# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Introduction

The purpose of this chapter is to provide an overview of the literature in the area of intellectual capital and organizational performance of SMEs in Malaysia. The literature survey gives a schematic view of matters discussed in the thesis. The review is divided into three components.

The first component will discuss the theory adopted for the thesis and the relevancy to the framework. The second component will discuss the intellectual capital, organizational performance and mediating variables – knowledge sharing and innovation – in detail. Third component is proposing a new theoretical framework. Models and past literature will be highlighted to show the existing relationships.

## 2.2 Resource-Based Theory

Resource-based value is an efficiency-based explanation of performance differences and a firm-level analytical tool (Peteraf and Barney, 2003). The resource-based view posits that competitive advantage can only be sustained if the capabilities creating the advantage are supported by resources that are not easily duplicated by competitors. In short, the firm's resources must have "barriers to imitation" (Rumelt, 1984). Barney (1991) developed his resource-based argument using two alternative assumptions – that firms may be

heterogeneous with respect to strategic resources and that those resources are not perfectly mobile. His definition of a firm's resources include "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable a firm to conceive of and implement strategies that improve its efficiency and effectiveness." These resources can be classified as physical and capital resources, human capital resources, and organizational capital resources. Barney (1991) asserts that to be a potential source of sustained competitive advantage, a resource must have four attributes: it must be valuable, rare, imperfectly, imitable, and not substitutable.

- A resource must be valuable, and be able to exploit opportunities or neutralize threats. When a resource is valuable, it allows a firm to conceive and implement strategies to improve efficiency and effectiveness. If a resource is not valuable, it is not a resource.
- A resource must be rare among current and potential competitors. If everyone has the resource, then no one can gain advantage from it. Valuable but common resources can help ensure survival but not competitive advantage.
- A resource must also be imperfectly imitable. Valuable and rare resources are only sources of sustained competitive advantage if other firms cannot obtain them. A resource can be imperfectly imitable for three reasons. First, the ability to obtain the resource depends on unique historical conditions. Second, the link between the resource and the sustained competitive advantage is causally ambiguous. Third, the resource is socially complex.

- A resource must not be substitutable. In other words, there must be no strategically equivalent valuable resources that are either rare or imitable. Strategically equivalent resources may be similar to another firm's resources (e.g. the top management team) or very different (e.g. substituting a charismatic leader for a systematic company-wide planning system).

Resources are the basic building blocks to a firm's functioning and performance. A firm's resources are simply the inputs into the production process, such as machinery, financial capital and skilled employees (Hisrich and Peters, 2008) and define resources as the inputs into the production process. Organization is studied in terms of how their resources can predict their performance in a dynamic, competitive environment (Holsapple and Joshi, 2001).

### 2.2.1 Resource-Based Theory to framework

The resource-based perspective argues that sustained competitive advantage is generated by the unique bundle of resources at the core of the firm (Conner and Prahalad, 1996; Barney, 1991). In other words, the resource-based view describes how business owners build their business from the resources and capabilities that they currently possess or can acquire (Dollinger, 1999). The term "resources" was conceived broadly as "anything that can be thought of as a strength or weakness" of the firm (Wernerfelt, 1984, p. 172). The theory addresses the central issue of how superior performance can be attained relative to other firms in the same market and posits that superior performance results from acquiring and exploiting the unique resources of the firm.

Implicitly the resource-based perspective is the centrality of the venture's capabilities in explaining the firm's performance. Resources have been found to be important antecedents to products and ultimately to performance (Wernerfelt, 1984). According to resource-based theorists, firms can achieve a sustainable competitive advantage from such resources as strategic planning (Michalisin et al. 1997; Powell, 1992), management skills (Castanis and Helft, 1991), tacit knowledge (Polanyi, 1692,1966), and capital employment of skilled personnel (Wernerfelt, 1984) among others. Resource based theorists (e.g. Barney, 1991; Grant, 1991; and Peteraf, 1993) contend that the assets and resources owned by companies may explain the differences in performance. Resources may be tangible or intangible and are harnessed into strengths and weaknesses by companies and in doing so lead to competitive advantage. The resource-based theory continues to be refined and empirically tested (Bharadwaj, 2000; Hadjimanolis, 2000; Medcof, 2000).

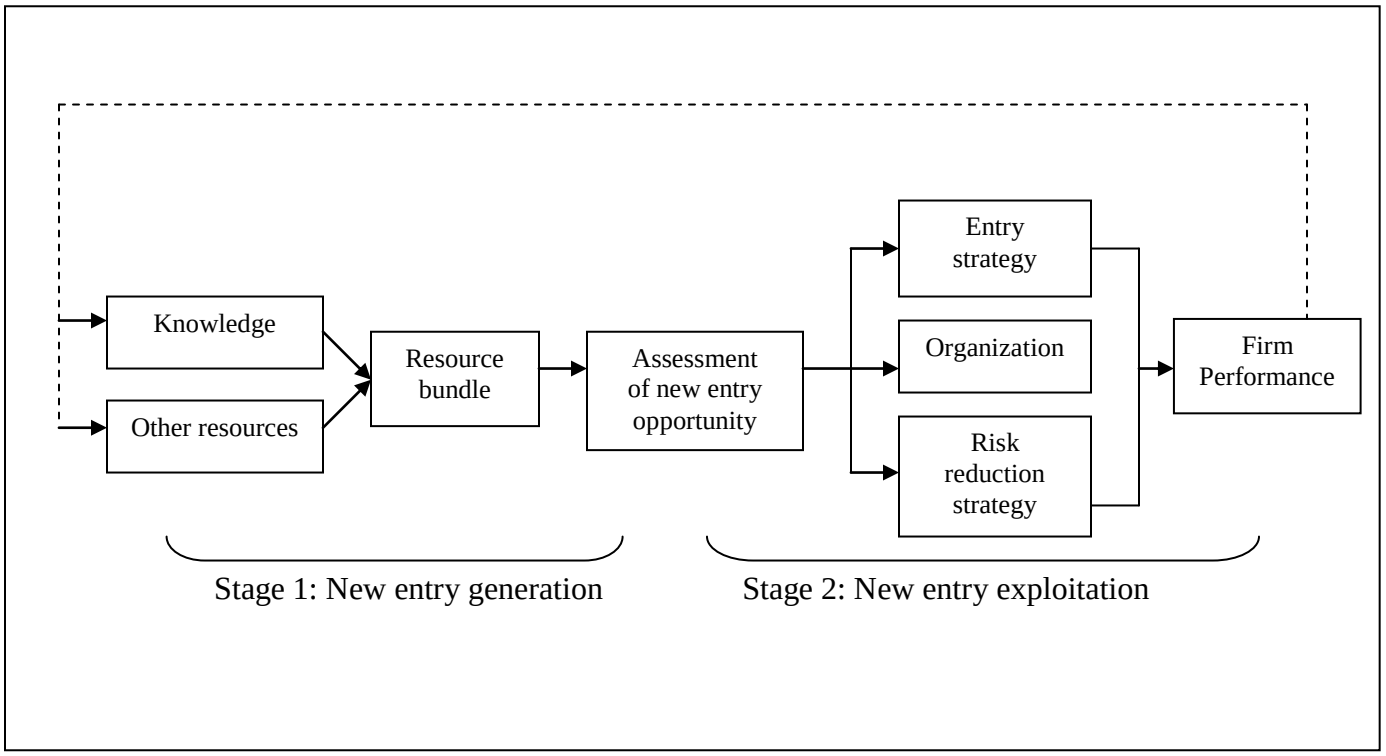
The resource-based view for the firm suggests that the firms' internal characteristics, especially the cultural patterns of learning and human capital assets accumulation have a significant impact on the firm's capability to introduce new products and compete within disparate markets (Tvorik and McGivern, 1997).

As emphasized by many authors, firms must have resources that are valuable, rare and difficult to imitate, in order for them to survive in the long term compared to their competitors. Knowledge, especially tacit knowledge is one of the strengths that the organization has that is more difficult to transfer or copy (Nooteboom, 1993).

Hisrich and Peters (2008), in Figure 2.1, further highlight that in order for a firm to create unique resources, which are rare, valuable and non-imitatable, it has to exploit its internal knowledge. Internal knowledge that is possessed by employees, if well utilized, would lead

to creativity and innovation. Barney (1991) suggests that firms should implement strategies that exploit their internal strengths through responding to environmental opportunities while neutralizing external threats and avoiding internal weaknesses. Therefore, in order for an SME to exploit the market it has to have entrepreneurial strategy, which has three key stages (Hisrich and Peters, 2008):

1. The generation of a new entry opportunity.
2. The exploitation of a new entry opportunity.
3. A feedback loop from the culmination of a new generation and exploitation back to Stage 1.




