

**KNOWLEDGE MANAGEMENT CAPABILITIES AS PREDICTOR OF
PROJECT PERFORMANCE IN MALAYSIAN CONSTRUCTION
COMPANIES**

by

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**KEUPAYAAN PENGURUSAN PENGETAHUAN SEBAGAI PREDIKTOR
PRESTASI PROJEK DALAM SYARIKAT PEMBINAAN MALAYSIA**

ABSTRAK

Bagi memahami kejayaan dan kegagalan pengurusan pengetahuan (KM), keupayaan KM mesti dikenal pasti dan dinilai. Literatur telah menawarkan asas teori yang menganggap keupayaan organisasi sebagai prediktor prestasi KM. Dalam usaha untuk menjadikan KM lebih berkesan, kajian ini cuba untuk mengintegrasikan perspektif KM yang terbahagi ke dalam kerangka holistik iaitu merangkumi keupayaan infrastruktur pengetahuan (teknologi, struktur, dan budaya) dan keupayaan proses pengetahuan (perolehan, penukaran, penggunaan, dan perlindungan), berdasarkan kajian Gold (2001) dan prestasi projek dari segi masa, kualiti, kos dan keselamatan di samping manfaat projek. Bagi merapatkan jurang di antara teori dan praktikal, kajian ini menjajarkan unit analisis yang lebih rapat kepada peringkat pengamal pelaksanaan dengan memilih organisasi berasaskan projek iaitu syarikat pembinaan sebagai populasi kajian. Sebanyak 85 sampel boleh guna berdasarkan kuasa statistik dan saiz sampel Cohen (1998) telah diperolehi daripada Syarikat G7 yang disenaraikan di bawah Lembaga Pembangunan Industri Pembinaan (CIDB), Malaysia. Analisis regresi telah dijalankan melalui pemodelan Kuasa Dua Terkecil Separa (partial least square regression, PLS) menggunakan perisian SmartPLS[®]. Keputusan kajian ini menunjukkan bahawa terdapat hubungan yang positif di antara keberkesanan KM dan projek. Keputusan kajian ini adalah penting dalam mewujudkan satu instrumen kajian yang sah dan boleh dipercayai untuk syarikat pembinaan, serta dalam menyediakan bukti kukuh bahawa keupayaan

KM adalah penting untuk meningkatkan projek. Kajian ini juga mencadangkan hala tuju untuk kajian masa depan yang berkaitan.

**KNOWLEDGE MANAGEMENT CAPABILITIES AS PREDICTOR OF
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ABSTRACT

To understand the success and failure of knowledge management (KM), KM capabilities must be identified and assessed. Literature has offered theoretical grounding with regard to organizational capabilities as predictor of KM performance. In order to make KM more effective this study attempts to integrate the fragmented KM perspectives into the holistic framework including, knowledge infrastructure capability (technology, structure, and culture) and knowledge process capability (acquisition, conversion, application, and protection), based on Gold's (2001) study and project performance from the standpoint of time, cost, quality and safety in addition to project benefits. To bridge the gap between theory and practice, this study aligns unit of analysis more closely with the practitioners' level of implementation by selecting project based organization (PBO), namely construction organization as population. The sample of 85 useable respondents was collected through Cohen's (1988) statistical power and sample size conventions, from G7 Companies listed with CIDB. The regression analysis was conducted through partial least squares structural equation modelling using SmartPLS[®] software. The results of this study indicated that there is a positive relationship between effective KM and performance. The results of this study are valuable in establishing a valid and reliable survey instrument for construction companies, as well as in providing strong

evidence that KM capabilities are essential to improving performance. It also recommends direction for future related studies.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter begins by providing a background of knowledge management, the topic of this study, at the international level followed by the Malaysian construction scene. It further discusses the research gap to be filled by this study and a presentation of the research questions to be answered. The third section presents the objectives which this study seeks to achieve. The fourth section presents the scope of the research followed by the significance of the study. Finally, organisation of the research is presented in the last part of the chapter.

