organizations use project managers' interactions, (internally and externally), unofficial external training courses, and professional organizations to increase organizational learning. As organizational maturity increases, managers begin to codify these channels into formal ones thereby creating explicit knowledge. They use channels like database repositories, manuals, websites, and official internal and external training opportunities to foster organizational learning. In addition, firms use other artifacts such as PM guides and manuals to facilitate education and knowledge transfer in an organization's PM methodology and toolsets.

The study also sets forth specific recommendations to project managers, organizations, and the Project Management Institute to include knowledge management and organizational learning as indicators of organization maturity in their Organizational Project Management Maturity Model (OPM3©) model.

Keywords:

Leadership, Management, Tacit Knowledge, Explicit Knowledge, Learning Organization, Knowledge Sharing and Transfer, Organizational Knowledge, Organizational Learning, Knowledge Organization, Knowledge Work, Knowledge Worker, Knowledge Management, Organizational Maturity, Organizational Project Management Maturity Model, OPM3©, Information Systems, Information Technology, Project management Institute.

Cite This Article: Dedrick A. Smith, and John Hannon, "KNOWLEDGE MANAGEMENT'S ROLE IN ORGANIZATION MATURITY IN PROJECT MANAGEMENT" *International Journal of Research – Granthaalayah*, Vol. 3, No. 5(2015): 48-59.

1. INTRODUCTION

Many organizations today turn to Management by Projects (Gareis, 1994, pp. 3-4) as a primary



INTERNATIONAL JOURNAL of RESEARCH –GRANTHAALAYAH

A knowledge Repository



management structure. Why? Leaders who pack project management tools within their managerial toolkit are more organized and therefore help the firm produce superior goods and services. Since many of these projects demand highly educated and skilled networking, database administration, manufacturing, engineering, finance, purchasing, sales and marketing workers, the transfer of knowledge between project team members is critical to continued firm success. Firms that manage their competitive advantage (Porter, 1985) are attempting to maintain their competitiveness by increasing knowledge. In a highly mobile workplace, organizational actors—defined in this work as hourly employees to board of directors' members—have considerable tacit knowledge that can be lost when they separate from the organization.

Tacit knowledge is that knowledge that is composed of an organizational actor's personal internal experiences, and includes education and work experiences. As personal knowledge, it is not easily accessible to others in the organization. Brown and Duguid (1998) remind us that, “knowledge is usually thought of as the possession of individuals. Something people carry around in their heads and pass between each other” (p. 95). Therefore, tacit knowledge is personal knowledge, owned by an individual, and derived from personal experiences, education, and intuition; it is not organizational knowledge. Organizational knowledge on the other hand is information held in the collective organizational consciousness. It encompasses organizational practices, documented research, lessons learned, best practices, and other firm based leadership tools. Organizational knowledge is explicit and physical in nature, and therefore, can be accessible by organizational actors.

2. WHAT THE RESEARCH SHOWS

Brown and Duguid (1998) argue that pressures generated from division of labor and centralization of practice inevitably break organizations down into communities of practice (CoP). These CoPs are structures that firms use—examples are teams, units, departments, and/or divisions—to create particular organizational processes that initiate, develop, and maintain workflow and acceptable procedures. They are in fact self-contained knowledge repositories. Senge (1995) looked at these autonomous units and saw the need for within firm knowledge sharing and transfer, is defined as the ability of the organization to transfer tacit knowledge between different organizational units and distinct organizational actors. Later Tiwana (2002) added the need to use information systems (IS) to facilitate knowledge transfer between these organizational players.

In their extensive 2005 work, Easterby-Smith and Lyles deconstructed the topic of knowledge management into four realms: organizational learning; the learning organization, organizational knowledge, and knowledge management. The literature uses the two terms organizational learning and learning organization interchangeably, one author, Tsang (1997) posits a distinction between the terms by defining organizational learning as:



“...certain activities that take place in an organization while the learning organization refers to a particular type of organization, in and of itself. Nevertheless, there is a simple relationship between the two—a learning organization is one, which is good at organizational learning” (p. 75).

Tsang’s distinction is critical for the central theme of this paper which is both organizational learning and learning organization play distinct knowledge sharing roles in organizations, especially in firms that employ project management (PM) tools and techniques.

