How to Support Knowledge Creation in New Product Development:

An Investigation of Knowledge Management Methods

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Knowledge management methods need to be selected depending on the purpose for which knowledge is 'being managed'. In this article, purpose is considered in terms of encouraging knowledge creation in new product development (NPD) projects. Given that companies have started to deploy a number of knowledge management methods in support of NPD efforts, the central aim of this research is to investigate how ten such methods support knowledge creation during the development of new products. We provide evidence from a survey of 356 responses of members of 94 NPD projects on the utilization of (and satisfaction with) 14 knowledge management methods. The 10 highest rated knowledge management methods (in terms of satisfaction) are discussed in more detail, explaining how they operate to support knowledge creation in NPD projects, and illustrated with examples from companies such as *ABB, Siemens, BP Amoco, Volkswagen, IBM, HP,* and others. Moreover, we highlight ways to evaluate the contribution of such knowledge management methods.

Knowledge management methods need to be selected depending on the purpose for which knowledge is 'being managed'. In our investigation, purpose was considered in terms of encouraging knowledge creation in new product development (NPD) projects. As such, this article goes beyond a large and growing literature on knowledge management pertaining to the capturing, locating, transferring, and sharing of primarily *existing* knowledge (von Krogh, Ichijo, & Nonaka, 2000). By contrast, our research addresses the question of creating *new* knowledge to support new product development in organizations (see Figure 1).

Although the first and second steps in Figure 1 stress the exploitation of existing knowledge or the dissemination of new knowledge, most beneficial for innovation and NPD is the creation of new knowledge (Armbrecht Jr. *et al.*, 2001). As Ruggles (1998) states:
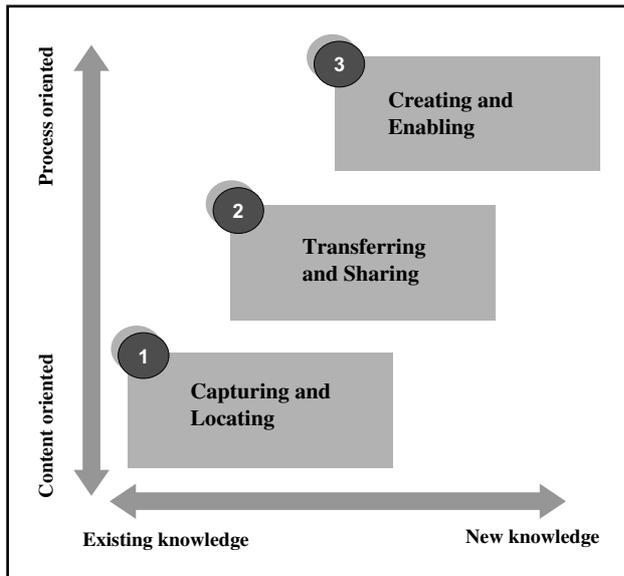
Figure 1 Evolution of Knowledge Management Initiatives; figure based on von Krogh *et al.* (2000)

''While the ever-popular efforts involving capture, access, and transfer of knowledge can lead to increased efficiency, knowledge generation is the key to growth.'' Consequently, managers face the challenge of identifying and selecting those knowledge management methods that enable the organization to reach and to excellently perform the third stage of the evolution of knowledge management initiatives, i.e., creating and enabling.

Given that companies have started to deploy a number of knowledge management methods in support of NPD efforts, the central aim of this research is to investigate how ten such methods support knowledge creation during the development of new products. The remainder of this article divides into three parts.

First, we provide evidence from a survey of 356 responses of members of 94 NPD projects on the utilization of, and satisfaction with, 14 knowledge management methods. In particular, we investigated (1) which knowledge management methods companies are familiar with, (2) which of these methods they actually deployed, and (3) to what level of satisfaction. The vast majority of respondents were NPD project managers, product managers, or R & D directors.

Second, in the main part of this paper, we explain how the 10 highest-rated knowledge management methods (in terms of satisfaction) operate to support knowledge creation in NPD projects. In doing so, we provide case examples from companies such as *ABB, Siemens, BP Amoco, Volkswagen, IBM, HP*, and others, that participated in our research.

Third, we close by highlighting ways for assessing the value contribution of such knowledge management methods. Specifically, we discuss the assessment of knowledge management activities and knowledge management results.

Which Knowledge Management Methods are Deployed in NPD Projects, and how Satisfied are Companies with Them?

Based on an extensive literature review and a series of interviews with practitioners, 14 knowledge management methods were selected for consideration in this study. All of these methods met the following three selection criteria:

❖ well known and widely used,
❖ perceived as nurturing knowledge creation activities, and
❖ applicable in NPD projects.

It is important to note that the methods are not completely distinct but rather characterized by some overlap in terms of structure and objective.

We sent out a total of 376 questionnaires to members of 94 NPD projects in 33 companies in Germany, Austria, and Switzerland. Of these, 356 usable questionnaires were returned, for a response rate of 95%. Listing the 14 knowledge management methods, we asked the respondents to evaluate their level of satisfaction with each, as well as well as the frequency with which these methods were deployed in their organizations. The respondents answered on a five-point ratings scale (satisfaction: ''not satisfied'' to ''very satisfied''; deployment: ''not at all'' to ''very frequently''). The respondents had the option to tick a check box if they were not familiar with a particular knowledge management method.

Figure 2 displays all of the selected knowledge management methods and the percentage of the respondents of the survey that were familiar with them. *Story telling*, *knowledge maps*, and *knowledge broker* are known least. Reasons for that are manifold. Story telling, for example, is a relatively new and elaborate method. Moreover, the knowledge management methods known can be distinguished as two groups: those that are known and deployed, and those that are known, but not deployed. The data further indicate that those methods that are deployed by the majority of those who know them are generally considered effective (i.e., companies are satisfied with them). Also, it is possible that those methods that are known but largely not deployed did not prove successful.

Respondents who actually deployed a particular knowledge management method provided data on their satisfaction with that method in support of a specific NPD project. Data analysis shows consistency with our previous reasoning. The more often