



University of
Salford
MANCHESTER

Knowledge management and organisational performance: a literature review

Pathirage, CP, Amaratunga, RDG and Haigh, RP

Title	Knowledge management and organisational performance: a literature review
Authors	Pathirage, CP, Amaratunga, RDG and Haigh, RP
Type	Conference or Workshop Item
URL	This version is available at: http://usir.salford.ac.uk/9960/
Published Date	2004

USIR is a digital collection of the research output of the University of Salford. Where copyright permits, full text material held in the repository is made freely available online and can be read, downloaded and copied for non-commercial private study or research purposes. Please check the manuscript for any further copyright restrictions.

For more information, including our policy and submission procedure, please contact the Repository Team at: usir@salford.ac.uk.

KNOWLEDGE MANAGEMENT AND ORGANIZATIONAL PERFORMANCE : A LITERATURE REVIEW

C.P. Pathirage, R.D.G. Amaratunga and R. Haigh
Research Institute for the Built and Human Environment
University of Salford, Salford M7 1NU
E-mail: C.P.Pathirage@pgr.salford.ac.uk

ABSTRACT: Although knowledge management is considered as a very recent phenomenon, research in to knowledge and the management of the knowledge within the business context has grown dramatically over the last few years, in a number of different directions. As a result, a great deal about, what knowledge is and the ways in which knowledge is managed, have been addressed by many authors. However, despite the growing body of theory, there are relatively few knowledge management texts that make an explicit connection between knowledge and performance. Knowledge is not always utilised and that utilised knowledge does not always result in improved performance. Thereby measurement of performance is of utmost importance for an organisation to ensure the successful implementation of knowledge management exercise. This paper is aimed at reviewing literature on both knowledge management and organisational performance. Based on the review it was underlined knowledge management as a strategy which leads to performances. The paper highlighted the extreme importance of looking into the performance measures which can be deployed in knowledge organisations and recommends further research to be carried out on this regard.

Keywords – Organisational strategy, Performance measurement, Knowledge management

1. INTRODUCTION

Knowledge management is a concept that has emerged explosively and that has become a hot topic in the business community over last few years. Academics and practitioners from different disciplines have become active partners in this relatively recent phenomenon. Yet the degree of interest, the view and the interpretation of so call knowledge management seems to be depending on the environment and the profession of these academics and practitioners. Thereby review of current literature reveals numerous definitions of knowledge management due to this wide range of interest, perspectives and issues represented by different authors. In general terms, knowledge management is used to refer to all efforts, to enhance and increase the value of the generation, sharing and application of knowledge. Knowledge and the management of knowledge appear to be regarded as increasingly important features for the organisational effectiveness, survival and maintenance of competitive strength (Martensson, 2000). Therefore effective knowledge management is a critical success factor in organisations and it is some thing that must be done correctly in order to contribute to the real business objectives.

Many organizations are embracing knowledge management but few of them are able to implement it successfully to see the benefits. Even if they achieve benefits, the measurement of benefits/ progress of knowledge management is of utmost importance for an organization to ensure that the objective of the knowledge management exercise is being fulfilled. When it comes to measurement of the performance and also benefits of knowledge management activities in an organization there are few methods that authors have suggested (Arora, 2002). Also there are relatively few knowledge management texts that make explicit connection between knowledge and performance (Kalling, 2003). This highlights the utmost importance of the issue of how to measure the performance of a knowledge management approach in an organisation.

It is intended from this paper, to present a literature review on the current developments in knowledge management and organisational performance. Since it is not feasible to cover all the literature, as a researcher who has just started the work, the aim of the survey is not so much to summarise but to draw some conclusions on aforesaid disciplines and thereby to find out the correlation, if any, between two. The paper is organised broadly into three sections out of which the first section is devoted on gaining some critical insights on knowledge and knowledge management. The second portrays the organisational performance and the evolution of measurement frameworks, where as in the final section, a critical examination of relationship of these two disciplines is presented.