Source: Hisrich and Peters (2008)

**Figure 2.1**
**Resource-Based Value model**

Grant (1996) extends the resource-based theory into the knowledge-based view concerning knowledge as a resource of the firm. Knowledge that is residing within the individual and organizations that put their knowledge into applications lead to the capability of an organization to utilize this resource and turn it into profit. He argued that while the resource-based theory perceives the firms as a unique bundle of idiosyncratic resources and capabilities where the primary task of management is to maximize value through the optimal development of existing resources and capabilities, the knowledge-based view highlights the importance of processing the resources into products and services. The knowledge-based view puts weight on the importance of the coordination, organizational capability, organizational structure and the boundaries of the firms. The main issue is that resources must be channelled and processed through the right means to transform it into profit. Otherwise, the resources and capability will remain static in the organization.

Looking at the resource-based theory from the entrepreneurship perspective, it can be divided into two, namely, entrepreneurial recognition, which is defined as the recognition of opportunities, and opportunity seeking behaviour, which is a resource as well as the process of combining and organizing resources (Alvarez and Busenitz, 2001). Kirzner (1979) argues that knowledge experts do not fully recognize the value of their knowledge or how to convert it into profit or else the expert would be an entrepreneur. Although the entrepreneur may not have the specific knowledge of the expert it is the entrepreneurs who recognize the value and the opportunity of expert knowledge (Kirzner, 1997). Entrepreneurs develop inventions and innovations around why and how they see and create new opportunities (Alvarez and Busenitz, 2001). Danneels (2002) suggests that product

innovation is the core organizational process in which the various resources and competences of the firm are brought together. In addition, product innovation can serve as a vehicle for the renewal of firm competences/resources. As entrepreneurs expand their knowledge base and absorptive capacity, it creates their competitive advantage. However, the resource-based theory does not consider all the resources possessed by a company but only focuses on the critical (or strategic) resources, especially those that are the basis of the company's sustainable competitive advantage. Based on the empirical research of fourteen case studies of SMEs, Rangone (1999) has listed SME's sustainable competitive advantage based on three capabilities:

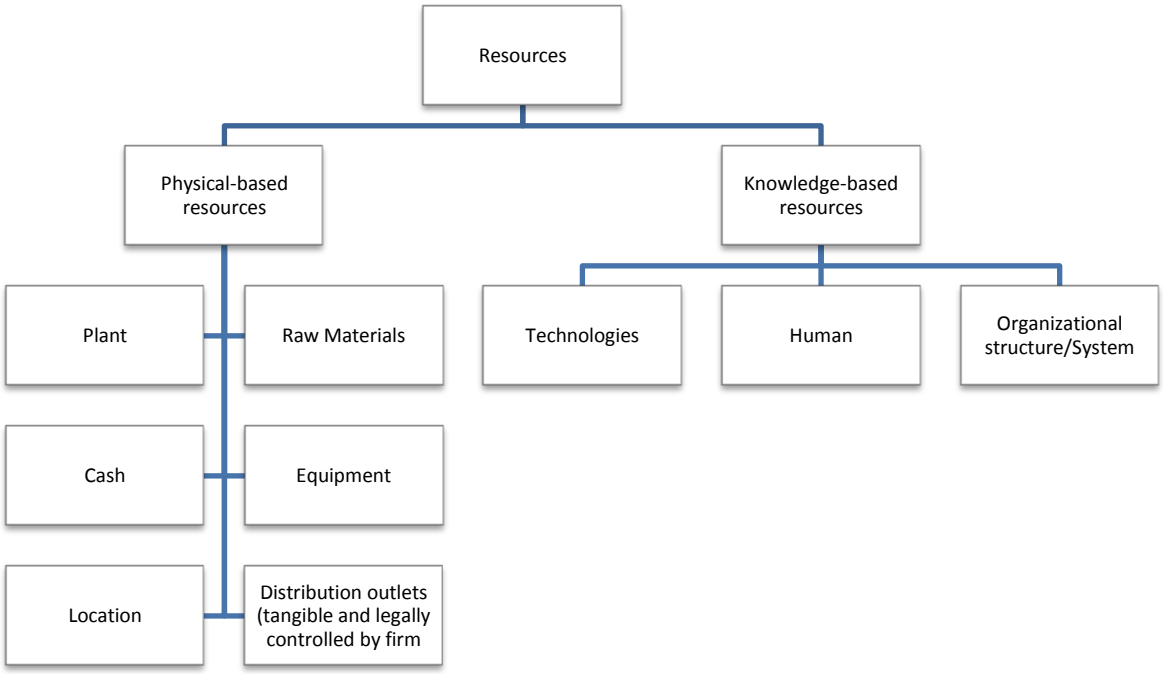
- Innovation capabilities: a company's ability to develop new products and processes, and achieve superior technological and/or management performance (e.g. development cost, time-to-market, etc.)
- Production capability: the ability to produce and deliver products to customers, while ensuring competitive priorities, such as quality, flexibility, lead time, cost, dependability.
- Market management capability: the company's ability to market and sell its product efficiently and effectively.

Based on this model, SMEs either consciously or unconsciously put their strategic focus on one or more of the basic capabilities.

## 2.3 Organizational Resources

A few authors agreed that organizations are able to perform better if they are able to exploit their internal resources and capabilities (Penrose, 1959 as cited by Marr et al. 2004).

Therefore, entrepreneurs need to understand what are the key resources and drivers of performance and value in their organizations. The concept of performance drivers suggests a causal relationship between resources and organization value creation. Penrose further argues that it is never resources themselves that create value, but the services that the resources can render (Marr et al, 2004, pg 312). Barney (1991) and Miller and Shan Sie (1996) suggested that resources could be grouped into property-based resources and knowledge-based resources. Figure 2.2 shows these two basic categories of resources.

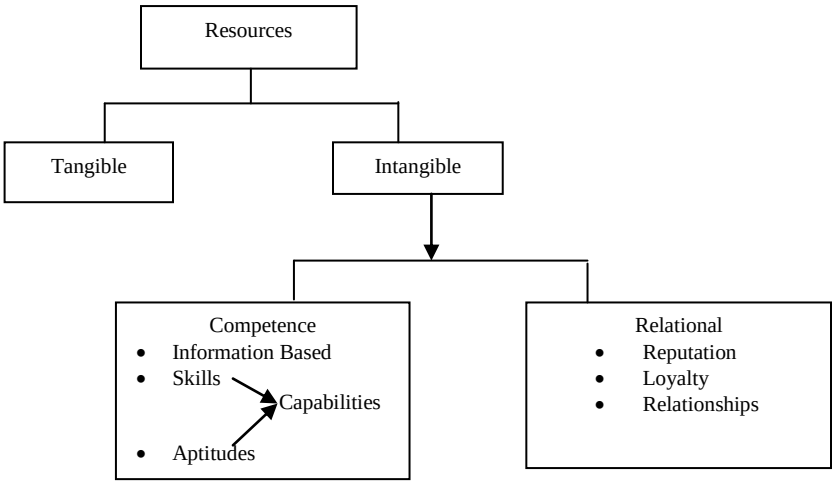



Source: Miller and Shan Sie (1996), Barney (1991)

**Figure 2.2**
**Basic Resources**

Knowledge-based resources are often intangible and cannot be imitated by competitors, as they are subtle and hard to understand, involve talents that are elusive, and

the connection with the result is difficult to discern (Lippman and Rummelt, 1982). Grant (1991) added to these financial, technological and reputational resources. Resource allocation is a recurrent theme in the strategy literature. It focuses on the firm's efficient use of organizational resources. An efficient resource allocation process, therefore, provides the firm investment opportunities to create competitive barriers (Porter, 1980) or to execute acquisitions and divestitures that reduce transaction costs (Williamson, 1975). An organization's resources exist as a bundle of assets that are interdependent according to the resource-based theory. Company resources are divided into two, namely, tangible and intangible resources (Haanes and Lowendahl, 1997) as shown in Figure 2.3.



