



Measuring knowledge management performance using a competitive perspective: An empirical study

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ABSTRACT

This paper proposes an approach of measuring a technology university's knowledge management (KM) performance from competitive perspective. The approach integrates analytical network process (ANP), which is a theory of multiple criteria decision-making and is good at dealing with tangible and intangible information, with balanced scorecard (BSC) that contains four perspectives, including customer perspective, internal business perspective, innovation and learning perspective, and financial perspective, being adopted as the indicators of KM performance measurement (KMPPM). This paper makes three important contributions: (1) it propose a methodology of comparing an organization's knowledge management performance with its major rivals to offer effective information for improving KM, increasing decision-making quality, and obtaining clear effort direction of attaining competitive advantage; (2) it explores the case involving a lot of findings that present the positions of the case organization against its major rivals and imply that the technology university has to reinforce knowledge creation and accumulation to catch up with its competitive rivals; and (3) it is generic in nature and applicable to benefit an organization. The results prove the proposed method can act as a measurement tool for the entire KM of an organization.

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1. Introduction

Despite the various studies trying to develop metrics and methods to measure knowledge (Edvinsson, 1997; Lee, Lee, & Kang, 2005; Liebowitz & Wright, 1999), people think knowledge measurement is one of the most difficult parts of the knowledge management (KM) activities (Ruggles, 1997). Some studies argue that knowledge cannot be measured, but that activities or outcomes associated with applying knowledge can be measured (Ruggles, 1998). However, knowledge is a critical factor in an organization's competitiveness. It is also the future value of an organization. Nevertheless, knowledge is intangible and difficult to measure. Therefore, how to manage knowledge, becomes a critical issue, and KM becomes the key to success for an organization. To obtain effective knowledge management, it is necessary to be able to measure KM performance (Ahn & Chang, 2004). However, most of the metrics and methods of knowledge measurement that have been developed are concentrated on measuring the knowledge within the organization. In this hypercompetitive environment, the contributions of a KM performance measurement method will be seriously limited without comparing with major rivals from competitive

perspective. Thus, its most important task is to compare the organization's KM performance with that of its major competitors, to find out what is required to attain the competitive edge.

To achieve this aim, this paper proposes an approach of measuring KM performance from competitive perspective. This approach integrates the analytical network process (ANP) with balanced scorecard (BSC) that contains four perspectives, including customer perspective, internal business perspective, innovation and learning perspective, and financial perspective, being adopted as the indicators of KM performance measurement. The ANP employed in this paper is a multi-attribute decision-making approach based on the reasoning, knowledge, experience, and perceptions of experts in the field. Even though it does not provide an optimal solution, it is valuable for MCDM involving intangible attributes that are associated with strategic factors (Joseph, 1999). One of the major advantages of using ANP is its capability to evaluate the consistency of the decision-maker while making pair-wise comparisons of the relevant importance of the environments.

The remainder of this paper is organized as follows. In Section 2, the relative literatures are reviewed. The details of the approach and a case study are illustrated in Section 3. Then, in Section 4, some important issues such as implications, limitations, and so forth are discussed. We conclude this paper in Section 5 with suggestions and future researches.

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2. Literature review

2.1. Knowledge management performance measurement

In recent years, the evaluation of KM performance has become increasingly important, since it promotes strategic organizational learning and so provides the capabilities required to meet customer needs (Marr, 2004; Smits & Moor, 2004). Some recent examples are as follows. Ahn and Chang (2004) developed the AP³ methodology to assess the contribution of knowledge to business performances by employing product and process as intermediates between the two (Ahn & Chang, 2004). González, Giachetti, and Ramirez (2005) proposed a knowledge management system (KMS) called “a KM-centric help desk”, which is designed to be incorporated into the daily operation of the help desk, to draw up diverse knowledge resources in the organization including databases, files, experts, knowledge bases, and group chats (González et al., 2005). The benefits of the KMS are evaluated using a simulation study with actual data from a help desk. Lee et al. (2005) provided a knowledge management performance index (KMPI) for assessing the performance of a firm in its KM at a point in time (Lee et al., 2005). For the purpose of the KMPI, they had defined a knowledge circulation process (KCP) as a logistics function having five components: knowledge creation, knowledge accumulation, knowledge sharing, knowledge utilization, and knowledge internalization. When the KCP efficiency increases, the KMPI expands as well, enabling firms to become knowledge-intensive.