2. KNOWLEDGE AND KNOWLEDGE MANAGEMENT

2.1 Knowledge and its Characteristics

Land, labour and capital was considered as the traditional factors of production. With the realisation of the importance of knowledge as a primary resource, the classical factors of production have become secondary to knowledge. Thereby knowledge has become more relevant to sustained business than capital, labour or land and considered as a very crucial factor affecting an organisation's ability to remain competitive in today's fast changing and non-linear business environment. Knowledge based theory of the firm postulate that knowledge is the only resource that provides sustainable competitive advantage (Roberts, 1998) and therefore, the firm's attention and decision making should focus primarily on knowledge and the competitive capabilities derived from it. The significance of knowledge as a fundamental factor behind an enterprise's success was highlighted with the above and it is important at this end to find out what constitute the knowledge and how it is generated within organisations. Better understanding of knowledge will be a pre-requisite for the successful exploitation of the same.

Knowledge involves thinking with information. But the context in which information is used seems to be varying. According to Beveren (2002) Information is data within a context, where data are raw facts that can be shaped and formed to create information. Definitions on knowledge seem to be hinting two different perspectives i.e. on technological perspective, where as the other attempts to accent the human intervention in knowledge. But still there is an ongoing argument to say whether knowledge involve any human aspect/ involvement or not. This highlight from the following citation done by Beveren (2002); "Even though some argue knowledge can be acquired, stored and used outside of the human brain, for some knowledge cannot exist outside of the human brain and that only information and data can exist outside of the brain". But yet most of the definitions on knowledge has a higher credence on the personal relevance and stresses the human intervention. As Grey (1996) argues knowledge is the full utilisation of information and data, coupled with the potential of people skills, competencies, ideas, intuition, commitment and motivation. Therefore knowledge, as a "justified true belief", is that which people believe and value on the basis of the meaningful and organised accumulation of information through experience, communication or inference. Yet one point needs to be stressed to this end i.e. "knowledge is not information". Information requires processing and transforming to be knowledge. In this regard, the six characteristics of knowledge described by Mc Dermott (1999) provide a good platform to distinguish it from information. As he asserts;

- (1) Knowledge is a human act
- (2) Knowledge is the residue of thinking
- (3) Knowledge is created in the present moment
- (4) Knowledge belongs to communities

(5) Knowledge circulates through communities in many ways

(6) New Knowledge is created at the boundaries of old.

The first two characters reinforce and uphold the argument on the human aspect of the knowledge. As any other system knowledge too contains its sub-components.

Knowledge is classified in terms of public versus private, component versus architectural (Matusik and Hill, 1998), hard versus soft knowledge, tacit versus explicit and so on. But most commonly knowledge is divided into two, explicit and tacit. Explicit knowledge is clearly formulated or defined, easily expressed without ambiguity or vagueness and codified and stored in a database. Tacit knowledge is the unarticulated knowledge that is in a person's head that is often difficult to describe and transfer (Bollinger & Smith, 2001). Therefore, this in a way harmonise the argument on whether knowledge is a technology or personal thing. As Wiig et al (1997) perceives knowledge too possesses some inherent characteristics. Knowledge is intangible and difficult to measure, volatile, increases with use, can be used by different processes at the same time, often has long lead times and has wide-ranging impact on the organisation. Having discussed about knowledge and its characteristics, it is worthwhile at this point to look into, what is knowledge management, for the effective management of this valuable resource. As the amount of knowledge ever increases within an organisation, there needs to be some formal policy to manage organisational knowledge effectively. This process of managing and providing access to organisational knowledge commonly called knowledge management.

2.2 Knowledge Management

As portrayed in the previous section, knowledge is a valuable asset that needs to be managed. There are many definitions of knowledge management, all of them hinting the same idea, but highlighting different facets of the organisations. The strategic perspective of knowledge management seems to be the most famous. According to Milton et al (1999) knowledge management is to provide strategies to get the right knowledge to the right people at the right time and in the right format. The seminal work done by the authors like Bollinger & Smith (2001), Dawson (2000), Bhatt (2002) certainly make the strategic perspective of knowledge management more famous over the others. Yet the writers like Beveren (2002) define knowledge management as a practice that finds valuable information and transforms it into necessary knowledge critical to decision making and action. This considers knowledge management as a supporting tool for decision making and performance. However it is worthwhile at this point to mention some influential work done by writers Wiig (1996) and Poynder (1998), which in a way have largely shaped this new phenomenon of knowledge management.

