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Developing a Scorecard for Enterprise Knowledge Management

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Abstract

Enterprise knowledge management is becoming a critical component of competitive success. Managers must ensure that they can successfully generate, leverage and reuse knowledge assets in their organisations. In this view, they must seek to develop an environment that promotes effective knowledge management initiatives. Self-assessment audits can help managers and decision makers ascertain whether they are incorporating best practices in terms of knowledge management initiatives. This paper presents findings from an exploratory case study analysis. Specifically, it presents a knowledge management scorecard expressly designed to help managers to measure their performance in terms of knowledge management against best practice. It helps to provide an overview of a company's strengths and areas for improvement with regard to knowledge management, highlighting those areas that require attention. In this view, it serves as a checklist for knowledge management.

Keywords

Knowledge Management, Self-Assessment Scorecard, Exploratory Case Study Analysis

1 Introduction

According to Drucker [1993], innovation is the application of knowledge to produce new knowledge. It requires systematic efforts and a high degree of organisation. As we enter the knowledge society, ownership of knowledge and information as a source of competitive advantage is becoming increasingly important. In other words, organisations depend more on the development, use and distribution of knowledge-based competencies. This is particularly relevant in knowledge intensive processes such as research and development (R&D) and product innovation. Consequently, R&D organisations are starting to pay attention to the concept of managing their knowledge base in order to increase competitive advantage, through effective decision-making and increased innovation [Nonaka 1991], [Davenport et al 1996], [Sveiby 1997]. Knowledge is a key resource that must be effectively managed if improvement efforts are to succeed and businesses are to remain competitive. Audits or scorecards can help managers and decision makers improve their knowledge management initiatives. They assess whether the conditions necessary for effective knowledge management are in place and the degree to which best practice is used. The use of scorecards provide an overall assessment of the practices adopted with respect to best practices and enables decision makers to identify whether or not the required managerial processes and practices are in place [Chiesa et al 1996]. This paper aims to facilitate the understanding of knowledge and knowledge related work. Key concepts are defined from the outset. A knowledge management audit specifically designed to identify key success factors for successful knowledge management is developed using qualitative research techniques and presented in this paper. This scorecard is intended to help managers and leaders to measure their performance against best practice.

2 Understanding Knowledge, Information and Data

Understanding the key concepts of data, information and knowledge is important for setting the scope of this study. Many authors have noted that there is a difference between these concepts [Knock et al 1997], [Wilson 1996], [Bohn 1994]. Data is characterised as a set of discrete facts about events and the world. Glazer [1991] contends that information is "*data that have been organised or given structure – that is placed in context – and thus endowed with meaning*". In other words, information is the outcome of capturing and providing context to experiences and ideas. Knowledge on the other hand is composed of tacit experiences, ideas, insights, values and judgements of individuals [Bohn 1994]. It is dynamic and can only be accessed through direct collaboration and communication with experts who have the knowledge. According to Wilson [1996] by selecting and analysing data, we can produce information and by selecting and combining information we can generate knowledge. The processing hierarchy of data, information and knowledge is illustrated below (cf. Figure 1).

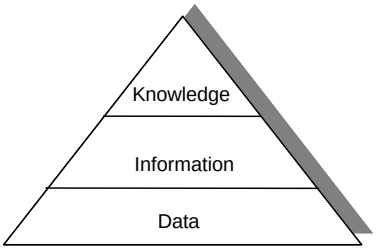

Figure 1 Hierarchy of Knowledge Assets

It is important to note that information technologies can help translate data in to information. Information, on the other hand, is converted into knowledge through social human process of shared understanding and sense making at both the personal level and the organisational level. According to Churchman (1971) "*to conceive of knowledge as a collection of information systems seems to rob the concept of all its life……Knowledge resides in the user and not in the collection. It is how the user reacts to the collection of information that matters*". Therefore, managing knowledge is about creating an environment that fosters the continuous creation, aggregation, use and reuse of both organisational and personal knowledge in the pursuit of new business value.

