

KEY ISSUES IN INNOVATION AND KNOWLEDGE MANAGEMENT IN THE FINANCE AND CONSTRUCTION SECTORS

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In today's dynamic global trading environment it is vital that firms develop dynamic capabilities allowing them to stay ahead of the competition. It is generally accepted that innovation can provide a firm with sustainable competitive advantage. Tacit knowledge, the type which resides in humans and organisational routines, has also been identified as a means of sustainable competitive advantage. An examination of how teams, units and organisations build dynamic capabilities from innovations through harnessing and exploiting knowledge for organisational benefits will be made. A comparison will be made between the UK construction and finance industries. The UK construction industry is often seen as underachieving in terms of meeting its own needs and those of its client. In contrast, the finance sector is perceived as being highly innovative one of the UK's most profitable industries. Current innovation and knowledge management practices in both industries will be examined, plus the relationships between Innovation and Knowledge Management in each sector will be analysed using a new conceptual framework. The key challenges likely to be faced by the researcher as well as proposed research methodology are also documented. Evidence from the literature points to innovation as a complex social process. Similarly, it is suggested that a robust research methodology for uncovering complex social processes in innovation and knowledge management will benefit from the employment of qualitative research approaches.

Keywords: competitive advantage, conceptual framework, innovation, knowledge management, tacit knowledge.

INTRODUCTION

The on-going PhD study on which this paper is based aims to examine the inter-relationship between innovation and knowledge management in the finance and construction sectors. Whilst there is a large body of existent literature on each individual topic the relationship between the two has not been investigated in any significant depth. One of the main reasons for the current popularity of the practise of innovation is that it can provide a firm with a significant sustainable advantage. Likewise knowledge management has been identified as being an important topic in the pursuit of competitive advantage. In today's interdependent global economy one of the most important and non-replicable components that a firm can be said to possess is what people know and what they do with it (Civi, 2000). People are such a vital resource as they allow a firm to utilise dynamic capabilities, namely what people know. These can be termed the knowledge inputs of an organisation. Innovations

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based on knowledge of its members prove valuable as they are unique to the originating organisation. This is more important than ever before due to the global nature of competition as the foundation for a new world order has been laid; one based on knowledge and innovation (Amidon, 2002). A firm must mobilise its resources to survive in the long term. The relationship between innovation and knowledge management is truly symbiotic, for this reason the two will be examined during the course of this study. Without people's knowledge it would not be possible for innovation to exist. Nor would innovation be possible without the effective utilisation of knowledge, therefore knowledge must be managed effectively in order to become a translatable and therefore valuable currency.

Some industries are more innovative than others. This study aims to examine the reasons behind this and transfer knowledge from one to the other. Both the finance and construction industries within the United Kingdom are to be examined. Although an important industrial sector with 1.4 million employees and contributing almost 10% of the country's GDP, the UK construction industry suffers from poor perceptual problems, thus discouraging many young people from entering this field. As a result the industry is facing a potential skills shortage. Additionally, the industry is plagued with adversarial relationships between contractors and suppliers, professionals and tradespersons. Such a situation can be contrasted with the financial industry. Despite being one of the UK's most traditional industries, it currently enjoys many accolades due to the innovative nature of its service proposition.

As innovation is a complex social process it is expected that the researcher will encounter many challenges associated with the social embeddedness of the phenomenon. The results are expected to be qualitative which, generally, are harder to analyse than more quantitative data. Since much of the study focuses on social issues it is likely that there will be a certain degree of reluctance encountered in uncovering these issues. This may be on the part of the individuals or organisations under consideration. The accuracy of much of the primary data collected depends, not only on the willingness of the individuals in question, but also on their open and honest responses. The question of ethics will also arise during the study, at all times anonymity and confidentiality will be assured. In an effort to minimise problems, a detailed and robust research methodology is to be developed prior to the commencement of the social research element of the study.

