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AN ANALYSIS AND APPLICATION OF KNOWLEDGE MANAGEMENT PRACTICES IN MULTINATIONAL R&D ACTIVITY

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Abstract:
Both business and academic communities believes that by leveraging knowledge and managing it strategically can sustain an organisation in its long-term competitive advantages (Nonaka, 1991). Scholars and observers from various disciplines agree that knowledge is at center stage of organizational competitiveness. This means that knowledge is information combined with experiences, circumstances, understanding, and manifestation that is ready to apply to decisions and actions. Using a case study and interview method, this research aims to explore what knowledge management and practices are and how to create, transfer and use it more effectively in MNO in the R&D sector. The research found that perception and understanding of the organisation's tacit and explicit knowledge were key to the competitiveness of the company. The importance of this research lies in the heart of it revealing and explaining that not only does the environment receive explicit knowledge created by the organisation such as technologies, products or services, etc; but how tacit knowledge is to be brought into a new cycle of organisational knowledge creation and how it is applied and transferred.

Keywords: Knowledge Transfer and Sharing, Tacit and Explicit Knowledge, Knowledge Management and Organizational Culture.

1. INTRODUCTION

As a matter of debate, the past decade has witnessed the emergence of new R&D management practices that are more systematically designed and more attuned to corporate strategy. Roussel, Saad, and Erickson (1991) suggest that the only real product of R&D is knowledge. This makes the relationship between KM and R&D management inherently close, since R&D processes can primarily be seen as KM processes, transforming information on technological advancements and market demands into the knowledge needed for new product concepts and process designs creating competitive advantage.

Thus, this research aims to explore what knowledge management and practices are and how to create, transfer and use it more effectively in MNO in the R&D sector.

2. KNOWLEDGE MANAGEMENT IN R&D ACTIVITY

R&D divisions must develop specialist knowledge to provide insights into scientific and technological processes that enhance the value of products or improve production processes. However, Collinson (2001, pp. 339) argues that two related dilemmas occur – over the short term R&D must be able to assist in the overall commercialization of existing knowledge, i.e. it must leverage knowledge and expertise to solve immediate problems faced by business units. Due to this nature of specialization, the problems or needs of each other for problem solving is difficult to identify. The solution, states Collinson (2001, pp. 339) lies in an effective interface that enables continuous integration of knowledge that directs the R&D specialists towards the problems and opportunities recognized by manufacturing specialists, market specialists or specialists dealing with customers, for instance. The interface must also provide these outside specialists with a clear understanding of what capabilities the R&D has to offer and how it can add value to the rest of the firm. The second dilemma, argues Collinson (2001, pp. 339) is that over the long term, R&D must develop knowledge and expertise that will provide competitive advantage in the context of anticipated technologies and markets. This means that the R&D must also be able to forecast future technologies and markets, and this knowledge must be integrated for strategic decision-making independently of the immediate demands of those serving current market needs (Collinson, 2001, pp. 339). In order to do this, it is essential to understand what knowledge is and how it can be managed.

3. WHAT IS KNOWLEDGE?

In their latest book 'International business networks: *tacit knowledge for competitive advantage*', Holden and Glisby (2009) state that, 'knowledge is a fluid mix of framed experiences, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information.' They argue that it originates and is applied in the minds of *knowers'*. In short, knowledge is generated; it is codified and coordinated; it is transferred; it is, then, in principle used. The purpose of these knowledge generating processes explains Holden and Glisby (2009), is to serve the generator (for example, the scholar, who becomes more knowledgeable), the encoder or coordinator of knowledge (for example, an encyclopaedia), and the user (the person who consults the encyclopaedia) to extend or re-evaluate his or her existing knowledge.

4. THE MANAGEMENT OF KNOWLEDGE

Nymark (2000) explains that "the idea of knowledge in knowledge management implies knowledge that is not scientific, that is, knowledge which 'is contained in and transmitted by scientific texts' and which is associated with a paradigmatic mode of thinking and knowing which is constituted by the traditional scientific logic for description and explanation".