1.2 Background

In general, knowledge represents power, and through knowledge-sharing processes, the power and potential of knowledge is spreading (Buckman, 2004). Moreover, organisations must connect knowledge-oriented processes, technologies,

and organisational forms with their business strategies to maintain a sustainable competitive advantage (Zack, 1999).

Typically, organisations attempt to combine and coordinate their unique knowledge with traditional resources, processes, and capabilities in new and distinct ways, and transform them into innovative resources better than those of their competitors (Bakar, et al, 2011). Zack (1999, p. 128) stated that “knowledge can be considered the most important strategic resource, and the ability to acquire, integrate, store, share, and apply it the most important capability for building and sustaining competitive advantage”. Knowledge, especially tacit knowledge, is usually embedded in complex organisational processes and routines that are hard to imitate, so competitors need to engage in similar experiences that require time and effort in order to gain similar knowledge. For these reasons, the ability to identify, absorb, and utilize knowledge is critical to a company’s strategic success (Casselman & Samson, 2007). If organisation’s employees learn and accumulate knowledge from their experiences and reapply it beyond their core competencies so it is directly related to the company’s product or service, the company will gain a strategic advantage (Zack, 1999).

In recent times, knowledge has come to the front of organisational research and government policy, with terms such as ‘knowledge management’ and ‘knowledge economy’ becoming increasingly prominent. Since the mid 1990s there has been a noted increase in Knowledge Management both in research and in practice with many organisations now employing chief knowledge officers or chief learning

officers to develop a Knowledge Management strategy and to lead initiatives (Anumba, et al., 2005).

The weaknesses in the knowledge capability of the construction industry in many developing countries are well known and widely reported as in the studies by (Abu Bakar, 2002, 2005; Kirmani, 1988; Serpell & Ferrada, 2007; Wells, 1986). Literature points out the lack of capabilities, as an extensive technology and knowledge base, in a strong innovation system as reason for this situation where knowledge is defined as the key to socio-economic development (Abu Bakar, 2005; Van Egmond, et al., 2003).

The study of knowledge management is currently one of the topics of interest in information technology and management literature (Al-Alawi et al, 2007). Knowledge management has become one of the most important trends in business because organisations are trying to achieve greater value from the knowledge they possess (Grossman, 2006), such as finding better ways to value, assimilate, and apply knowledge to create new knowledge (Denning, 2006).

Many organisations have embarked on knowledge management as a core strategy to enhance their performance (De Long & Fahey, 2000; Inkpen, 1996; Zack, 1999). Knowledge management is now widely recognized as a competitive advantage, and a rising number of organisations are incorporating the knowledge management strategy (Buckley & Carter, 1999; Inkpen, 1996; Marshall, Prusak, & Shpilberg, 1996). De Long and Fahey (2000) point out that a high percentage of organisations that implemented knowledge management as a corporate strategy have not achieved their

objectives and have a growing sense of disenchantment about the practicality of knowledge management.

Previously, the organisations had put high emphasis on information technology as the crucial enabler for knowledge management. But many researchers and practitioners are citing organisational capabilities as enabler of knowledge management (Davenport & Prusak, 1998; Moore & Birkinshaw, 1998). Davenport and Prusak (1998) posited seven pitfalls of knowledge management and posited that if an organisation is spending one third of its time on technologies for knowledge management but neglecting the content, organisational culture, and motivational approaches, it will actually make a knowledge management system unsuccessful.

1.3 Problem Statement

Construction is a project based industry or a Project based organization (PBO) in which people from different backgrounds and expertise come together for a certain period of time and may never work again together, it is a knowledge based industry as well, and is known for its chronic loss of knowledge because of its unique nature. Therefore, to prevent the loss of knowledge and re inventing of wheel every time a new or similar project is dealt with, the management of knowledge generated from every project is an appropriate solution as discussed earlier. In a knowledge-based environment, it logically follows that knowledge management explicitly helps organisations improve organisational performance (Sabherwal & Sabherwal, 2007). However, organisations are often challenged to identify the relationship between

knowledge management and organisational performance because the implementation of knowledge management often occurs informally (Carrillo, et al., 2003). It is critical that organisations determine whether the investment in a knowledge management system pays off in terms of demonstrable performance improvement (Iftikhar, et al., 2003). However, many knowledge management-related studies focus only on fragmented or limited knowledge management perspectives, such as knowledge sharing (Hsu, 2008), and knowledge management styles (Lee & Choi, 2003). Moreover, it is necessary to develop a holistic framework for knowledge management.