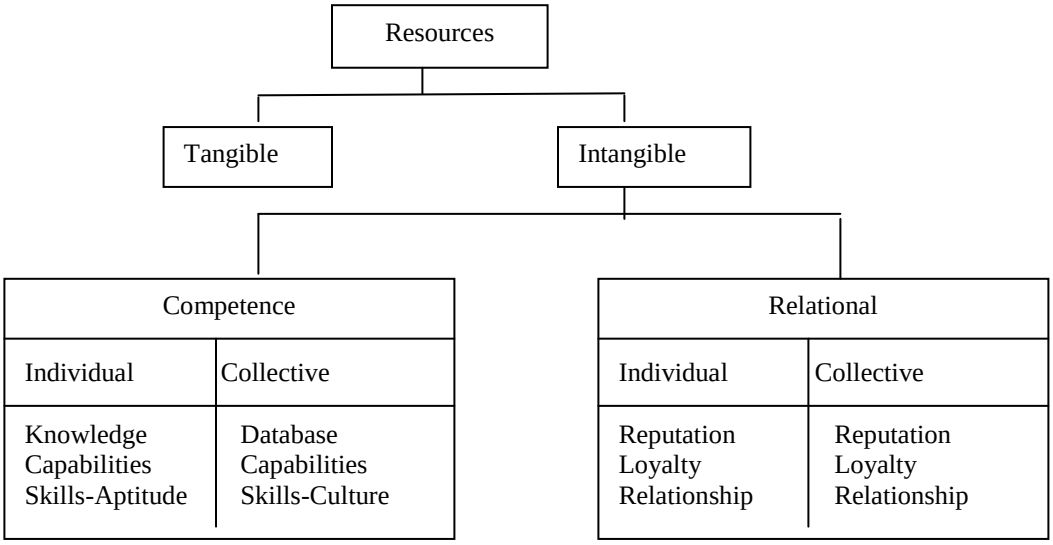

Sources: Haanes and Lowendahl (1997)

**Figure 2.3**
**The Haanes and Lowendahl Model**

Intangible resources are the intellectual capital of the company, which is further divided into competence and relational resources. Competence is the ability to perform a given task. It exists at two levels – individual (knowledge, skills, aptitude or capabilities)

and organizational (information-based like databases, technology and procedures). Relational resources refer to the reputation of the company, client loyalty and the relationships it has with customers (Tan et al. 2008). Lowendalh (1997) further divides the competence and relational categories into two subgroups, individual and collective, depending on whether the resource is employee or organizational as shown in Figure 2.4. This is to distinguish between people dependent and organizational dependent.

The organizational resources are divided into people, organization and the structure of the organization, which forms a combination of resources for an organization.



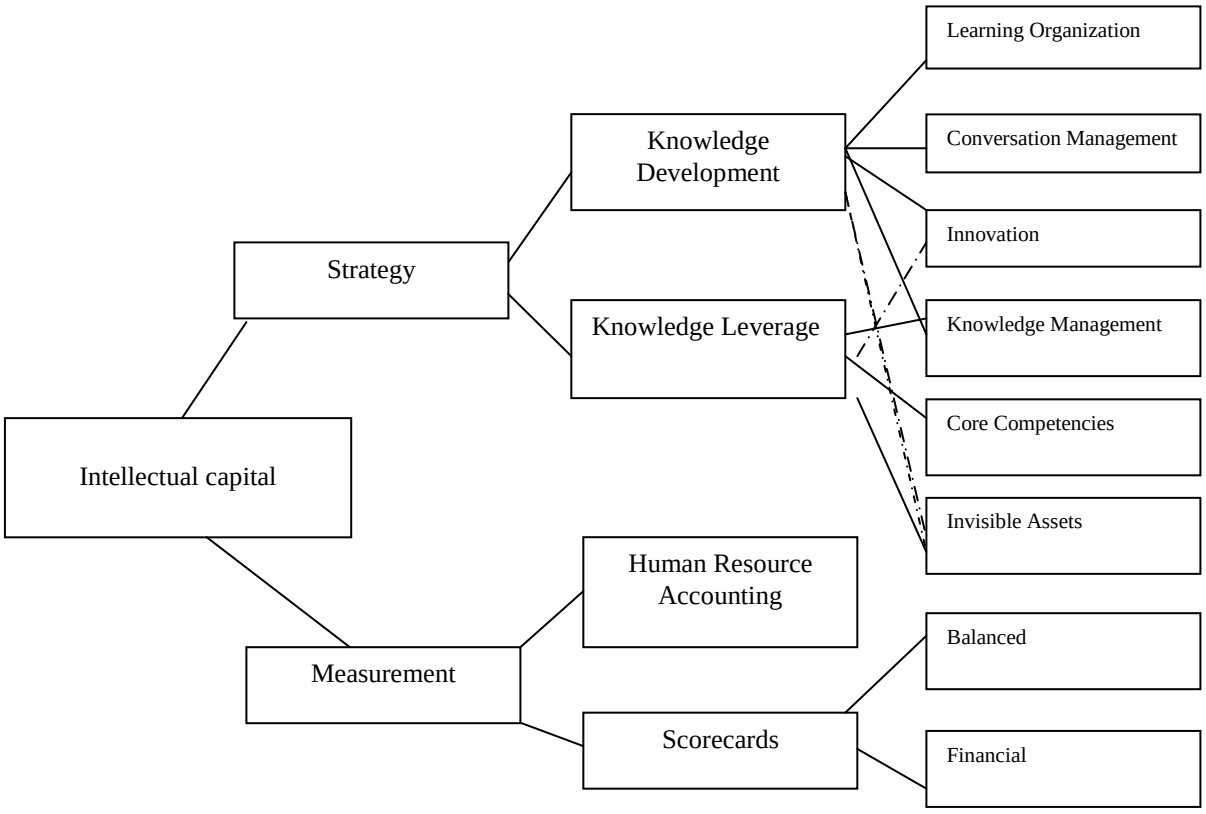

Source: Lowendahl (1997)

**Figure 2.4**
**The Lowendahl Model**

## 2.4 Intellectual Capital

Intellectual capital was first discovered in the banking and accounting areas where accountants were concerned that the market value of an organization was more than what

appeared on the financial reports. Skandia Bank started the inquiry concerning the intangible assets that existed in the form of non-financial assets such as employees' skills, talents and capabilities, and internal and external structures. There are two approaches to the research on intellectual capital. First, is to measure the intellectual capital assets in the organization, which concerns discovering hidden assets in its people, structure and external relationships by proposing a number of different methods of measurement and reporting of intellectual capital (Liebowtisz and Suen, 2000). This approach is also known as the stock approach, which is concerned with calculating the dollar value of the intangible assets (Guthrie and Ricerri, 2002). The other approach is how to capitalize intellectual capital to enhance the organizational performance. This approach is known as the flow approach, which views intellectual capital as being concerned with identifying the knowledge resources that drive value creation rather than assigning a specific dollar value to the resources (Boedker et al., 2005). Roos et al. (1998) show that the theoretical roots of intellectual capital can be traced to two different streams of thought, namely, the strategic stream and the measurement stream as shown in Figure 2.5




Source: Roos et al. (1998)

**Figure 2.5: Conceptual roots of Intellectual Capital**

While the first one studied the creation and use of knowledge, the second one focused on the need to develop a new information system, measuring non-financial data alongside the traditional financial data. In reality, knowledge development and knowledge leverage are enmeshed. A widespread application of knowledge is a goal in itself and a means to develop new knowledge (Roos et al. 1998).

Internal resources are dependent on the organization and are divided into structure, human resources and technology (Maranto-Vargas and Rangel, 2007). The competitive

advantage of an organization is viewed from the uniqueness of its resource mix and the inability of competitors to replicate the mix (Holsapple and Joshi, 1998).

Spender (2006) views an organization as a dynamic, knowledge-based activity system, maintaining that it is an organization's knowledge and ability to generate knowledge that forms competitive advantage. A few authors have identified the type of knowledge resourcesthat can be found in an organization, as shown in Table 2.1.

**Table 2.1 Type of knowledge resources**

| **Type of knowledge resources identified in KM frameworks** | |
|---|---|
| **Authors** | **Knowledge resources** |
| Leonard-Barton (1995) | 1. Employee knowledge<br>2. Knowledge embedded in physical systems |
| Petrash (1996) | 1. Human capital<br>2. Organizational capital<br>3. Customer capital<br>4. |
| Sveiby (1997) | 1. External structures<br>2. Internal structures<br>3. Employee competencies |

Source: Holsapple and Johsi (2001)

The term "knowledge resources" has been used interchangeably with the term "intellectual capital", as argued by Fincham and Roslender (2003, p.3) "the imperative to manage knowledge coincides with that of managing intellectual capital". Knowledge is one of the organizational resources that often become embedded, not only in documents or repositories but also in organizational routines, processes, practices and norms (Steinheider and Al-Hawamdeh, 2004). Furthermore, knowledge management activities have been