According to Gordon and Grant (2005), some theorists have already suggested that the management of knowledge is not necessarily new. They agree with Pemberton (1998) that records have been kept for thousands of years before the emergence of philosophy and its focus on knowledge. In order to demonstrate his point, he goes back to the pre-Socratic times of the sixth and fifth centuries BC and discusses thinkers such as Anaximander, Pythagoras, Anaxagoras and Thales. In more recent times, scholars trace the connection back to the writings of Frederick Taylor, the father of scientific management, but it is only in the last 20 years that knowledge management has come to the fore.

In 1995, Nonaka and Takeuchi argued that knowledge management is a dazzling, multi-faceted, controversially discussed concept. Philosophers and representatives of a variety of different disciplines are debating the meaning, definitions, and dimensions of knowledge and knowledge management.
Holden (2002, p. 71) quotes the management consultants of KPMG (1999) defining knowledge management as "the systematic and organised attempt to use knowledge within an organisation to improve performance". Holden (2002, p. 71) explains that the word *'attempt'* in the above definition is the operative word since the implementation of knowledge management systems frequently encounters resistance and is organisationally demanding. However, Roberts (2000, pp. 115-120) argues that as a concept, knowledge management is as vague as it is widespread. He argues that organisations have always managed knowledge but it is only until recently that the term 'knowledge management' creped-up in computer systems, marketing materials and technologies conference agendas.

5. KNOWLEDGE AS A RESOURCE – EXPLICIT AND TACIT

Holden (2002, p. 68) explains that it is possible to make major distinctions about the nature of knowledge. The most important distinction, state the authors, is that which is made between knowledge which is *tacit* and knowledge which is *explicit*.

5.1 Tacit Knowledge

Tacit knowledge is highly personal and hard to formalize. Polyani (1996, p.4) says 'we can know more than we can tell'. Nonaka, Toyama and Byosiere (2003) suggest that subjective insights, intuitions and hunches fall into this category of knowledge. Cohen and Bacdayan (1994) state that tacit knowledge is deeply rooted in action, procedures, routines, commitment, ideals, values, and emotions.

5.2 Explicit Knowledge

Explicit knowledge can be expressed in a formal and systematic language and can be shared in the form of data, scientific formulae, specifications, manuals, etc. It can be easily processed, transmitted and stored. Explicit knowledge is about past events or objects 'there

and then', and it is oriented to a context-free theory. It is sequentially created by digital activity.

According to Dierkes, Antal, Child and Nonaka (2003, p. 494), westerners tend to view knowledge as explicit. Japanese, on the other hand, tend to regard knowledge as primarily tacit. However, the authors' argue that in reality, these two types of knowledge are complementary, and both are crucial to knowledge creation.

6. KNOWLEDGE WORK

Holden (2002, p. 76) explains that knowledge work can be seen in terms of generation, codification and transfer of knowledge. However, these should not be seen as operationally discrete categories. He agrees with Collins' (1998) argument that all of them overlap with the use of a personal knowledge base; the acquisition of new information; the combination, processing, production and communication of information; and the continuous learning from experiences.

6.1 Generation of knowledge: Acquisition and Creation

Burton-Jones in Holden (2002) state that the primary aspect of knowledge acquisition is that firms need a constant supply of knowledge inputs such as the selection and management of knowledge resources; they need to balance the supply of knowledge and demand; and the acquisition of knowledge of other firms. Holden (2002, p. 77) states that acquisition starts a variety of internal and external sources such as documentary resources that are printed, etc., computer databases, and interaction with other knowledgeable persons.

Creation, states Holden (2002, p. 77) is the act of combining the above sources into new knowledge configurations. Levinthal and Myatt (1994) and March (1991) mention that when organisations innovate, they do not merely process information. Instead, they create new information and reshape the environment through interactions with their environments. They argue that instead of simply solving problems, organisations create and define problems, develop and apply new knowledge in order to solve these problems, and then further develop new knowledge through problem-solving activities. Therefore, in order to understand an organisation's knowledge-related capabilities, the focus should be on how it can continuously create new knowledge from its existing capabilities and not the stock of knowledge such as technology, etc. (Barney, 1991).