1.4 Research Questions

With reference to the previous sections, the research questions are thus formulated as;

1. What kind of structural relationships is between knowledge infrastructure capabilities and the four aspects of project performance exist in the Malaysian construction business environment?
2. What kind of structural relationships is between knowledge process capabilities and the four aspects of project performance exist in the Malaysian construction business environment?
3. How do the knowledge infrastructure capabilities and knowledge process capabilities relate to the knowledge management capabilities in Malaysian construction business environment?

4. What is the impact of knowledge management capabilities on project performance in the Malaysian construction business environment?

1.5 Research Objectives

Responding to the main inquiry of the study to identify the relationship between knowledge management capabilities and organisational performance in the viewpoint of Project performance in terms of time, cost, quality and project benefits in the Malaysian construction company's context, the research objectives for this study are the following:

1. To study the impact of knowledge management capabilities on project performance in the Malaysian construction business environment.
2. To determine the relationships between knowledge infrastructure capabilities and the four aspects of project performance in the Malaysian construction business environment.
3. To determine the relationships between knowledge process capabilities and the four aspects of project performance in the Malaysian construction business environment.
4. To assess knowledge infrastructure capabilities and knowledge process capabilities in relation to the knowledge management capabilities in Malaysian construction business environment.

The research objectives involve determining whether an organisation's investments in knowledge management pay off through project performance.

Linking knowledge management to project performance makes a strong case for adopting and funding knowledge management and demonstrating its benefits (Carrillo, et al., 2004). Although it is highly feasible that there is a relationship between knowledge management and performance, empirical studies have been deficient in proving that relationship (Carrillo, et al., 2004; Hsu, 2008; Lee & Choi, 2003). Moreover, other studies have emphasized financial indicators as measurements of organisational performance, rather than non-financial variables because managers constantly aim to maximize the shareholders return on investment (Laitinen & Chong, 2006).

1.6 Purpose of the Study

The main purpose of this current study is to identify the empirical relationship between knowledge management capabilities and organisational performance in Malaysian construction companies.

Gold, Malhotra, and Segars (2001) attempted to integrate the fragmented literature of knowledge management into a holistic view and develop a framework for knowledge management. Several research studies have validated the framework of knowledge management capabilities created by Gold, Malhotra, and Segars (2001) (Khalifa & Liu, 2003; Smith, 2006b). However, the framework has not been tested in Malaysian business environment. The purpose of the current study is to validate the framework in a study of Malaysian construction companies.

The original and previous studies selected senior managers in the organisation, at the level of vice-president or above, who could describe the structural elements of the organisation and its knowledge-oriented processes. Gold et al. (2001, p. 197) stated, “the use of key informants for knowledge management purposes can come from those in the organisation that have access to, and use of, the organisation’s knowledge”. Thus, for the current study, the targeted sample should satisfy three conditions: persons who interact with top management, those who are actually working with the bottom line, and those who have certain autonomy to lead a project, team, or department. Project managers in a construction company work on all these three levels and are the most active players in the knowledge management process.

After Gold (2001) introduced the framework for knowledge management capabilities, researchers studied the correlation between knowledge management capabilities and key business issues. The Gold, et al. (2001) study found that knowledge infrastructure capability and knowledge process capability significantly affected organisational effectiveness. Further, Smith (2006) discovered that both knowledge infrastructure and knowledge process capabilities have a significantly positive impact on organisational effectiveness. Liu & Khalifa (2003) found that both knowledge infrastructure and knowledge process capabilities could explain knowledge management success. Taejun Cho (2011) in his study studied the middle managers in KOSPI 200 Korean companies and attempted to measure organisational performance through balanced score card.

There is no known study that have attempted the relationship and its effects between knowledge management capabilities and project performance in construction organisation, specially in construction companies it is still unknown from a holistic point of view, until the current study responded to that need by investigating the relationship between project performance and successful knowledge management capabilities. Specifically, this study used empirical evidence to identify the relationship between knowledge management capabilities and the four perspectives of project performance.