As Wiig (1996) perceives knowledge management in organisations must be considered from three perspectives with different horizons and purposes; Business perspective, Management perspective and Hands-on operational perspective. Therefore the definitions provided by most of the authors will fall under one or more perspectives provided by Wiig. For Gregory (1996), knowledge management consists of activities focused on the organisation gaining knowledge from its own experience and from the experience of others to fulfil the mission of the organisation, which in turn underline the business perspective of knowledge management. While highlighting the management perspective, Beveren (2002) argues that the main focus for knowledge management should be on human intellectual capital and strategies for human resource management that encourage creativity and innovation within and between employees. In the context of operational perspective, knowledge management is usually concerned with capturing an organisation's know-how and know-what through creation, collection, storage, distribution and application (Miller, 1999).

By taking entirely different path to Wiig's three perspectives of knowledge management, Poynder (1998) argues on three major schools of thought on what knowledge management is. The first school suggests that knowledge management is primarily an information technology issue. The underlying premise of this school of thought is seen as, building of extensive computer networks to allow more sharing of information and knowledge. But one finds a very strong opposition on this school of thought. This is evident from Newman (1991), who cites knowledge management as not a technology thing or a computer thing. The second school evoke that knowledge management is more of a human resource issue with emphases on organisational culture and teamwork. It considers strong, positive organisational culture as a critical factor in developing and sharing of skills, resources and knowledge. The third or the final school promotes the development of processes to measure and capture the organisation's know-how. As the author perceives the third school suggested by Poynder goes in hand in hand with the operational perspective of knowledge management described by Wiig. The second school represents the combination of both business and the management perspectives of the same. Thereby it depicts a close relationship between the work of both Wiig and Poynder on knowledge management.

The origin of this new phenomenon called knowledge management has gained its roots from different disciplines. DiMattia and Oder (1997) argue that the growth of knowledge management has emerged from two fundamental shifts: downsizing and technological development. Even knowledge management complements and enhances other organisational initiatives such as Total Quality Management (TQM), Business Process Re-engineering (BPR) and organisational learning (OL), providing a new and urgent focus to sustain competitive position. Thereby it can be argued that the advent of knowledge management as a consequence of application of techniques like TQM, BPR etc., in view of improving the operational and the organisational performance. Therefore as authors like Gooijer (2000), Armistead (1999), Kalling (2003), Steele et al (2003) argued, knowledge management as a technique which enhances the organisational performances. To this end it is worthy to get some basic insights on organisational performance before dealing with knowledge management as performance augment tool.

3. PERFORMANCE AND MEASUREMENT FRAMEWORKS

3.1 Organisational Performance and Measurement

The word performance is widely used in all fields of management. Terms such as performance management, measurement, evaluation and appraisal are commonly discussed in management literature. Despite the frequency of use of the word performance, its precise meaning is rarely explicitly defined by authors. Often, performance is identified or equated with effectiveness and efficiency (Neely et al., 1995). The review of oxford dictionary depicts, "carrying out a task" as the meaning for the performance. Performance is referred to in most of the references as either an action (obtaining performance) or an event (a result) or both simultaneously. In view of this, according to Bourguignon (1995) performance refers simultaneously to the action, the result of the action and to the success of the result compared to some benchmark. All in all performance is doing today, what will lead to measured value outcome tomorrow. Thereby in view of better outcome for tomorrow, throughout the last two decades a number of industries, primarily manufacturing, have introduced new methods and techniques to shift traditional paradigms.

This has led to the creation of new philosophies such as concurrent engineering/construction, lean production/construction and many others such as Just-In-Time (JIT), TQM, etc. As Kagioglou et al (2001) perceives the main driver behind those philosophies is to

optimise an organisation's performance both internally and externally within its respective marketplace. In turn this has led to the rethinking of performance management systems through effective performance measurement and as a consequence performance measurement has become a very popular topic in recent years both in academic and management literature (Amaratunga, 2001).