3. PROJECT MANAGEMENT AND SHARING KNOWLEDGE

One such PM tools is the Organizational Project Management Maturity Model (OPM3[®]) cycle (Project Management Institute, 2003, pp. 35-46). Based on the concept of continuous improvement and self-assessment; OPM3[®] relies on the ability of an organization to become skilled at lessons learned and establish best practices as necessary. This creates an atmosphere for organizational openness and therefore establishes the foundation of a learning organization.

The Project Management Institute (PMI) addresses the critical nature of knowledge sharing and transfer between organizational actors in both tacit and explicit knowledge by emphasizing the importance of capturing lessons learned (Project Management Institute, 2004). Archiving lessons learned is not the only data gathering knowledge management technique that organizations use in the creation of best practices (Project Management Institute, 2004); however, other data can be transferred between organizational actors allowing the organization to create organizational knowledge. Project plans, product specification, service requests, user and system documentation, blueprints, contracts, correspondence, and other work products all add to the richness of potential information that may be transferred between actors. There are many Information Systems (IS) tools to help firms collect, categorize, and retrieve these types of explicit data objects and through data warehousing and data mining tools they can retrieved and used by actors. However, many firms still have difficulty determining how to store, organize and present this information so that it is easily accessible to all organizational members.

4. PMI and OPM3[®]

As an organization moves toward maturity in project management it, consequently, displays particular characteristics. The OPM3 (Project Management Institute, 2003) discusses three primary drivers, namely: (a) organizational project knowledge and how to use the exemplary (b) assessment of the use of organizational and the modeling best practices and capabilities, and (c) the further development of best practices (p. xv). This constant improvement can aid in the facilitation of organizational knowledge transfer between organizational actors; therefore, the codification and management of organizational knowledge assets. It is postulated that through the continual use of the OPM3 model, the organization develops mechanisms, such as, knowledge management methodologies and systems to facilitate knowledge transference and



sharing; consequently, formalized knowledge management methodologies and systems is an indicator of organizational maturity.

Knowledge management has evolved into a systematic approach that uses information systems applications and methodologies like data warehousing and management, the internet, intranet, extranet portals, electronic discussion boards, chat channels, and other technological tools to aid knowledge transference. In project management, software application manufacturers have developed server-based applications that centralize, maintain, and disseminate project data in real-time to organizational actors both in collocated and in decentralized (or virtual) organizations. Diverse communication devices have been developed enabling connections through technology to empower the workplace to be virtual in nature.

5. KNOWLEDGE SHARING AND TRANSFER

Foundational work which an integral part of knowledge generation and knowledge codification. This leadership skill set comes into play when attempting to capture what Fisher and Fisher (1998) termed as *knowledge work*. Following the guidelines set forth by Frederick Taylor in the late 20th Century, leaders capture worker knowledge by standardizing worker tools and methods. Currently known as “best practices,” this knowledge codification provides tool sets for working rules and procedures and then relies upon that rule set to transfer worker knowledge to new employees. Documenting each best way of doing business reduces costs for practices that are fundamental to organizational practices. An understanding of the role knowledge management plays and the methodologies that organizations use, especially those who use PM, increases the added value of knowledge management within any organization.

The goal of knowledge management is to collect data, information, and tacit knowledge and to place these assets into [an] IT databases for later retrieval by other organizational actors (see the following “Knowledge Management” section). The basis of knowledge management also requires foundations be developed in an organization so that the knowledge can be shared and transferred between organizational actors. These foundations are found in the literature under theories of organizational learning, organizational knowledge, organizational memory, the learning organization, and knowledge engineering. Since these foundational theories are vital to any knowledge management discussion, this study builds on the precepts of knowledge and knowing as incorporated within PMI’s OPM3 framework.

6. OPM3[®]: AN ORGANIZATIONAL MATURITY MODEL

The OPM3[®] model was created in the late 1990s under a committee set up by the PMI Board of Directors, where members of the committee came from 34 countries (PMI, 2003). The PMI has created two different models before the OPM3, standards for project managers (the individual) and for projects, which brought it to the organization and the OPM3 model. The purpose of the model is to help organizations to understand the organizational project management maturity cycle and their place within. The requests of the OPM3 model, according to the PMI:



A maturity model is a conceptual framework, with constituent parts, that defines maturity in the area of interest—in this case, organizational project management. In some cases, such as with OPM3, a maturity model may also describe a process whereby an organization can develop or achieve something desirable, such as a set of Capabilities or practices. (p. 5)

1. OPM3 has six major steps:
2. Preparation for Assessment,
3. Perform Assessment,
4. Plan for Improvements,
5. Implementation of Improvements,
6. Repeat the process, and
7. Transition from to the foundational information.

