Measuring the Effects of Knowledge Management Practices

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Abstract: Successful managers focus their attention on factors that are critical in establishing and maintaining an organisation's competitive edge. The knowledge and skill of employees is one of those factors and it requires proactive management attention. Conceptually, this is achieved through Knowledge Management, a term that has existed in the mainstream of business lexicon for quite some time. Despite this, there is the conspicuous absence of a common understanding of the term that frustrates many managers. Studies have clearly established that there are three interdependent and complementary pillars that support the concept of Knowledge Management. These are Organisational Learning Management (OLM), Organisational Knowledge Management (OKM) and Intellectual Capital Management (ICM). OLM, which has so far dominated both academic and practitioner debate, concerns itself with the problem of capturing, organising and retrieving explicit knowledge, or information, and has led to the simplistic misconception that Knowledge Management only involves the capture, or downloading, of the content of employees' minds. ICM is dominated by those particularly interested in defining key performance indicators that will measure the impact and the benefits of applying knowledge management practices. If management requires measurement this is an essential task but it can only be undertaken once an organisation has clearly established the strategy-structure-process parameters to ensure it accesses, creates and embeds the knowledge that it needs...the OKM pillar of knowledge management. This paper looks more deeply at this pillar and in particular the lack of a general *integrative* approach to enhancing organisational performance in this key strategic area. It considers to what extent such an approach may help an organisation more effectively manage its most relevant source of competitive advantage. With a greater awareness of the various factors allied to the managing and leveraging of human oriented and system oriented knowledge assets, some proposals are put forward to assist in developing or redefining an organisation's intellectual capital reporting models in search of a planning, control and performance measurement system that accounts for the management of an organisation's intellectual assets.

Keywords: organisational learning management, organisational knowledge management, intellectual capital management, performance indicators, competitive advantage

1. Introduction

More than a decade ago, Handy (1996) suggested that managing the knowledge and skills of its employees was the current organisational challenge. Since then each of the management disciplines has sought to contribute to the concept of Knowledge Management (KM) in a rather independent way. This paper considers the possibility of an integrated approach using empirical data as the foundation for providing an idea of what could be done. Then, using deductive reasoning to argue its practical rationality, a model is developed that ought to enable organisations, and researchers, to gain a greater understanding of how it may be possible to bring an *integrative* approach to KM.

1.1 Interrelationship between OLM, ICM, and OKM

The respective scholarly and practitioner contributions in the broadly related fields of KM offer various theoretical perspectives from which to regard the management of knowledge related assets as the central role. Raub and Rüling (2001, p. 114) maintain that, while research on business strategy has been occupied with outlining a comprehensive knowledge-based theory of the firm, each of the management disciplines has contributed their own, quite often different, views on how to analyse and manage knowledge as an organisational resource. Even though it may be described in many different ways, KM is generally concerned with how organisations create (learning processes), disseminate (knowledge sharing), and measure (intellectual capital measurement) knowledge related assets (Argote 1999, Edvinsson and Malone 1997, Huber 1991, Sveiby 1997, Sveiby and Risling 1986).

In terms of creation, knowledge is considered endogenous (Romer 1986, 1990) driving increasing returns on investments in new knowledge. This perception encouraged extensive study of 'knowledge sharing', which emerged from the field of organisational learning. Successful knowledge sharing

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involves extended learning processes as new knowledge is integrated into products, services, or business processes both old and new (Nelson and Rosenberg 1993). Practically every writer on management argues that measurement is critical to the success of organisations (Fitz-Enz, 1995). Without measurement managers are unable to focus on the attainment of sustainable objectives because their attention is not focused on the appropriate facts. This has led to a plethora of measurement methods specifically focusing on the measurement of intellectual capital (see, for example, Andriessen 2004, Daum 2003, Lev 2001).