1.7 Research Methodology

The research methodology consists of two main aspects of literature review and research analysis to gather all information in relation to knowledge management capabilities and project performance specifically in Malaysian construction companies. Because of the geographical distribution of the companies (see chapter three) and difficulties with face to face interviewing a quantitative research approach is adopted and a survey method is used. The data is collected through questionnaire dissemination.

The research is conducted through structured questionnaires sent to particular qualified respondents, in this case the Project managers or managers involved intimately in a project that satisfied the conditions of: the persons who interact with top management, those who are actually working with the bottom line, and those who have certain autonomy to lead a project, team, or department. The respondents

are approached through their companies registered with CIDB Malaysia as Grade 7 companies. The survey is conducted by sending 590 questionnaires via post for about six months. Prior to the main survey a pilot survey is conducted to test the reliability and validity of the questionnaire items.

After the main survey data was collected it was analysed via SmartPLS[®] software as the study is predictor in nature, therefore variance based structural equation modelling is decided to be the most appropriate the discussion on the technique and its appropriateness is discussed in detail in chapter three.

Two a-priori and two post-hoc supporting analysis are conducted; namely a-priori analyses for item scale reliability (Chronbach's Alpha and composite reliability-rho) and power analysis for determining sample size and post-hoc analyses of power analysis and sample adequacy and Herman's single factor test for detecting any common method variance or bias.

1.8 Significance of the Study

The discipline of knowledge management lacks standards for assessing knowledge management effectiveness (Grossman, 2006). As Grossman (Grossman, 2006, p. 246) stated, "If the discipline of knowledge management is to survive and make a long-lasting contribution, it will need to achieve greater levels of standardization and better metrics to assess its effectiveness." This research helps to fill the void of assessment standards through empirical validation of Gold et al.'s

(2001) theory that organisational effectiveness is the outcome of the combined effectiveness in terms of project performance and benefits of infrastructure capability and process capability. In addition, it helps to bridge the gap between knowledge management theory and practice by aligning the unit of analysis in this research more closely with the practitioners' level of implementation, i.e. project managers of a construction organisation. This study is the first to examine the relationships of knowledge-management process capability from the project-based perspective in contrast to the organisation perspective. The organisation-perspective helps with generalizability of the study, while the project based-perspective leads to results of a more informative and prescriptive nature

However, the link between knowledge management and organisational performance is not supported by sufficient empirical studies (Lee & Choi, 2003). Moreover, the field of knowledge management is new, and there is little research and empirical data to guide the development and implementation of knowledge management or to support the potential benefits of it (Alavi & Leidner, 2001a). In addition, most quantified research has focused on limited and fragmented aspects of knowledge management. For these reasons, the current study quantifies knowledge management issues holistically in order to understand the organisational performance implications of knowledge management.

Gold, Malhotra, and Segars (2001) developed the framework for knowledge management capabilities, attempting to integrate the fragmented knowledge management issues. Several replication studies have proved the validation and reliability of the framework of knowledge management capabilities in different

global locations, but it has never been done in the construction business environment. The current study examines the framework of knowledge management capabilities empirically in Malaysian construction business environment for the first time and analyzes the results in the same context

Further understanding of the knowledge management and organisational performance relationship can assist managers in implementing a knowledge management system and also provide a theoretical ground for researchers to pursue a deeper understanding of knowledge management.

1.9 Thesis Organization

This thesis includes six chapters. Chapter 1 states the background of knowledge management in general and with reference to the construction industry and specifically Malaysian construction industry, the effectiveness and failures of knowledge management and knowledge management capabilities. It further defines organizational performance, knowledge performance and project performance. Then problem statement, research questions, research objectives and purpose of the study is mentioned, leading to the conceptual model and the significance of the study.

