



Information and Knowledge Management Enablers in Business Contexts: An Exploratory Analysis

Karen Nelson and Michael Middleton

School of IS, Queensland University of Technology, Australia, Tel: +61 7 38461950, kj.nelson@qut.edu.au

ABSTRACT

Although, the strategic imperative to manage knowledge for business survival and competitive advantage is widely accepted, integrated frameworks to assist organisations achieve successful outcomes in both IM and KM projects are lacking. We propose that a number of organisational factors – which for us are enablers – may influence the outcome of information and knowledge initiatives. The focus of this project was ten candidate enablers, which had been identified in a review of the literature and explored in previous research work. This paper discusses the findings from two exploratory surveys with IM and KM practitioners, which indicated that all ten enablers were perceived as important to the performance of IM and KM. However, the importance and attention attributed to the enablers appears to be highly organisational and possibly initiative specific.

INTRODUCTION

In recent times information and business professionals, and academics have become increasingly fascinated with a seemingly new phenomenon, knowledge management. While some authors believe KM to be merely a reinterpretation of IM, and others believe it to be just another management fad, independent writers with a business focus such as Senge (1990), Peters and Waterman (1992) and Drucker (1993), and the IT research organisation – Gartner – have articulated sensible reasons to explain why organisations should embark on KM projects. The reasons given for these projects are based on a premise that knowledge and the capability to manage it are the most crucial elements in sustaining or improving organisational performance.

Regard for knowledge as a strategic resource is well documented (for example see von Krogh, Roos & Klein 1998) and corroborates Nonaka and Takeuchi's 1995 theoretical framework, which as Magalhaes (1998:101-102) puts it, is based on an understanding that business advantage arises from the ability of an organisation to create new knowledge. Several case studies have been reported that show support for this idea, (for example refer to the Skandia AFS case (Marchand, 1998) and Nonaka, Umenoto and Sasaki (1998)). Although the overall number of empirical studies in KM is low, recent quantitative evidence has further substantiated this case-based reasoning by showing a direct relationship between effective information and knowledge management practices and corporate performance, (Marchand, Kettinger and Rollins 2000). Furthermore, well-organised IM and KM are seen to be complementary (Blumentritt and Johnston 1999; Marchand 1998) with both required to operate effectively to ensure adequate supply of both "old and new knowledge" (Stephens, 2000).

This paper presents the results of some exploratory research, which aimed to identify the organisational enablers for information- and knowledge-focused activities and describe these enablers within a business environment. This work is part of a larger research project, which aims to develop a multidimensional integrated framework for IM and KM, and to test the application of this framework within business contexts.

INFORMATION MANAGEMENT AND KNOWLEDGE MANAGEMENT

Information and Knowledge Processes

The relationship between data, information and knowledge existing at various points along a continuum (leading to wisdom) has been discussed and debated for some time. Although there is some confusion in the use of these terms, most authors agree that knowledge is the ultimate result of the capture of raw facts (data), applying specific context and purpose to it to produce information, and finally applying

one's own terms of reference to produce knowledge within the minds of individuals. Tuomi (1999) challenges this view, and proposes that knowledge comes first and is used to create data. His view is that individual knowledge is represented in the design of databases, and as such information is derived from the data contained within these repositories.

Some authors find that making a distinction between the three information stages is unwarranted and does not provide any benefit. Others, although they agree that making a distinction is largely unnecessary, create boundaries for their work in a specific area by providing definitions. Still others (including the authors of this paper) believe that effective IM and KM activities rely on a sound understanding of these stages and what they mean. We have therefore adopted definitions from Marchand (1998) for this paper:

- Data are context free and can always be shared because the receiver cannot or does not interpret them (email is data to those who do not share the context for its interpretation).
- Information includes all documents and verbal messages that make sense or can be interpreted by organisational members and is never context or value free. Information always encompasses an act of transfer or sharing among people and involves interpreting representations of our or others knowledge and is context specific for use and application.
- Knowledge is always personal – it resides inside peoples' heads. Knowing means not only to understand or believe but also to use or apply that knowledge. In an organisational context, knowledge conversion processes depend on human to human or human to technology interactions (see Nonaka and Takeuchi, 1995). Knowledge use emphasizes personal interpretation and understanding and is context specific for expressing beliefs and commitments.