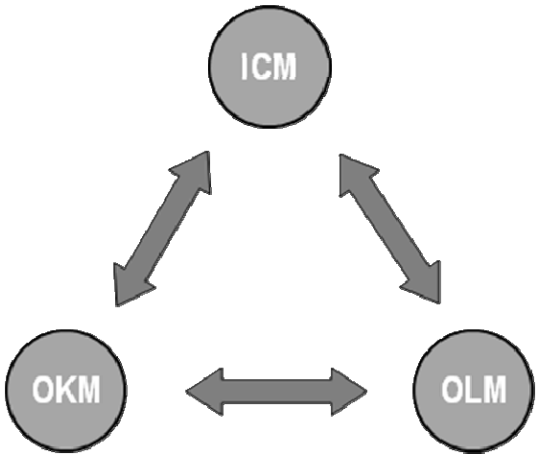

Figure 1: Categorisation of the main streams: ICM, OKM, and OLM

In summary, all contributions pertaining to the management of knowledge may be allocated to one of the following three interdependent and complementary pillars (Minonne 2007a):

- Intellectual Capital Management (ICM)
- Organisational Knowledge Management (OKM)
- Organisational Learning Management (OLM)

These three pillars relate to each other, by informing one another as depicted in Figure 1. According to Minonne (2007b), OKM strategies inform OLM initiatives about *what* organisational learning practices to implement. Hence, OKM is more concerned with the definition of the methodology perspective and, as such, it can be argued that OLM is more focused on the concrete procedures, methods, and techniques to implement new or refined KM practices and thus supports a change of strategic management direction (Argyris 1982, 1990, Argyris and Schön 1978). OLM is also concerned with the *management* dimension of knowledge by offering appropriate procedures, methods, and techniques for facilitating organisational learning and, following an inductive strategic management approach (i.e. from individual- to group- to organisational-learning), towards the implementation of specific organisational learning practices (Trillitzsch 2004, in Minonne 2007b). The remaining pillar, ICM, appears to be more concerned with the *measurement* of intangible assets as opposed to the more *management* oriented approach that has been discussed so far. ICM's goal is to identify those intangible factors not included on a traditional balance sheet, measure them, and present them in a coherent way. As such it will address factors other than simply knowledge but nevertheless it remains a prerequisite for more effectively conducting OKM.

1.2 Four forms of KM integration

These three pillars provide the foundation for a knowledge-based orientation of strategic management (Minonne 2007b) yet, at this time, they lack a unifying vision. Each of the three pillars needs to be considered when translating corporate strategy into contextual KM targets, which results in one or more of the defined targets relating to at least one of the pillars. Subsequently, the defined targets can be implemented by considering one of the following four complementary forms of integration.

Cultural integration allows KM to become an integral part of the overall organisational culture. It encourages the organisational knowledge exchange and its application with high value esteem and can therefore be conveyed systematically. Some common practices in this field are after action reviews, job rotations and communities of practice.

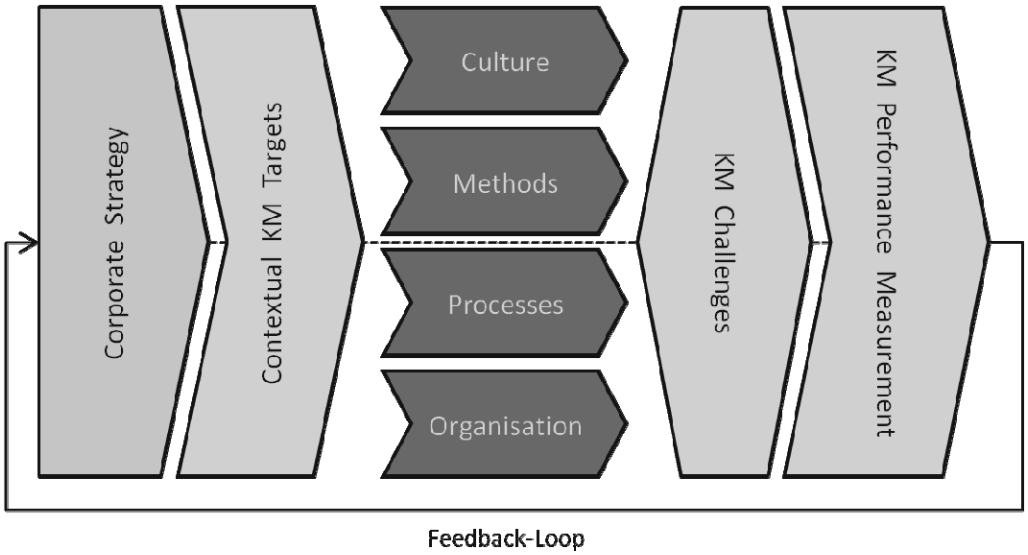

Figure 2: Adapted from Minonne (2008)

