KNOWLEDGE MANAGEMENT IN IRISH CONSTRUCTION: THE ROLE OF CPD ACCREDITATION

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Research into knowledge management (KM) in the global construction sector has proliferated in recent years. The need for individuals to develop and learn within this paradigm indicates that continuing professional development (CPD) has a part to play. There is however a distinct lack of empirical evidence on this topic in the context of the Irish construction industry. This paper investigates current approaches to both KM and CPD within the Irish construction sector and the influence exerted by Engineers Ireland, the leading professional engineering body in the country. Based on the findings of a study into KM in the leading twenty Irish construction companies, the paper presents the results of research conducted with the Managing Directors and Senior Managers from these organisations. The research has found that almost half of the leading construction companies are now considering adopting a formal approach to KM, the level of CPD within these companies being relatively high. Engineers Ireland CPD accreditation programme appears to be influencing these companies in both their KM and CPD endeavours.

Keywords: continuing professional development, Engineers Ireland, Irish construction industry, knowledge management

INTRODUCTION

It is recognised that the effective management of knowledge can bring considerable gains to construction organisations, their projects and individual workers (Egbu *et al.* 2005). Largely project-based, the construction sector is a complex, dynamic and changing environment (Raiden and Dainty 2006). The uniqueness of projects, fragmentation within the construction process, mobile staff and changing teams, the increasing need to become more customer-oriented and the high level of external knowledge required by construction companies all make the case for KM more compelling (BSI 2003). Interest in Knowledge Management (KM) stems from a number of issues: a dramatic improvement in data processing capabilities and communications technologies, an increased recognition that businesses must continuously improve and acknowledgement of learning as a core strategic competency (KLICON 1999). Jashapara (2004) defines KM as: *"the effective learning processes associated with exploration, exploitation and sharing of human knowledge (tacit and explicit) that use appropriate technology and cultural environments to enhance an organisation's intellectual capital and performance."* This indicates an interdisciplinary approach to KM; human resource management

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(HRM) and information science being the two most common dimensions (Jashapara 2004). Initial KM efforts focused predominantly upon the development of computer systems to 'manage' knowledge, to the detriment of the human aspect which is so vital to KM (Dainty *et al.* 2005). Quintas (2005) cites the central foci of KM as *"the management of people, and the relationship between individuals, groups and organisational knowledge."* The role of the human resource (HR) function in training and development within organisational KM initiatives is vital (Olomolaiye and Egbu 2005). Continuing Professional Development (CPD) is a key part of the HR function in respect of training and development, and is now being widely recognised as a requirement for membership of professional bodies (Wall and Ahmed 2005). Within the Irish construction industry, there are a number of professional bodies offering CPD initiatives and accreditation, including the Construction Industry Federation, the Royal Institute of the Architects of Ireland, Engineers Ireland and the Society of Chartered Surveyors. Part of an ongoing MSc by research exploring KM within the leading twenty Irish construction companies (based on 2004 turnover), the purpose of this paper is:

1. To ascertain the current position of these companies in relation to formal KM.

2. To identify current approaches to CPD practice

3. To explore whether Engineers Ireland CPD accreditation influences the level of KM

This shall be achieved through a review of literature and the presentation of the results of primary research conducted with Managing Directors and Senior Managers from a number of these leading companies.

KNOWLEDGE MANAGEMENT STRATEGY

If an organisation wishes to enjoy the benefits of KM (see Table 1), the development of a well-defined KM strategy is required (Carrillo *et al.* 2003). This strategy must be integrated into the overall strategy of the business, as a means of improving organisational performance. The main feature of a KM strategy is the promotion of a knowledge sharing culture, a suitable ICT infrastructure, and the identification of processes and activities where value can be added through KM (Carrillo *et al.* 2004).

Prior to developing a KM strategy, the effectiveness of current approaches to managing knowledge within the organisation should be explored in terms of people, process and technology. Initial focus, it is recommended, should be directed on people issues upon which to form the basis of knowledge sharing throughout the organisation (Sheehan *et al.* 2005).

