Identifying Critical Knowledge for Projects

Timothy Kotnour

Rafael Landaeta

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Timothy Kotnour, Ph.D., University of Central Florida
Rafael Landaeta, University of Central Florida

Abstract

This article is the result of an investigation of the challenge faced by project managers in identifying critical knowledge for projects. Five major areas of project knowledge are identified. The literature defines knowledge as information that has been given meaning.

The critical knowledge for projects was identified through the literature and by our experience as applied researchers. Managers of multi-project organizations can use this article as a guide for identifying the critical knowledge that is vital for their projects.

Introduction

Based on Bohn's (1994) definition of technical knowledge, project's knowledge can be generally identified as an understanding of the impact that project's input variables (e.g., an organization's capabilities) have upon project's operation (e.g., execution of a project activity), and consequently upon project's outputs (e.g., quality of a project's deliverables).

The identification of the critical knowledge for projects is vital for managers of multi-project organizations. The understanding of the critical knowledge for projects enables the development and implementation of strategies focused in making available the right knowledge at the right time to the right individual or project (Kotnour, et al, 2003).

In projects, having the right knowledge at the right time enables project managers and project team members to (a) make better project decisions, (b) solve a project's problem, and (c) improve project's performance and capabilities (Kotnour, 1999; Dixon, 2000).

The literature has identified important knowledge for projects (Kotnour and Britton, 2000) and for teams (Cannon-Bowers, and Salas, 2001). However, we believe that the literature lacks in a framework that can provide a top-level view of all the general areas of knowledge that are important for projects.

The underlying research questions of this work are: What is the critical knowledge for projects? And why is the specific knowledge critical for projects?

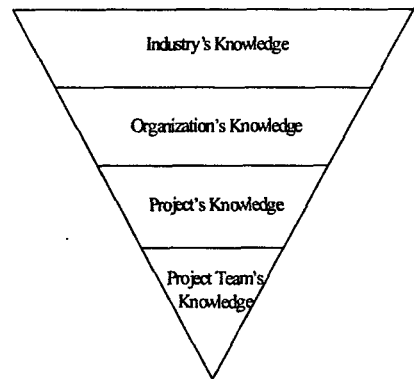The results of this work are general. Managers of multi-project organizations can use this article as a guide to identify the critical knowledge of their projects.

Critical Knowledge for Project

We identified five areas of knowledge that are critical for projects based on the impact that these areas have upon the project performance: knowledge about the industry, knowledge about the organization, knowledge about the project, and knowledge about the project team.

Exhibit 1 represents the project knowledge changing from a general or broad domain (e.g., industry's knowledge), to a more specific or narrow domain (e.g., project team's knowledge).

Exhibit 1. Critical areas of project knowledge.

Industry's knowledge. This area of the project's knowledge refers to the understanding of how the project's actions, capabilities, and outputs influence the industry. It also refers to how the industry influences the project's actions, the project's capabilities, and the project's outputs. The project's industry includes (a) the market in which the organization performs, and (b) the locations in which the organization performs.

The markets provide knowledge about competitors, potential competitors, customers, potential project customers, and potential projects' partners. For projects, it is important to understand the value proposition that creates or can create a competitive advantage in the specific industry. For projects, it is also important to understand how the value

proposition is changing over time, and what factors make it change. Having this knowledge will enable projects to predict future market niches in which the organization can compete. It also enables projects to understand their competitive opportunities and threats.

The location(s) of the organization is important because it provides knowledge about the operational environment of the projects. The political system, the demographics of the region(s), the local economy, the levels of education of the region(s), the available technology, the educational system, the legal system, the national culture, and the work culture provide to projects vital understanding of the external environment that supports its operations. Having this knowledge enables projects to understand their operational opportunities and threats.

Organization's knowledge. This area of project knowledge refers to the understanding of the extent in which the organization influences the project's actions, capabilities, and outputs. It also provides knowledge on how the project's actions, capabilities, and outputs influence the organization. The organization's knowledge is constructed by (a) the organization's strategic design, (b) the organization's culture, and (c) the distribution of power within the organization (Ancona, et al, 1999).

The organization's strategic design provides knowledge about the organization's mission, vision, goals, objectives, strategies, processes, and leaders' actions. It also provides understanding on the existing functional areas, the key organizational members or units, and how the processes and functional areas are aligned to support the organization's strategy. Having knowledge about the organization's design is important for projects because it enables an understanding of how the project's actions and outputs are aligned to the overall achievement of the organization's mission, vision, and goals. It is also important to projects because it provides an understanding of organizational capabilities can support and improve the project's actions.

The organization's culture provides understanding on the behaviors that are valued by members of the organization. It also provides access to the understanding of underlying norms and beliefs that guide the actions of organizational members (Schein, 1990). The understanding of the organization's culture is important for a project because it enables the

development of a project's culture that is aligned with the culture of the organization. A project with a culture than differs from the organizational culture could produce a culture clash that can jeopardize the project's performance.

The distribution of power within the organization refers to the understanding of how power is granted, distributed, and used within the organization. Understanding the distribution of power within the organization is important for projects because it enables accessing, holding, and using power to collect resources and execute the project's activities.

Project's knowledge. This area of knowledge refers to the understanding of (a) the project's actions, (b) the project's goals and objectives, and (c) the project's capabilities.

The project's actions include (a) what to do to execute the project, (b) what to do to solve a project's problem, and (c) what to do to improve the performance and capabilities of the project.

