Chapter 4.7
Deploying Knowledge Management in R&D Workspaces

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ABSTRACT

The active and effective management of valuable knowledge is widely believed to be a core competency for solidifying the competitive advantage of an organization. Whether knowledge management (KM) is a new idea or just a recycled concept *per se* both managerial and academic campuses have sought a vast array of KM strategies, solutions, frameworks, processes, barriers and enablers, IT tools and measurements over the past decade. Although there are many KM studies for both public and private sectors, most of them focus on the practice of international companies and western experiences, relatively few cases are reported on KM deployment and implementation in the Chinese community, especially for knowledge intensive research and development (R&D) institutes whose missions are to serve traditional industries. To reveal some of the accomplishments gained in the Asia-Pacific region, this chapter presents and discusses the lessons learned from a particular case study in fostering the KM initiative and system in a research-oriented institute serving the metal industry.

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KNOWLEDGE ASSETS IN R&D-ORIENTED ORGANIZATIONS

R&D plays a fundamental role in the competitiveness of technological innovation. These R&D processes can primarily be seen as information transformation processes, transforming infor-

mation about client orders, market demand and technological advancement into product and process designs (Drongelen *et al*., 1996). In the case of R&D organizations, knowledge workers synthesize tangible and intangible resources to create value-added knowledge-based products as their major outputs. These knowledge assets are indexed in terms of consultancy, innovative products, expert reports, and intellectual properties. The majority of professional knowledge and expertise frequently originates in the context and activity of research projects and industrial services implementations. In a project-based engineering firm, there are three main aspects of knowledge: technical, entrepreneurial and project management knowledge (van Donk & Riezebos, 2005). From another point of view, types of project knowledge can be viewed as: knowledge about projects, in projects and from projects (Damm & Schindler, 2002). Knowledge for R&D work exists in various forms and sources as indicated in Table 1. The ability to manipulate R&D knowledge highly depends on the type of knowledge source and form. For instance, internal-explicit knowledge is easy to collect and manage, while external-tacit knowledge requires a lot of efforts to acquire and maintain. Accordingly, when an organization wishes to incorporate KM, the first step is to implement knowledge audit to identify the sources of R&D knowledge and decide the management priority.

In practice, Paraponaris (2003) further indicates that, for R&D process, knowledge could be viewed as a stock of regular object inventories to explore the potential for innovation. Nevertheless, the transfer of implicit knowledge among individuals is another story. Knowledge acquisition is not a matter of 'copy, paste and save' between individuals or teams with the knowledge to those without it (Sapsed *et al*., 2000). *Knowledge sharing networks*, (i.e. communities of practice) provide a common purpose and effective links allow for repeated interactions that create knowledge spillovers based on shared knowledge creation. Moreover, accumulation of personal knowledge in each individual is not totally equivalent to accumulation of embedded knowledge in the organization. In other words, the

Table 1. Forms and sources of R&D knowledge (Adapted from Parikh (2001) Modified with additions by Chang (2008))

	Internal	**External**
Tacit	Experiences/judgments* Insights/intuitions/beliefs* Educational background Cultural background Intra-organizational relationships Unwritten rules of thumb History and stories Master technicians Experts/researchers	Industry experts/consultants Industry best practices Communities of professions* Inter-organizational relationships Consumers Academic researchers Informal social networks* Other research organizations
Explicit	Organizational databases Information systems File systems Standard operating procedures Discussion minutes/trails Design and prototypes Product manuals Own patents Training courses* Machine/equipment* Manufacturing processes*	Trade publications External databases Benchmarking matrices Others' patents Competitors' products and manuals Academics research articles Specifications and design manuals Seminars and conferences* Standards Regulatory guidelines and governmental policies*