CONTINUING PROFESSIONAL DEVELOPMENT (CPD)

CPD in construction has been defined as: *"the planned acquisition of knowledge, experience and skills and the development of personal qualities necessary for the execution of professional and technical duties throughout a construction professional's life (Wall and Ahmed 2005)."* Based on initial desk research, the main CPD efforts within the leading Irish construction companies currently focus upon becoming accredited by Engineers Ireland (formerly known as the Institute of Engineers of Ireland). CPD accreditation with Engineers Ireland is aimed at benefiting the individual, organisation and the economy in general. These identified

benefits of CPD accreditation, appear to converge quite well with the perceived benefits of KM (highlighted in Table 1.).

Activities identified as contributing towards an individual's CPD include internal training (both formal and informal), postgraduate studies, and external training. Specifically defined criteria have been established by Engineers Ireland, against which accreditation of companies is considered: CPD policy, performance management system, CPD activity, recording of CPD, mentoring, involvement with professional institutions, KM system and management control system. The scope of this paper shall consider the activities shown in Table 2.

Table 1: Benefits of CPD & KM (Engineers Ireland 2006, Graham and Thomas 2005)

Benefits of CPD	Benefits of KM
- Maximise employee potential	- More effective teamwork
- Improved recruitment and retention of staff	- Motivate, satisfy & retain staff
- An innovatory and dynamic culture	- Innovation, success & market leadership
- Raise the profile of the organisation	- Client orientation & satisfaction
- Sustain the economy within the Knowledge Economy	- Raise profile and availability of knowledge
- Optimise return on learning and development spend	- Cost/time reduction
- Align business goals with personal development	- Process & product improvement
- Supports career planning and promotion procedures	- Improved decisions & problem solving
- Benchmarking against industry best practice	- Less repeated mistakes & duplicated work

It is reasonable to suggest, therefore, that CPD has an important role to play in KM within construction, and indeed, other industries, at individual, project and organisational levels (Harrison and Kessel 2004). Although loosely defined, the prerequisite for a KM "system" indicates a technological approach this may provide the impetus for construction companies to adopt a more formal approach to KM.

Table 2: Selected Criteria for Engineers Ireland CPD Accreditation

CPD Criteria	Example of Practice
Performance Management System	Annual Performance Appraisal
CPD Activity	5 day average
Mentoring	Clear process for new and in some cases experienced staff
Knowledge Management System	Process for capturing & sharing knowledge & experience

RESEARCH METHODOLOGY

The research reported on in this paper is derived from two parts of the overall MSc research project, namely a postal questionnaire sent to the Managing Directors of the top twenty Irish construction organisations (based on 2004 turnover) and semi-structured interviews conducted with senior managers from ten of these companies. These leading firms were selected as they are perceived to exert the most influence on the approach to managing construction projects and the industry in general (Thomas 1999). The outcome of this study is not intended to be applicable to the rest of the industry, in accordance with Robson's (1993) views that *"small-scale surveys commonly employ non-probability samples. They are usually less complicated to set up and are acceptable when there is no intention or need to make a statistical generalization to any population beyond the sample surveyed."* Therefore no in-depth statistical analysis was utilised and no generalisation beyond the top 20 contractors is intended.

Managing Director Questionnaire

In order to get a good strategic overview of a number of issues the Managing Directors of these organisations were surveyed using a self-administered postal questionnaire (Graham and Thomas 2005). Following piloting and revision, the questionnaire was administered in June 2005; an overall response rate of 85% was achieved, which was deemed to be quite satisfactory.

Senior Management Interviews

Ten companies were selected through the identification of suitable interviewees based on the author's personal contacts. The positions held by these individuals differ depending on the organisational structure of each of the companies, with titles such as contracts manager, regional director, contracts director and area manager. Despite these different titles, all identified participants operate either at board level or directly below the main board of directors, and are heavily involved in the day to day operations of a number of construction projects within their respective organisations. This infers both strategic and operational perspectives on their organisations, and it was specifically for this reason that these individuals were chosen. The Human Resource Managers of these organisations were not considered at this stage as the authors wished to get an overview of the current KM practices within these organisations from a variety of perspectives including training and development. The interviews were conducted over a two month period between December 2005 and January 2006. With the interviewees consent, all interviews were recorded, with full transcripts produced upon completion. Once all ten interviews had been conducted a content analysis of each was undertaken, allowing for the identification of key, substantive points and the categorisation of responses (Gillham 2000). The results reported herein deal mainly with individual knowledge and the development and training afforded to employees.