The project's goals and objectives are the results of understanding the project stakeholders' needs. It also includes understanding the internal needs of the project. The project stakeholders needs include understanding what expectation those stakeholders have upon the project execution and outputs. Stakeholders' needs include compliance with regulations, fulfillment of an organization's procedures, a customer's project needs, a project team member's expectations, budget compliance, and deadline fulfillment.

Project capabilities provide knowledge about the project's management, culture, resources, infrastructure, external capabilities, and the project's information and knowledge that are available for the project.

Project management includes knowledge about the project's plan, priorities, control mechanisms, and the project manager's expectations of the project's activities. This knowledge is important for projects because it creates a common understanding at a top-level view of what needs to be do it within the project, when, how, and by whom.

Project culture consists of the norms, values, and beliefs that the members of the project team have developed throughout project execution (Schein, 1990). This knowledge is important for projects because enables the generation of a project's identity, as well as, facilitates the generation of ownership in the project's activities.

Project resources and infrastructure refers to the understanding of the tangibles and intangibles that a project requires to function. It refers to knowledge about the organization's current technology along with the process, tools, and competence to meet the project needs. The understanding of resources and infrastructure available is important because it enables projects to set strategies and execute the project's activities to meet the project's goals and objectives (i.e., to generate project's success).

Project external capabilities include the knowledge about external entities, which may have the processes, tools, and competence to support the project execution. This knowledge helps to set and execute the processes required to fill the project's internal capabilities gap.

Project information and knowledge comprise the project's body of knowledge that enable understanding and execution of the project actions (e.g., what to do to execute the project, what to do to solve a project's problem). Project knowledge is critical for projects because it enables project team members to execute the project. There are two sub-divisions of project information and knowledge: the project team's knowledge and the project team member's knowledge. In this work, we group both subdivisions of project information. In the next section, we describe the project team's knowledge.

Project team's knowledge. The area of project team's knowledge refers to the understanding of the project team's competencies. A project team's knowledge is important for projects because the project team members need to have a body of knowledge in order to perform the project's activities. Salas and Cannon-Bowers (2000) stated, "teamwork has a cognitively-based element in that knowledge has as much to do with individuals as with the team". Cannon-Bowers and colleagues (1995) identified a set of team competencies, these competencies are: (a) a project's cue-strategy associations, (b) a project's activity-specific teammate characteristics, (c) sharing a project's activity model, (d) a project's activity sequencing, (e) accurate project task models, (f) accurate project problem models, (g) a project's team role interaction patterns, (h) teamwork skills, and (i) boundary management roles.

A project's cue-strategy refers to the understanding of a project's environmental signals, hence project team members know how and when to change strategies.

A project's activity-specific teammate characteristics consist of understanding the competencies, expectations, strengths, and weaknesses of teammates. This knowledge is important because it enables the project team to maximize its performance (Cannon-Bowers and Salas, 2001).

Shared project task knowledge refers to knowledge about the project team's shared interpretation of the project's situation and the proper strategies to cope with the situation. Project team members need to have similar knowledge about the project's teamwork in order to be efficient and effective (Cannon-Bowers and Salas, 2001; Rentsh and Hall, 1994).

Project activity sequencing consists of understanding how to organize the project team's activities in order to meet the demands of project stakeholders. This knowledge is important for projects because it enables maximization and utilization of the use of project's human resources.

Accurate project task models refer to the understanding of how the project team interprets project activity information and requirements in a similar way. For projects, the understanding about the project's task models creates a common understanding that is important for the creation of synergy within the projects.

Accurate project problem models provide understanding of how to recognize problems, how to solve them, and how to avoid similar problems in the future. Accurate project's problem models are vital for achieving project success.

Project team role interaction patterns refer to the understanding of how the team communicates to make decisions. It is important for projects because it enables identification of who needs to communicate to whom, why they need to communicate, and identification of the project team's communication channels. Thus, project team members can replicate the communication pattern saving time and maximizing project performance.

Teamwork skills refer to the understanding of what skills are required to produce a successful project. This knowledge enables understanding what needs to be done in order for the project team to perform efficiently and effectively.

Boundary management roles consist of the knowledge about how a project team interacts with non-team members and other projects to collect resources and power. This knowledge is important because it enable the project to set and

execute the processes required for fulfill project's capability gaps.

Conclusion

Managers of multi-project organizations can use this article as a guide for identifying the critical knowledge of their projects. An understanding of the five areas of project knowledge can help managers of multi-project organizations identify critical knowledge's gaps. Consequently, managers can develop and implement an appropriate set of actions that will enable maximization of project performance through knowledge.

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Authors

Timothy Kotnour is an associate professor of industrial engineering at the University of Central Florida in the Industrial Engineering and Management Systems Department. Dr. Kotnour's research interests include engineering organizational performance improvement, strategic management, organizational learning/knowledge management, and project management. He received his M.S. and Ph.D. in Industrial and Systems Engineering with an emphasis in Management Systems Engineering from Virginia Tech. He is the director of the Management Systems Performance Laboratory and the Editor of the Engineering Management Journal.

Rafael Landaeta is a research assistant at the Management Systems Performance Laboratory. Mr. Landaeta's research interests include project management, knowledge management, organizational learning, and human resource management in engineering organizations. He is a PhD candidate of industrial engineering and management systems at the University of Central Florida. He received his M.S. in Engineering Management from the University of Central Florida.