

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review on latest works on knowledge management has included books, journals, seminar papers and working papers by consulting firms.

Many literatures available on knowledge management are derived from experience of large organizations and consulting firms alike. In view of the increasing recognition of intellectual capital as a competitive resource for corporate survival or better performance, knowledge management is getting more and more attention among executives.

Managing tacit or explicit knowledge could normally be managed by two ways which are codification and personalization (Hansen *et al.*, 1999). The companies deploying codification strategy are basically selling relatively standardized products, thus knowledge is preferably codified and stored in databases, where it can be accessed and used by anyone in the organization. On the other hand, for those companies that provide highly customised solutions to unique problems, knowledge is shared mainly through person-to-person contacts. In this personalisation strategy, the chief purpose of computers is to help people communicate. Therefore, it is clear that both strategies require information technology to play a very important role assisting people to share, retrieve, reuse and renew organizational knowledge. In order to deploy such methods, the SMEs must be ready with the appropriate IT infrastructure.

2.2 Knowledge Economy: Global Perspective and Local Reality

Economic activities have long been traditionally based on three resources, which are labour, capital and land, since the age of classical theory of economics. The

emergence of knowledge as the ultimate resource to ensure productive results from the three resources, however, has shown a revolution of the productivity paradigm in the 1990s. In early 1990s, Peter Drucker wisely pointed out that 'knowledge is the only meaningful resource today' and other resources became secondary and can be obtained easily provided there is knowledge (Drucker, 1993).

The meaning of knowledge economy, or knowledge-based economy (KBE) seems varied to different parties. As the Organization for Economic Co-operation and Development (OECD) puts it, knowledge-based economy is defined as 'economies which are directly based on the production, distribution and use of knowledge and information' (OECD, 1996) in its report 'The Knowledge-based Economy'. The report, even though only based on OECD's member countries, describes the shift of capital from tangibles to intangibles for economic growth in the global perspective. The above meaning has been redefined and expanded further as an economy 'where knowledge (codified and tacit) is created, acquired, transmitted and used more effectively by enterprises, organizations, individuals and communities for greater economic and social development' (Dahlman, 2000). Al-Hawamdeh and Hart (2002) summarize the topics of KBE that have been discussed into few themes as follows:

- The awareness of knowledge as an important factor of production;
- A trend towards a borderless and globalized economy;
- Changes in organisational structures;
- The emergence of knowledge management as a management practice.

Has Malaysia embarked on the road towards a knowledge-based economy? Is it possible to distinguish between a knowledge-based economy and those which are not? In this regard, the World Bank has developed a simplified 'knowledge assessment scorecard' consisting of 20 criteria, based on an original set of 200 indicators. Under

this scorecard, six areas which comprise varying number of variables are performance indicators, economic incentives, institutional regime, human resources, innovative system and information infrastructure (Dahlman, 2000). (For details see Appendix A)

Based on the *Digital Planet 2002: The Global Digital Information Economy* published by World Information Technology and Services Alliance (WITSA)², the overall performance of Malaysia is satisfactory. On the cumulative average growth rate (CAGR) for 1993-2001, Malaysian ICT spending was 9.3 per cent (while the CAGR average for the 55 countries surveyed was 7.6 per cent) and IT spending at RM10.64 billion. The users of computer registered a growth rate of 23 per cent in 2000 from 2.69 million to 3.28 million in 2001. In this regard, Malaysian CAGR was 25.3 per cent comparing to the average CAGR of 18.5 per cent. On the other hand, the statistics of internet users was recorded at 2.51 million in 2000, and has increased to 3.25 million in 2001 by 29 per cent which was slightly lower than the average growth of 30 per cent. In terms of ratio in 2001, our ICT spending was 6.6 per cent to GDP against the average of 7.6 per cent. Besides, ICT spending per capita was US262.10 while the average was US395.30.

2.3 Knowledge Society: Recognizing and Appreciating Knowledge

The emergence of knowledge society and knowledge economy is correlated or indicates a cause-effect relationship. Both are mutually inclusive and enrich each other. Peter Drucker (2001) characterizes the knowledge society as being borderless (because knowledge travels more effortlessly than money) and upward mobility (that available to everyone through easily acquired formal education). In addition, knowledge society is

² As quoted in Rahman (2002).

by essence information rich and able to respond swiftly to technological changes (Al-Hawamdeh and Hart, 2002).