3 Understanding Knowledge Work

The nature of knowledge work is ad hoc, demand driven and creative [Harris 1999]. Davenport et al [1996] contends that knowledge work focuses on the acquisition, creation, packaging or application of knowledge. In this view, knowledge work is complex and diverse and it is performed by workers with a high level of expertise and competence. According to Harris [1999], a knowledge worker is formally defined as one who gathers, analyses, adds value and communicates information to empower decision-making. A knowledge worker's job entails doing work for which there is no finitely determined process. Their tasks are not prescribed in advance, but are determined just in time in response to issues, opportunities or problems as they arise. Each event may require the development of customised or unique content and collaboration with a different group of people. According to Laudon and Laudon [1999] not only do knowledge workers use their knowledge to interpret incoming information, but they also create new knowledge as well. Takeuchi [1998] contends that knowledge workers now constitute up to 35-40% of the workforce and these will become the leading social group. Drucker [1993] believes that the great management task of this century will be to make knowledge work productive. Davenport et al [1998] also state that organisations' core competencies will centre on managing knowledge and knowledge workers in the future. They add that industrial growth and

productivity gains will depend heavily on improvements in knowledge work. However, there is little evidence (anecdotal, empirical or otherwise) to suggest that adequate provision is made for promoting, capturing, sharing and disseminating knowledge in organisations. Also, as knowledge management initiatives and systems are just beginning to appear in organisations, there is little research and field data to guide the development and implementation of such systems or to guide the expectations of the potential benefits of such systems. Upon analysis it seems that these deficits must be addressed. Thus, a viable approach is critically needed for improving knowledge work. In this view, it is imperative to design an environment to support both knowledge work and knowledge workers.

4 Research Approach

Researchers are calling for greater employment of field based research methods in order to cope with the growing frequency and magnitude of changes in technology and managerial methods [Lewis 1998]. Consequently, this study uses case study analysis. Qualitative research methods such as case study analysis can help us to understand the social and cultural contexts within which people work. In this instance, no attempt is made to isolate the unit of analysis from its context, but instead the unit of analysis is of interest precisely because of its relation to its context. This approach is also suitable for exploratory, theory building research where the emphasis is on sense making and meaning. The strength of case study research is that it employs various sources of evidence to improve the accuracy and comprehensiveness of resulting theory [Johnston et al 1999], [McCutcheon and Meredith 1993]. Qualitative data sources include observation and participant observation (i.e. fieldwork), interviews and questionnaires, documents and texts, as well as the researcher's impressions and reactions. By adopting this approach, the strengths of one data collection method compensates for the weaknesses of the other. In addition, the subject can be examined from different angles and a more complete picture of the situation is provided

Six case studies were conducted during this study. The aim of this activity was to understand the knowledge management in specific industrial contexts. The sample chosen for this analysis was selective, based on Irish organisations with a reputation for adopting best practice. The industrial sector of the organisation's selected consisted of companies from many sectors including medical devices, electronics, telecommunications and pharmaceuticals. The goal of this analysis was (a) to understand knowledge management practices in each organisation and (b) to identify factors that facilitate knowledge management in industry. Figure 2 illustrates the research methodology employed in this study.

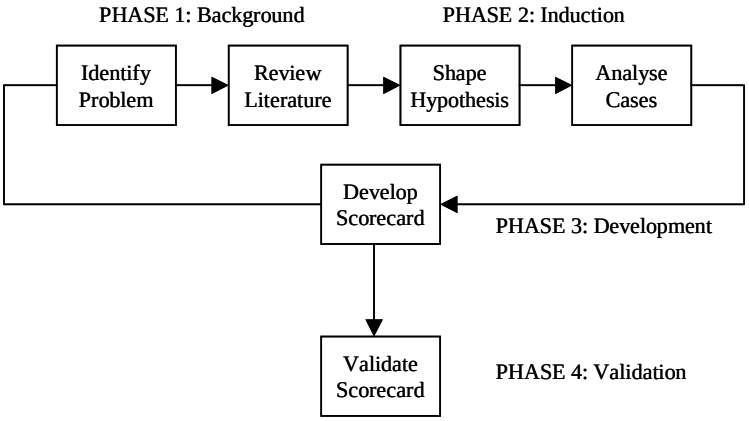

Figure 2 Research Methodology

There are four key stages in this methodology. These are (a) background, (b) induction, (c) development and (d) validation. These are briefly discussed below.