While explaining the distinction between performance management and measurement Bititci et al (1997) describes performance measurement system as "... is the information system which is at the heart of the performance management process and it is of critical importance to the effective and efficient functioning of the performance management system." A much more simple definition given by Evangelidis (1992), portray performance measurement as the process of "... determining how successful organisations or individuals have been in attaining their objectives [and strategies]". It is necessary for organisations to implement an effective performance measurement system that "enables informed decisions to be made and action to be taken because it quantifies the efficiency and the effectiveness of past actions through acquisition, collation, sorting, analysis, interpretation and dissemination of appropriate data" (Neely, 1998). This highlights that performance measurement system has a number of constituent parts;

- Individual measures that quantify the efficiency and effectiveness of action
- A set of measures that combine to assess the performance of an organisation
- A supporting infrastructure that enables data to be acquired, collated, sorted, analysed, interpreted and disseminated.

Thereby as the author perceives, a performance measurement framework should exploit and address all these three aspects to be effective. Due to the failure in effective exploitation of aforesaid aspects, together with so many other failures have given rise to number of performance frameworks to be proposed, which needs some elaboration.

3.2 Evolution of Performance Measurement Frameworks

It is important to consider how an organisation's performance is measured and how it can be communicated to the wider market i.e. how can it be understood and interpreted by the potential investors, employees and customers. For many years frameworks have been used by organisations to define the measures that they should use to assess their performance. As evident, those performance indicators have traditionally concentrated on finances e.g. return on investment, sales per employee, profit per unit production. DuPont used a pyramid of financial ratios, which linked a wide range of financial ratios to return on investment. The apparent inadequacy of financial measures for contemporary businesses has been identified by a number of authors, like Johnson (1994), Crawford & Fox (1990), Hayes et al (1988), Johnson and Kaplan (1987). Following a review done by T. Johnson and R. Kaplan, highlighted the failure of financial performance measures to reflect changes in the competitive circumstances and strategies of modern organisations. But much more comprehensive reasoning out for the heavy criticisms on financial measures was presented by Neely (1999) who identified the following;

- Encourage short-termism
- Lack strategic focus and fail to provide data on quality, responsiveness and flexibility
- Encourage local optimisation
- Do not encourage continuous improvement

Organisations that rely on financial measures alone can identify their past performance but not what contributed to achieve that performance. Therefore, in addition to measuring 'what' the performance of an organisation was, the 'how' that performance was achieved should also be identified on an on-going basis.

The subsequent revolution in performance measurement promoted organisations to implement non-financial measures that appropriately reflect their objectives. Thereby in view of overcoming the drawbacks of financial measures, Keegan, Eiler and Jones (1989) proposed a performance measurement matrix reflecting the need for balance measurement. It categorised measures as being “cost” or “non-cost” and “external” or “internal”, reflecting the need for greater balance of measures across these dimensions. The SMART (Strategic Measurement and Reporting Technique) pyramid developed by Wang Laboratories also supported the need to include internally and externally focused measures of performance. Following their study of performance measurement in services industries, Fitzgerald et al (1991) proposed a framework classifying measures into two basic types. Those that relate to results (competitiveness, financial performance) and those that focuses on the detriments of those results (quality, flexibility, resource utilisation and innovation). Beside all these performance measurement frameworks one of the most popular measurement framework has been the balance scorecard (BSC) proposed by Kaplan and Norton (1992). As writers like Kennerley and Neely highlighted, one salient feature of BSC is that it reflects many of the attributes of other measurement frameworks but more explicitly links measurement to the organisation’s strategy.

The Balanced Scorecard (BSC) is a performance management system which incorporates four main measurement categories (perspectives) each of which with a wide range of potential sub-measures. The difference with traditional approaches to performance measurement is that it includes a range of "leading and lagging" indicators - customer perspective, internal/business processes, learning and growth, and financial - to evaluate whether a business is moving toward its strategic goals (Gentia Software, 1998). Despite its widespread use, numerous authors have identified shortcomings or drawbacks of the BSC. Many authors have highlighted the absence of measurement of the human resource perspective/ employees’ satisfaction, supplier performance, product/ services quality and environmental/ community perspective in the BSC model (Maisel, 1992; Ewing and Lundahl, 1996; Lingle and Schiemann, 1996; Brown, 1996). A further criticism of the BCS is that it does not reflect different dimensions of performance as the SMART pyramid and results and determinants model do. As Kagioglou et al (2001) point outs BSC does not make an attempt to identify the relationship between the measures developed for certain goals, assuming that all measures will only be specific to a particular goal.