Information technology is the pre-eminent driver in shaping knowledge society. It allows and facilitates dissemination of knowledge much easier and faster. The proliferation of the Internet enables ideas, insights and information can be exchanged and spread electronically through cyber communities, e-forums or other virtual platforms. This phenomenon coupled with the liberalization of education, especially in tertiary education level, has transformed the demographic structure of highly educated citizens becoming more significant. The workforce, thus, tends to be specialized and professional in their selected field. In other words, there is a trend of knowledge workers who are increasingly expanding their presence in the workforce.

2.4 Knowledge Workers: the Powerful Workforce

At a glance, knowledge worker may generally appear to some professional, highly technical, or management workforce. In this environment an increasing number of people spend their working day in the realm of information and ideas, (Stewart, 1997:40), and the knowledge has become the locus of all jobs, regardless of job ranks and status.

On the contrary, Davenport suggests that even though almost all work involves some use of knowledge, knowledge work is typically defined as those jobs in which the creation, distribution, or application of knowledge is primary. Therefore, treating and considering all knowledge workers the same creates a major barrier to improving the effectiveness of them (Davenport, 2001b). A study undertaken by the Institute for Strategic Change distinguishes between knowledge worker and High-End Knowledge Workers (HEKWs). The study reveals that HEKWs, or senior knowledge workers, are

those who typically control their own work structure, highly collaborative, work in multiple settings, do individual and group works, and have high levels of passion, power and occupational mobility (Davenport *et al.*, 2002).

2.5 Knowledge-Creating Company

The idea of the knowledge-creating company was originally coined by Nonaka (1991) where he equalled knowledge-creating with continuous innovation. This is more apparent when he found that the success secret of Japanese companies such as Honda, Canon and NEC, of responsiveness to customer, new market exploration, rapid new product development and the way they manage and create new knowledge.

Nonaka further expands his finding and insight with co-author Takeuchi in their book ‘The Knowledge-Creating Company’. In summary, they conceptualize the knowledge creation into four modes (socialization, externalization, internalization and combination) as illustrated in Figure 2-1.

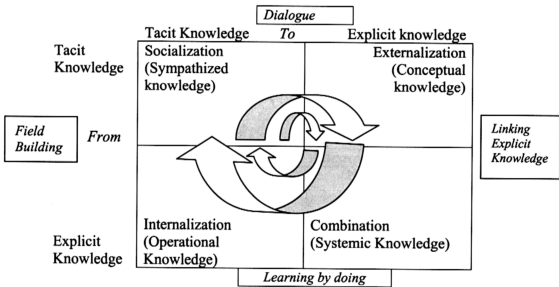


Figure 2-1: Knowledge Spiral and Knowledge Creation

Source: Adapted from Nonaka (1995:70-73)

According to their notion, the process of creating knowledge is dynamic in

nature. The spiral of knowledge is imperative to depict a continual flow and interaction of knowledge from tacit to explicit and vice versa (Nonaka, 1995). For example, merely conversion of knowledge from tacit to tacit through socialization does not transfer the knowledge effectively within the organization and thus create no value to business.

The primary purpose of a company in creating knowledge is to remain competitive and outperform competitors. However, knowledge resides in the human brain in tacit form. Therefore, it not surprising that Arie de Geus (1997) suggests people as the ‘carriers of knowledge’ are the source of competitive advantage because knowledge has displaced capital and has become the critical production factor.

2.6. Knowledge Hierarchy: Data, Information and Knowledge

Knowledge is now the lifeblood of all companies. Don't confuse it with information.

Hauschild (2001)

It is important to recognize the difference of data, information and knowledge. They may be perceived interchangeable for discussion convenience, but there is a transformation of value adding from data to knowledge as shown in Figure 2-2.

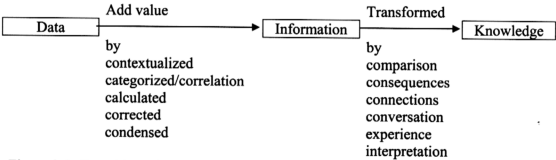


Figure 2-2: Transition of Data, Information and Knowledge

Source: Adapted from Natarajan (2001:19) and Davenport (1998a:4)

Data is undoubtedly the raw material for constructing information. It is structured records of transactions. But unfortunately there is no inherent meaning in data. Only if the data is contextualized, categorized, calculated, corrected, condensed it becomes information with more meaningful context. And with an appropriate cognitive process, information is transformed into knowledge by methods of comparison, consequences, connections, conversation, testing and experiencing the information given. A working definition of knowledge, to Davenport and Prusak, is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information (Davenport, 1998a).