- **Background:** This phase incorporates defining the theoretical domain, targeting the research, identifying the problem and determining the scope of the study.
- **Induction:** This phase comprises analysing the data within and across organisations or cases, developing initial hypothesis and comparing hypothesis to the literature and cases.
- **Development:** This phase involves developing and presenting the knowledge management scorecard.
- **Validation:** The final phase incorporates evaluating and verifying the scorecard against proven theoretical concepts and industrial practice.

The next section summarises the key findings from this study. Specifically, it presents critical factors that are important for developing an effective environment to facilitate successful knowledge management initiatives. From this a knowledge management scorecard is developed and presented.

Comment [KC1]: Introduce the scorecard – is it a checklist of success factors or is it intended as a more extensive continuous performance management instrument?
What level in the organisation is it used?
Has it been validated and tested?
Practical Application and use of the scorecard…(testing and validation)

How do we redesign the organisation based on these findings?
Out a roadmap in place to help us

5 Critical Factors for Effective Knowledge Management

The findings of this study revealed that the key to successfully managing knowledge resources in organisations is multifaceted. However, an organisation's attributes or characteristics can have a significant impact on knowledge management initiatives. Therefore, companies must purposefully construct strategies and structures so as to enhance knowledge generation, transfer and reuse. Consequently, if organisations wish to encourage these activities they must explore the range of identifying factors. Takeuchi [1998] asserts that western companies pay too much attention to managing explicit knowledge (managing existing knowledge) at the expense of tacit knowledge. It is important to remember that companies do not merely manage knowledge; they create it as well and everyone in the organisation should be involved in knowledge creation. Therefore, building an effective environment depends on adopting a holistic approach to all aspects of the organisation. This includes people, process as well as technology related issues. From our study we have identified and grouped five key categories that enable effective knowledge management. These are; (1) Strategy and Leadership; (2) Culture and Climate; (3) Architecture and Structure; (4) Motivation and Performance; and finally; (5) Communication and Collaboration. Each of these categories facilitate knowledge activities in organisations and therefore must be effectively managed.

5.1 Strategy and Leadership

Strategy and leadership have been identified as the first critical success factor to enable enterprise knowledge management. Defining a clear purpose and strategic intent are critical to the success of knowledge management endeavours [Ulrich 1998], [Kotnour et al 1997]. Strategy influences knowledge generation and use by providing a context for the perception and interpretation of the environment and a boundary to decision-making. Leaders have the ability to influence a group towards the achievement of goals. Their role is to create a vision and effectively communicate this by setting clear objectives.

5.2 Culture and Climate

Creating a culture and climate for knowledge generation, transfer and use has a positive impact on knowledge management [Davenport and Prusak 1998]. It is possible to create an organisation that has an appropriate culture to enable knowledge creation, transfer and reuse. This is achieved by developing a culture of openness and sharing, teamwork by motivating and engaging people and embedding knowledge management activities in the day-to-day business processes, internal

systems and structures. In this view, knowledge management initiatives can change values, norms and behaviours, which in turn can have a direct impact on performance.

5.3 Architecture and Structure

An organisation's architecture and structure has been identified as a critical success factor for knowledge based work. Communities of practice and autonomous cross-functional teams are emerging as the dominant organisational component of the new economy. They are more consistent with flatter, more flexible and more responsive organisations. Here, work is organised around value adding processes or projects that are carried out by small, multi skilled, self managed teams.