REVIEW OF LITERATURE

Innovation Defined

In order to understand innovation more fully it is helpful, not only to examine what innovation is, but also what it is not. The study of innovation stretches back several decades. Many definitions of innovation have been proposed (Pierce and Delbecq, 1977, Shephard, 1969, Rogers, 1971, Myers and Marquis, 1967). At its simplest level it has been defined as the invention of something new (Pierce and Delbecq, 1977). Shephard defines innovation as being when an organisation learns to do something new that it did not know how to do before and then proceeds to do it in a sustained way (Shephard, 1967). Three ideas emerge from this definition: innovation is closely connected to organisational learning; innovation can be planned and also should have a contextual basis. The idea of a context for innovation is supported further by Rogers (1995) who speaks of diffusion across a social system.

Subsequent definitions suggest that innovation should not only be a solution to a social problem. It should also be of economic or social value (Myers and Marquis, 1967). Such an idea is further supported by Drucker (1985) who suggests that innovation can be the means by which an organisation creates new wealth producing resources or endows existing resources with enhanced potential for creating new wealth (Drucker, 1985).

Having considered the above it can be said that an operational definition for innovation in the context of this study should include the following components; a social context for innovation, innovation as the introduction of something new with the intention of benefit to the adopting entity. The definition provided by West and Farr includes all three of these components and for this reason is the one that will be used to define innovation throughout the study. They define innovation as being the intentional introduction and application within a role, group or organisation of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the group, organisation or wider society (West and Farr, 1990).

However, there are some common misconceptions regarding innovation. There is a tendency to confuse innovation with invention; however, the two are not to be confused as invention is only the first step in a long process of bringing a good idea to widespread and effective use (Tidd et al, 1997). Thus invention can be said to be the absolute novelty of an idea (Zaltman, 1973). Nor is innovation interchangeable with creation as is sometimes the case in the literature. West and Farr (1990) remove ambiguity between the terms when they compare Oxford English Dictionary definitions between the two words, to create is defined as “*bring into existence, give rise to*” whereas innovation is defined as “*to bring in novelties, make changes*”. Therefore the act of innovation does not necessarily involve creation; it can simply involve the introduction of changes which have been previously developed elsewhere.

Innovation as Competitive Advantage

Innovation has long been identified as a means of providing the innovator with competitive advantage. One of the earliest writers on this subject was the economist Joseph Schumpeter who termed innovation as ‘creative destruction’. Schumpeter’s work undoubtedly laid the basis for much of the current debate on competitive advantage. Competition is at the core of the success or failure of firms (Porter, 1985), thus innovation should be concerned with enabling a firm to compete more effectively. The pursuit of competitive advantage is an idea that is at the heart of much of the strategic management literature (Fahy, 2000). Porter defines competitive advantage as being “when a firm sustains profits that exceed the average for its industry, it is said to possess a competitive advantage over its rivals.” (Porter, 1985). Whilst competitive advantage can come from size, or possession of assets, etc. the pattern is increasingly coming to favour those organisations which can mobilise knowledge and technological skills and experience to create new products, processes and services (Tidd et al, 1997). In short it is believed that a firm can create a distinct competitive advantage through innovating. Thus innovation is a critical element in the competitive struggle of both enterprises and nation states (Freeman and Soete, 1997). Innovation is an essential precursor to economic growth as technological change [or innovation] contributes as strongly to economic growth and wealth creation as do the traditional factors of production: labour and capital (Utterback, 1994). Thus it can be seen that the importance of innovation cannot be overestimated.

Innovation can be both a means of *creating* competitive advantage and also a means of *maintaining* competitive advantage depending upon a firm's position within an industry (Quintas, 1996). Industry new comers tend to be innovative and this is what often lends them a new appeal. Such newcomers pose dangerous threats to existing firms within the arena as most industry shattering innovations do not spring from the established competitors within an industry but from new firms (Utterback, 1994). Established players within the industry can hope to maintain their advantage through innovating as not to innovate is to die (Freeman and Soete, 1997).

RESEARCH METHODOLOGY

A thorough and detailed review of literature will form an ongoing part of this study. Sources of current, reliable literature have been identified as books, journals, periodicals, internet databases and conference papers. Attendance and involvement at conferences is also expected to increase overall awareness of the current issues on the subject.

