THE INFLUENCE OF KNOWLEDGE MANAGEMENT AND INTELLECTUAL CAPITAL ON ORGANIZATIONAL INNOVATIONS

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This paper is based on an on-going postgraduate research study, which is aimed at investigating the role of knowledge management and intellectual capital assets on organizational innovations in project based industries. The central hypothesis to the study is that by effecting knowledge management (KM) and managing intellectual capital (IC) there is wider scope for the generation, implementation and exploitation of organizational innovations. The study employs a combination of research approaches, including ethnographic interviews, semi-structured interviews, postal questionnaires and the analysis of archive documents. The paper explores the factors that favour effective implementation of KM and IC in organizations, and examines the link between such factors and the generation of ideas for innovation. Innovation is viewed as the successful exploitation of an idea, which is new to the unit of adoption. It can also be viewed as a process dependent on the tacit knowledge of individuals, motivated by the capacity for intuition and creativity in every human being. Therefore, the cultivation of an environment conducive to human creativity and freedom of thought is essential for innovation generation. This paper argues that KM and IC management are important pre-requisites for this process to succeed. In addition to the thorough review of the relevant literature, the paper draws its tentative conclusions from ethnographic interviews with senior, mid-level and junior personnel from different organizations. It concludes that KM and IC contribute to process and product innovations in different complex ways. The role of culture, networking (systems and people), motivation, organizational systems and structure are important in this regard. From a construction industry context, there is very little empirical study on the impact and measurement of knowledge management and intellectual capital on incremental and radical innovations in projects and in the wider organization context. There is therefore ample scope for research in the area.

Keywords: innovation, intellectual capital, knowledge management

INTRODUCTION

The importance of new ideas and their manifestations as processes, practices or products cannot be overstated in competitive markets and in an era of globalization. They are at the core of social change. Increasingly, innovation is being recognized as a fundamental agent of organizational change. Organizations that continually innovate are perceived to have competitive advantage over those that fail to exploit opportunities for innovation. However, the management of innovation is a challenging issue that involves complex understanding. How does an organization become innovative? How are opportunities for innovation exploited to create competitive

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advantage? What type of management should be implemented to encourage innovation?

Predictably there is no clear-cut recipe for success but there have been recommendations made by academics and practitioners alike (Egbu, 2001, 1999a, 1999b). Innovation comes from ideas, ideas that emanate from a collection of different knowledge bases. Both organizational and individual knowledge plays a part in the generation and development of innovations and therefore, must be managed effectively (Egbu, 2000a, 2000b). Stewart (1994) argues that an organization's capacity to innovate depends considerably on the knowledge and expertize possessed by its staff, assets 'that can vanish overnight'. Therefore, managing that knowledge is an essential requirement for innovative organizations. Knowledge management (KM) is about harnessing the different types of knowledge or intellectual capital (IC) in an organization so that they can be commercially exploited, leading to competitive advantage.

Aims and objectives of the paper

This paper attempts to improve our understanding of the complex relationship between knowledge management and intellectual capital in improving organizational innovations. In the main, it takes a social science perspective to examine the complex areas of knowledge management, intellectual capital and innovations. This paper is concerned with three main areas of investigation. The first is to explore the factors that favour knowledge management practices and intellectual capital exploitation in organizations. The second is to discuss the link between KM, intellectual capital and organizational innovations. The third is to document some practical knowledge management issues faced by organizations that have come out so far from an on-going study. In so doing, it highlights the different knowledge management practices, indicating that organizations are at different stages of the KM development trajectory and that they 'learn' differently and at a different pace.

METHODOLOGY

This paper is based on an on-going postgraduate research study, which is aimed at investigating the role of knowledge management and intellectual capital assets on organizational innovations in project based industries. The study employs a combination of research methodologies including an extensive review of the relevant literature on knowledge management, discussions with researchers in knowledge management, ethnographic interviewing with practitioners, postal questionnaires and the analysis of archive documents. Five organizations are participating in this study and they are all project-based organizations. They include private and public sector organizations from diverse backgrounds, including construction, manufacturing and housing industries. Small, medium and large organizations were targeted and participants were chosen from senior management, middle management and junior personnel. So far, 20 ethnographic interviews have been conducted in five diverse project-based organizations, drawn from construction, manufacturing and local authorities.