According to Marchand (1998), knowledge is converted to information for communication and transfer, which means the two are inextricably linked in a complementary and co-dependent relationship. Therefore, in practice it is not enough to talk about KM as an isolated construct, but that effective management of knowledge should be based on sound information management and knowledge management processes as well as addressing elements of the information environment such as culture, behaviour, information politics and technology. For us this means that information management focuses on the acquisition, capture, sharing and use of essentially tangible information, while knowledge management focuses on the creation and identification of intangible information so it can be shared with others, or for conversion to tangible information. The approach used for managing knowledge in organisations reflects a focus on either sharing or conversion, and these approaches are known respectively as personalisation or codification strategies (Hansen, Nohria and Tierney, 1999; Davenport and Grover 2001).

Candidate Enablers for Effective IM and KM

Information, knowledge and their application within organisational or corporate contexts are the subject of a large (and ever-increasing) number of publications (for example see (Davenport and Prusak 1998; Dixon, 2000; Housel and Bell 2001; Marchand, Kettinger and Rollins, 2001). A recurring theme is that a number of “factors” are critical for successful implementation of IM and KM initiatives. A review of literature in the IM and KM areas revealed the range of elements that are regarded by academics and practitioners as constituent parts (our candidate enablers) of IM and KM frameworks³. These candidate enablers often include - but are not limited to: information and information technology architectures (McGee and Prusak 1993), individual behaviours (Bonner, Casey, Greenwood et al. 1998) organisational culture, policy and strategy and information politics (Davenport, Eccles and Prusak . 1992) Davenport 1997) (Norton 1994) (Orna 1999) (Strassman, 1995), people management (including roles and responsibilities) (Ichijo, von Krogh and Nonaka 1998) (Broadbent 1997) (Standards Australia, 1999) and processes (Marchand, Kettinger and Rollins 2000). Some authors have addressed various groupings of enablers because it is believed to be “unlikely that the adoption of new titles, procedures or technology alone will produce sustainable competitive advantage” (Nonaka, Umenoto and Sasaki 1998). Davenport (1997) presented a holistic view of organisational information environments in his model of an information ecology, which incorporated many of the enablers mentioned above.

These candidate enablers, each with a scope statement and examples of the sources in which they were identified are provided in Table 1. The scope statements in this table have been derived to set boundaries for the purposes of categorization. These statements are not intended to limit the interaction and co-dependencies that may exist between many of the enablers.

Our first research question aimed to clarify what emphasis IM and KM practitioners placed on the candidate enablers in terms of the effectiveness of IM and KM activities and is **RQ1: how do practitioners rate the significance and relative importance of the candidate enablers to the performance of IM and KM activities?**

Ideally each key enabler in an information environment would be designed and operate optimally to facilitate effective information and knowledge management, but practically this aim is difficult to achieve. Not only do these enablers constitute a substantial portion of the fabric of organisations, but also, the ubiquitous nature of these resources means they have a management need that permeates all business processes. This ideal position is further complicated by co-dependencies between environmental elements (for example strategy, politics, organisational structure and people management) and the need to manage resistance to change when attempting to transform enablers such as culture and behaviour. Yet the need to address these enablers seems inherent in any IM or KM initiative. Our second research question aimed to compare the significance of these enablers with the actual situation in a sample of Australian organisations and is **RQ2: how closely is the significance of each enabler reflected by “state of practice” in our sample organisations**

RESEARCH METHOD

An interpretive research approach has been adopted throughout this research project⁴. Data has been collected using various research methods and is both qualitative (from action research and case study work) and quantitative (from embedded and exploratory surveys). In this particular part of the study our aim was to explore practitioners’ perceptions of IM and KM before embarking on more substantial qualitative data collections using case studies and interviews.

The research questions in the section above were addressed using two exploratory survey instruments, which required qualitative and quantitative responses. Both instruments were pre-tested, piloted and administered by email to a group of individuals unknown to the researchers, but who were members of an active KM forum.