5.4 Motivation and Performance

Peoples' ideas, skills, experience and motivation will drive the knowledge-based economy; therefore motivation and performance measurement systems must become a component of overall corporate strategy. Motivation theory suggests that individuals respond positively to stimuli that reward achievement and performance. Performance measurement and reward systems are key elements in aligning the interests of employees to that of the organization [Liebeskind 1996], [Bukowitz and Pertrash 1997]. They can be adjusted to encourage the desired behaviour from all staff. Therefore, if organisations wish to encourage knowledge management activities such as knowledge sharing and reuse they must design motivation and measurement systems that incorporate these activities.

5.5 Collaboration and Communication

Communication increases the amount of information directly in that more communication usually yields more information. Collaboration facilitates the cross fertilisation of ideas. Communication among employees and with outsiders stimulates their performance. Thus, the better that members are connected with each other and with key outsiders the better their performance.

In sum, this study identified five success factors for effective knowledge management. Over time, the application of these success factors may influence the cultural norms of an organisation and contribute to the development of an environment for effective knowledge management. In order to ascertain the degree to which these practices are incorporated, a self-assessment scorecard based on these factors was developed. The scorecard is a self-assessment audit that consists of fifty statements, or traits, based on the critical success factors model. It is targeted at the organisational level of the company. It enables managers and decision-makers to acquire an overview of their strengths (to be exploited) and weaknesses (to be improved) with regard to knowledge management. In other words, it serves as a checklist for effective knowledge management. This acts as the critical first stage in an organisations continuous performance management process. The knowledge management scorecard simply requires respondents to circle the extent to which they agree or disagree with the statements. The list of statements is presented in table 1.

6 Action plan

The self-assessment scorecard enables analysts and decision makers to understand their AS-IS situation or current state in terms of best practice knowledge management (cf. Figure 3). This involves measuring their activities against best practices. It helps to provide an overview of a company’s strengths and areas for improvement. It can also be used as a mechanism to focus and prioritise improvements to where it is most needed. Finally, the scorecard can act as a means of measuring progress over time through periodic comparisons.

Please circle the extent to which you agree or disagree with these statements
1 represents strongly agree and 5 represents strongly disagree