In this paper, a full explanation of KM, IC and innovation will be given, including their operational definitions adopted for the research study. Specific attention will be paid to the factors that facilitate the effective implementation of KM and IC from an organizational context, followed by the link between KM, IC and innovation. Some tentative findings from the study are also reported.

LITERATURE REVIEW: KNOWLEDGE MANAGEMENT, INTELLECTUAL CAPITAL AND INNOVATION

Innovation is a complex phenomenon. Despite diverse perspectives, many researchers are in agreement on the importance of innovation as a pre-requisite for competitive advantage. Innovations come from many different sources and exist in many different forms. A common typology distinguishes product and process innovation. Product innovation describes that where a new product is the outcome. Process innovation denotes innovation where the process by which a product is developed is exposed to new ideas and therefore, leads to new, often more sophisticated methods of production. Moreover, there is a dichotomy between radical and incremental innovation (Damanpour, 1987). Innovation can be radical, in response to crisis or pressure from the external environment, but it can also be incremental where step by step changes are more common.

Research on innovation has developed and taken on various shapes over the last 50 years. The level of analysis in innovation research is a useful preparatory consideration. The individualist perspective, which is grounded in social psychology, is predicated on the assumption that the individual is the source of innovation. They are the 'champion[s]' (Madique, 1980) or 'change agents' (Rogers, 1983) in an organization. In contrast to this perspective, it is postulated that the structures and functions of an organization are the pivotal determinants of innovation (Kimberly and Evanisko, 1981; Pierce and Delbecq, 1977; Zaltman *et al.*, 1973). This structuralist perspective is grounded in open systems theory and structural contingency theory; therefore, organizations are analysed as systems of interdependent parts, which cannot exist autonomously. It is assumed that the organizational characteristics, such as size, strategy, longevity and function play a central part in organizational innovations.

The structuralist perspective has been criticized for drawing inert conclusions about the nature of innovation and perceiving the organization as an objective entity that is driven predominantly by predictable forces (Slappendel, 1996). Increasingly there have been recommendations to take a more multivariate approach to the study of innovation. Integration of both the individual and organizational levels of analysis to achieve a synthesis between action and structure is encouraged (Van de Ven and Poole, 1988). Attempts to incorporate these diametrically opposed concepts have influenced developments in process theory. In essence, process perspectives recognise the unpredictable and dynamic nature of innovation. It is a complex process with cognitive, social and political dimensions that should be understood in particular organizational contexts (Egbu *et al.*, 2001, Swan *et al.*, 1999).

In order to create an environment conducive to innovation, it could be argued that there needs to be an effective management of this complex process. Thus, increased attention is focused on KM and IC management as a possible pre-requisite to successful innovation.

In the last decade there has been a shift in management focus from traditional accountancy practices where financial capital is paramount, to growing realization that intangible assets are of greater significance in our knowledge-based economy (Egbu *et al.* 2000, 2001). However, the Gottlieb Duttweiler Foundation found that only 20% of knowledge available to an organization, is actually used (Brooking, 1996). Knowledge can be a valuable resource for competitive advantage and harnessing its value is one of the pre-eminent challenges of management.

Identifying and exploiting knowledge assets, or intellectual capital (IC), has been vastly documented. There are different types of knowledge in an organization from the tacit knowledge of individuals, which is unarticulated and intuitive, to explicit knowledge that is codified and easily transmitted (Nonaka and Takeuchi, 1995). Further distinctions have been made by academics and practitioners involved in the IC debate. Three components of IC have been identified comprising human, structural and customer capital (Edvinsson, 2000; Bontis, 1998; Bontis *et al.*, 2000). Clearly, structural capital describes the internal structure of an organization, such as its strategies, core competencies and culture, which is always context specific. Customer capital encompasses the external intangible assets of an organization. External forces play a part in determining the market position and strength of an organization. Customers are the principal determinants of this position (Smith and Saint-Onge, 1996). However, it is asserted that the human capital in an organization is the most important intangible asset, especially in terms of innovation (Edvinsson, 2000; Stewart, 1997; Brooking, 1996). The unique tacit knowledge of individuals is of immense value to the organization as a whole, and is the "wellspring of innovation" (Stewart, 1997). Identification of the different types of knowledge available to an organization is the first step to understanding how to manage them. Therefore, KM is intrinsically linked to IC.