In discussing knowledge, however, it is always helpful to clarify 'what is knowledge' with knowledge hierarchy or knowledge pyramid which basically consists of data, information, knowledge levels as illustrated in Figure 2-3.

Knowledge in general, on the other hand, can be studied in several perspectives. For OECD, it has differentiated knowledge into four categories:

- (i) know-what: about facts;
- (ii) know-why: about scientific knowledge of the principles and laws of nature;
- (iii) know-how: skills and capabilities to do something;
- (iv) know-who: regarding socially embedded relationship to get access to expert and specialized knowledge (OECD, 1996, pp. 12).

Meta Appearance		Examples	Nature
Meta Knowledge -source, description, rules	Wisdom	Multiple knowledge, Internalized and integrated into all actions	Internalized
	Corporate Knowledge		Highly Abstracted
Meta Information - source, time, label	Business Intelligence	Full statement, Summary Statement, Combination of word/number	Heavily Summarized and Dimensional
	Management Information		Summarized and Aggregated
Meta Data - type, length, structure, attributes, properties	Operational Data	Number, words	Atomic Data and Integrated Detail
	Transaction Data Tacit Data		Very Detail and Granular

Figure 2-3 Knowledge Hierarchy or Knowledge Pyramid and Meta Knowledge

Source: Adapted from Raddling (1998: 29-37)

Knowledge can be tacit and explicit by its nature of difficulty and easiness to share. Tacit knowledge is difficult to articulate, and usually shared through highly interactive conversation, storytelling and dialogue. On explicit knowledge, Zack (1999) characterises it into three types as follows:

- Declarative knowledge is about *describing* something like a share, explicit understanding of concepts.
- Procedural knowledge is about *how* something occurs or is performed which lays a foundation for efficiently coordinated action in organisation.

- Causal knowledge is about why something occurs that often in the form of organisation stories which enable coordinating strategy for achieving goals.

Leonard (1998) suggests that there are three types of skills and knowledge possessed by a firm. 'Public or scientific' knowledge that are available to all could only be viewed as 'supplementary capability' in strategic importance. The second type is 'industry specific' knowledge or the 'enabling capability' which is necessary but not sufficient to distinguish a company from others. Finally, the third type is 'firm specific' knowledge that is hard to be duplicated or imitated by others. The firm specific knowledge contributes to the building of core capability of a particular organization. Similarly, to deliver the desired results, knowledge management focuses on the common knowledge within the organization that is more firm specific. Common knowledge as popularized by Nancy Dixon is the knowledge that employees learn from doing the organization's tasks (Dixon, 2000). It is proprietary intellectual property owned by a particular company. This type of knowledge, if managed and transferred effectively within the organization, could generate tremendous business value.

2.7 Intellectual Capital: Types of Hidden Brainpower

According to the International Federation of Accountants (IFAC) intellectual capital 'can be thought of as the total stock of capital or knowledge-based equity' that a company possesses. Furthermore, it can be both the end result of a knowledge transformation process or the knowledge itself that is transformed into intellectual property or intellectual assets (Dzinkowski, 1998).

From another point of view, Ulrich (1998) observes that intellectual capital is the only appreciable asset while other assets starting depreciate when they are acquired.

With the inclination of increasing knowledge work, human capital is the most valuable but often the least appreciated. Therefore, in order to leverage intellectual capital effectively, he concludes that the employees' capability and willingness have to be well taken of because 'intellectual capital = competence x commitment'.

Edvinsson, the Corporate Director of Intellectual Capital at Skandia AFS (a Swedish insurance and financial company), reveals that the value of a company is now lied on the hidden dynamic factors (intellectual capital) which primarily consists of human capital and structural capital. For human capital, it consists of the combination of knowledge, skills, innovativeness, and individual competence. Whereas structural capital may include databases, software, organisational structure, customer capital, etc. What makes Edvinsson's observation distinctive is he aptly suggests that human capital can not be owned by the company, while the structural capital is 'everything left at the office when the employees go home' (Edvinsson, 1997, pp. 11).

As the result of numerous researches done by Skandia, the first Intellectual Capital Report was published in 1994 which was supplementary to its 1994 Annual Report. With more than 100 measures (details in Appendix B), the report was based five major categories as shown in the following Skandia Market-Value Scheme.

In other words, the measurements is valuing financial focus, human focus, customer focus, process focus, renewal and development focus (innovation capital) to establish the company's market value (Figure 2-4).