Survey 1 consisted of 9 questions. Questions 1-7 requested qualitative information such as occupation, professional affiliation, em-

Table 1: Candidate IM and KM enablers from the literature

Candidate IM & KM Enabler (& Code)	Scope	Examples of Reference to Enabler in Literature
Information Architecture (IA)	Elements that define what information the organisation has, what it needs to achieve its goals, and what should be done with information and / or knowledge. (Tools include: information maps, directories, yellow pages etc.)	McGee and Prusak 1993, Orna 1999; Davenport 1997.
Information Behaviour (IB)	How individuals behave and are encouraged to behave in respect to information, for example how information sharing, exchange, use and communication occurs between individuals.	Davenport 1997; Bonner, Casey, and Greenwood et al 1998; Orna 1999
Organisational Culture (OC)	How “the way things are done” effects IM and KM.	Brooking 1999, 112; Bertels and Savage 1998; Davenport 1997; Ichijo, von Krogh and Nonaka 1998; Orna 1999; Standards Australia 2000; Norton 1994
IM Processes (IMP)	Activities focussed on managing tangible information.	Orna 1999; Marchand et al 2000; Davenport 1997; Standards Australia 2000
IT Practices (ITP)	Management of IT to support IM and KM.	Marchand et al 2000; Brooking 1999; Orna 1999; Standards Australia 2000
KM Processes (KMP)	Activities focussed on the capture and sharing of knowledge held within the minds of individuals.	Marchand et al 2000; Standards Australia 2000; Ichijo, von Krogh and Nonaka 1998
People Management (PM)	Interventions to create environments that enable and encourage people to create, share and use knowledge, for example dynamic teams, role rotation, reward and recognition programs, training and education.	Broadbent 1997; Brooking 1999; Ichijo, von Krogh and Nonaka 1998; Standards Australia 2000
Information Policy and Strategy (IP&S)	High-level formal statements that explicitly assert the organisation’s intent for information and or knowledge and provide guidance about the overall approach to information and or knowledge.	Strassman 1995; Davenport 1997; Orna 1999; Standards Australia 2000
Information Politics (IP)	Organisational activities and behaviours specifically related to the power information instills and how these are managed to ensure effective information and knowledge use.	Marchand et al 2000; Strassman 1995; Davenport, Eccles and Prusak 1992, Davenport 1994, 1997
Organisational Structures (OS)	Formal roles, responsibilities and authority for IM and KM.	Bertels and Savage 1998; Blacker, Crump and McDonald 1998; Ichijo, von Krogh and Nonaka 1998; Davenport 1997; Orna 1999;

ployer type, and some demographics (age and gender). Question 8 contained a series of 50 statements or principles, which the respondents were asked to rate on a 5-point Likert scale to indicate their perceived importance to IM or KM. The fifty items were made up of five descriptive statements for each enabler. These statements were derived from the literature and were seen as adequately describing each enabler in the pre-test and pilot stages. The participants were not aware of the list of candidate enablers at this stage and as such the links between the statements and enablers were not made visible in the survey. In addition the five statements for each enabler were distributed throughout the question. Question 9 invited respondents to include additional principles that they thought were important and had not been addressed in Question 8.

Survey 2 consisted of 7 questions. Question 1 presented the list of ten candidate enablers (accompanied by scope statements) and required respondents to indicate their significance to IM and KM effectiveness (using a 7 point Likert scale). Question 2 asked respondents to rank the relative importance of the enablers from 10 (most important) to 1 (least important), while Question 3 requested additional enablers. In Question 4 the set of fifty principles used in Survey 1 was reused and this time respondents were asked to indicate (again using a 7 point Likert scale) how well the statement reflected the situation in their organisation. Questions 5 and 6 focused on position titles and organisational size, while Question 7 asked for descriptions of IM and KM projects.

These exploratory surveys did not attempt to derive factor inter-relationships. Rather, questions were associated with the perceptions of specific enablers. Copies of the survey forms are available from the authors.