KM performance measurement methods are broad categories of research issues. It may be said that the method developments are diversified due to researchers' backgrounds, expertise, and problem domains (Alavi & Leidner, 2001). In the prior research, we classified KM evaluation methods by using the following eight categories (Chen & Chen, 2005): qualitative analysis, quantitative analysis, financial indicator analysis, non-financial indicator analysis, internal performance analysis, external performance analysis, project-orientated analysis, and organizational-orientated analysis, together with their measurement matrices for different research and problem domains. These methods are summarized in Table 1.

2.1.1. Qualitative and quantitative approaches

A qualitative research approach was finalized by using the outcomes of a pilot study and the reviews by researchers of organizational learning. For example, the success of knowledge can be shared in an organizational culture, not only technological knowledge, but also the knowledge related to behavioral factors (Hertzum, 2002). In addition, expert interviews, critical success factors method (CSFs), and questionnaires are used to implement qualitative methods for exploring specific human problems.

From an organizational perspective, attention to an organization's internal controls has increased significantly since the 1990s. Changchit et al. used a questionnaire for an experimental examination to test how satisfactory the expert system was, to be able to facilitate the transfer of internal control knowledge to management (Changchit, Holsapple, & Viator, 2001). The results indicated that expert systems are viable aids for transferring internal control knowledge to managers. Longbottom and Chourides reported on interviews with key staff members of organizations, at various stages of approaching and deploying KM programs (Longbottom & Chourides, 2001). In a follow-up paper, the researcher investigated issues concerning the CSFs and measurements of KM, establishing practical and key factors likely to enhance the successful implementation of a KM system (Chourides, Longbottom, & Murphy, 2003).

The aim of quantitative analysis is to present the extent of the impact on both decision-making and task performance, using his-

Table 1

A review of KM performance evaluation perspectives.

Category	Sub-categories	Researchers
Qualitative analysis	Questionnaire	Changchit et al. (2001)
	Expert interviews	Longbottom and Chourides (2001)
	Critical success factors	Chourides et al. (2003)
Quantitative analysis Financial indicator analysis	Return on investment	Laitamaki and Kordupleski (1997)
	Net present value	Stein et al. (2001)
	Tobin's q	Lev (2001) Hall et al. (2000)
Non-financial indicator analysis	Communities of practice	Smits and Moor (2004)
	Individual, context, content and process knowledge assessment	Holt et al. (2004)
Internal performance analysis	Balanced scorecard	Kaplan and Norton (1996) Martinsons et al. (1999)
	Activity-based evaluation	Hasan and Gould (2001)
External performance analysis	Benchmarking	Marr (2004) Pemberton et al. (2001)
	Best practices	Asoh et al. (2002)
Project-orientated analysis	Social patterns	Bresnena et al. (2003)
	KM project management model	Kasvi et al. (2003)
Organizational-orientated analysis	Intellectual capital	Edvinsson (1997) Sveiby (1998)

torical data that is easily available, relevant, accurate, and timely. This evaluation can avoid the drawbacks of qualitative analysis, especially in the subjective judgment of empirical results. Therefore, a quantitative research approach is designed to represent a tangible, visible and comparable 'ratio'. In other words, quantitative analysis can be used to measure the explicit knowledge of an organization or an individual, with both financial and non-financial indicators as discussed below.

2.1.2. Financial and non-financial approaches

Traditional quantitative methods focus on well-known financial measures, such as the analysis of financial statements, the payback period, the return on investment (ROI), the net present value (NPV), the return of knowledge (ROK), and the Tobin's q . These methods are best-suited to measure the value of daily transaction processing systems.

Laitamaki and Kordupleski used an ROI index to evaluate KM projects and performance in customer value added (CVA) products (Laitamaki & Kordupleski, 1997). From a managerial perspective, Stein et al. deployed a knowledge-based system which was designed to automate tasks previously performed manually, train new staff members, and capture knowledge, to enable a university organization to improve services (Stein, Manco, & Manco, 2001). Performance evaluation used NPV to diagnose the project outcome. Finally, the system could be viewed as an estimation tool, giving a competitive advantage to the organization (Stein et al., 2001). From an empirical point of view, it is well-known that Tobin's q ignores replacement costs for intangible assets because of the accounting treatment of intangibles (Lev, 2001). Therefore it is a fairly common practice, in studies using Tobin's q as a measure of corporate performance, to “correct” the denominator of q for the presence of

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