Data will take the form of semi-structured interviews and case studies. Case studies are a useful form of data collection as they will allow for a comparison to be made between industrial sectors. Interviews will be conducted with selected professionals in both sectors as they will provide valuable primary sources of information. Qualitative and quantitative data will be obtained using case studies, interviews and postal questionnaires. Data obtained from all sources will receive rigorous statistical treatment.

Building Dynamic Capabilities

If knowledge is to be an effective learning resource for the organisation it first needs to be captured and then needs to be transformed into a currency that the organisation will benefit from. As tacit knowledge presents many problems due to its implicit nature it is important that methods are developed to translate this 'soft' knowledge into a 'hard' resource.

For knowledge to be managed effectively systems need to be in place allowing a firm to share information that may not initially be easy to share. One way in which such an obstacle can be overcome is by installing communication systems with components including the elements of interaction, language and proximity (Koskinen, 2003). Motivational systems are also a useful tool that can encourage people to share their knowledge. Knowledge that is not managed efficiently is effectively a wasted resource.

Certain organisational variables have been pinpointed as impacting directly upon the collective ability of an organisation to innovate. As these variables influence innovation it is reasonable to expect that the same variables will also have an impact upon the knowledge management capabilities of an organisation. The key variables that the literature search has indicated to have the greatest influence on organisational innovation are: size (Mansfield, 1963; Kimberley and Evanisko, 1981; Utterback, 1994), top management support (Shepard, 1967), organisational slack (Pierce and Delbecq, 1977; Rogers, 1983), structure (Van de Ven, 1989; Zaltman et al, 1973; Shepard, 1967), culture (Kanter, 1983, Schein, 1985) and age (Pierce and Delbecq, 1977; Kimberley and Evanisko, 1981). The current study aims to assess the impact that each of these variables has on organisational innovation, in certain contexts, in both the finance and construction sectors.

FINANCE VERSUS CONSTRUCTION INDUSTRY

Managing Knowledge for Innovation

The role that knowledge management plays in relation to innovation has not fully been examined. Although the importance of each has often been acknowledged and both are featured heavily in strategic writings, it would seem that the relationship between the two has not yet been explored to its fullest potential.

In this study, knowledge management means the management of any process or practice of creating, acquiring, capturing, sharing and using knowledge wherever it resides in order to meet existing and emerging needs, to identify and exploit existing and acquired assets and to develop new opportunities.

The resource based view of the firm purports that sustained competitive advantage derives from the resources and capabilities that a firm controls that are valuable, rare, imperfectly imitable, and not substitutable (Barney, 1991). One of the least substitutable resources that a firm can be said to possess is that of its members. The knowledge that organisational members have can be used to create a unique combination of assets therefore when considering the pursuit of advantage in relation to organisations it can be said that the collective knowledge of members directly contribute to the firm's resources. In this instance knowledge can truly be said to be power.

As with innovation it is believed that knowledge can provide the firm with a source of sustained advantage (Nonaka and Takeuchi, 1995). There are two types of knowledge, as identified by Polyani (1962). He divided knowledge into the two components of explicit knowledge and tacit knowledge. Explicit knowledge can be expressed in words and numbers and shared in the form of data, scientific formula, specifications and manuals (Civi, 2000). Tacit knowledge on the other hand is less tangible and resides in humans and organisational routines (Polyani, 1962). Tacit knowledge tends to become embedded within an organisation over time and so can be difficult to extract to transform into useable knowledge currency. The same is true of knowledge that resides within people. A person's knowledge can become so deeply rooted inside them that very often their actions are described as intuition. Intuition, however, is the result of a store of knowledge that is so readily activated that the person may not even realise that they are drawing upon this; it has been defined as a kind of second nature which derives from the internalisation of explicit knowledge (Koskinen, 2003). This allows for the emergence of a relationship between tacit and explicit knowledge, as it is suggested that tacit knowledge may be the result of embedded explicit knowledge (Koskinen, 2003), therefore it can be seen that the two are mutually supportive.