Lierni's (2004) and Smith's (2010) twenty first century work, examined knowledge management linkages and organizational project management maturity. Both found basic causal relationships between knowledge management and project management organizational maturity. Lierni found causal relationships within the OPM3 (PMI, 2003) model and the use of knowledge management.

[There is a] perception exists that there is a positive relationship between the use of knowledge management and the improvement in the management of projects. The primary reasons for the perceived positive relationship may be because knowledge management increases the likelihood of “awareness” of and “accessibility” of the knowledge available, which improves the management of risk. (Naser Al-Zayyat, Al-Khalidi, Tadros, & al-Edwan Al-Balqa, 2009, p. 110)

Linkages between knowledge management and organizational roles are well documented by researchers Aiman-Smith, Bergey, Cantwell, and Doran (2006); Brown and Duguid (1998); Easterby-Smith and Lyles (2005); Huber (2001); Lierni (2004); Senge (1994); Tsang (1997); and others. It is these linkages and their overall connections to organizational maturity in project management that is the focus of this study. Along these lines, this study extends the work of Lierni (2004) and articulates the work Smith (2010) which examines knowledge management's role as it can be applied to the OPM3 model.

7. WHY ARE LESSONS LEARNED AND PRACTICES IMPORTANT

According to the PMI, to end a project, all administrative tasks, such as lessons learned, best practices, and others specific tasks, and contract closures must be completed before a project is considered fully completed (PMI, 2004). The PMI refers to the records of lessons learned, best practices, contracts, project plans, and associated journals as organizational assets (PMI, 2004), to place the importance on the overall necessity of the information. Best practices are to be stored in the best practices directory (PMI, 2004). What are best practices?



A Best Practice is an optimal way currently recognized by industry to achieve a stated goal or objective. For organizational project management, this includes the ability to deliver projects predictably, consistently, and successfully to implement organizational strategies. Furthermore, Best Practices are dynamic because they evolve over time as new and better approaches are developed to achieve their stated goal. Using Best Practices increases the probability that the stated goal or objective will be achieved. (PMI, 2004, p. 13).

Developing best practices helps an organization to build its project management processes and demonstrates the organization's commitment to those processes.

The PMI developed a directory of best practices for organizations to use as a blueprint for implementing OPM3. These best practices are found within the model, and can be used as a stepping-stone for increasing organizational project management maturity. Although organizations must select the best practices they are to implement, the establishment of best practices must be developed through organization maturity in project management organization maturity in project management experience. This allows the firm to create benchmarks that can be measured internally and especially (Loo, 2003).

Kerzner (2003) developed a model for aggregating best practices that identifies which domains the firm should focus: internal integrated processes, culture, training and education, informal project management, behavioral excellence, and organizational culture. Lavingia (2006) identified five domains for effectively developing best practices:

1. Step One: Common Language
2. Step Two: Structured Project Development and Execution process
3. Step Three: Application of Value Improving and Development of best practices
4. Step Four: Total Cost Management
5. Step Five: Training and Certification. (pp. PM.01.1–PM.01.5)

While these areas are not the only areas that organizations should focus, they clearly are a starting point by which an organization can create best practices.

Where do best practices come from? Best practices are developed by both organizational maturity in other domains, from the experiences of the organization maturity in project management organization maturity in project management processes. The PMI (2004) indicated that in the closing stages, project managers should document lessons learned; however, the next stage must be followed up. Through follow-up, the organization should assess, review, and develop lessons learned into organization maturity in project management organization maturity in project management best practices. This allows the project management processes to be reviewed and for the integration and propagation of lessons learned to other project managers on other projects. In organizational learning these lessons learned become part of organizational maturity although some organizations do not document lessons learned in IT systems and do not



allow for the aggregation of lessons learned into best practices. The supposition is that through this aggregation, organizations increase OPM into organizational capabilities.

According to the PMI (2002), “Lessons Learned are the learning gained from the process of performing the project” (p. 363). It is critical to document these lessons; however, to document them and not review and assess them does nothing for future learning. Kerzner (2003) advised lessons learned to be “documented so that project managers can learn from past mistakes” (p. 688). The model helps to identify lessons learned that can become into organizational best practices.