Chapter 2 provides a review of various research literatures that relates to knowledge and knowledge management, knowledge definitions, Knowledge infrastructure from stand point of social capital and process capabilities from stand point of knowledge integration, and knowledge management performance. It further

stresses upon characteristics of construction industry and the construction industry in developing countries and the relation of knowledge management with regard to construction industry. Social capital knowledge management in project environment is further discussed. Previous studies on knowledge management in Malaysian construction industries are also discussed. Furthermore, Organizational performance and project performance are defined from the standpoint of cost, time, quality, health and safety and project benefits.

Chapter 3 considers the presents the research design, for collecting data, the survey method is implemented as a main instrument, and data are collected from project managers from Grade 7 Malaysian construction companies, as the study attempted to identify the relationship between knowledge management capabilities and project performance. It further explains measurement and instrumentation, measurement items, pilot survey for validation and reliability of instrument, statistical method selection and relative parameters. It further states the data collection procedure adopted, response rate and supplement analytical methods adopted for confidence in the results. For collecting data, the survey method is implemented as a main instrument, and data are collected from project managers from Grade 7 Malaysian construction companies. Because the study attempted to identify the linear relationship between knowledge management capabilities and project performance, a correlation research design is used.

Chapter 4 presents the findings and discussion for the statistical analysis conducted in this proposed study, which includes profiles of respondents and firms that participated, the conceptual model, process of model refinement and model

assessment, techniques of reliability and validity followed by structural model evaluation. It also discusses predictive relevance, and fit indices for the model. Furthermore, post-hoc analysis for sample adequacy and common method bias are discussed. The results of the Structural Equation Model (SEM) through Partial Least Squares (PLS) technique are further presented for hypotheses evaluation.

Chapter 5 presents the findings and discusses the results of the study with reference to initial model and final model evolution.

Chapter 6 concludes the study as well as points out certain limitations of the study. It also points to the contribution this study has made for academics and practitioners in knowledge management and construction related companies. It further gives recommendation and direction for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The business environment in which the construction industry players is characterized by continuous changes and intense competition (Bakar, et al., 2011). To remain competitive and survive this challenging business environment, the construction companies must leverage their resources and manage both internal and external factors that influence their performance (Bakar & Tufail, 2012).

This chapter presents the review of relevant literature. First, an overview of knowledge is discussed, followed by a review of knowledge management concept. Next, the knowledge management capabilities are presented. The chapter then discusses the knowledge management performance, project performance. Next, this chapter presents the pictures of knowledge management in Malaysian construction industry. Lastly, a summary is presented to conclude the chapter.

2.2 Knowledge

There is no single definition for knowledge and it is difficult to define, even though it has been debated since the Greek era. Even then, some scholars define knowledge as “a multifaceted concept with multilayered meaning” (Nonaka, 1994, p. 15), and an abstract concept that does not have direct referent in the real world (Andriessen & van den Boom, 2007). But still, organisational scholars argue that knowledge is a multifaceted concept with multi-layered denotation for different circumstances and for different types of people. However, knowledge in general can be defined as experience, know-how, insight, information, and capabilities (Chou & He, 2004). Table 2.1 represents the definitions of knowledge from previous researchers.

Table 2.1. Definition of Knowledge

Authors	Year	Definition of knowledge
Nonaka & Takeuchi	1995	Justified true belief.
Ruggle	1996	A fluid mix of framed experience, value, contextual information, and expert insight.
Allee	1997	Experience or information that can be communicated or shared.
Davenport & Prusak	1998	Framed experiences, values, contextual information, and expert insights.
Den and Huizenga	2000	A collection of rules and information to fulfil a specific function.
Alavi & Leidner	2001	A state of mind, an object, a process, a condition of having access to information, a capability.
Al-Hawari	2004	An object that can be codified, distributed, understood, and applied in order to achieve a set of goals.
Hoffman	2005	A mixture of many things, and usually subjective.
Al-Alawi, Al-Marzooqi, & Mohammed	2007	The new wealth of organisations which can achieve superior business performance and a competitive advantage.

Sources: (Al-Alawi, et al., 2007; Alavi & Leidner, 2001a; Allee, 1997; T.H.

Davenport & Prusak, 1998; Hoffman, Hoelscher, & Sherif, 2005; Nonaka & Takeuchi, 1995a; Ruggles, 1998).