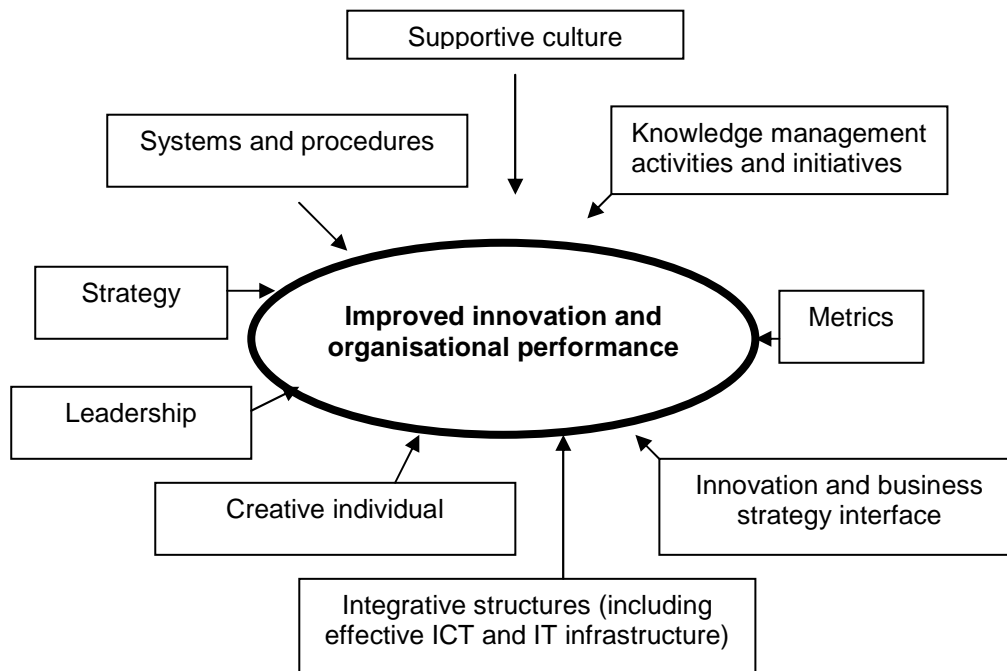
As tacit knowledge has a tendency to become embedded within an organisation it needs to be drawn out and utilised to enable it to fulfil the potential that it presents. Knowledge can be said to be a dynamic capability in that it has the potential to either increase or decrease. Knowledge also has the potential to transfer through the movement of human capital and therefore can not be counted as a fixed resource.

The interplay between knowledge management and innovation presents the opportunity for a unique study into the two fields. One of the main objectives of the on-going study is to develop and test a framework which addresses the relationship between innovation and knowledge management. It is hoped that the conceptual model can then be applied in a real business setting. This will allow for obstacles associated with innovation and the management of a large store of knowledge to be

dealt with effectively in order to increase organisational effectiveness and in turn profitability.

The diagram is a tentative model that has been developed to show the linkages between innovation and knowledge management. The model is, as yet, in its early stages as further discussions with industry practitioners may lead to further developments and key issues which would need to be explored in more depth.

Diagram 1: A Tentative Model of Linking KM and Innovation for Improved Innovation and Organisational Performance



Finance vs Construction Industry

Both the finance and construction industries are of significant national economic importance as they contribute around 5 and 10 percent of the countries GDP respectively (www.statistics.gov.uk; www.dti.go.uk). However, each has unique strengths and weaknesses that can be examined and assessed to allow for a mutually beneficial knowledge transfer between the two industries to occur.

The UK construction industry, despite providing almost a tenth of the countries GDP and employing an average of 1.4 million people (www.dti.gov.uk, 2005) is often seen as underachieving it terms of meeting its own needs and those of its clients (Egan, 1998). Additional problems for the industry include high levels of conflict, low investment, inadequate research and development, negligible profit margins and low levels of esteem of the industry by the public in general and graduates or school leavers in particular (Latham, 2001). In addition, the industry is perceived to be adversarial in nature, with a low level of trust amongst key professionals (Latham, 1994). These factors are seen as impacting negatively on the industry's collective ability to innovate. Despite such factors there are many opportunities that would allow for the industry to manage the knowledge available which could, in turn, facilitate innovation.