CURRENT KM POSITION

The Managing Director survey found that only one respondent (6%) organisation currently has a KM strategy; unfortunately this company did not participate in the interviews. A further seven (41%) of the respondents stated that they intend to implement a KM strategy within the next 3 years. The remaining nine organisations (53%) reported having no plans for a KM strategy at present.

Prior to administering the questionnaire, an initial phone survey was conducted in order to identify suitable survey respondents within each of these companies. It was found that none of the 20 companies had a Knowledge Manager, Chief Knowledge Officer or any role for managing knowledge.

Based on the interviews with the senior managers, 60% felt that the management of knowledge within their organisations was *"informal,"* with the remaining 40% citing a *"conscious management of knowledge."* All ten interviewees stated that they weren't currently aware of a KM strategy being in place within their organisation, but many felt that the introduction of one was worth considering, and could contribute to improving the overall performance of their organisations. In terms of the need for KM and indeed CPD, one of the interviewee's comments on competitiveness in the coming years was particularly pertinent:

"It's a question of making sure that the people employed in the industry are the best available, it will be down to the individuals and teams that are put forward by companies to get work, based on their experience and skills."

CPD

At present, a total of twelve of the top twenty firms are accredited or in the process of becoming accredited by Engineers Ireland. Of the interviewee's organisations, two companies are fully accredited, five are pursuing accreditation (protocol) and three have informal CPD. This section explores some of the criteria required for Engineers Ireland CPD accreditation including mentoring, graduate training programme, postgraduate studies, staff appraisal and KM system.

Mentoring

The Managing Director questionnaire found that 65% of the respondent organisations have a mentoring programme in place for graduates. The interviews with senior management identified four companies as having a graduate mentoring programme, with a further two having a mentoring programme for all staff up to contracts management level. Respondent H indicated that their company is currently looking to implement a mentoring system in the near future: *"I see a mentoring system as being more involved than learning from colleagues on site, it brings the individual into contact with issues that are not particular to the actual project they happen to be on."* Another respondent (company C) felt that although they had a policy for mentoring, *"the implementation of the mentoring isn't where it should be at the moment, the system that's in place probably needs some tweaking and more formalisation. Mentors themselves probably need some training and take a stronger role in the function of mentoring."* Respondent F said that their company ensures that the mentor is a person not involved directly with the protégé on a day to day basis, someone on *"neutral territory."* He added *"it took us a while to get it going because people didn't really understand what mentoring was all about, but we actually did some training of the senior people on mentoring, and that helped, so it's actually working a lot better now."* Interviewee E, whose organisation run mentoring at all levels up to contracts management, and is himself mentored by the company's Development Director, identified a benefit of it as creating *"a sense of ownership within the company, you really feel that you're part of the organisation, you really get an understanding of where we're trying to go."*

Graduate Training Programme

Respondent B, who's organisation have a 5 year graduate training programme for engineers, felt that it helped to attract and retain staff. Organisation G place the onus on the graduate to manage their own training *"every graduate is given a training log book, where the onus is on them to get their supervisors to record their training, but the onus is on the company to manage CPD, but we expect the graduate to be proactive and to come forward as well."* The graduate training programme, respondent F felt, was important for developing future managers *"we find most engineers when they come in they're smart, they're good logical thinkers, but when it comes down to getting their hands dirty, it's pretty much start again, so the training course that we put them on is really the practical, managerial aspects of building."* These sentiments were echoed by Respondent B who said *"ultimately graduate engineers in our organisation become managers."* However, respondent F added, *"there is a problem there with young engineers, after two years they all want to be contract managers, so they are impatient in the main, and sometimes that's been a problem."*