Methodical integration attempts to integrate human and system oriented KM practices into knowledge intensive work processes in such a way as to positively influence the organisational performance in terms of quality, productivity, and innovation gains. Some common practices in this field are:

- human oriented practices, including such methods as communities of practice, job rotation, coaching, mentoring, after action review and storytelling.
- technology oriented practices, including the likes of collaboration platforms, document management, yellow pages, skills inventories, expert systems, blogs and wikis.
- an *integrative* approach for managing implicit and explicit knowledge as explained in Minonne's (2007a) EIDA model.

Procedural integration aims to integrate KM into the business processes throughout the organisations' value chain so that it becomes an integral part of the intra- and inter-organisational work-flows. The aim of such practices typically lies in the implementation of continuous business processes, in the reduction of processing time, and the avoidance of work redundancy.

Organisational integration endeavours to integrate KM into the organisational structure and facilitate dedicated management of the organisational knowledge base. Some common approaches applied in this field are the centralisation, decentralisation, and responsibility (for example revenue, cost, profit, investment) centres.

A field study with over 260 participants from more than 250 different organisations in various industries was recently conducted in the German spoken region of Europe (Minonne 2008). The study concentrated on determining the level of success respondents had in each of the four forms of KM integration and on the *integrative* management of implicit and explicit knowledge (Minonne 2007b) as well as their ability to assess and manage performance.

In the field study, 26% of the respondents indicated that cultural integration was the prime contributor to successful KM followed by methodical integration, which for most respondents reflected on human oriented KM practices, with 25%. Organisational integration was best for 22% of respondents and a further 20% considered procedural integration their best option. The remainder of respondents recognised other, non-integrative factors as the keys to their KM successes. Despite the emphasis on one or the other particular form of integration, it was understood that organisations should really consider each of these four forms in parallel if they want to implement KM practices in an *integrative* manner. The challenge for management is to comprehend the optimum proportion of each that is best suited to their organisation.

2. From corporate strategy to contextual KM targets

It is widely acknowledged that the knowledge based view of the firm is an outgrowth of the resource based view that, in addition to land, labour, and capital, regards knowledge as the key resource. This emphasises the role of organisational capabilities to create sustainable competitive advantage (Barney 1991, Hamel and Prahalad 1990, Wernerfelt 1984). In other words, a knowledge based view regards knowledge assets and the organisation's capabilities as prime strategic resources (Grant 1996, Spender 1996).

Goh (2004) advocates that knowledge adds value to an organisation through its contribution to products, processes and people. Furthermore, Turner and Jackson-Cox (2002) emphasise that knowledge creation within an organisation centres on the crucial presumption that human based knowledge is created and enlarged by means of social interaction. Relying on Nonaka and Takeuchi's (1995) work, they conclude it is this interaction that converts individuals' explicit knowledge into collective, structural and procedural, that is implicit knowledge within an organisation. On the other hand, KM transforms these intellectual assets into enduring value by identifying knowledge that is useful for management actions. According to Minonne (2008), in coordination with an organisation's strategic objectives, KM provides support in exploring, innovating, disseminating and automating corporate knowledge. An *integrative* KM approach embraces cultural, organisational, procedural, and methodical integration and as such enhances an organisation's capability for productivity, quality and innovation gains.

Despite such a positive outlook, the field study established that more than 50% of respondents do not have a defined KM strategy. Of the remainder, only 12% reported that their KM strategy was founded from their overall corporate strategy. Subsequently, the participants were asked how actively KM was practiced in their organisation. One third of the respondents reported not practising KM at all, 17% expect to do so in the short to medium term with the remainder confirming active KM. Unfortunately, nearly 40% of those active in KM admitted to being unable to judge their performance because they have few or no measurement tools and lack the appropriate skills to develop them.