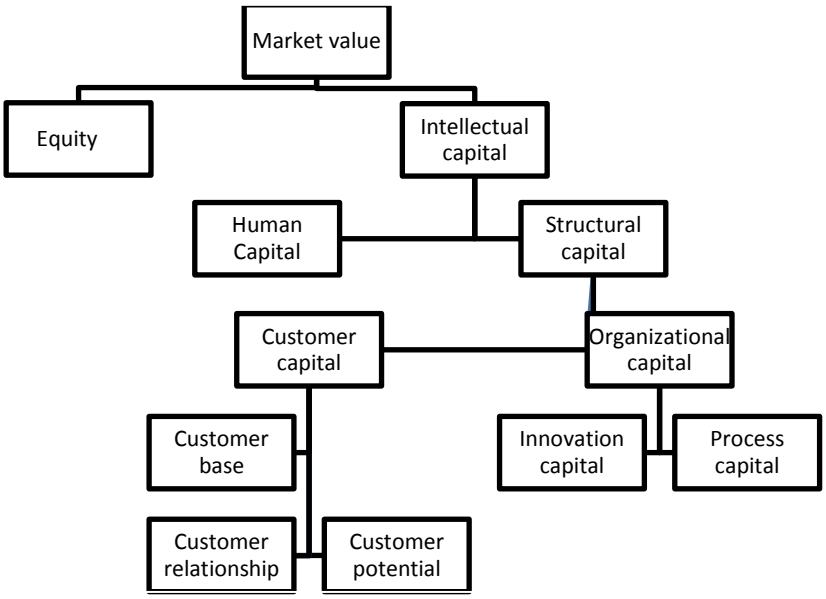
defined as tactics and initiatives taken by the organization to identify, enact, develop and dispose of its knowledge resources (Boedker et al., 2005). Intellectual capital is created through the combination and exchange of knowledge. The combination and exchange of knowledge can result in innovation – incremental and radical – and through this combination and exchange, knowledge sharing takes place. In order for knowledge sharing to take place, opportunity, deployment, motivation and combination capability must exist. These factors are summed up by Cohen and Levinthal (1990) as absorptive capacity, which depends on the existence of related prior knowledge. Intellectual capital is hard to identify and harder still to deploy effectively but once a firms find it and exploits it, it will win (Stewart, 2000).

Stewart (1997) defines intellectual capital as "the intellectual material – knowledge, information, intellectual property, experience – that can be put to use to create wealth." Edvinson (1997) defines intellectual capital as the possession of knowledge, applied experience, organizational technology, customer relationships and professional skills that provides Skandia with a competitive edge in the market. Roos and Roos (1997) define intellectual capital as the sum of the hidden assets of the company not fully captured on the balanced sheet and, thus, it includes both what is in the heads of organizational members and what is left in the company when they leave. Bontis (1998) defines intellectual capital as the pursuit of the effective use of knowledge (the finished product) as opposed to information (the raw material). From the strategic perspective, intellectual capital (IC) is used to create and enhance the organizational value, and success requires IC and the ability to manage this scarce resource by the company (Chen et al, 2004).

The above definition can be concluded as (Cohen and Kaimenakis, 2007):

1. Intellectual capital consists of intangible resources that contain knowledge that can be used by the firm to accomplish its goals.
2. The combination of these intangible creates value for the firm.
3. Firms do not own or control all these resources.
4. The intangible resources will not bring positive results to firms without effective management.
5. Along with effective management, these resources can provide the firm with a sustainable competitive advantage.

Edvinsson and Malone (1997) developed an intellectual capital (IC) framework, which is also known as the Skandia Knowledge Management approach, as shown in Figure 2.5.




Source: Mc Elroy, 2002

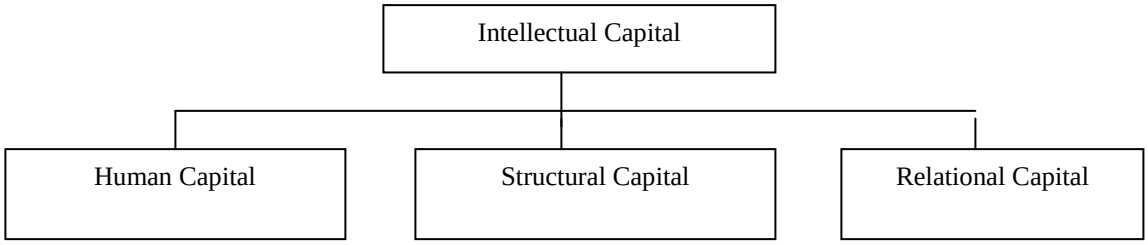
**Figure 2.5(a)**
**Skandia Knowledge Management framework**

Stewart (1997) suggests that intellectual capital is knowledge management since organization is a knowledge-based activity system (Holsapple and Joshi (2001). But Awad and Ghaziri (2004) stress that knowledge management is not intellectual capital, as defined clearly by Wiig (1997):

- Intellectual capital focuses on building and governing intellectual assets from strategic and enterprise governance perspectives.
- Knowledge management has tactical and operational perspectives in facilitating and managing knowledge.

Wiig (1997) also points out that intellectual capital cannot be pursued in isolation as they keep knowledge flow vibrant to secure the competitive advantage in the long term.

Intellectual capital can be located in its people, its structures and its customers. The model in Figure 2.6 indicates that intellectual capital is divided into three parts: human capital, structural capital and customer/relational capital. Stewart (1997) explains that human capital is the accumulated capabilities of the individuals responsible for providing customer solutions. Structural capital refers to the capabilities of the organization to meet market requirements and customer capital refers to the extent and intensity of the organizations' relationships with customers. The three types of capital are interrelated – each positively or negatively affecting the other.

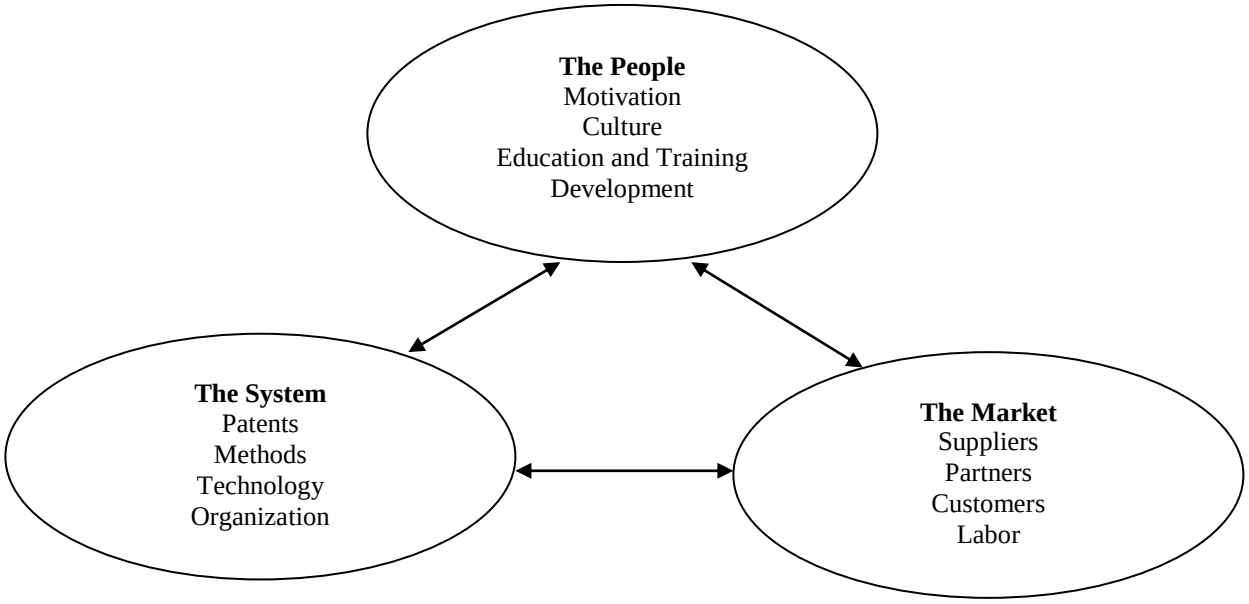



Source: Stewart (1997).

**Figure 2.6**
**Components of Intellectual Capital**

The Danish Confederation of Trade Unions (1997) also clarify the understanding of intellectual capital by classifying intellectual capital into three components – the people (human capital), the system (structural capital) and the market (customer or relational capital) as shown in Figure 2.7.

"The People" element represents employee and managers' competence, both individually and collectively. It suggests that this element depends on people's motivation, their culture, education and training and development. "The System" is the knowledge in the company that is independent of people. It includes patents, methods, technology and the organization of the company. "The Market" consists of the relationship between the organization and the outsiders including suppliers, partners, distributors and customers. "The Market" is also the source of money, labour and knowledge that the company lacks.




Source: DCTU (1997).

