Chapter XX

The Lifecycle of a Knowledge Management System for Organizational Learning: A Case Study

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Abstract

This chapter describes the development and operation of a knowledge system to support learning of organizational knowledge at the Jet Propulsion Laboratory (JPL), a US national research laboratory whose mission is planetary exploration and to do what no one has done before. JPL 101 is a Web-accessible database of general organizational knowledge captured in a series of quizzes. The heart of JPL 101 is the content that is encoded as questions and annotated answers with connections to related information and resources. This chapter
describes the requirements generation process, implementation, and rollout of the JPL 101 system. Data collected over 19 weeks of operation were used to assess system performance with respect to design considerations, participation, effectiveness of communication mechanisms, and individual-based learning. Analysis of content three years after primary operations assessed the degree of knowledge obsolescence in the system. These results are discussed in the context of organizational learning research and implications for practice.

### Background

The Jet Propulsion Laboratory (JPL) is a United States Federally Funded Research and Development Center (FFRDC) managed by the California Institute of Technology (Caltech) under contract with the National Aeronautics and Space Administration (NASA). JPL’s primary mission is to explore our own and neighboring planetary systems. In pursuit of this mission, JPL has a rich program of technology development, science, and mission development (the three value-adding processes of the laboratory) as well as an extensive infrastructure to support Research and Development.

### Setting the Stage

The JPL 101 system described in this chapter is a Web-accessible database of general organizational knowledge that is encoded as questions and annotated answers with connections to related information and resources and captured in a series of quizzes. JPL 101 was conceived as both a learning resource and a knowledge repository. The motivation for the system was twofold: to improve the connection between different communities at the laboratory spanning value-adding and enabling processes; and to share valuable insights on stakeholder issues and basic operations gained through previous knowledge capture activities.

To perform the planetary exploration mission and to do what no one has done before, large numbers of technical and professional disciplines must be integrated to support innovation (the value-adding processes). In addition, infrastructure and support services are required to perform routine organizational functions (the enabling processes). While cross-functional project teams have become a common approach to integrating multidisciplinary knowledge in support of product development (Brown & Eisenhardt, 1995), less attention has been paid to bridging gaps between value-adding and enabling processes.

In established firms, emergent knowledge processes (EKPs) (Markus, Majchrzak, & Gasser, 2002) such as product development take place within the context of the organization’s bureaucracy. The clash between those tasked with operating the bureaucracy and those who must work within it can be viewed as another flavor of “thought world.” Dougherty (1992) describes thought world differences among members from the marketing, engineering, and manufacturing functions in new product development teams. Areas such as human resources, contracting, accounting, and information technology also draw from different professional disciplines, focus on different critical issues, and use different approaches to define and solve problems. While cross-functional teams serve to bridge thought worlds by