To understand the success or otherwise of an organisation's activities in each of the recommended four forms of integration, it is essential to find key indicators that measure performance (KPIs). Generally these fall into two groups. The first is *effectiveness* (for example, quality improvement or innovation gains) and the second is *efficiency* (for example, productivity increase through improved business processes). An insight of the study is that organisations having a KM strategy and actively managing it focus particularly on the efficiency dimension as it can be operationalised more easily compared to the effectiveness dimension expressed, for example, in new knowledge creation.

An effective performance measurement system includes critical success factors, a mix of financial and non-financial data, and a balance between different views. Furthermore, effective performance measures are dynamic and therefore, apart from being subject to change at any time, will not be appropriate in every situation. At all times, however, they will always be congruent with organisational objectives, easily understood by all employees and promote intended behaviour within the organisation (Turner 2000).

3. Challenges related to KM performance measurement

Looking back on the field study, the following question was asked to understand the challenges facing management in their pursuit of world class KM: *Which challenges does your organisation have to overcome?* On a scale between 'no challenge at all' and 'a big challenge', the big challenges identified by the respondents were deriving KM targets from strategy, developing the KM culture, finding the balance between human oriented and system oriented KM practices (generally referring to technology focused approaches), and measuring performance.

3.1 Deriving KM targets from strategy

The importance of KM in positioning an organisation for growth and sustainability requires identification, quantification, reporting and participating in the coordination of the various knowledge elements in an organisation. More than a decade ago IFAC (1998) highlighted the need for better tools to monitor an organisation's investment in knowledge assets such as people skills, information bases and technological capabilities. This requires past and future oriented information, both financial

and non-financial information, and both numerical and textual information. In other words the targets to be monitored should be measurable (Turner 2000).

Effectiveness is often confused with efficiency and this is mostly reflected in strategic objectives. As organisations strive to achieve their goals they may become more efficient but their effectiveness doesn't always improve. In other words, it is possible to be both effective and efficient but rarely does it happen at the same time. Unfortunately, sometimes the price of greater efficiency is less effectiveness. When setting KM targets efficiency is about speed and cost whereas effectiveness is about quality and purpose. Effectiveness comes from taking the time to stop and evaluate and should therefore be the first considered when setting KM targets from strategy.

Earlier it was emphasised that the KM targets need to be measurable. This will require the development of extensive quantitative, mainly operational and financial, and qualitative measurements in support of KM strategy. A quantitative approach to measurement promises a more sustainable information base compared to a qualitative one. If, for whatever reason, a quantitative assessment is not a realistic option, a qualitative approach to performance measurement is a better option than no measurement at all.

3.2 Developing a KM culture

With cultural integration being considered a prime contributor to the success of KM practice, it is critical for the development of an organisation's KM culture to have senior management involved to the extent of *practising what they preach*. This was supported by half of the participants in the field study. Next, communication between all members of an organisation is paramount. Indeed, that was the view of most of the participants in the study. Of particular relevance to 61% of the respondents actively managing knowledge was the idea of collaboration between old and young personnel. The old contribute knowledge acquired through experience (particularly the tacit dimension) whereas the young bring new theoretical ideas from their recent education (the implicit dimension). Continuing the communication concept, communities of practice should also contribute greatly to the dissemination of individual and organisational knowledge yet only 36% of respondents actively use this practice.

Historically, management by objectives and reward systems have been used to modify specific aspects of organisational culture (Cattell 2005). With the management of knowledge this is seen as counterproductive. Indeed, 86% of the respondents actively managing knowledge support this view.

3.3 Alignment of human oriented and system oriented KM practices

Although we live in a time where technology offers highly sophisticated system features, the first step in KM should always be bound to human factors. On many occasions organisations have made the mistake of introducing high quality technology before employees were sensitised and motivated for the use of the new system's capabilities. If it is accepted that effectiveness precedes efficiency it would be preferable to start with the human oriented approach because it represents a precondition for taking a system oriented approach and it is more promising in achieving short-term success in KM. Ideally, both orientations should be aligned by taking an *integrative* approach. This was also explained in Minonne's (2007a) EIDA model.