**Figure 2.7**
**The Danish Confederation of Trade Unions Model**

Human capital refers to the value of knowledge, skills and experiences held by individual employees in a firm; structural capital is the "embodiment, empowerment and supportive infrastructure of human capital" (Edvinsson and Malone, 1997), which includes all the things that support human capital in a firm but that are left behind when employees go home at the end of the day (McElroy, 2002). The goal of this intellectual capital model is to achieve a multiplicative effect in order to enhance rapid knowledge sharing and develop new business applications, which can be facilitated by the right company culture, leadership and infrastructure (Skandia, 1996a). According to de Castro et al. (2004) intellectual capital, especially relational capital is very much into social networking where the relationship with external parties, such as customers, suppliers, and the government, play a crucial and very significant role to the organization.

However, Mc Elroy (2003) commented that intellectual capital itself does not emphasize the value of the relationships between people in firms and between firms and other firms. Trust, reciprocity, shared values, networking and norms are all under social capital, which adds value to the firm by speeding the transfer of information and development of new knowledge (Mc Elroy, 2002). Furthermore, intellectual property is mostly about patents, trademarks and copyrights.

Table 2.2 shows the components of intellectual capital as highlighted by various authors. As mentioned by Huang and Hsueh (2007) "numerous IC indicators have been identified (Guthrie et al. 1999; Miller et al. 1999) as research teams promulgated different theories of IC and evaluated organizations against them" (p. 388).

## Table 2.2 Taxonomy of Components of Intellectual Capital

| Author | Components of Intellectual Capital |
|---|---|
| Skandia (1994) | 1. Human capital<br>2. Structural capital<br>a.Customer capital<br>b.Organizational capital |
| Brooking (1996) | 1. Market assets (customer capital)<br>2. Human centred assets (human capital)<br>3. Intellectual property assets (structural capital)<br>4. Infrastructure assets (social capital) |
| St Onge (1996)<br>Edvinsson and Malone (1997)<br>Stewart (1997)<br>Roos et al (1998)<br>Bontis (2002) | 1. Human Capital<br>2. Structural Capital<br>3. Relational Capital |
| Van Buren (1999) | 1. Human Capital<br>2. Innovation Capital<br>3. Process Capital<br>4. Customer Capital |
| Sveiby (2000) | 1. External structure<br>2. Internal structure<br>3. Employees |
| Pollard (2000) | 1. Human capital<br>2. Structural capital<br>3. Customer capital<br>4. Innovation capital |
| O'Donnell and O'Reagan (2000) | 1. People<br>2. Internal Structure<br>3. External Structure |
| Cohen and Prusak (2001)<br>Davies and Magowan (2002) | 1. Human capital<br>2. Structural capital<br>3. Customer capital<br>4. Social capital |
| Wang and Chang (2005) | 1. Human Capital<br>2. Innovation Capital<br>3. Process Capital<br>4. Customer Capital |
| Nillson and Lindskog (2008) | 1. Human Capital<br>2. Structural Capital<br>3. Relational Capital<br>4. Financial Capital |
| Zerenler et al. (2008) | 1. Employee capital<br>2. Structural capital<br>3. Relational capital |

Compiled by researcher

Few researchers have produced their own version of the Intellectual Capital of human capital, structural capital and relational capital. Table 2.3 shows the taxonomy of intellectual capital by various authors. Details are shown in Appendix 2.

**Table 2.3**
**Taxonomy of Intellectual Capital Dimensions**

| Authors | Human Capital | Structural Capital | Relational Capital |
|---|---|---|---|
| Bontis, Nick (1998) | Tacit knowledge<br>Sheer intelligence of member<br>Network of node<br>*Generic inheritance*<br>*Education*<br>*Experience*<br>*Attitude of life and business* (Hudson, 1993) | Systems<br>Procedures<br>Structures | Customer capital:<br>• Marketing channel<br>• Customer r/ship<br>• Government<br>• Suppliers<br>• Industry associations |
| Anne Brooking (1996) | Skills, abilities and expertise, problem-solving abilities and leadership style | All the technologies processes and methodologies that enable a company to function | Brands, customers, customer loyalty and distribution channels |
| Goran Roos(1997) | Competence, attitude and intellectual agility | All organizational innovation, processes, intellectual property and cultural assets | Relationships include internal and external stakeholders |
| Thomas Stewart (1997) | Employees are an organization's most important asset | Knowledge embedded in information technology | Market information used to capture and retain customers |
| Cohen and Kaimenakis (2007) | Employees' capabilities, skills, knowledge, technical expertise, etc. | Organizational capital: databases, charts, manuals | Knowledge embedded in customers, suppliers, government and related-industries |

Source: compiled by researcher

Recent frameworks have emphasized three characteristics of intellectual capital (Pena, 2002). First, the increasing importance of intellectual capital management requires a shift in the way the corporate managers or top management run their organizations. As knowledge has become a critical resource that firms must master in today's competitive landscape, and

in order to manage knowledge, the organization needs information from its non-financial indicators to measure intangible assets.

Second, intellectual capital must respect and comprehend each firm's idiosyncrasies. It must be tailored to meet the specific information needs of a particular organization to improve its own strategic decision making.

Third, the framework has to be understood from a dynamic perspective. The interaction among different intellectual capital elements experiences a permanent change as firms evolve over time. However, the benefits of intellectual capital have been proven empirically. Table 2.4 illustrate the benefits of intellectual capital to an organization.

**Table 2.4 The benefit of Intellectual Capital**

| Authors | Benefits of Intellectual capital |
|---|---|
| Bontis (1997)<br>Bontis et al. (2000) | Business performance |
| Zhen et al. (1999) | Product improvement |
| Civi (2000) | Competitive Strategy |
| Carneiro (2000) | Competitiveness and innovation |
| Anell and Wilson (2002) | Competitive advantage |
| Hurwitz et al. (2002), Lev and Feng (2001) | Driver of stock return |
| Chen et al (2005) | Future financial indicators |

Source: Tan et al. (2008)