There are many definitions of KM. However, an operational definition has been developed for the purposes of this research. KM is about the processes by which knowledge is created, captured, stored, shared, transferred, implemented, exploited and measured to meet the needs of an organization. These processes lead to the establishment of a knowledge-based organization. A thorough review of the relevant literature and discussions with targeted researchers in the field would suggest that the development of successful knowledge management programmes involve due cognisance of many factors. They involve 'hard' (e.g. technology) and 'soft' (e.g. people, culture, leadership) issues. These issues will be detailed in the following section.

THE RELATIONSHIP BETWEEN KM, IC AND INNOVATION

This section of the paper discusses the link between KM, IC and innovation. In doing this, it explores the factors that promote knowledge management in organizations, with coverage given to such factors as people, culture, politics, leadership and the external environment.

According to the individualist perspective, the major determinants of innovation are the characteristics of the individuals in an organization. For example, Shepard (1967) cites existential psychology and postulates the merits of the "self-actualizing" person, who works as an autonomous individual with self-worth, not conceding to organizational conformity. In addition, the characteristics of leaders are important. There must be an impetus to create an environment favourable to innovation. It is the role of senior management to have the vision and strategic focus to adopt innovations put forward by lower level employees (Egbu, 2001, Tatum, 1987). It is suggested that the unique tacit knowledge of individuals is a fundamental source of innovation (Egbu and Sturges, 2001, Stewart, 1997). People are the principal motors of change in the business environment and it is therefore, essential to study the dimensions of social interaction and networking within and across organizations. The management of knowledge is intrinsically linked to the management of people and the processes that facilitate innovation.

Organizational culture is of great significance to innovation. Tatum (1987) emphasizes that a climate favourable to innovation must be achieved by committing resources, allowing autonomy, tolerating failure and providing opportunities for promotion and other incentives. Thus, an organization must be flexible enough to facilitate the innovation process (Zaltman *et al.*, 1973). In order to establish a knowledge-based organization there needs to be a supportive organizational culture. It has been argued that the cultivation of a 'learning organization' is an essential requirement for knowledge managers (Senge, 1990). Further theories about organizational culture favour the evolution of a 'community of practice' where social interaction of employees cultivates a knowledge sharing culture based on shared interests, thus encouraging idea generation and innovation.

In all organizations, the politics of knowledge sharing is an issue. Employees and employers from diverse backgrounds often come into conflict over important decisions. It has been suggested that manipulating these tensions to achieve ‘creative abrasion’ is a strategy to maximize innovation (Leonard and Strauss, 1997). However, it is a challenging task that involves disciplined management. Leadership is an inherent part of organizational culture, but also extends into areas of strategy and structure. According to Van de Ven *et al.* (1989) leadership is an organizational responsibility. They emphasize the value of institutional leadership, to create the structures, strategies and systems that facilitate innovation and organizational learning. It should build commitment and excitement, collective energy and empowerment. Sullivan (1999) argues the need for a managerial commitment to the long-term strategic vision of an organization and the motivation to achieve the goals set out. Moreover, empowering employees to generate and share knowledge is the task of management. For example, implementation of rewards and punishment schemes are stimulus for successful KM (Scarbrough *et al.*, 1999). Motivating employees to share the knowledge they have involves good people management, where trust is itself an incentive. The establishment of a psychological contract between employer and employee, for example, is a constructive approach to developing a knowledge-sharing culture (Scarbrough *et al.*, 1999).