While the balanced scorecard has been criticized for not taking a broad enough view of the stakeholders who interact with an organization, a new measurement tool call performance prism was developed which defined the performance of the organisation from a number of perspectives. Executives in organizations across the world recognize and accept that the business empires they manage have a broader role to play in the 21st century than simply delivering value to their shareholders (Epstein). Now – and increasingly in the future – the best way for organizations to survive and prosper in the long term will be to think about the wants and needs of all of their important stakeholders and endeavour to deliver value to each of them.

Performance Prism addresses all of an organisation’s stakeholders – principally investors, customers, end-users, employees, suppliers, alliance partners, regulators and communities. A subtle, but vitally important, twist in the Performance Prism is the distinction between what the stakeholders want of the organization and what the organization wants of its stakeholders (Adams and Neely, 2001).

Having put heads together on knowledge management and performance frameworks separately, it is important at this end to find out the relationship of these two disciplines in the organisational context.

4. KNOWLEDGE MANAGEMENT AND ORGANISATIONAL PERFORMANCE

Despite the widespread recognition of the importance of knowledge, it is not so obvious to measure and nurture knowledge so that contribution of knowledge is linked explicit business performance improvement (Ahn & Chang, 2002). A survey done on U.S. and European organisations has recognised the importance of knowledge to a firm’s success and difficulties faced in measuring the value and performance of knowledge asset. Therefore, for the successful implementation of knowledge management, the measurement of knowledge management performance is of absolute necessity. In the recent years different research contributions about how the management of intangible assets can contribute to improve business performance and to create value for organisation have been produced (Marr et al, 2003). Most of these studies have investigated the link between knowledge management and performance measurements from different perspectives. Two most common perspectives are the strategic based view and the process based view.

Researchers like Firestone (2001) and Robinson et al. (2001) have focused their work on how the impacts of knowledge management initiative on business performance can be evaluated and measured by the use of Comprehensive Benefit Estimation (CBE). Other authors (Anderson 2002; Kingsley 2003) have focused their attention on quantitative measures of knowledge management project impacts, for example Return on Investment (ROI). Some researches have analysed casual relations between knowledge management initiative implementation and business performance improvement (Armistead 1999; Chong et al. 2000). As Marr et al (2003) asserts “all the analysed contributions, concerning the link between knowledge management and performance, highlight that the most important factor for driving knowledge management initiatives is the company strategy”. Thereby the relevance of strategy and measurement of results gained from knowledge management initiative are expressly discussed by aforementioned researches.

In parallel to this the strategic based view of the knowledge as portrayed in the section 2.2 highlights the importance of managing knowledge as a strategy, which ultimately reflects in the organisational strategy. Organisational strategy defines the organisation relative to its environment which includes defining the core competencies of the organisation. The establishment of the strategic positioning and direction of an organisation and the implementation of that strategy are almost certainly the factors which have greatest impact on its success. As Bailey & Clarke (2001) suggested managers can appreciate the currency of knowledge management by relating the knowledge to be managed organizationally to four distinct arenas of managerial focus – existing and potential strategy, and existing and potential performance. Together these cover where the organization is now, where it’s going and how it’s going to get there.

	Existing	Potential
Strategy	(B) <i>Strategic fit</i> where and how are we competing now?	(C) <i>Strategic potential</i> where are we going to compete in the future?
Operational processes	(A) <i>Performance management</i> how well are we delivering to strategic objectives?	(D) <i>Performance development</i> how can we enhance our current or future performance?

Fig. 1 Managerial knowledge portfolio(Bailey & Clarke, 2001)

The main four areas suggested by Bailey & Clarke (2001) in view of managing knowledge are shown in the figure 1. Knowledge for each area is to be driven by the critical question of each domain. According to Zack (1999) “an organisation’s strategic context helps to identify knowledge management initiatives that support its purpose or mission, strengthen its competitive position and create shareholders value”. Thereby the basic argument of the researches who perceive strategic view is that the starting point to define a knowledge management initiative is company’s strategy, through which organisation can establish its strategic objectives requiring knowledge management initiative to be achieved.