6.2 Codification of knowledge

Davenport and Prusak (1998) explain that the aim of codification is to put organisational knowledge into a form that makes it accessible to those who need it. They say that this process literally converts knowledge into code in order to make it organised, explicit and easily understandable. Holden (2002, p. 77) argues that codification is a problem, but not always a technical one. One method of doing this is to produce a knowledge map, which is used as a guide to the sources of knowledge that can be useful. Another method could be to involve the creation of a model.

6.3 Transfer of knowledge

Davenport and Prusak (1998) strongly suggest that the most effective and productive form of knowledge transfer is by face-to-face interactions. Researcher Dixon (2000) partially agrees with Davenport and Prusak (1998) that face-to-face meetings are the most effective form of knowledge transfer but also states that during her study, she noted that knowledge management systems can be designed with a combination of technology and face-to-face meetings. Holden (2002, p. 78) agrees with Collins (1998) that knowledge workers use a variety of information technologies to manipulate information such as electronic mails, groupware and information networks. These help knowledge workers to share information with individuals and/or groups. However, Holden (2002, p. 78) states that the challenges to transfer of knowledge are still very momentous. There are still issues of interdepartmental knowledge transfer and is also highly visible when it comes to geographical and cultural differences.

7. RESEARCH METHODOLOGY

The authors' used qualitative method of a case study with interviews in this research to collect primary data. The reason why the authors' chose this type of interviewing is because the authors' wanted rich, detailed answers from the interviewees. This requires flexibility and freedom for the interviewee to ramble or go off at tangents so that the authors can pick out the most important information and use it in this research. All primary data will be accessed from the interviews conducted in the company. Primary data is qualitative in nature.

Secondary data which is also the final source of data was collected from documents, archival records and published literature, which is from books, journals, articles and from the internet. The authors' have taken care to use only reliable sources of information to ensure the research data is not contaminated with unsubstantiated work from unrecognized authors.

The authors' are going to use thematic coding to analyze the different forms of evidences collected during data collection. Further, charts, diagrams and graphs may also be used to present data during data analysis.

8. RESULTS, ANALYSIS AND DISCUSSIONS

Using the guiding research questions and the interview transcripts, the authors' established a list of codes that approximated the content of the words of the informants across all nine interviews. The authors' viewed the process of thematic analysis as progressing through several levels of increasing abstraction. Coding represents the first level, when the researchers tried to capture the essence of an interviewee's words. The authors' found coding the most difficult task of analysis; it is the stage at which the ground is formed as the researchers walked on it. Once a code list was established, they were grouped into additional levels of abstraction. Throughout the process, the authors used the research question to direct and focus the emerging results.

Emerging Themes

Thematic analysis of the interviews revealed three dominant themes pertinent to the research question. The themes revolve around Cross culture, Communities of practice and Information technologies.

8.1 Cross Culture

During thematic analysis, the authors' found cultural issues within the R&D department across international boundaries. During interviews, one issue that many managers pointed out was the issue with engineers in China in particular, having problems with sharing of knowledge among their employees in Denmark on technical aspects of product development. Although this issue is not major and organisational culture of the company in Denmark is being taught and promoted in China, this could become a matter of concern in the long run. With the fast rate of development of the organisation in international countries, the case company sees this as an issue and plans to take up more steps to prevent cross cultural problems in the future. Holden (2002, p. 3) argues that no internationally operating firm and its managers however experienced in international business can ever escape from the possibility of misjudgement, misinterpretation and mistakes in handling multicultural relationships. Nevertheless, culture is a problem area for management of international firms. This recognition of culture in the context of international business operations creates challenges and problems for firms and their management has given rise to a sub-discipline of international management studies called cross-cultural management (Holden, 2002). Cross cultural management, explains Holden is a branch of international management as an academic discipline which emerged in the 1960's. In order to overcome the problems created by cultural differences, it is advised that emphasis may be given to networking and organisational learning. Nonaka and Takeuchi (1995) state that an organisation's internal diversity must match the variety and complexity of the environment, in order to deal with the complexities of the external environment. This means that organisations must interact with the environment on equal terms (Holden, 2002, 98), creating a knowledge oriented concept of culture. Hence organisational learning creates the four modes of knowledge creation.