RESULTS

Some of the survey findings are reported below.

Survey 1 Findings

There were 6 respondents in the pilot group (100% response rate) and 20 respondents in the sample group (21% response rate), which was a low response rate but for the purposes of this exploratory work we felt adequate. The pilot and sample group were assessed separately and as no differences were found the results were pooled (26% response). The ten most important principles, their average score (out of 5) and the enabler that they represent are listed below.

- Sharing information (4.77) - IB.
- Identifying the information needed to meet business objectives (4.73) - IMP.
- Demonstrating appropriate information behaviours at senior levels (4.69) - IB.
- Making key business information accessible throughout the enterprise (4.65) - IP.
- Open communication between people (4.58) - OC.
- A strong affinity between the espoused and experienced culture (4.58) - OC.
- Meeting the information needs of core processes (4.54) - IMP.
- Capturing learning from past experiences (4.50) - KM.
- Investing in employee training, skill enhancement or education (4.50) - PM.
- Making decisions that support the firm's mission or goals / Encouraging collaboration between IT, content and HR managers (4.46) - OC/OS.

The data collected about the importance of principles allowed us to extrapolate the enabler rankings from this initial survey. The values in this figure were calculated by averaging all the statement scores for each of the enablers. Figure 1 illustrates that the aggregated average for all enablers was over 3.5 on the 5-point scale used, with the scores ranging from 4.39 for information behaviour to 3.79 for information architecture.

Survey 2 Findings

The second survey was pre-tested for accuracy and then piloted with the survey 1 pilot group before being distributed to the 21 respondents from the previous survey. 15 responses were obtained (71% response rate).

The importance ranking of the enablers is shown in Figure 2. The most highly ranked enablers were information behaviour, organisational culture and people management. The least highly ranked enablers were information technology practices, information policy and strategy, and organisational structure.

Two sets of data are shown in Figure 3; significance and organisational alignment. Firstly, the respondents saw that 9 of the 10 enablers were seen as significant to the ultimate success of IM and KM, and that these organisational aspects required some type of planned attention to ensure IM and KM initiative success. It was only seen necessary to pay attention to organisational structures when problems arose. Secondly, Figure 3 shows the degree of alignment between the IM and KM enablers and the actual situation in the sample group of

Figure 1: Enabler importance by principle statement

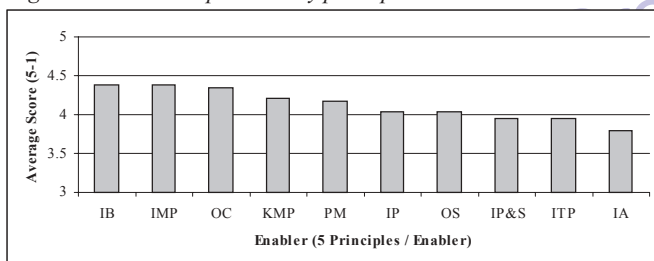
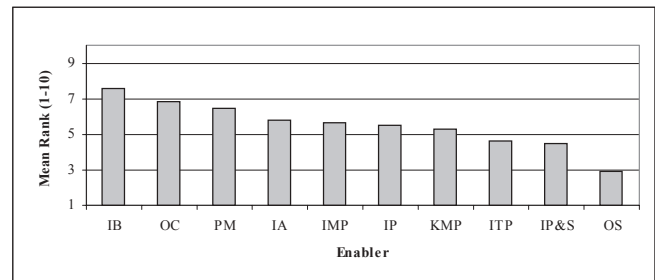


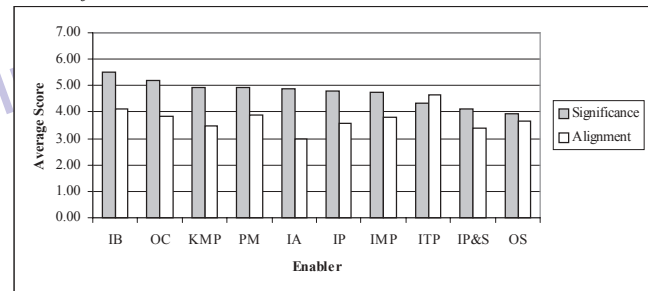
Figure 2: Ranking of IM and KM enablers



organisations. Alignment was assessed using a 7-point Likert scale where a 7 meant that the principle statement is highly aligned with the organisation's circumstances and 1 indicated no alignment between the organisation and the statement. Responses from 14 organisations were used to provide the alignment score for each enabler (no data was received from one organisation for this question). For the organisations surveyed, an average score of close to 5 indicates good alignment with the enabler, while scores nearer to 3 indicate some degree of alignment between the organisation and the enabler.