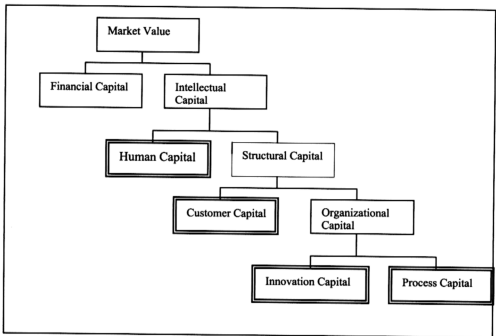


Figure 2-4 Skandia Market-Value Scheme

Source: Edvinsson (1997, p. 52)

The study on the elements of intellectual capital is not exclusive of one perspective. By the collective efforts of Hubert Saint-Onge, Charles Armstrong, Gordon Petrash and Leif Edvinsson, a new perspective, Value Platform, was created as follows:-

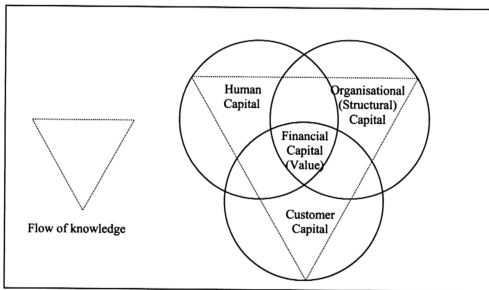


Figure 2-5 Value Platform

Source: Envinsson (1997:146)

This Value Platform (as shown in Figure 2-5) depicts the imperative of interconnection of three types of intellectual capitals. Only when the three ----- human, structural and customer----- are in good alignment and complementing one another, then the company will increase market value or yield financial gains.

Finally, to put it simple, elements of intellectual capital are further developed by Society of Management Accountants of Canada (SMAC) as shown in Figure 2-6.

Human Capital <ul style="list-style-type: none"> - Know-how - Education - Vocational qualification - Work-related knowledge - Occupational assessment - Psychometric assessments - Work-related competencies - Entrepreneurial innovativeness, proactive and reactive abilities, changeability 	Customer (Relational Capital) <ul style="list-style-type: none"> - Brands - Customers - Customers loyalty - Company names - Backlog orders - Distribution channels - Business collaborations - Licensing agreements - Favourable contracts - Franchising agreements
Organizational (Structural) Capital	
Intellectual Property <ul style="list-style-type: none"> - Patents - Copyrights - Design rights - Trade secrets - Trademarks - Service marks 	Infrastructure Assets <ul style="list-style-type: none"> - Management philosophy - Corporate culture - Management process - Information systems - Networking systems - Financial relations

Figure 2-6 Elements of Intellectual Capital

Source: SMAC (1998) Quoted in Dzinkowski (1998)

Skandia also has developed Skandia IC Navigator as a tool to conceptual the value creation of intellectual capital coupled with a time frame as shown in Figure 2-7. In this Navigator, the Financial Focus is a result appeared in the past form after the combination of other four IC factors. While Customer Focus and Process Focus are presently creating business value, the Renewal and Development Focus are preparing the organization for the future changes and challenges. Finally, the Human Focus is the

central part to enable all focuses are operating in an aligned direction and thus delivering true value to the business.

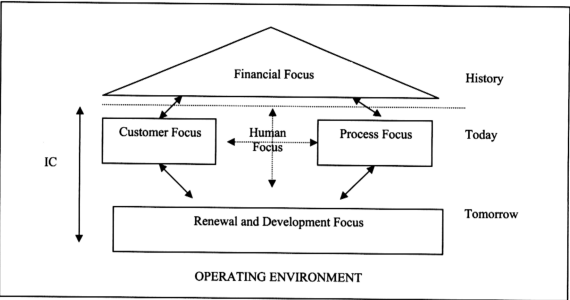


Figure 2-7 Skandia IC Navigator

Source: Edvinsson (1997: 68)

2.8 Intellectual Capital Management

Managing the intangibles or intellectual capital entails different approaches than knowledge management. According to Sanchez’s (2000) observation, management of intangibles is a much broader concept than knowledge management. Its main purpose is to augment the organisation’s value through the formation of competitive advantages. The process always includes identifying the critical intellectual capital, assessing the links with the present and future value of the organisation, measuring the value, discovering intangible activities and being able to efficiently manage those activities.