The span of the construction industry is vast. This presents both opportunities and threats. One of the key opportunities arising from the scope of the industry is that there is a vast body of knowledge bridging several disciplines, which, if captured,

could prove valuable for the industry as a whole. Conversely the weakness that emerges from this is that due to the fragmented nature of the industry such knowledge is rarely captured effectively.

The broad scope of the industry means that one single project often requires input from a number of key players, which contributes, in part, to the poor relationships common amongst stakeholders as each are concerned primarily with pursuing their own interests. One of the major threats to the industry as highlighted by the Latham report was that of the lack of integration (Latham, 1994). It has been suggested that one means by which the problem could be solved could be by the use of IT to facilitate sharing of information and knowledge as a major factor in securing improved performance in the future (Vakola and Rezugi, 2000). However the authors go on to note that a possible problem associated with the utilisation of IT as a knowledge sharing mechanism is that many construction workers are not IT literate. Another way in which the problem of fragmentation could be tackled is by way of effective partnering. Hartmann and Girmscheid (2004) believe that the single service necessary for designing, producing and operating a building can be brought together and combined so that they result in an optimal solution for the client's demands (Hartmann and Girmscheid, 2004).

Industry problems involving innovation and knowledge management are not solely a result of fragmentation. An additional contributing factor is that of high staff turnover, in other words the migration of knowledge. The industry is already international in nature and this trend looks set to continue with the inclusion of new member states, such as Poland, to the European Union. Whilst an international scope to the industry can be beneficial it can also be detrimental in that knowledge can flow out of the country just as easily and silently as it flowed in. Also once a project has ended the unique blend of skills and knowledge developed during the project is often lost as each contractor moves in different directions after the completion of the project. A key opportunity exists to try and capture the knowledge created by these unique teams. One way in which the flow of human capital may be minimised could be by introducing incentives which would work to slow down staff turnover and in turn retain some of the knowledge created during a project.

Whilst construction is essentially a service industry and therefore facing problems associated with services it can equally embrace opportunities offered by its own complex duality. One of these is the area of technological innovation. Currently one popular area for innovation within the industry is that of sustainability in building practices.

The typical size of firm within the industry is small (less than 250 employees). Small firm size does not necessarily guarantee effective knowledge management systems are in place as there may seem to be little point in formalising embedded tacit knowledge and therefore it remains just that as oppose to being disseminated into a translatable form. Small firms often present a problem for innovation as they may not have the economies of scale needed to make innovation a viable option. Small firms tend to be concerned primarily with survival and, unless the owner is particularly entrepreneurial, innovation does not tend to come high up the list of priorities.

Another factor that tends to limit innovation potential is the tendering process for projects. Projects are often offered in terms of competitive tender with price being the key determinant, leaving little margin or indeed incentive for innovation. Rigid

contracts are often drawn up which also work to discourage innovation (Innovation Matters, Issue 1, 2006).

In contrast one of the UK's most innovative sectors is the financial services industry (www.innovation.gov.uk) employing over 1 million people in the UK and enjoys net overseas earnings of £31.2 billion (www.dti.gov.uk). Innovations can take two forms; they can either be radical or incremental. Radical innovations tend to change the structure of the industry as a whole whilst incremental innovations often have a gentler effect, although they are often thought to be more profitable. Many recent innovations within the industry have involved the utilisation of technology to create new services for customers. Such innovations include the introduction of ATM machines, telephone banking and more recently internet banking. All these innovations involved gauging customer demand and adapting to changing lifestyles. Early findings from the current study would suggest that one of the key issues facing banking organisations currently is that of effectively managing existing physical properties. One high street bank that recently pledged not to close any of their branches in the face of competitors closing theirs, is now left with the problem of how best to utilise the space. It has been suggested that the concept of banking in a physical bank is becoming increasingly outmoded with the public's perception of banking being altered by new technologies. A major threat to the dominance of banking as we currently know it is the supermarket, many of the major supermarkets offer not only banking services as part of their portfolio but also simple yet revolutionary services such as cash back at all till points. It has been suggested that many supermarkets carry more physical cash than high street banks at any given time.