A recent study done by Ahn and Chang (2002) suggested a framework for valuation of knowledge, called the KP³ methodology which stresses the process view. The basic building blocks of the KP³ methodology consist of four components: Knowledge, Process, Product and Performance.

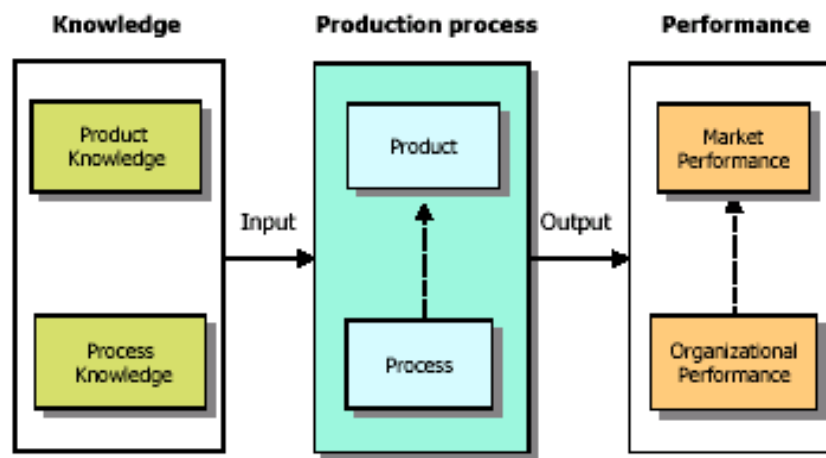


Fig. 2 Overview of KP³ methodology (Ahn and Chang, 2002)

As depicted in the figure 2 knowledge is further classified into two: product knowledge and process knowledge whereas performance is divided into market and organisational performance. While the KP³ methodology leads the process view of knowledge management performance, the frameworks suggested by Bornemann & Sammer (2003), Steele et al (2003) combines the both strategic and process view of knowledge performance. Bornemann & Sammer, in their knowledge management assessment model stresses four levels of potential intervention, starting with the strategy focused target level, next covering all knowledge workers, then action level focusing on operations and processes and finally to data level. The framework devised by Steele et al, uses a set of key performance indicators (KPIs) stretching from strategic to operational level.

Despite specific work done in combining knowledge management and performance measurement, many authors expressly admit the difficulty of measuring the contribution of knowledge on business performance (Kalling 2003; Steele et al 2003; Ahn and Chang 2002; Marr et al, 2003). The issue of how to measure the success of a knowledge management approach is one which is still being explored by organisations, researchers and management consultants (Gooijer, 2000). As Marr et al (2003) perceives the relevant problem for organisation is not only necessarily to measure knowledge management impacts on performance, but also to improve its ability to exploit and create knowledge in order to increase the value for its stakeholders. The immeasurable nature of knowledge has made this much more difficult and also has made it a great challenge to be achieved.

5. CONCLUSION AND FURTHER RESEARCH

This paper attempted to draw the relationship between the knowledge management and the organisational performance through a review of current literature on the subject area. A thorough reading of available knowledge management and performance literature was virtually impossible due to the current scope of the field and especially due to limited time period of the study. Yet paper reviewed some major frameworks from both knowledge management and performance measurement, with regard to the issue of converting knowledge into improved performance. In the process, knowledge and knowledge management was illustrated and the evolution of performance measurement was discussed.

All in all, knowledge management can be considered as a managerial approach which drives managers in applying and developing organisational knowledge in view of increasing competitive advantage over time. But most important issue to be addressed is how an organisation can evaluate a knowledge management initiative focused to improve business performance. The literature analysis revealed the difficulty expressed by many authors to link knowledge management and business performance. The intangible and the immeasurable nature of the knowledge have caused this difficulty to a great extent. As Marr et al (2003) cites another reason which aggregate this problem is due to the difficulty in understanding the cause-effect relationship between knowledge management and business performance improvement. Over and above all these, two issues were highlighted from the knowledge management assessment frameworks discussed in section 4. Firstly the necessity for clear identification of benefits expected from knowledge management exercise. In fact, many organisations embark on knowledge management initiatives without a clear idea of what business benefits they could expect. In this regard the strategic view of knowledge performance is of immense importance. Secondly the proper selection of performance measurement framework which would enable organisations to assess the envisioned knowledge management targets. Thereby a comprehensive framework needs to address both these issues, which rarely found in current literature. Case being this, to this end it is of utmost importance to further investigate on performance measures which could be deployed in knowledge organisations.