Postgraduate Studies
The interviewees were asked about their employees undertaking third level postgraduate studies, which most saw as something which an individual would undertake based on their own personal motivation, respondent A stated *"it's a personal thing, it wouldn't be directed by the company."* A number of the respondents questioned the relevance of these courses to their organisation. In relation to postgraduate studies, respondent B said *"the difficulty we have is that from a construction point of view is the time commitment and the usefulness of the course is always a big question."* Conversely, respondent E stated *"most of our contracts managers have one or two postgraduate diplomas, in project management, contract law, project administration, arbitration, and it's fully supported by the company."* Some individuals saw the postgraduate courses as an opportunity for skills conversion, the uptake of these in organisation C *"generally consist of diplomas in project management, for engineers to get more general management experience."*

Staff Appraisal
Of the Managing Director questionnaire respondents, 76% indicated that they have formal procedures for appraising staff performance. In the interviews, seven of the respondents identified having staff appraisals. Of the three who have no such formal procedures, respondent D, operates *"a very crude appraisal system"* with staff that he is directly responsible for, but this is not company policy. Company I don't operate appraisals either, *"there would be feedback to head office on a person's performance but they wouldn't sit down with an individual."* All the other respondent's organisations perform annual appraisals, whereby a senior member of staff sits down with an individual and reviews their performance over the previous year, using it as an opportunity to plan individuals training and development for the year ahead. The interviewees were asked whether these appraisals were directly related to any financial reward, respondent C stating *"we try and separate the two from the point of view that if you're looking at a training plan or a performance appraisal, money can take over the agenda."* Organisation E have a comprehensive appraisal form which the individual fills in and rates themselves prior to meeting with a senior manager, who goes through the form with them. The form appraises the individual under headings such as job knowledge, problem solving, quantity and quality of work, task management, skills set\training, team building and communication, customer service, flexibility\adaptability, business knowledge, achievements of goals set previously, strengths and areas for improvement and an action plan and goals for the coming year, *"it's a tool for people to track their progress, to evaluate themselves, to set goals and to review previous goals, it's not linked to bonuses."* Organisation F operate a similar approach, with the interviewee adding *"there's no doubt when somebody comes in looking for a financial review, if they've got a bad appraisal it doesn't help,"* this was a recurring theme from all seven respondents who use staff appraisals, with the exception of company J where *"it is directly linked to the salary review, which I have an issue with, that's one golden rule that I have, based on my experience in other companies, never discuss salary at an appraisal!"*

Knowledge Management System
The senior managers were questioned about the presence of a KM system within their organisation. Only respondents F and G identified the presence of a specific system for managing company knowledge. Respondent F: *"we have a lessons learned database, and at the end of every job, a number of things are taken from the job, a*

number of positives, a number of negatives and they're written up and put into the lessons learned database." Although the system is currently in operation, he questioned its usage at present *"the theory is that before you start a particular package, you log onto the database and have a look at the relevant lessons learned, so the theory is good, but you're depending on people to take the time to look at it."* In attempting to promote the database, *"we give seminars based on lessons learned on a fairly regular basis."* Respondent G cited the company intranet as their KM system, but conceded that in practice, *"the end of project reviews are on paper and stored in paper format on site, but we're looking to transfer that to our intranet."*

DISCUSSION

This paper has explored the presence and level of both KM and CPD within the leading Irish construction companies. This section discusses the main findings of both the questionnaire and interviews undertaken, a summary of which is illustrated in Table 3.

Current KM Position

Based on both the questionnaire and the interviews, almost half of the leading Irish construction organisations are considering implementing a KM strategy within in the next three years. Of the interviewees, those who are planning to do so have quite a good level of CPD activity with four out of five engaged in the Engineers Ireland accreditation programme. Despite none of the top twenty contractors having a specific role for managing knowledge or information, the findings indicate that the KM imperative is now gaining momentum within these organisations.

Continuing Professional Development

A considerable proportion of the leading Irish construction companies are currently accredited or are actively seeking CPD accreditation with Engineers Ireland. Of the companies not seeking accreditation, two of these are quite poorly developed in terms of the identified criteria for accreditation. Interestingly, the third company in this category is showing signs of developing their CPD approach and is currently rolling out a comprehensive mentoring programme and planning a KM strategy. In relation to the identified activities, the following are some of the key points to note:

Mentoring: aids in the development of both new and experienced employees in areas outside of their day to day role, the mentors themselves require some initial training prior to implementation, and it helps promote a sense of ownership within the organisation

Graduate Training: gives the individual the opportunity to train and develop themselves within a structured programme, can aid in the transition of engineering graduates from technical to managerial roles, although there is an acknowledged problem with graduates wanting to progress quicker than the planned programme

Postgraduate Studies: the leading companies differ on the relevance of courses to their employees, some questioning, others advocating them. In general, they are usually undertaken based on personal motivation, findings suggest that they are excellent for skills conversion of engineering graduates and enhance promotional prospects to more senior management roles.