**Table 2.5 Definition of Intellectual capital (IC)**

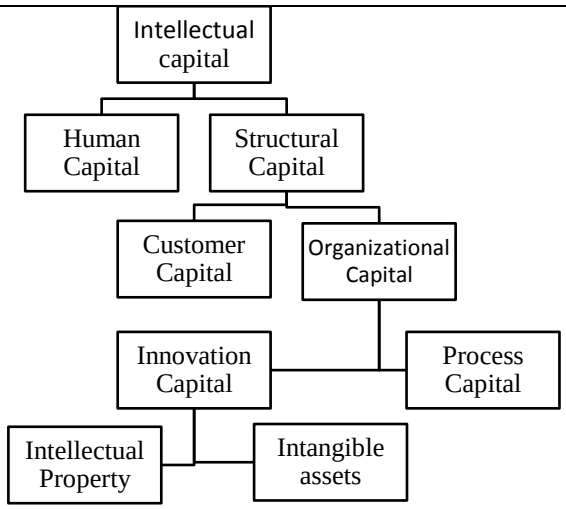
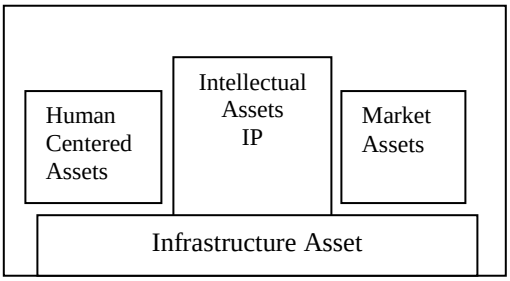
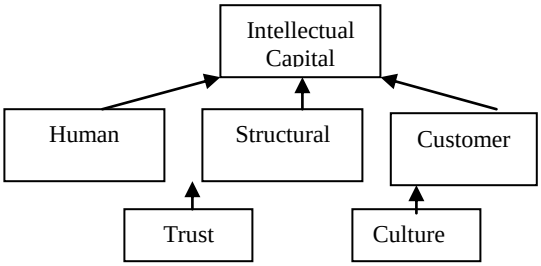
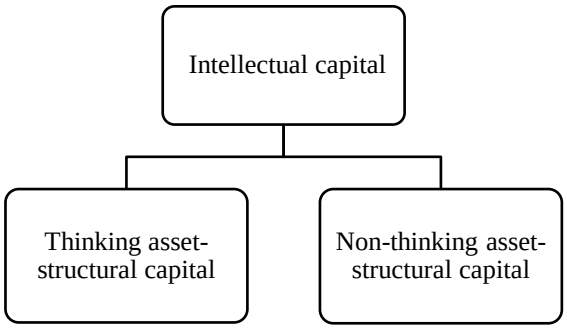
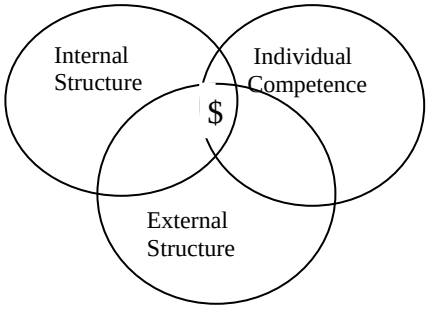
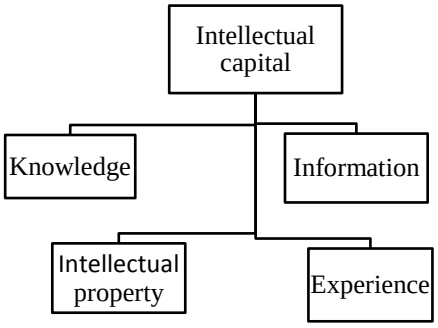
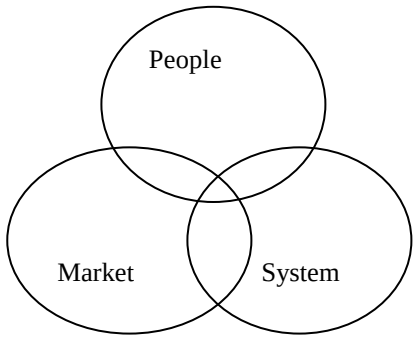
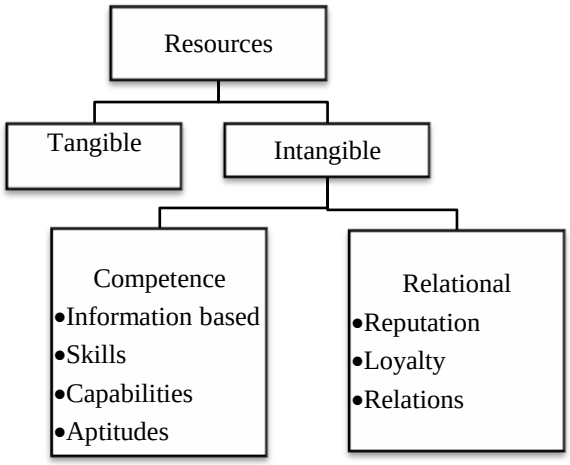
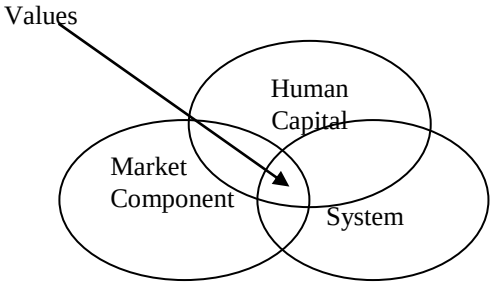
| | |
|---|---|
| **Skandia (1994)** | |
| IC is the aggregate sum of intangible values which comprises of:<br>i. Human capital – knowledge skills and capability<br><br>ii. Structural capital – everything that remains when the employees go home: databases, software, manuals, trademarks, organization structures, etc. Customer capital is the relationship built up with the customers, and is a significant part of the structural capital |  |
| **Brooking (1996)** | |
| IC components are :<br>i. Market assets<br>ii. Human centered assets<br>iii. Intellectual property<br>iv. Infrastructure asset |  |
| **Bontis (1996)** | |
| IC includes three sub-domains<br>i. Human capital<br>ii. Structural capital<br>iii. Custosmer capital<br><br>With two supporting drivers<br>i. Trust<br>ii. Culture |  |

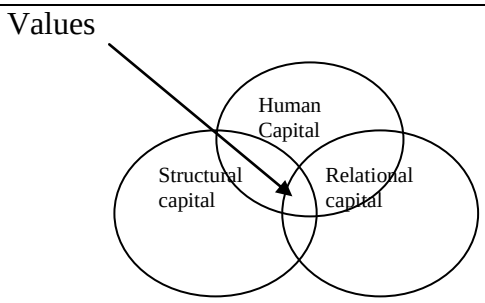
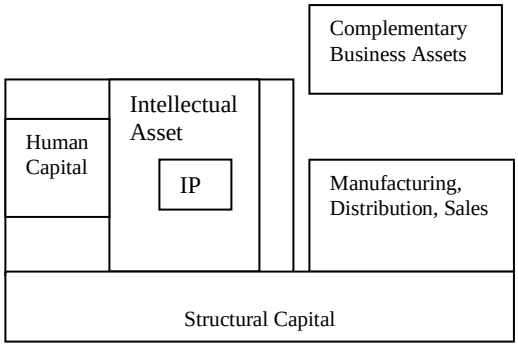
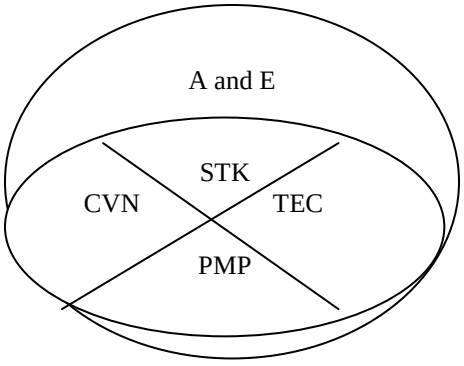
**Table 2.5 (continued)**

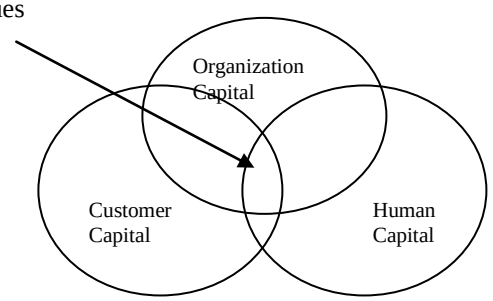
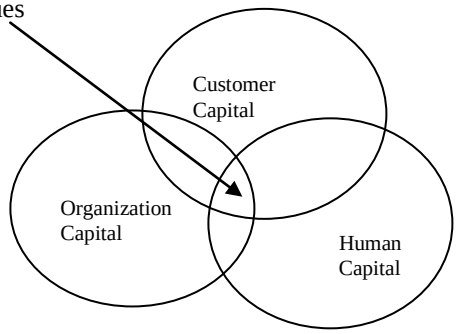
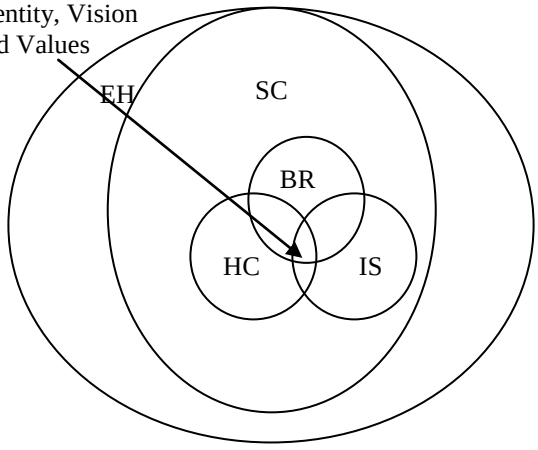
| | |
|---|---|
| **Roos et al. (1997)** | |
| IC includes:<br>i. Thinking assets –human capital<br>ii. Non-thinking assets – structural capital |  |
| **Sveiby (1997)** | |
| IC consists of three invincible assets:<br>i. Employee competence<br>ii. Internal structure<br>iii. External structure |  |
| **Stewart (1997)** | |
| IC as intellectual material which consists of:<br>i. Knowledge<br>ii. Information<br>iii. Intellectual property<br>iv. Experience<br>That can be put to create wealth |  |