6. REFERENCES

- Ahn, J.H. and Chang, S.G., (2002), *Performance oriented knowledge management methodology*, Invited paper for journal of management information systems.
- Amaratunga, R.D.G., (2001), *Theory building in facilities management performance measurement: application of some core performance measurement & management principles*, Ph.D. thesis, University of Salford, UK.
- Anderson, M., (2002), *Measuring intangible value: the ROI of knowledge management*, [online] www1.astd.org/news_letter/member/links/Anderson.html.
- Armistead, C., (1999), Knowledge management and process performance, *The journal of Knowledge Management*, Vol.3(2), pp.143-154.
- Arora, R., (2002), Implementing KM- A Balance Scorecard approach, *The Journal of Knowledge Management*, Vol.6 (3), pp.240-249.
- Bhatt, G., (2002), Management strategies for individual knowledge and organisational knowledge, *The Journal of Knowledge Management*, Vol.6 No.1, pp 31-39.
- Beijerse, R.P., (2000), Knowledge management in small and medium sized companies: knowledge management for entrepreneurs, *The Journal of Knowledge Management*, Vol.4 (2), pp.162-179.

- Bailey, C. and Clarke, M., (2001), Managing Knowledge for personal and organizational benefit, *The Journal of Knowledge Management*, Vol.5 (1), pp58-67.
- Bellinger, G., (1997), *Knowledge Management – Emerging Perspectives*, www.outsights.com/systems/kmgmt/kmgmt.htm (visited 2nd February 2003)
- Beveren, J.V., (2002), A model of knowledge that refocuses knowledge management, *The journal of Knowledge Management*, Vol.6(1), pp.18-22.
- Bititci, U.M. et al., (1997), Integrated performance measurement systems: an audit and development guide, *The TQM magazine*, Vol.9(1), pp.46-53.
- Bollinger, S. and Smith, D., (2001), Managing organizational knowledge as a strategic asset, *The Journal of Knowledge Management*, Vol.5 (1), pp8-18.
- Bornemnn, M. and Sammer, M, (2003), Assessment methodology to prioritize knowledge management related activities to support organisational excellence, *Measuring business excellence*, Vol.7(2), pp 21-28.
- Chong et al., (2000), Where does knowledge management add value?, *Journal of Intellectual capital*, Vol.1(4), pp366-380.
- Crawford, K.M, and Fox. J.F., (1990), Designing performance measurement systems for just-in-time operations, *International research of production research*, Vol.28(11), pp.2025-2036.
- Dawson, R., (2000), Knowledge capabilities as the focus of organisational development and strategy, *The journal of Knowledge Management*, Vol.4(4), pp.320-327.
- DiMattia, S. and Oder, N., (1997), Knowledge management: hope, hype or harbinger?, *Library journal*, Vol.122(15), pp.33-35.
- Epstien, M. J., *Measuring and managing performance in the 21st Century*.
- Evangelidis, K., (1992), Performance measurement is performance gained, *The Treasurer*, February, pp.45-47.
- Firestone, J. M., (2001), Estimating benefits of knowledge management initiatives: concepts, methodology & tools, *Journal of the KMCI*, Vol.1(3).
- Fitzgerald, L. et al., (1991), Performance measurement in service business, *The chartered institute of management accountants*, London.
- Gentia Software, (1998), *Balanced Scorecards; in Gentia Software, Inc. Gentia & Balanced Scorecard*, GartnerGroup.
- Gooijer, J., (2000), Designing a knowledge management performance framework, *The journal of Knowledge Management*, Vol.4(4), pp.303-310.
- Gregory, R., (1996), *What is knowledge management?* [online]. The knowledge management forum, Available From : http://www.km-forum.org/what_is.htm
- Grey, D., (1996), *What is knowledge* [online]. The knowledge management forum, Available From : http://www.km-forum.org/what_is.htm
- Gulthrie, J., (2000), Intellectual capital review: measurement, reporting and management, *The journal of Intellectual Capital*, Vol.1 (1).
- Hayes, R.H. et al, (1988), *Dynamic manufacturing: Creating the learning organisation*, free press, New York, NY.
- Johnson, H.T., (1994), Relevance regained: Total quality management and the role of management accounting, *critical perspective on accounting*, Vol.5(2), pp.259-267.
- Kagioglou, M et al, (2001), *Performance management in construction: A conceptual framework*, *Performance management and measurement-* mike perm paper.
- Kalling, T., (2003), Knowledge management and the occasional links with performance, *The journal of Knowledge Management*, Vol.7(3), pp.67-81.
- Kaplan, R.S. and Norton, D.P., (1992), Balance Scorecard-measures that drive performance, *Harved business review*, January-February, pp.71-79.