There are, however, two divided camps among practitioners regarding intellectual capital management. Chase (1997) elaborates that from one perspective it is seen as creating value, while from the other it is extracting value. Companies focusing on value creation usually concentrate their efforts on how knowledge is created and

transforming it into organizational wealth. Value extraction proponents aim to create intellectual assets and intellectual property from intangible assets.

Whether value creation or extraction, both standpoints are about managing the most appreciable resource in one firm. In doing so, it is imperative to recognise process and enablers that transform intellectual capital to the desirable results.

Developed by the Effective Knowledge Management Working Group, an Intellectual Capital (IC) Management Model and Matrix is shown as Figure 2.8.

Figure 2-8 illustrates the model needs a strategy to synergise the intangible resources through systemic processes that are teamed up with various enablers and eventually to deliver economic value to the organisation. Eight enablers listed across the top in Figure 2.8 are (i) Leadership (ii) Structure (iii) Culture (iv) Technology/Process (v) Rewards and Recognition Systems (vi) Measurement (vii) Knowledge, Skills and Ability/Competency (viii) Management that will drive the processes to actual activities.

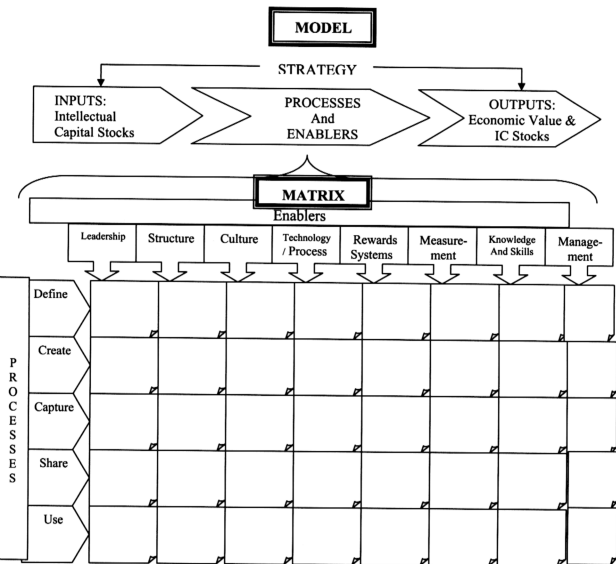


Figure 2-8 Intellectual Capital Management: Model and Matrix

Source: Adapted from Bassi (2000)

The matrix also identifies five core categories of processes, that in reality overlap and reinforce each other, are listed below:-

- Define: Identify IC types, needs, and requirements. Examples: Defining core competencies, establishing staffing requirements, targeting market segments.
- Create: Creating New IC and uncovering existing IC. Examples: Training, identifying best practices, competitive intelligence.

- Capture: Compiling, gathering, representing, codifying and re/organise IC. Examples: Building corporate yellow pages/expert directories, creating best practices databases, process documentation.
- Share: Disseminating, distributing and transferring IC. Examples: Sharing best practices, forming knowledge network, deploying intranets/extranets/decision support system.
- Use: Applying, incorporating, re-using, exploiting, and leveraging IC. Examples: better decision making, faster product development, strategic planning.

2.9 Knowledge Management: Its Elements and Composition

The implementation of knowledge management requires collaboration from many departments and efforts, from discussion during in-house meeting, to meeting with outside consultants, from top management commitment to everyone participation, and people issue to technological infrastructure. Integrating full strength for knowledge management always invites complex planning and cautious execution.

To make it more understandable, Arthur Andersen (1999) illustrates four significant elements in knowledge management as shown in Figure 2-9. It suggests that people and knowledge can be bridged by the assistance of technology. Furthermore, the power of linking between people and knowledge will be exponentially increased only when knowledge sharing occurs. The whole process of the metaphorical formula is the successful factors for knowledge management system (Arthur Andersen, 1999).

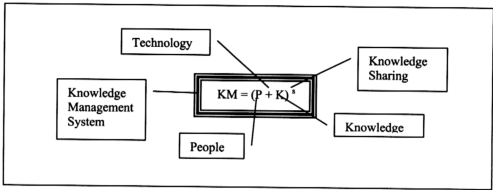


Figure 2-9 Elements in Knowledge Management

Source: Arthur Andersen (1999)

As a multidisciplinary field, knowledge management has to mobilise many functions and disciplines to achieve its objectives. It needs the combination of business process analysis, information technology, human resources, motivation (to encourage people to share knowledge in the first place), training and education, communication, and publishing (in presenting knowledge in documentation, digital databases and meta knowledge), cognitive science and learning (Raddling, 1998).