## Table 2.5 (continued)

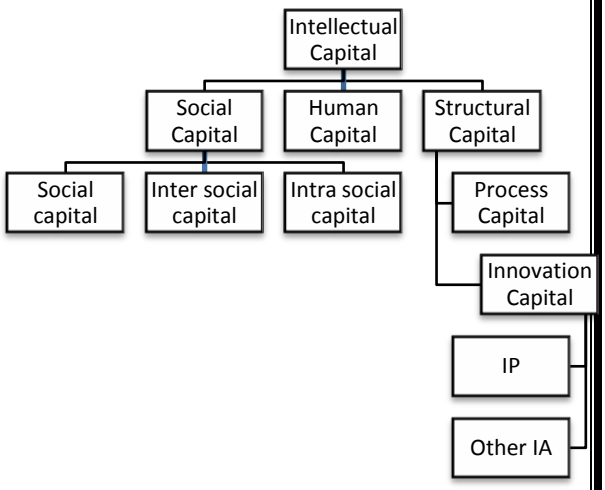
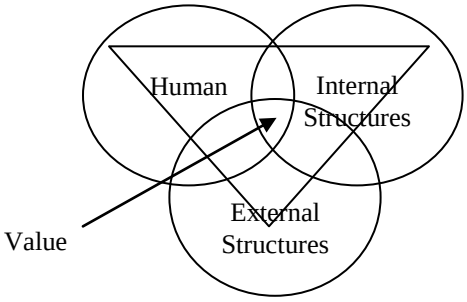
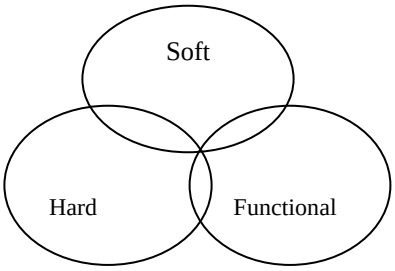
| | |
|---|---|
| **Danish Trade Union (1997)** | |
| IC includes:<br>i. People<br>ii. System<br>iii. Market |  |
| **Haanes and Lowendahl (1997)** | |
| IC is intangible resources of:<br>i. Competencies – various abilities to perform and are reflected at individual and organization level<br>ii. Relationship – reflected in the reputation of the company – customer loyalty<br>Both of these exist in an individual and collective fashion. |  |
| **Edvinsson and Malone (1997)** | |
| IC consists of:<br>i. Human capital – what people can do individually and collectively<br>ii. System components- knowledge in firms which is independent of people includes patents, contacts and databases<br>. Market components – relationship between organization and outsiders |  |

## Table 2.5 (continued)

| | |
|---|---|
| **Saint-Onge (1997)** | |
| i. Human capital – capabilities of individual to provide solutions to customers<br>ii. Relational capital – the depth, width, attachment and profitability of franchise<br>iii. Structural capital – the capabilities of organization and to meet market requirements |  |
| **Sullivan (1998)** | |
| IC is knowledge that can be converted into profits: IC comprises three elements:<br>i. Human capital<br>ii. Intellectual assets<br>**iii.** Structural assets |  |
| **Andriessen and Tissen (2000)** | |
| Five categories of intangible assets:<br>i. Skills and tacit knowledge (STK)<br>ii. Collective values and norms (CVN)<br>iii. Technology and explicit knowledge (TEC)<br>iv. Primary management processes (PMP)<br>Assets and Endowments (AandE) |  |
| | |

| | |
|---|---|
| **Guthrie and Petty (2000)** | |
| 1. Internal: Organization (structural) capital<br>2. External: customer (relational) capital<br>**3.** Employee competence: human capital | Values<br>  <br> |
| **Mayo (2000)** | |
| Most of common forms of IC:<br>i. Customer (external) capital-customers' relationship, loyalty, satisfaction and image.<br>ii. Organizational (internal structure) capital – systems, patents, know-how,database, knowledge, culture.<br>iii. Human capital – individual competence and experience, judgement, leadership and motivation | Values<br>  <br> |
| **Allee (2000)** | |
| Expanded view of IC:<br>i. Business relationship – alliances and business relationship with customers, partners, suppliers, investors and government (BR)<br>ii. Internal structures – systems, work processes that leverage competitiveness including IT, communication and technologies (IS)<br>iii. Human competencies (HC)<br>iv. Social citizenships (SC)<br>v. Environmental health (EH)<br>vi. Corporate identity (CI) | Identity, Vision and Values<br>  <br> |

## Table 2.5 (continued)

| | |
|---|---|
| **McElroy (2002)** | |
| Modifies Edvinsson's IC model:<br>i. Human capital<br>ii. Structural capital<br>iii. Social innovation capital |  |
| **Hussi (2004)** | |
| 1. Human Capital<br>2. Internal Structures<br>3. External Structures |  |
| **Cohen and Kaimenakis (2007)** | |
| IC is divided into 3 factors:<br>a. Hard intellectual assets (HC and CC)<br>b. Soft intellectual assets (HC and SC)<br>c. Functional intellectual assets (SC) |  |

Source: Mazlan Ismail (2005, researcher (2010)

Despite the growing acknowledgement of the strategic significance of intellectual capital, there is limited understanding of how organizations manage, measure and report their knowledge resources (Guthrie, 2001 as cited by Boedker et al. 2005). There are many definitions of intellectual capital in the relevant literature by various authors in various areas such as accounting and business. The intellectual capital concept is expanding to others areas such as construction, marketing, education etc. Most of the definitions of intellectual capital dedicated to human capital, structural capital and relational capital as three main components of intellectual capital even though some of the definitions used different terms. Table 2.5 summarizes the definitions of intellectual capital.

The following section will discuss the elements of intellectual capital in detail.

### 2.4.1 Human Capital

The employees in the organization make up the human capital of the organization. Employees are the most important resources in the organization. Known as human capital, employees' skills, commitment, capabilities, talents and knowledge are an organization's intangible assets that can be turned into its competitive advantage. The human capital of one organization to another organization is difference that makes it difficult to imitate, difficult to copy, rare and non-replaceable. Knowledge must be managed effectively in people and organizations to ensure that wealth-creating capacity can be maintained (Bohn, 1994 as cited in Martinez-Torres, 2006). Human capital is important because it is a source of innovation and strategic renewal (Cohen and Kaimenakis, 2007). A study carried out by Chen et al. (2004) found that other than through innovation capital and customer capital,

human capital has no direct relation to performance. However, human capital is a very important resource of the organization. Human capital represents the individual tacit knowledge embedded in the mind of the employees. It can be defined as a combination of employee's competence, attitude and creativity (Chen et al. 2004). According to Mayo (2001), human capital can be divided into three dimensions: capability and potential, motivation and commitment and innovation and learning. Table 2.6 shows the dimension of human capital.

**Table 2.6 Human capital dimensions**

| | |
|---|---|
| Capability and potential | Educational level, professional skills, experience, attitudes, personal networks, values and the ability of current employees to evolve within the organization. |
| Motivation and commitment | Whether employees align their own interests with those of the firms |
| Innovation and learning | The degree to which employees are open to change |

Source: Mayo (2001)

Human capital is different from structural capital in managing knowledge (Stewart, 2000). Human capital is the source of innovation, as people contribute their creativity, while sharing and transporting knowledge require structural intellectual assets and structural capital is more towards strategy and purpose. According to Man and Lau (2002), the emphasis on the human factor is supported by the findings of Stoner (1987) that the key distinctive competence of small firms is the experience, knowledge and the skills of the owners and workers. For SMEs, the entrepreneur and the inventor are pure human capital (Hisrich and Peters, 2008). An SME is more than the owner itself, it is about the people

who make things go and earn profit for the organization. The most important is human capital, which is about what people can do, individually and collectively (Brennan and Connell, 2000).

### 2.4.2 Structural Capital

Intellectual capital by itself is of little value without the leveraging effect of the firm's supporting structural capital resource. The structural capital comprises systems, structure, corporate culture, the organizational process efficiency, databases, information and production technology (Cohen and Kaimenakis, 2007). Structural capital is the embodiment, empowerment, and supportive infrastructure of human capital (Bontis, 1998). It provides the environment that encourages individuals to invest their human capital to create and leverage knowledge. The structural capital encompasses all forms of knowledge including human capital, which is supported by employees such as organizational routines, strategies, process handbooks, databases and many more (Boisot, 2002, Walsh and Ungson, 1991, Pablos, 2007). It also encompasses the organizational capacity, including the physical systems used to transmit and store intellectual material (Edvinsson and Malone, 1997). This component of intellectual capital is the firm’s infrastructure, which is developed to commercialize their intellectual capital (Edvinsson and Sullivan, 1996). Unlike human capital, structural capital can be formally captured and embedded (Tan et al., 2008). Structural capital provides a platform for people to be creative (Stewart, 2000). While firms do not own human capital (Cohen and Kaimenakis, 2007), structural capital belongs to the organization. It can be reproduced and shared. A good structural capital will provide a good environment for rapid knowledge sharing, collective knowledge growth, shortened lead