8.2 Information Technology

During thematic analysis, the authors found that the organization is giving a lot of importance to information technology. Almost all interviewees mentioned that new software called 'The case company wiki' is under development where explicit information will be stored in a common database and will be accessible to all R&D employees of the organization worldwide. The R&D staff will also be able to post questions and give suggestions to other employees who are unsure about certain technical data. Also, virtual meetings and video conferences help in the sharing of tacit knowledge and knowledge creation. It is evident that computer-assisted communication technologies, particularly intra-organizational technologies provide the firm with information about markets, industries and suppliers. Huber (1990) states that organizational intelligence is likely to be more accurate, comprehensive and timely with the increased storage and acquisition of external information and the development of computer-enhanced organizational memories. Information technologies refer to the availability, level of investment in and usage of state-of-the-art computer-assisted communication technologies and decision-aid information technologies (Huber, 1990; Sethi and King, 1994; Kendall, 1997). Finally, the anonymity associated with general decision-aid information technologies allows users to participate freely in discussion without considering status and personality, thus alleviating common problems such as conformity of thought. Hence, it is clear that information technologies are positively correlated to the level of knowledge creation. The analysis reveals that the information technology facilitates the processes of socialization, externalization, combination and internalization. All interviewees agreed that this database and virtual meetings and conferences create new knowledge. All knowledge stored in the database enables employee accessibility, which fulfils the combination process. Further, this database allows for future access enabling the

internalization of knowledge within the R&D department worldwide. Hence, it is evident that tacit knowledge is converted into explicit knowledge and is communicated.

8.3 Community of practice

Another theme developed in this analysis is derived from partial extension of the information technology creating virtual, and face-to-face informal meetings called the community of practice. Employees of the R&D department were enthusiastic about the current features and functions of the community of practice. They said that community organizes annual seminars and special chapter workshops each year to help socialize and develop community ethos. This, they said allows members to share knowledge not only through virtual contexts, but also have meetings for all employees to socialize and share knowledge with co-workers. In particular, communication between employees located in Denmark, Finland, India, China, etc. will be able to share their knowledge on this single virtual platform besides virtual conferences, etc. The analysis reveals that this community of practice facilitates the processes of socialization, externalization, combination and internalization. All interviewees agreed that interacting with other co-workers creates new knowledge. The virtual CoP holds a structured archive that contains all the discussions that take place. In the combination process, the archive of CoP makes it possible for members to access information over a period of time and benefits through the use of organization memory. This also enables for future workshops and meetings are easier to be conducted, creating new and broad topics. This also enables for events-promotion, courses, publications and stories that helps in the internalization of knowledge within the R&D department worldwide. Evidence also shows that individual's tacit knowledge is transferred into explicit knowledge and is communicated.

The data indicates that these themes are important influencers of knowledge management and transfer. As would be expected, within the themes there is tremendous variability as to where compatibility and incompatibility exists and where opportunities exist for knowledge application.

9. CONCLUSION AND RECOMMENDATIONS

Both business and academic communities believe that by leveraging knowledge, an organisation can sustain its long-term competitive advantages (Nonaka, 1991). Scholars and practitioners from various disciplines agree that knowledge is at center stage. This means that knowledge is information combined with experiences, circumstances, understanding, and manifestation that is ready to apply to decisions and actions. Although knowledge and information may sometimes be difficult to distinguish, they both are important and entail human involvement. Hence it is not surprising that organizations everywhere are paying attention to knowledge as a key resource – exploring what it is and how to create, transfer and use it more effectively.

In order to meet the aim and objectives of this research, a detailed explanation of what knowledge management is, was done in order to understand the theoretical aspects of knowledge management. Then the case company's perception of the importance of knowledge was analysed out of the interviews conducted and understanding of the organisation's tacit and explicit knowledge was analysed. The company's knowledge work and management of knowledge was then analysed out of the interviews. Finally, the challenges managers face with respect to knowledge sharing and transfer was studied and explained. The findings in this research show the three major themes that emerged – cross-culture, communities of practice and information technology. These three themes were

closely studied and explained. Therefore, this concludes the investigation in understanding the knowledge management practices of the case company to and meets the aim and objectives of this research.

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