In many organizations, this information has been placed in a notebook, database file, or some other format, and left to gather dust both literally and figuratively, leaving project managers wanting. In many mature organizations, data-warehousing methodologies have developed techniques that allow the information, to be mined from these electronic sources. This data mining allows project managers to gain access to information that before had been lost to them. If the information is placed in a database or documented in an electronic file rather than a notebook or other static physical construction, the information is easily accessed.

Through these data warehouses and mining methodologies, organizations have developed ways to not only capture databases; they have used mining techniques to create unified knowledge management methodology. As organizations and technologies increase in maturity, formalized knowledge management techniques are being created, implemented, and enhanced. According to Tiwana (2003), as the knowledge sharing and transfer and collaboration between organizational members increase the use of formalized mechanisms, such as, IS becomes an integral part of the process. Knowledge management is not just the management of information within an organization using a data processing system but includes, knowledge sharing and transfer, as well as, organizational learning.

8. STATEMENT OF THE PROBLEM

The OPM3 (PMI, 2003) model is continually expanding to help organizations manage project management maturity. The model’s assessment procedures help organizations understand where they have been, where they are, and what processes they need to implement to continue successful project management methodologies. As organizations mature in business and project management processes they call upon centralized information technology solutions to facilitate these processes. The constantly improving OPM3 model (PMI, 2003), consistently includes knowledge and best practices. Stressing knowledge assessment though, does not go far enough. Why? It does not specify the role that knowledge management plays in project management organizational maturity nor does it detail how organizational knowledge is best captured and transferred. If the model is to be enhanced to include such detail, tools that aid organizations in managing organizational explicit and tacit knowledge need to be developed and then added.



9. PURPOSE OF THE STUDY

The purpose of this study is to examine the role knowledge management plays in project management organizational maturity. How do organizations manage their organizational knowledge to further project management processes and increase organizational maturity?

As organizations strive to refine their project management processes, they mature in their uses of the overall project management methodologies. The PMI has developed OPM3 to help organizations assess their level of organizational project management (OPM) sophistication. The PMI (2003) defines the purpose of the model:

OPM is the systematic management of projects, programs, and portfolios in alignment with the achievement of strategic goals. The concept of Organizational project Management is based on the idea that there is a correlation between an organization's capabilities in Project Management, Program Management, and Portfolio Management, and its effectiveness in implementing strategy. The degree to which an organization practices this type of project management is referred to as its organizational project management maturity. (p. xiii)

Understanding OPM maturity facilitates an organization's strategic goals by aligning project management sophistication and organizational demands. Once aligned organizations can assess future demands for IT, PM, product knowledge, managerial skill sets, just as with any other critical business product or services support decision. Since the primary objective of any organization is to create competitive advantage (Porter, 1984), it is critical that organizations value business processes. PMI (2003) describes the role the OPM3 model plays in this regard as:

[OPM3 is] a standard developed under the stewardship of the [PMI]. The purpose of this Standard is to provide a way for organizations to understand [OPM] and to measure their maturity against a comprehensive and board-based set of organizational project management Best Practices. OPM3 also helps organizations wishing to increase their organizational project management maturity to plan for improvement. (p. viii)

Although the OPM3 model is comprehensive, little research has been undertaken to determine the role knowledge management plays in organizational maturity. Aiman-Smith, et al. (2006), Brown and Duguid (1998), Easterby-Smith and Lyles (2005), Huber (2001), Lierni (2004), Senge (1994), Tsang (1997), and many others have begun this work, however, only Lierni (2004) created a picture of the roles knowledge sharing, knowledge transfer and capacity knowledge management play in a firm's project management process. His study suggests but does not investigate the linkages between knowledge management and organization maturity in project management organization maturity in project management; and thus became the intent of this investigation.



Research Question

Do linkages exist between knowledge management and project management in organizations that use project management for project efficiencies, project effectiveness, and knowledge sharing and transfer?

Null hypothesis. No linkages exist between knowledge management and project management in organizations that use project management to enhance project effectiveness and efficiencies.

Alternative **Hypothesis.** Linkages exist between knowledge management and project management in organizations that use project management to enhance project effectiveness and efficiencies.