Staff Appraisal: the use of an appraisal allows individuals to both assess and review performance and training and development needs for the previous and coming year,

many companies review financial reward separately, although the performance appraisal is taken into account, when conducting a pay review.

KM Systems: the use of these is not clearly defined at present, with the use of specific technological solutions limited to an intranet and lessons learned database.

Table 3: Overview of KM and CPD Activities

Company	Low								High	
---	I	D	A	H	C	J	E	B	G	F
KM Strategy										
- Have a KM Strategy										
- Plan to have a KM Strategy						X	X	X	X	X
- No plans for a KM Strategy	X	X	X	X	X					
Management of Knowledge										
- Conscious	X						X	X		X
- Informal		X	X	X	X	X			X	
Mentoring										
- Graduates					X	X	X	X	X	X
- Experienced Staff						X	X			
CPD										
- Accredited (Engineers Ireland)									X	X
- Protocol (Engineers Ireland)		X		X	X		X	X		
- Informal	X		X			X				
Staff Appraisal										
- Annual				X	X	X	X	X	X	X
- Every 6 months										
- HR Manager				X						
- Supervisor							X		X	X
- Senior Management					X	X		X		X
KM System										
- Lessons Learned Database										X
- Intranet									X	
Graduate Training Programme								X	X	X
Postgraduate Studies			X		X	X	X	X	X	X

The level and usage of these CPD practices vary within the leading construction companies, although as Table 3 suggests, that companies have a relatively high level of usage of the identified activities, are well developed in terms of mentoring, CPD, graduate training, postgraduate studies and staff appraisal. The level of usage of a KM system within all companies appears to be somewhat lacking, with companies F and G both citing difficulties in its implementation and its use.

Influence of CPD Accreditation on KM
The two companies who have obtained CPD accreditation are both planning to implement a KM strategy, with mixed intentions for those currently at the protocol stage of accreditation. This raises the question of whether the CPD accreditation process influences KM, and while a conclusive statement can't be made, the awareness raised from the accreditation process may in fact have improved awareness of KM. Interestingly, the two accredited companies cited a *"conscious management of knowledge"* and exhibit the most extensive use of CPD activities. Those companies who plan to have a KM strategy appear to be well developed in relation to most CPD activities, apart from KM systems (see Table 3). Companies with no plans for a KM strategy appear to be quite underdeveloped in their use of CPD activities, and are mixed on their approach to CPD in terms of achieving accreditation from Engineers Ireland.

CONCLUSIONS

Adopting a formal approach to the management of knowledge in construction organisations is now seen to be of benefit at individual, project and organisational levels. At the core of a KM initiative are people and learning, with their development and training an important facet. CPD has been explored as a key area in the contribution to KM in this paper, and in relation to the stated objectives, the following can be concluded about the leading Irish construction companies:

1. Currently only one of these companies has a KM strategy, with a further 41% intending to develop such a strategy in the short to medium term.

2. The level of CPD activities varies within the leading firms, although there appears to be a distinct gap between the high and low level organisations in relation to mentoring, CPD accreditation, graduate training programmes, postgraduate studies and the use of staff appraisals.

3. The research findings suggest that being CPD accredited by Engineers Ireland influences the level of KM. Companies who are planning to develop a KM strategy are using a range of identified CPD activities.

Research into the area of KM in the Irish construction sector has been limited to date, but through this report and a wider study, it is hoped to further the research agenda on KM within the leading Irish construction companies. The work of Engineers Ireland and its CPD accreditation programme appears to have contributed to raising the profile of KM. It is the author's intention to explore further the role and requirements of KM from a CPD perspective, with in-depth primary research focusing on both Engineers Ireland and the HR Managers within the leading Irish construction companies.

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