Figure 3 allows a visual comparison between (1) the significance of each enabler and (2) the organisational 'state of practice' for that enabler.

Figure 3: Comparison of enabler significance and organisational "State of Practice"



DISCUSSION

The results of Survey 1 indicated that practitioners recognised the relevance of 50 principles seen to be important to IM and KM. The data, when aggregated for each enabler shows a ranking of enablers from most to least important in terms of IM and KM, however, the small number of responses precludes any statistical inference. Another limitation of this first survey is that the statements used to gauge the importance of each enabler were derived from the literature and as such were contrived to correspond to a single candidate enabler. Despite these limitations we believe this data indicates that all ten-candidate enablers were seen as important for the facilitation of sound IM and KM, and this initial exploratory assessment provided us with a foundation on which to base further research activities.

Although the response rate for survey two was quite high (71%), the sample size once again prohibits statistical data analysis. However, the main purpose of survey 2, which was to inform the researchers prior to embarking on interview and case study processes, was achieved. Although the order of enablers in Figure 1 (importance of enabler by principle), Figure 2 (ranking of enablers), and Figure 3 (significance of enablers) differs, the data does indicate that all ten enablers are seen as having an important role to play in the overall performance of organisational IM and KM activities. Furthermore, practitioners were able to distinguish between what is theoretically ideal (Question 8 in Survey 1) and the actual "state of practice" regarding that principle in their organisation (Question 4 in Survey 2). We have shown the alignment data alongside the significance data to indi-

cate the gap between the ideal and actual situations in our sample organisations. Further interpretation of this data could be used to show the fit against an aggregated benchmark for each organisation and enabler. This data could be then used by organisations to focus their IM and KM strategies. The data also suggest that a large quantitative data collection and analysis may produce some significant differences between theory and practice in this area.

CONCLUSION AND FUTURE RESEARCH DIRECTION

This exploratory analysis of IM and KM frameworks in business contexts has provided answers to the two research questions posed. The data from the 2 exploratory surveys confirmed that participants saw ten organisational factors as having a role in enabling information and knowledge management activities. The surveys also indicated that there are gaps between the significance of IM and KM enablers, and the actual situation in our sample of Australian organisations.

As expected, this study raises a number of further challenges that we will be pursuing. Firstly, a clear distinction between the processes required to manage information and knowledge is needed. Secondly, we need to gather more data to confirm the integrated framework and its component enablers. Thirdly, we will elaborate on the characteristics of the candidate enablers. Fourthly, we will describe the impact of each key enabler on IM and KM initiatives after organisational assessment in further case studies. Finally, (for now) we plan to describe the role of each enabler within IM and KM initiatives.

The overall goal of this on-going research is to provide practical guidelines to assist organisations optimize their environments so that the outcomes of IM- and KM-oriented projects are beneficial to them. This exploratory study has provided the foundation to achieve this goal.

ENDNOTES

1 Although this interest does seem relatively recent, philosophical discussions about knowledge and knowing engaged Plato and Aristotle and many scholars since. The potential of untapped knowledge within peoples minds was succinctly stated by Polanyi (1966) who said "*we know more than we can tell*" thereby emphasizing the current challenge for business.

2 Another view is that the current popularity of KM is largely driven by the commercial imperatives of software vendors and consulting firms.

3 Further discussion about IM and KM framework development is the subject of another paper by Nelson and Middleton (2001) currently under review.

4 A paper discussing the adoption of a multi-method research approach in IM and KM research is currently under development by the authors.

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