The external business environment is an essential dimension in this discussion. While not everyone would honour the structuralist view that the principal determinants of individual and organizational knowledge are social structures, few could deny the influence of external forces on organizational effectiveness. Achieving competitive advantage requires focused attention on consumer trends and the market. This has become increasingly complex since the globalization of business environments, which has compelled organizations to compete and co-operate internationally. The climate of the market has a significant influence on the innovation process. It is argued that a turbulent environment, where the organization is in crisis, is likely to induce the adoption and implementation of radical innovations (Shepard, 1967; Pierce and Delbecq, 1977). In the construction industry the advent of partnering, alliances, joint venturing, PFI and Prime Contracting initiatives has necessitated even further collaboration and knowledge sharing. A more controversial view of approaching KM and IC is to adopt an expanded social systems view, addressing the challenges of global interdependencies, environmental concerns and larger social responsibility (Allee, 2000).

KNOWLEDGE MANAGEMENT PRACTICES: SOME TENTATIVE FINDINGS

All the organizations that participated in the study declared that they manage the knowledge assets within their organizations in one form or another as they see this as important to the survival of their businesses.

Formality of Practices – Tacit and Explicit Knowledge

Some of the organizations maintained that informal KM practices existed in the form of verbal communication and social interaction. However, all organizations backed this up with more formal procedures to encourage knowledge sharing, such as regular meetings and an Intranet. The largest organization that participated in the study had implemented formal programmes, such as Investors in People (IIP) and the Business Excellence Model (BEM) to assist in the formal development of KM practices. In contrast, the smallest organization, with approximately 25 employees, opted out of IIP because of its rigid regulations for employee assessment, preferring a more flexible approach to monitoring and evaluating employee performance. In this example, it could be argued that, the size of an organization might influence the level of formality involved in KM practices.

Culture

All the participating organizations declared that there was some degree of teamwork involved in their business. One respondent asserted that "the whole thing revolves around teamwork", suggesting that informal team meetings are a regular and valuable practice for sharing and transferring knowledge. While in another organization there was less emphasis on the benefits of teamwork due to the specialized nature of the work done.

However, looking more closely at two of the participating organizations with very specialized staff, there was a noticeable difference in culture and how this influences the communication of productive knowledge. Whilst one of the organizations had a relatively open culture, encouraging interaction of employees as a means of generating new ideas, the other could be said to be more autocratic in its approach to innovation. Most ideas were directed from senior level and fed downward through the organization.

Leadership

Three out of the five organizations interviewed had developed a specific role for the project manager. They recognized the important contribution that the management of knowledge can make in project environments and how this then links to the wider organizational base. It was highlighted that such a defined role was beneficial to the co-ordination and leadership of the projects. In these organizations, all their project managers were committed to the human capital in projects and in the wider organizations and promoted flexible and open ways of working. Where there was no formally defined project manager, commitment from senior management to acknowledge human capital varied. In one organization core values and competencies of the organization were identified, documented and communicated throughout the organization.

The above discourse highlights the importance of the human capital (i.e. tacit knowledge). It therefore follows that any knowledge management programme that

only focuses on explicit knowledge and ignores tacit knowledge is bound to have a limited contribution to the innovative capability of an organization.

CONCLUSIONS AND RECOMMENDATIONS

The paper has considered the importance of knowledge management and intellectual capital to organizations. Knowledge management practices differ from organization to organization. Organizations are at different stages in the knowledge management trajectory. Organizations 'learn' at different rates and apply different techniques (formal and informal) in managing knowledge. In the study on which this paper is based, there is a general consensus that the management of knowledge assets is vital for business. The management of knowledge and intellectual capital provides opportunities for project creativity and innovation. However, the effective implementation of knowledge management in organizations depends on many factors, which includes people, culture, structure, leadership, people and the environment. In most organizations, there is a lack of appropriate formal measuring constructs for the measurement of the benefits of knowledge assets to organizational performance.

There are also very few empirical studies on knowledge management in project environments, which takes a human resource perspective. For researchers, education and training providers, there is an urgent need as well as ample scope for a concerted effort to be levelled at this very important area, and for it to be exploited for the benefit of project clients.

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