10. RESULTS AND ANALYSIS

The purpose of this study was to investigate the nature of knowledge management's use in project management. Secondly, the study attempted to demonstrate correlations that exist between knowledge management and organizational maturity in project management. Finally, this study explored any linkages involving knowledge management role and any enhancements that can be made to the PMI (2003, 2008b) OPM3.

Knowledge management comes in many forms, as discussed in Alavi and Tiwana (2005), Cohen and Bacdayan (1994), Easterby-Smith and Lyles (2005), Garvin (1998), and Senge (1990, 1994, 1995), but is indicative of organizational learning and the learning organization. Knowledge management is indicative in organizations that use organizational learning that is called the learning organization; because of their knowledge sharing and transfer between organizational actors. Organizational maturity in project management is measured by the PMI's OPM3 as discussed earlier. The OPM3 was designed to garner an understanding into the correlations that indicates the level of maturity in PM. This study delves into these finding if knowledge management has any impact on the OPM3 and examines opportunities for any enhancements to the model.

A mixed method approach was used for the study. An online survey with 59 of question was posed to members of the Project Management Institute worldwide. There were 136 respondents to the online survey. The respondents were asked if the researchers could contact them via telephone of those responding in the affirmative a randomized sample was drawn using a computerized algorithm. Five respondents were contacted from the randomized sample and were asked 27 qualitative questions for confirmation of the online survey.

A factor analysis was used to determine knowledge management's role in project management out of the 59 questions 16 were demographic questions. In this paper only a subset of survey for this paper. This subset focused more directly on knowledge sharing and transfers thus organizational learning and the learning organization.



Although 59 questions were asked in the survey the top twelve questions which articulate knowledge management's role in the organization. The online survey questions indicated how respondents reflected on their use of knowledge management in their organization. Although one respondent to the telephone survey was very dissatisfied with his organization's approach to knowledge sharing. This was due to him being a contractor to another organization and that organization too had very little knowledge sharing taking place.

Table 1: Factor Analysis Question Ranking

Question ID	Question	Component ranking
C11	To what extent have other project managers in your organization use knowledge management in the management of their own projects.	.854
C12	To what extent has the use of knowledge management in your organization resulted in the fulfillment of a project functional–technical requirement exceeding the customer's expectations.	.851
C13	To what extent, has the use of knowledge management in your organization resulted in project schedule reduction?	.832
C10	To what extent have you, as a project manager, used knowledge management in the management of your projects?	.782
C16	To what extent, has the use of knowledge management in your organization resulted in project cost reduction?	.746
C19	Knowledge management adds value to project management. My organization's knowledge management System is easy to use. I can usually find data I need when using the knowledge management System?	.732
C29	Using the knowledge management system allows me to integrate information on the organization's best practices, if so how?	.656

Table 1: Factor Analysis Question Ranking (Continued)

Question ID	Question	Component ranking
C9	Are you satisfied with your knowledge management/project management tools?	.644
C21	My Organization's knowledge management System provides knowledge transfer between my organizational members.	.622
C25	Has your organization established organizational learning methodologies, if so how?	.560
C26	Using the knowledge management system enables me to share my knowledge with coworkers and others, if so how?	.558
C28	Using the knowledge management system allows me to increase my knowledge in PM, if so how?	.549

As demonstrated in Table 1, many organizations fostered knowledge transference through formalized knowledge channels rather they were through IT tools or through lessons learned and best practices. In the telephone survey the respondents indicated that they had other channels



such as formal courses or the organizations sponsor round tables both internally and externally. One organization sponsored “debriefs” where their personnel went to training and he would be required to return to the firm and brief his colleagues. Other organizations foster information channels as well by supporting external connections to outside training opportunities.

11. CONCLUSION

This research supports the proposition that knowledge management is an indicator of organizational maturity in Project Management, and as such, can be used as an enhancement to the Project Management Institute’s organizational project maturity model. There are strong support factors that support that knowledge management has linkages to organization maturity in project management organization maturity in project management. Project managers expect and demand that their organizations develop both formal and information channels to support their organizational learning, they themselves also will foster these channels as well. In summary, this study adds to the body of knowledge for both Project Management and knowledge management as it is applied both practically and theoretically. There were limitations and addressed within this study; however, it provides a framework for academic researchers, organizations, and practitioners to continue research into the value and mechanisms essential to proper and complete knowledge transfer.

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