- Keegan, D.P. Eiler, R.G. and Jones, C.R., (1989), Are your performance measures obsolete?, *Management accounting (US)*, Vol.70 (12, June), pp.45-50.
- Kennerley, M. and Neely, A., (2002), *Performance measurement frameworks: A review*, in *Business performance measurement: theory and practice*, University of Cambridge, UK
- Kingsley, M., (2003), *Measuring the return on knowledge management*, [online] www.llrx.com/features/kmroi.htm
- Marr et al, (2003), Linking knowledge management initiatives & business performance: The knowledge asset value creation map, Proceedings of 4th European conference on knowledge management, MCIL, 18-19 September 2003.
- Martensson, M., (2000), A critical review of knowledge management as a management tool, *The journal of Knowledge Management*, Vol.4(3), pp.204-216.
- Matusik, S. and Hill, C., (1998), The utilisation of contingent work, knowledge creation and competitive advantage, *Academy of management review*, Vol.23, pp.680-697.
- Mc Dermott, R., (1999), Why information technology inspired but cannot deliver knowledge management, *California management review*, Vol.41, pp.103-117.
- Miller, W., (1999), Building the ultimate resource, *Management review*, January, pp.42-45.
- Milton, et al., (1999), Towards a knowledge technology for knowledge management, *International journal human-computer studies*, Vol.51, pp.615-641.
- Neely, A.D., (1998), *Performance measurement: Why, what and how*, London economics books.
- Neely, A.D., (1999), The performance measurement revolution: Why now and what next?, *International journal of operations and production management*, Vol.19(2), pp.205-228.
- Neely, A.D and Adams. C.A., (2001), The performance prism perspective, *Journal of cost management*, Vol.15(1), pp.7-15.
- Neely, et al., (1995), Performance measurement system design – a literature review and research agenda, *International journal of operations and production management*, Vol.15(4), pp.80-116.
- Newman, B. (1991) *An open discussion of knowledge management* [online]. The knowledge management forum, Available From : http://www.km-forum.org/what_is.htm
- Poynder, R., (1998), Getting to the nuts and bolts of knowledge management, *Information world review*, April, p.20.
- Roberts, H., (1998), *The bottom-line of competence-based management: management accounting, control and performance measurement*, presented at EAA conference, Antwerp.
- Robinson et al, (2002), *Evaluating knowledge management strategies: an IMPakT assessment*, Proceedings of 3rd European conference on knowledge management, ECKM2, 24-25 September 2002, Dublin.
- Roos, J. et. al., (1997), *Intellectual capital – Navigating in the new business Landscape*.
- Rowley, J., (1999), What is knowledge management?, *The Journal of Knowledge Management*, Vol.20 No.8, pp 416 - 419.
- Steele, A et al., (2003), A framework to create key performance indicators for knowledge management solutions, *The journal of Knowledge Management*, Vol.7(2), pp.46-62.
- Wiig, K.M., (1997), Knowledge management : where did it come from and where will it go?, *Expert systems with applications*, Vol.13(1), pp.1-14.
- Wiig, K.M. et al, (1997), Supporting knowledge management: a selection of methods and techniques, *Expert systems with applications*, Vol.13(1), pp.15-27.
- Zack, M., (1999), Developing a knowledge strategy, *California management review*, Vol.41(3), pp.125-145.