This view is supported by the results of the field study where 36% of the respondents focused on human oriented KM practices, about half more strongly than others. Of these organisations, 67% suggested that it was a most successful approach to KM and that their targets were well achieved. System oriented KM practices were the preferred option for 31% of the respondents yet only 39% of those were happy with their achievement of targets. A small proportion, just 23%, tried to actively align the two orientations with 63% of those being satisfied with their performance. Just 10% of respondents had a haphazard approach to KM with 42% of them being happy with what they did. These results clearly indicate that organisations with an aligned approach, or at least focusing on a human orientation, are significantly more effective in KM than those using only a system slant.
The choice of orientation of KM practices for actively conducting KM in an organisation is a difficult one that will inevitably be tied to strategic direction. Furthermore, justification of the expenditures involved in that choice, by describing the benefits in quantifiable terms using relevant KPIs, is the most significant challenge for all organisations.

3.4 Measuring performance

Progress toward thinking about the knowledge aspects of business will require an operationally useful framework within which a broader range of data concerning the knowledge resources of an organisation may be collected and analysed. In keeping with the notion of a strategic involvement, this effort should not be confined to one functional area but should be fully articulated with the financial and operational functions of the organisation in a unified whole. This epitomises a fundamental touchstone of strategic management in that it will integrate KM issues into the business plan.

No organisation can have a clear view of its direction and its future without fully taking into account the impact of knowledge assets on any strategic vision and the potential impact, in turn, of such strategic vision on its knowledge assets. In this regard, organisations need to demonstrate the linkages between their core business processes, the resultant KM choices and policies, and the impact on performance.

This may be best achieved by moving from vague, subjective terms to the more specific, objective language of numbers. That said, in the absence of a more useful measurement system, 36% of the field study respondents rely on the vaguer, qualitative forms of measurement while 31% used quantitative measures and the remainder no form of measurement at all. It was generally agreed that by using consistent, relevant data that is quantified where appropriate and compared with benchmarks and historical information where this is available, management will be able to reinforce their accountability in this ever increasing sphere of influence over organisational performance. Clearly a new, vibrant way to account for knowledge assets is wanted.

Historically, performance indicators fall into conceptually different categories. There are those that examine the results of a particular objective and others that measure management of the means or determinants to competitive success. The mix of factors used to gain a competitive advantage will vary, often significantly, among organisations. As a consequence, while indicators of results may be similar, those of determinants almost certainly will not which makes it impossible to design a completely generic system for measuring the performance of an organisation's KM practices (Turner 2005). Indeed, a custom solution is needed for almost every organisation.

In that respect, Fitz-Enz (1995) suggests there are five key underlying principles that should form the basis of developing a measurement system relating to an organisation's human resources, the prime knowledge assets of an organisation. First, the effectiveness and efficiency of any function should be measured by some combination of cost, time, quantity, quality or human reaction indices. Second, a measurement system promotes productivity by focusing attention on the important issues, tasks and objectives. Third, performance should be measured at both individual and team levels. Fourth, managers ought to be measured by the effectiveness and efficiency of the units they manage, and fifth, the ultimate measurement is not efficiency, but effectiveness. The last of these is probably the most important in so far as it should ensure that all the resources of an organisation, i.e. human, physical and financial, are directed toward achieving its strategic objectives.

Using these guidelines, the end product needs to help management evaluate how their objectives might be achieved by identifying each available alternative and the impact each of those alternatives will have on their organisation. It should also recognise the importance of each of the three pillars, OLM, OKM and ICM, in their own right as well as demonstrating their synergistic effects. With this information it should be "that if not the best, then at least better decisions about action can be made" (Chapman, 1997, p.202).

The accounting for, and reporting of, organisational knowledge therefore poses three principal challenges:

- First, there is a need for better tools to manage an organisation's investment in its knowledge assets.
- Second, there is a need to measure, over the long-term, an organisation's return on its investment in knowledge assets.

- Third, there is a need for some form of indicator that is capable of differentiating between organisations in which the knowledge base is appreciating and those in which it is depreciating.