STATEMENT	SCORE				
Strategy and Leadership					
1. The organisation has an effective knowledge management strategy in place	1	2	3	4	5
2. The knowledge management strategy is clearly defined and communicated to all employees	1	2	3	4	5
3. All knowledge management initiatives are linked to strategies	1	2	3	4	5
4. The knowledge management strategy is used to establish the appropriate priorities	1	2	3	4	5
5. The knowledge management strategy is supported by key performance measures	1	2	3	4	5
6. Leaders create a vision and effectively communicate this by setting clear objectives	1	2	3	4	5
7. Strategies are flexible enough to respond to changes in the environment	1	2	3	4	5
8. Top management team collaborates effectively	1	2	3	4	5
9. Senior management are accountable for knowledge management outputs	1	2	3	4	5
10. Top management actively promote the generation, transfer and use of information	1	2	3	4	5
Culture and Climate					
1. The organizational culture promotes idea generation	1	2	3	4	5
2. There is a formal idea generation process in place	1	2	3	4	5
3. The organisation provides support for codifying critical information	1	2	3	4	5
4. Risk taking is actively encouraged	1	2	3	4	5
5. There is a high level of trust in the organisation	1	2	3	4	5
6. Adequate resources are dedicated to achieve knowledge management goals	1	2	3	4	5
7. All employees participate in generating ideas	1	2	3	4	5
8. We proactively share knowledge and information with each other	1	2	3	4	5
9. All operations are driven by customer needs	1	2	3	4	5
10. There is an effective mentoring system in place	1	2	3	4	5
Architecture and Structure					
1. The organisational structure is flexible and organic	1	2	3	4	5
2. The structure enables the voice of the customer to be captured effectively	1	2	3	4	5
3. The organisational structure promotes knowledge generation and learning	1	2	3	4	5
4. Autonomous cross functional teams are used to implement projects	1	2	3	4	5
5. Project teams are organic, flexible and agile	1	2	3	4	5
6. All team operations are driven by customer needs	1	2	3	4	5
7. All team members are mutually accountable	1	2	3	4	5
8. Team members are empowered to make decisions	1	2	3	4	5
9. Teams work together to solve problems	1	2	3	4	5
10. There is a high level of co-operation across the organisation	1	2	3	4	5
Motivation and Performance					
1. Performance indicators are clearly defined and communicated to all employees	1	2	3	4	5
2. Performance indicators are aligned with the organisations goals	1	2	3	4	5
3. Effective performance indicators are used	1	2	3	4	5
4. Performance indicators encourage desired behaviour	1	2	3	4	5
5. Knowledge sharing and reuse is actively encouraged and rewarded	1	2	3	4	5
6. The organisation defines and measures performance against customer requirements	1	2	3	4	5
7. Team members rewards are equitable	1	2	3	4	5
8. Performance indicators should be developed which demonstrate	1	2	3	4	5
9. The value of knowledge is monitored according to its contribution to the bottom line	1	2	3	4	5
10. Adequate and effective training is provided to all employees	1	2	3	4	5
Communication and Collaboration					
1. Virtual team members are equipped with effective ICT tools	1	2	3	4	5
2. The “right” information is available at the right time, and in the right format	1	2	3	4	5
3. Collaboration facilitates the cross fertilisation of ideas	1	2	3	4	5
4. Alliances are often formed with other organisations for mutual benefit	1	2	3	4	5
5. Communications among team members is efficient and effective	1	2	3	4	5
6. Communications between project teams is efficient and effective	1	2	3	4	5
7. Information on ideas generated, problems raised and project status are accessible	1	2	3	4	5
8. Communities of practice enable core competencies to be	1	2	3	4	5
9. Individual skills are effectively leveraged within and between project teams	1	2	3	4	5
10. Virtual team members seamlessly communicate with each other	1	2	3	4	5

Table 1 Knowledge Management Scorecard

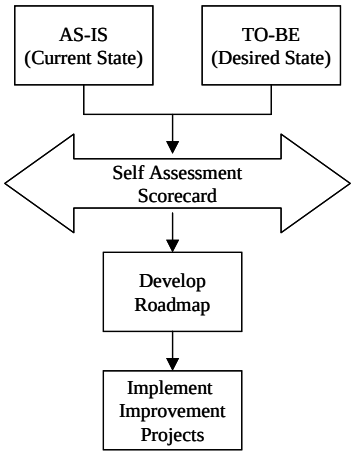

Figure 3 Migration Methodology

The next step in the process is to identify the TO-BE or desired state. From this, an implementation roadmap can be developed**.** A Roadmap is a time based plan that defines where an organisation wants to go, and how it intends to get there. This involves developing a social and technical infrastructure**.** A roadmap incorporates developing visions, defining strategies, setting goals, identifying performance indicators, establishing milestones, and lists of tasks with associated timelines. It helps focus resources on the critical tasks that are needed to meet those objectives. Finally, the performance of the new situation must be continuously monitored to ensure that key performance indicators are being met.

7 Conclusions

Research indicates that an organisation's core competencies will centre on managing knowledge and knowledge workers in the future. It seems that industrial growth and productivity gains will depend heavily on improvements in knowledge work. Thus, a viable approach is critically needed for improving knowledge work. This paper aims to improve the understanding of knowledge and knowledge related work. It aims to develop a critical success factors model for managing knowledge management initiatives in industry. From this a scorecard is developed that aims to help managers and influencers understand their strengths and their weaknesses with regard to knowledge management.

Self-assessment scorecards can help analysts and decision makers to identify gaps between their current and desired performance. They enable decision makers to identify where successful strategies can be further exploited and pinpoint where problems, or potential, problems lie. Furthermore, they provide the necessary information that can be used to develop action plans to improve performance. In other words, the self assessment process not only enables managers to draw in existing knowledge but also to apply it in a structured manner to their own priorities and concerns.

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