Despite of huge numbers of knowledge definitions, in the area of knowledge management, a formal definition of knowledge is still lacking (Hlupic, et al, 2002). The definition of knowledge has been debated in the field of Epistemology for centuries. Moreover, the literature in the field of knowledge management often avoids the epistemological views of knowledge (Minonne, 2007), and characterize knowledge in evolutionary term, from data, to information, to knowledge (Hinds & Aronson, 2002). In the economic field, the definition of knowledge is influenced by information theory, whereas knowledge is often complemented with explanations of the differences between knowledge, information, and data (Bollinger & Smith, 2001).

2.2.1 Tacit and Explicit Knowledge

Looking from traditional perspective, knowledge starts from data, which consists of certain facts and numbers. The traditional view of knowledge is seeing knowledge as a hierarchical model, where knowledge at the top, information in the middle, and data at the bottom (Mason, 2003). If the data is arranged within some context, then it becomes information. Moreover, when experiences and judgements are added to the mixture, then it finally becomes knowledge (Milam, 2005). In general, information contains facts, where knowledge itself is more subjective, focusing on the linkages or relationships (Hauschild, et al. 2001). Generally, information becomes knowledge when it is processed into the minds of the individuals (Alavi & Leidner, 2001).

Even though there are many different opinions on the taxonomies of knowledge, it is commonly agreed that knowledge can be split in to two types; tacit and explicit (Hubert, 1996; Nonaka & Takeuchi, 1995; Tiwana, 2002). Based on its modes of expression, knowledge can be differentiated into tacit knowledge and explicit knowledge (Chou, 2005; Frappaolo, 2008; Nonaka, 1994; Nonaka, Konno, & Toyama, 2001). Both types of knowledge should be managed successfully to leverage intellectual assets that will add value to the organisation (Cohen, 1998).

Generally, tacit knowledge is difficult to articulate, express and formalize to others, and therefore, it is transmitted in informal and subtle ways (Lawrence, et al, 2005; Sabherwal & Sabherwal, 2007). Nonaka (1994) opined that tacit knowledge is “deeply rooted in action, commitment, and involvement in a specific context, and pointed out that it can include cognitive and technical elements”. Tacit knowledge refers to knowledge that includes individual experience, know-how, skills, beliefs, perspectives, insights, intuitions, hunches, instincts, values, understanding of a future state, and the creative processes (Frappaolo, 2008; Lawrence, et al., 2005; Sabherwal & Sabherwal, 2007). Furthermore, Mason (2003) affirmed that tacit knowledge also includes concepts of values and facts, which are commonly understood and known to a society or group, often called common sense, and these common values and facts are usually constructed and transmitted through apprenticeships and the broader cultural environment.

Explicit knowledge (codified/visualised) is the knowledge that can be transmitted in the form of formal and systematic language (Nonaka, 1994; Nonaka & Peltokorpi, 2006). Explicit knowledge usually includes words, pictures, diagrams,

computer codes, procedure manual, and the like, so it can be conveyed to others in formal and obvious ways (Lawrence, et al., 2005). Explicit knowledge is often referred to information (Frappaolo, 2008). Usually, explicit knowledge is stated in clear language formatted in individuals' mind, so it can be stored in a knowledge database or managed by a knowledge management system (Carvalho & Ferreira, 2001; Noe & Peacock, 2002).

Although both tacit and explicit knowledge are important, tacit knowledge has the potential to be the substantial value to organisation because it is more difficult to capture and diffuse (Frappaolo, 2008). Nevertheless, the two states of knowledge are not dichotomous in fact, and tacit knowledge forms the necessary background for assigning the structures to develop and interpret explicit knowledge. Many organisations believe that tacit knowledge is more difficult to manage than explicit knowledge, but it is the most valuable one (Hauschild, et al., 2001). Most knowledge in an organisation remains in the individual's mind in the form of tacit knowledge. It must be converted into explicit knowledge, available to share with those who need it, so it will be useful for the organisation (Von Krogh, et al., 2000). However, knowledge management should manage and acquire tacit knowledge that resides within individuals as well as explicit knowledge, because tacit knowledge could be essentially useful to an organisation when it is converted into explicit form and shared with others (Frappaolo, 2008).

