

Measuring Knowledge Management Capabilities

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INTRODUCTION

As business professionals know, creating awareness of a problem and its impact is a critical first step toward the resolution of the problem. That which does not get measured, does not get managed (Redman, 1998). In fact, measurement is a precursor to improvement. This is true for knowledge management (KM) capabilities of an organization. "In today's knowledge-based economy," Alan Greenspan recently said, "70% of organizational assets are knowledge assets." Knowledge assets are intangible capabilities, and there is a recognized need to "make a greater effort to quantify the value of such intangible assets" (Teece, 1998b). How does one measure the worth of an organization's knowledge assets? What does one mean by knowledge assets anyway?

In this article, we afford some formal structure to the idea of measuring knowledge management capabilities of an organization, with the ultimate goal of improving business performance through better management of knowledge assets. We describe a large-scale effort at Intel to assess such capabilities with a view to enhance them. This project started in May of 2002. We describe the different types of knowledge assets identified, the potential capabilities associated with managing knowledge assets, the metrics devised for their measurement, and the assessment methodology that is being standardized across the corporation. We also provide results of the initial validation of the instrument and its ability to ascertain KM capabilities correctly. Hundreds of knowledge workers (Davenport, 2003) have so far participated in this study to benchmark KM capabilities of their units. Some units are already planning the next steps for improving their KM capabilities.

BACKGROUND: WHAT IS KNOWLEDGE?

The direction required to quantify the value of knowledge assets begins to come into focus when one realizes

their diversity in an organizational setting. Some knowledge assets are "grounded in the experience and expertise of individuals," that is, tacit knowledge, while others can be stored as knowledge objects that exist on their own, that is, explicit knowledge (Fahey & Prusak, 1998; Teece, 1998a). Therefore, to describe knowledge assets that exist across organizations, domains that encompass knowledge work and can be studied for improving on-the-job productivity must be identified. For this reason, we start with classifying the whole gamut of knowledge residing in an organization into a knowledge-asset framework.

We categorize institutional knowledge assets into four areas: expertise, lessons learned, knowledge documents, and data. This categorization resulted from the realization that knowledge in each area has a unique (a) mix of tacit and explicit content, (b) method of transfer and contextual value, and (c) life cycle (creation to application), including its shelf life. To contrast the unique nature of each knowledge area, its characterization along these three dimensions needs to be understood.

Expertise

Expertise is high in tacit knowledge. Individuals in an organization are often considered experts within a particular domain. The transfer of expertise occurs via consultation, collaboration, mentoring, and observation, that is, through personal interaction. The shelf life of this type of knowledge depends on the currency of the knowledge in the context of its application, and it can be extended by renewal and learning. The availability of experts and the ability of an organization to locate required expertise for a given situation quickly can result in performance improvement (Dooley, Corman, & McPhee, 2002).

Lessons Learned

Lessons learned are the essence of learning from past successes and failures. They represent highly specific

knowledge gained while completing a project or task. They lie toward the tacit end of the tacit-explicit continuum. Undocumented lessons are in the heads of people who learned them. To the extent lessons are documented, their transferability is improved (in a networked organization), but their applicability remains highly contextual. Recognizing the similarities between the characteristics of the current task with those of an earlier one from which the lesson was learned is an important step in their application. This type of knowledge is created when one recognizes that something substantial of recurring value has been learned. The shelf life of a lesson depends on its generalizability and the persistence of the context. The more generalized a lesson, the broader is its applicability and the longer its life. Organizations that exploit this type of knowledge have reported substantial cost savings (O'Dell & Grayson, 1998).

Knowledge Documents

Knowledge documents represent explicit knowledge such as project reports, technical reports, policies and procedures, research reports, publications, pictures, drawings, diagrams, audio and video clips, and so forth. Knowledge documents encompass internally generated as well as external information (Zack, 1999). Market research reports and operating manuals of complex machinery are good examples. Knowledge documents contain the background knowledge that can be referred to by a knowledge worker to educate themselves—to increase their awareness and understanding—about an area that they work in. Well understood taxonomies and archives, as well as the ease of access of relevant documents, is important to maximize the transferability and reuse of this knowledge. In contrast to lessons learned, the knowledge contained in knowledge documents is more permanent.

Data

The most explicit form of knowledge is contained in data used for strategic and tactical decision making (Fahey & Prusak, 1998). Here we do not refer to operational data generated by the day-to-day transactions of a business, but aggregated and historical data such as that stored in a data warehouse. Such data can be a constant source of useful knowledge when used for analytical processing, detecting patterns, modeling business situations, and so forth. The quality of metadata (design of the structure and descriptions of data) determines the availability and usability of this type of knowledge. The shelf life of data as a knowledge source can be very long; many retail corporations have spent millions of dollars

on creating large data warehouses that store years of summary data for discovering trends and patterns (knowledge) that can have a direct impact on strategic decisions.

One may argue that there is a substantial overlap among the knowledge assets described above. While we recognize that the lines separating these knowledge assets are gray, the core characteristics of the knowledge areas differ substantially, and therefore the knowledge needs of an organization can be more clearly understood if they are broken up among the different types of knowledge assets. Hansen, Nohria, and Tierney (1999) describe the differing views of knowledge in different organizations and show how an organization's business strategy drives its knowledge needs. We found that, particularly in large organizations, the functional nature of a business unit emphasizes the unit's knowledge needs.

While each business unit within Intel utilized all types of knowledge, we found that the importance, and therefore the strategic focus of a business unit, varied based on its core functional responsibility. TMG, an organizational unit focused on the rapid ramp-up of production operations, required a high level of capability within the lessons-learned category. Identifying shortcomings within this unique capability area therefore became critical. In contrast, SSG, a unit responsible for the development of system software solutions, required emphasis on different capability areas, namely, in expertise and knowledge documents. Being able to assess the existing capability levels in these differing knowledge areas is not only essential for benchmarking, but also for directing efforts to improve them and to monitor progress over time. The importance of KM capability assessment is validated by the actions of the business units subsequent to the assessment; most of the business units have already started investing in planned KM initiatives in those knowledge areas that are deemed important but low in capability level.

WHAT DOES MANAGING KNOWLEDGE MEAN?

Like any other intangible asset, knowledge needs to be managed in order to maximize its value by fully exploiting its utility. Each type of knowledge asset has its own unique characteristics as described above, however, a common framework can be applied to understand how it can be managed. One such framework stems from the concept of the knowledge life cycle (Alavi & Leidner, 2001). The four distinct stages of the knowledge life cycle are creation and capture, storage and archival, retrieval and transfer, and application and reuse. We

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