4. Conclusions and recommendations

This paper, in particular, investigated the lack of a general *integrative* approach for measuring the effects of KM practices as a foundation for effective management decision making. We discussed the extent to which such an approach helps an organisation more effectively manage its knowledge assets. Despite an emphasis on one particular form of integration by many of the study's respondents, we recommend that each of the four forms of integration are considered in parallel if organisations want to implement KM practices in an *integrative* way. However, the challenge is to comprehend the optimum proportion of each that is best suited to the particular organisation.

With a greater awareness of the four forms of KM integration allied to the managing and leveraging of human oriented and system oriented KM practices and an appreciation of the optimum proportion of each, organisations should be better placed to create a performance measurement system that accounts for the management of an organisation's knowledge assets. Some suggestions have been made to assist in the development of an organisation's KM performance reporting model. Fundamentally, KPIs that measure effectiveness and efficiency of an organisation's KM initiatives in each of the four forms of integration are required. At present it appears that organisations having a KM strategy and actively managing their organisational knowledge focus, as their first priority, on the efficiency dimension because it can be operationalised more easily than the effectiveness dimension.

However, it appears there are many challenges facing organisations. One is the apparent difficulty in establishing a KM culture. This has its foundation in pursuing system oriented practices ahead of human oriented practices. This results in a leaning towards efficiency rather than effectiveness, which should be the first consideration. However, some alignment between both orientations is preferable and there are models available to assist in that regard (see, for example EIDA in Minonne 2007a). Another is an inability to derive KM targets from overall corporate strategy. A superior appreciation of the four forms of integration should help to resolve this challenge by establishing relevant measurable targets that inform strategic direction. Finally, there is the challenge of performance measurement. In some ways this derives from an inability to set targets but also arises from an inability to determine appropriate quantitative, preferably, or qualitative KPIs.

We argue that an effective measurement system to assess the effects of KM practices includes critical success factors, a mix of financial and non-financial data, and a balance between the four forms of integration. Organisations require appropriate, relevant and effective forms of performance measurement, which should be congruent with organisational objectives as well as easily understood by all employees and should promote intended behaviour within the organisation. Those that are unwilling, or unable, to develop effective measuring and reporting systems are likely to suffer from product or service quality decreases, lower productivity growth and a reduced ability to compete because they will be less successful in acquiring and using relevant knowledge resources.

Key performance indicators that are developed to assess the progress of organisations in this compelling activity need to be aligned with one or another of the four forms of integration and may be either qualitative or quantitative in nature. At present, in many organisations, there is no synchronised approach to measuring the effects of KM practices despite this being considered a foundation for effective corporate strategy development and management decision making. We acknowledge that there is no unique solution to this dilemma. Over many years, authors have proffered a variety of suggestions about the development of suitable KPIs for the management of knowledge assets (see, for example, Arora 2002, Edvinsson and Malone 1997, Fitz-Enz 1995, Lev 2001, Neely 2002, Sveiby 1997 and Turner 1996) but they have often been focused on operational, rather than strategic aspects of KM. Nevertheless, we continue the search for a solution, which will provide a fundamental paradigm shift from the traditional operational approach to a more strategic involvement in KM.

In a following paper we shall introduce our Knowledge Management Monitor (KM^2), which is supported by the concepts embedded in the Knowledge Management Maturity Model (KM^3). KM^3 is founded on the idea that successful KM requires a recipe comprising different proportions of the four forms of integration (cultural, organisational, procedural and methodical). KM^2 adopts a strategic

management concept, the balanced scorecard, and promotes a balance between the four forms of integration, which is considered the prime consideration in measuring KM performance.

Intangibles, and in particular intelligence, are becoming the true sources of an organisation's competitive advantage. Knowledge, especially operational knowledge, has a limited shelf life and, while it is necessary to manage it effectively, it is not sufficient to create a competitive edge. Strategic knowledge and its effective management, on the other hand, is the key to exploiting current competitive advantages and creating new ones. This change in emphasis requires a transformation in the nature of an organisation's knowledge management system, which we believe will be well served by KM^2 and KM^3.

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