2.2.2 Knowledge Management

Regardless of the enormous numbers of literature on knowledge management, there is no widely accepted definition of knowledge management (Earl, 2001; Manovas, 2004), and there is no single definition for knowledge management (Desouza, 2005; Gorelick & Tantawy-Monsou, 2005). However, there are lots of definitions of knowledge management exist in the knowledge management literature (Grossman, 2006; Lloria, 2008). Knowledge management may be best described by the phrase ‘getting the right knowledge to the right people at the right time’, and can be viewed as a knowledge cycle of acquisition, storing, evaluating, dissemination, and application (Jennex & Olfman, 2008). The majority of knowledge management theory comes from strategy and organisational theory research, while knowledge management initiatives require the involvement of information technology (Alavi & Leidner, 2001). Table 2.2 shows various definitions of knowledge management from previous researchers, which related to organisational performance, organisational goals/objectives, and competitive advantage.

Table 2.2. Definitions of Knowledge Management

Author(s)	Year	Knowledge management definition
Bassi	1997	The process of creating, capturing, and using knowledge to enhance organisational performance.
Van der Spek and Spijkervet	1997	The explicit control and management of knowledge within an organisation aimed at achieving the company’s objectives.
Rastogi	2000	A systematic and integrative process of coordinating organisation-wide activities of acquiring, creating, storing, sharing, diffusing, developing, and employing knowledge by individuals and groups in pursuit of major organisational goal.
Darroch and McNaughton	2002	The management function that creates, locates, and manages the flow of knowledge within an

		organisation to ensure that knowledge is used effectively and efficiently for the long-term benefit of the organisation.
Bhirud, Rodrigues, & Desai	2005	The process of managing the organisation's knowledge by means of systematic and organisational specific processes for acquiring, organising, sustaining, applying, sharing, and renewing both tacit and explicit knowledge by employees to enhance the organisational performance and create value.
Debowski	2006	The process of identifying, capturing, organising, and disseminating the intellectual assets that is critical to the organisation's long-term performance.
Park	2006	Identification and sharing of required knowledge that is controlled and protected, and fulfil organisational objectives.
Lakshman	2007	An organisational capability that allows people in organisations, working as individuals, or in teams, projects, or other such communities of interest, to create, capture, share, and leverage their collective knowledge to improve performance.
Lloria	2008	A series of policies and guidelines that enable the creation, diffusion and institutionalisation of knowledge in order to attain the firm's objectives.

Sources: (Bassi, 1998; Bhirud, Rodrigues, & Desai, 2005; Darroch & McNaughton, 2002; Debowski, 2006; Lakshman, 2007; Lloria, 2008; Park, 2006; Rastogi, 2000; Van der Spek & Spijkervet, 1997).

2.2.3 Knowledge Management Capabilities

Gold, Malhotra, and Segars (2001) reported that while many organisations have invested in developing knowledge management, many of those projects have remained in the realm of information projects, which make little contribution to innovation regarding products and services. Effective knowledge management recognizes, creates, transforms, and distributes knowledge. Knowledge management competence may be classified into two types: knowledge infrastructure capability and knowledge processing capability. The former includes technology, structure, and

culture, while the latter refers to acquisition, conversion, application, and protection (Figure 2.1).

