

Multidisciplinary Project Teams

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INTRODUCTION

Knowledge in designing a product or rendering a service does not form a complete and coherent body of knowledge that can be precisely documented or even articulated by a single individual. Rather, it is a form of knowing that exists only through the interaction among various collective actors (Gherardi & Nicolini, 2000). Existing literature (Kanter, 1988; Nonaka, 1994; Spender, 1998; Starbuck, 1992) has highlighted a need for the development of a diverse workforce if knowledge creation is to be promoted and sustained within organisations. This literature suggests that a diverse set of resources (experts with different backgrounds and abilities) provides a broad knowledge base at the individual level, offering greater potential for knowledge creation.

Conceptually, a team can be viewed as a socially constructed phenomenon or linking mechanism that integrates individuals and organisations (Horvath, Callahan, Crosswell, & Mukri, 1996). A multidisciplinary team is defined by Nonaka and Takeuchi (1995, p. 85) as “a self-managed, self-organised team in which members from various functional departments, and/or areas of expertise work together to accomplish a common goal.” The primary goal of the multidisciplinary composition is to marry diverse bodies of knowledge in a way that produces a synergistic knowledge outcome that is innovative, contextualised, and, as such, has strategic value. For the most part, project team tasks are nonrepetitive in nature and involve considerable application of knowledge, judgement, and expertise.

The advantage of adopting multidisciplinary project teams is that they are quicker in integrating the expert knowledge of different functions, for example, design, construction, marketing, maintenance, and accounting. Cross-functional project teams with mutual accountability and collective work products have been found to decrease development time and increase product quality (Ancona & Caldwell, 1992; Dougherty, 1992; Van de Ven, 1986; Wheelwright & Clark, 1992). Multidisciplinary project teams create a “task culture,” facilitating the necessary close linkages and direct personal contacts between different functions (Cohen & Levinthal, 1990). These close connections are necessary, as new product development by its very nature

includes uncertainty about potential market response and about new technology (Henke, Krachenberg, & Lyons, 1993). This transformation process is a team-level phenomenon. It emerges through “heedful interrelationships” (Weick & Roberts, 1993) and interdependencies between team members, their actions and interactions, and the enmeshment of their individual knowledge paradigms. If creating new collective knowledge is indeed a team-level phenomenon, then the multidisciplinary team is considered the greenhouse where such a phenomenon can be best cultivated.

This article views the multidisciplinary project team as an unusual team arrangement, primarily because it is composed of professionals from various disciplines who take pride in their fields of expertise. They are committed to the basic assumptions of their paradigms and they perceive their roles in the team as representing their knowledge bases in the best possible way. In addition, a project on which a multidisciplinary team works can metaphorically be seen as an experiment, a vehicle for knowledge creation, with knowledge being created through the process of executing the project.

Examining knowledge creation from a microscopic view, it can be further subdivided into knowledge development and knowledge acquisition. The former develops knowledge that is made available through internal resources, whereas the latter acquires required knowledge by external means. Knowledge development involves the development of knowledge through internal effort after identifying the difference between required and available knowledge. Developing knowledge internally can be achieved via personnel in-house, or through research and development efforts, education and training, creativity techniques like brainstorming, or customer satisfaction surveys. Knowledge acquisition entails the acquisition of knowledge from external sources if developing knowledge internally is not possible. This is done through employing specifically qualified personnel, by merging or acquiring firms, by purchasing e-learning training, by forming joint-venture companies, or by employing an external company to conduct market research.

The relationship between knowledge creation and knowledge management is like the metaphor of the chicken and the egg, that is, it is hard to say which one should come first. If we imagine just managing existing

knowledge without creating new knowledge, we can foresee what kind of world we would be living in—probably just a highly effective society without much technological advancement or improvement in living standards. Alternatively, if we kept on creating new knowledge or innovating without properly managing our existing knowledge, we would end up going round and round in circles and repeating the same mistakes time after time. In order for a society to flourish or a new product to be successful when it is launched, knowledge should not simply be managed: The creation of new knowledge also should be possible. In essence, knowledge creation should go hand in hand with knowledge management, as without one or the other, our knowledge journey will be futile.

BACKGROUND

The issue of knowledge has been debated for several centuries. Knowledge has only recently been viewed as a collective phenomenon in organisational contexts. Two conflicting theoretical perspectives about knowledge emerge. The first, as highlighted by Prahalad and Hamel (1990) and Wernerfelt (1984), focuses on the resource-based view where knowledge is considered to be a set of strategically important commodities that exist independent of their creators and are context-independent (i.e., the firm's primary role is as knowledge applicator). The second perspective, from Berger and Luckmann (1966) and Nonaka and Takeuchi (1995), perceives knowledge as a set of shared beliefs that are constructed through social interactions and embedded within the social contexts in which knowledge is created (i.e., the firm's primary role is as knowledge creator). This view of knowledge embodies the social construction perspective held by this article of trying to understand knowledge creation processes in multidisciplinary project teams.

The present framework for examining the knowledge creation processes within multidisciplinary project teams is based on Nonaka and Takeuchi's (1995) organisational knowledge creation theory. Nonaka and Takeuchi's theory is utilised because it is one of the few knowledge creation theories available that examines the interrelationships between explicit and tacit knowledge. Further, Nonaka and Takeuchi's (1995) theory was inductively developed using case studies of product development projects, so the focus on technical knowledge creation is appropriate for this study. However, Nonaka and Takeuchi's (1995) knowledge creation model has some limitations that lessen the model's suitability for the study of knowledge creation in multidisciplinary

project teams. Their primary distinction between tacit and explicit knowledge is problematic as tacit or unarticulated knowledge is always a precondition for explicit knowledge (Engeström, 1999). Tuomi (1999) also criticises the model for taking culture and language for granted. The difficulty of discussing the role of language as a "repository of culturally shared meaning" (Tuomi, 1999, p. 340), critical for any knowledge creation theory, may make its use difficult for multidisciplinary project teams. It also is not clear what happens when the knowledge-creating spiral expands outside a team: Is knowledge still created in the same way (Tuomi, 1999)? As pointed out by Tuomi (1999, p. 328), "There is no model of social activity within the [knowledge creation] model—the motives for knowledge creation, and their relations to individual or organisational needs, remain obscure. Why some knowledge is created, and why some knowledge is not, remains an open question." Furthermore, Tuomi (1999) finds that though Nonaka and Takeuchi (1995) stress that the process of knowledge creation is "social", their underlying focus is on individual and intrapersonal knowledge. He adds that "as their concept of knowledge is intrapersonal, truth becomes a necessary aspect of knowledge, grounding intrapersonal knowledge into interpersonal reality" (Tuomi, 1999, p. 333).

In order to overcome some of the shortcomings in Nonaka and Takeuchi's knowledge creation model, if one accepts the social construction perspective of knowledge as a set of shared beliefs constructed through social interaction amidst certain social circumstances, then both individual and social levels require acknowledgement and integration.

Two multidisciplinary project teams, working on two different construction projects at the design stage, were selected for study. In this article, a construction project also can be treated as a product because at the end of construction a facility will exist, with consumers using it to fulfill their needs. The selection of a residential development project recognises the large reservoir of idiosyncratic knowledge developed by the owner company over the years. It also recognises the crucial innovating dynamics behind the need to compete on the market with other residential developments. The infrastructure project presented alternative opportunities for knowledge creation and learning, unique in several respects. First, it was a complex operation, distinguished by an extraordinary multiplicity of consultants employed. Second, it is rare to find such a project, usually managed by government, in private hands. Finally, the technical challenges presented in this project made it an interesting arena for knowledge creation and absorption within the team.

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