Although much of the work on innovation indicates that large organisations are more likely to be innovative due to an availability of slack resources (Pierce and Delbecq, 1977), size may also work to discourage innovation. Large organisations require more formal structures to operate effectively and it would appear that a high degree of formalisation discourages innovation (at least in the early stages of innovation). Financial institutions tend to be bureaucratic in structure and hierarchical in nature, both of these factors combine to actively discourage innovation. When there are many bureaucratic obstacles to be overcome innovations often meet, not only with resistance, but also with many delays. It tends to be the case that involvement in the project becomes excessive with approval needed from many sources prior to an idea being given the go ahead. Such factors may work to discourage innovation in the first instance. One way in which large firms can innovate successfully can be to act small, with autonomous teams working on projects (Sieloff, 1999). In order for this to be successful there also needs to be a certain degree of toleration of failure.

Early findings also indicate that the broad span of activities encompassed by financial institutions can be both a hindrance and a help in the field of innovation and knowledge management. Such a wide scope offers much innovation potential in many avenues although it also tends to mean that there is a lack of focus within divisions as they are overwhelmed by the amount of choices. Additionally, innovation becomes a sort of buzz word with there being only a limited comprehension of what innovation actually is. Also, there appears to be a slight innovation bias with there being a tendency to innovate for innovation's sake (Kimberley, 1981). Knowledge seems to be handled more effectively with the intranet being the main forum for knowledge sharing. However, there are many bureaucratic barriers surrounding this also, one of the main ones being who decides what information is suitable and what is not. Also, only existing knowledge is displayed, it is not a dynamic forum to facilitate the

sharing of existing knowledge or the generation of new, innovative ideas. Whilst the financial industry appears to be very good at producing radical innovations the incremental ones appear to be harder to introduce. This is mainly due to the fact that older, large organisations have evolved to be innovation resisting and generally tend to be risk averse.

CONCLUSIONS

In conclusion, therefore, it can be stated that innovation and knowledge management should be viewed as important activities of the firm as both can help provide sustained competitive advantage. Indeed, it is possible to state that it is not possible to succeed in today's knowledge intensive global environment without the planned implementation of each. Nor would it be possible to achieve success by focusing solely on innovation or knowledge management. Early results from the study illustrate the symbiotic relationship between the two. It is expected that subsequent research will reinforce this further. For this reason one of the key outputs of the study will be a new conceptual framework thus allowing the dual relationship between the two to be examined in more detail. It is expected that vital components of this framework will include organisational structure and culture as these are thought to impact directly upon an organisation's ability to innovate and capture knowledge.

It has been found that the construction industry, whilst forming a productive sector of the national economy, suffers from poor perceptual problems. Whilst these have not had a long-term effect on the industry it is only a matter of time before a skills shortage emerges as a result. Therefore it is imperative that the industry continues to work towards achieving a workable solution. Lessons can be learnt from the financial industry as it has worked to resolve problems to emerge as an innovative, forward looking sector.

Early results indicate that whilst the construction industry presently has problems realising its full potential in relation to innovation and knowledge management, the industry is fully aware of its own strengths and weaknesses in this regard. There are a number of initiatives that have been designed specifically to enable the industry as a whole to capture and handle existing knowledge more effectively. Indications in relation to the financial industry seem to be that it is a more traditional industry that is struggling to overcome bureaucratic barriers that work to impede innovation. It would also appear that whilst major technological breakthroughs have allowed for the introduction of radical innovations the equally important aspect of incremental innovation has been neglected. It would seem that the financial industry as a whole is struggling to meet the challenges presented by the 21st century. Competition is increasing from Eastern institutions that threaten the old order in the West; this threat is only set to increase over the coming decade.

Further directions that the research should take would be to explore the ways in which the construction industry can work to overcome the problems that they are faced with in the form of migratory knowledge and the lack of sufficient resources for innovation. Other areas that should be explored include the way in which financial institutions can overcome bureaucratic barriers to knowledge management and innovation and meet the challenges of formulating incremental innovations.

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