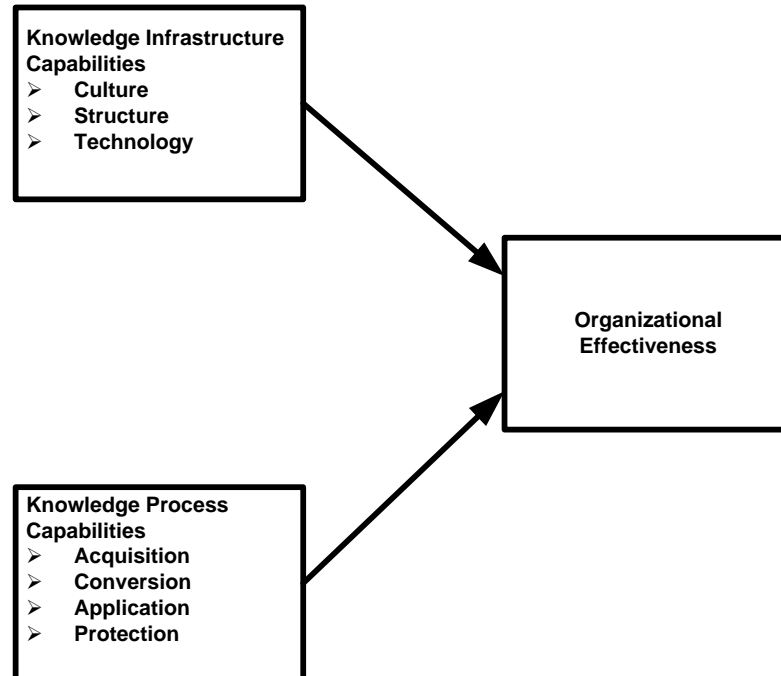


Figure 2.1. The Original Framework of Knowledge Management Capabilities (Gold, et al., 2001).

Knowledge has become one of the key sources for sustainable competitive advantage and it is critical in today's global economy. With effective management from the organisation, certain specific knowledge might have a great impact on the organisation's success, and can differentiate them from the competitors. Since knowledge has been considered as the main source for creating organisational core capabilities and the foundation for profit sustainability (Grant, 1996), organisations may possess a tendency for successful knowledge management through the development of key capabilities (Gold, et al., 2001). The organisations have to underline that the success of knowledge-based organisation obviously depends on the

effective knowledge management program in the organisation. Knowledge management initiatives will fail if investments in organisational resources and capabilities are inappropriate (Wiig, 1993).

Walton & Dawson (2001) defined knowledge management capabilities as the ability to deploy knowledge resources effectively and implement knowledge processes efficiently to derive organisational benefits. Actually, the term knowledge management capabilities refer to an organisation's capabilities to recognise, create, transform, and distribute knowledge (Gold, et al., 2001). Amit & Schoemaker (1993) defined organisational capability as a firm's capacity to deploy resources, which usually in combination by using organisational processes to affect a desired outcome. Grant (1997) affirmed that capabilities involve complex patterns of coordination between people and between people and other resources, and basically, capability is an organisational routine or a combination of interacting routines.

In 2001, Andrew. H. Gold came up with the framework of knowledge management capabilities. Gold (2001) classified knowledge management capabilities into knowledge infrastructure capability and knowledge process capability. Knowledge infrastructure capability has three key elements, which are technology, structure, and culture. Whilst knowledge process capability has four elements, which are acquisition, conversion, application, and protection.

Gold, et al. (2001) built the theory of knowledge management effectiveness from the perspective of organisational capability on two fundamental concepts of social-capital (in the role in creating intellectual assets) and knowledge integration (in the role in creating knowledge synthesis). Gold, et al. (2001) extended the Gold's

(2001) theory of knowledge management capability, where as they affirmed that an organisation's predisposition to organisational effectiveness lies in its knowledge management infrastructure and process capabilities. The infrastructure capability consists of three dimensions; technological, structural, and cultural, because those elements enable the maximisation of social capital (Gold, et al., 2001). Process capability consists of four dimensions; knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection, because those elements comprise the minimum set of knowledge management activities examined when developing the concept.

2.2.4 Knowledge Infrastructure Capabilities

A strong knowledge culture as an infrastructure capability encourages interaction and collaboration to promote the necessary change to meet organisational goals (Nonaka & Takeuchi, 1995a). The goals should be clearly communicated through the firm's vision and values, and should emphasize the role of knowledge in achieving the firm's goals (Gold, et al., 2001).

The structural component of knowledge infrastructure capability refers to the formal organisational design structure, and the incentive and reward systems. Organisational structure is cited in the literature as having a positive impact on knowledge sharing (Goh, 2003; Orlikowski, 2008; Yang & Chen, 2007) and enabling a firm to leverage its technological architecture (Gold, et al., 2001; Holsapple & Singh, 2001; Yang & Chen, 2007).