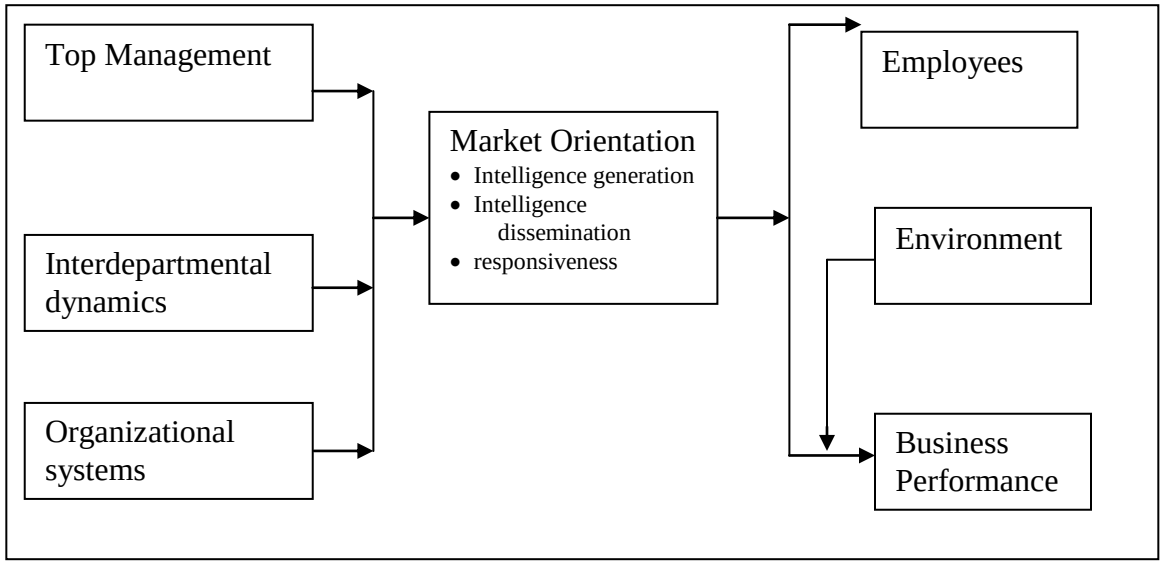
times and more productive people (Stewart, 2000). The system in the structural capital is the knowledge of the company, which is independent of people (Brennan and Connell, 2000). In fact, Stewart (2000) also refers to structural capital as knowledge management in which the knowledge of an organization is flowing.

### 2.4.3 Relational Capital

Relational capital embraces all the relations the firm has established with its stakeholder groups such as customers, suppliers, the community, and the government (Bontis, 1998, Allee, 2000). Most references refer to the third part of intellectual capital as customer capital as those authors are relating it to the market orientation and customer orientation. However, for the purpose of this study, relational capital will be adopted. Many nations are improving economically in today's knowledge-based economy by promoting and supporting SMEs with the necessary infrastructure (Cowey as in Wickramansingher and Sharma, 2005). Stewart (2000) points out that the relationship with these external stakeholders is to turn it into money.

The information from the market is turned into market orientation while the information concerning the customer is referred to as customer orientation. Customer capital is closely related to market orientation (Cohen and Kaimenakis, 2007). Market orientation is a set of behaviours and processes (Kohli and Jaworski, 1990) or an aspect of culture (Narver and Slater, 1990) to create superior customer value. Market orientation is also the implementation of the marketing concept via market intelligence generation,

intelligence, dissemination and responsiveness (implementing a marketing strategy) (Kohli and Jaworski, 1990). Figure 2.8 shows the model developed by Jaworski and Kohli (1993).




Source: Jaworski and Kohli (1993)

**Figure 2.8**
**Jaworski and Kohli Model**

Han and Kim(1998) emphasize that market orientation is to coordinate the customer's needs by obtaining and using the customer's information, competitors' capabilities and provision of other significant market agents and authorities (Keskin, 2006; Deshpande and Webster, 1989). This integrated effort on the part of the employees and across departments in an organization gives high or superior performance to an organization (Kohli and Jaworski, 1990). Customer orientation is defined as an integral component of the general underlying organizational culture and, thus, attention to information about customers' needs should be considered along with the basic set of values and beliefs that are likely to reinforce, such as customer focus, and permeate the firm (Appiah-Adu and Singh, 1998). They emphasized, that in SMEs, customer orientation is a

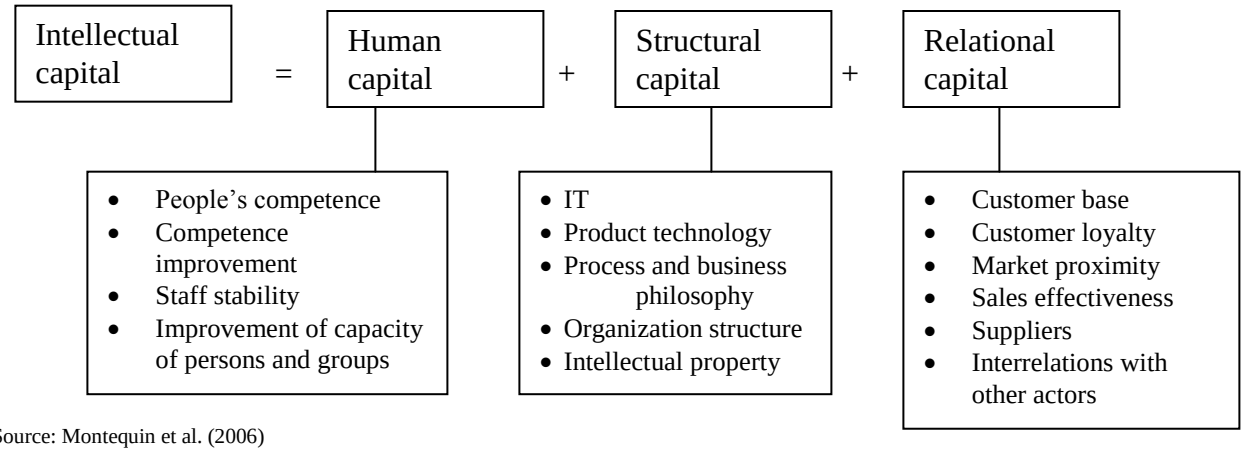
vital determinant of success because of the advantage of close proximity to their customers which Deshpande and Webster (1993) found a positive relationship between customer orientation and organizational performance.

Specifically, relational capital fosters a knowledge-producing behaviour – providing a source of ideas for change and improvement by market information processing and marketing strategies (Keskin, 2006). However, this knowledge has little benefit if not appreciated and implemented to enhance firm innovation. Contemporary classical schemes have divided intellectual capital into the categories of external (customer-related) capital, internal (structural) capital and human capital (e.g. Sveiby, 2001, 2002; Roos et al. 1998; Stewart, 1997; Edvinsson and Malone, 1997; Petty and Guthrie, 2000). In conclusion, it appears that most of the definitions of intellectual capital listed above include human capital, structural capital and relational/customer capital.

The three IC components (human capital, structural capital and relational capital) are closely intertwined and interdependent (Subramaniam and Youndt, 2005; Youndt, et al., 2004). IC provides the best possible value to organizations through the combination, utilization, interaction, alignment and balancing of the three types of intellectual capital as well as through managing the knowledge flow between the three components (Quink, 2008). Therefore, for this study, IC will be regardes as one construct. This concept is supported by Eren and Kocapinar (2009), Huang and Wu (2009) and Firer and Stainbank (2003) in treating IC as one construct.

### 2.4.4 Intellectual capital Studies

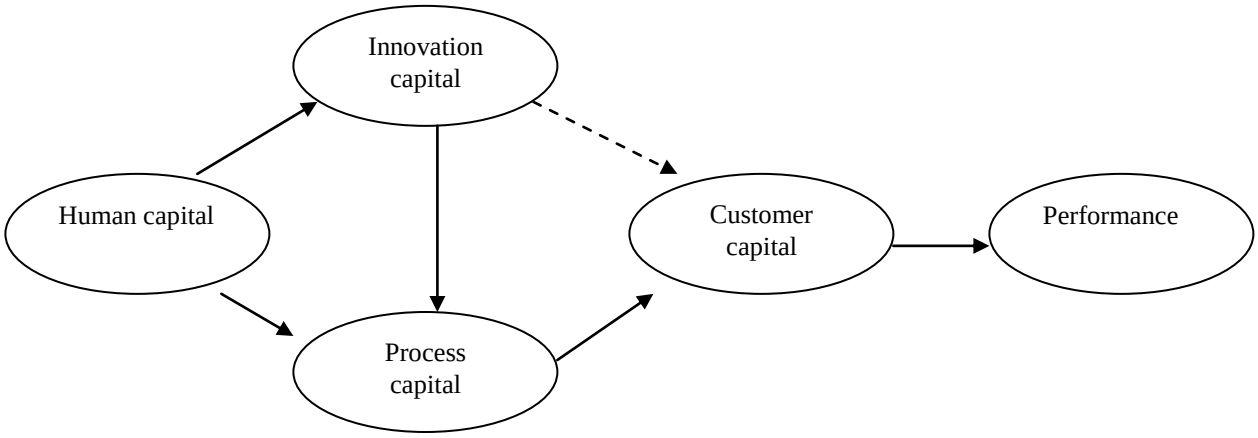
Montequin et al. (2006) in their study listed the important elements of Intellectual Capital for SMEs, as shown in Figure 2.9.




Source: Montequin et al. (2006)

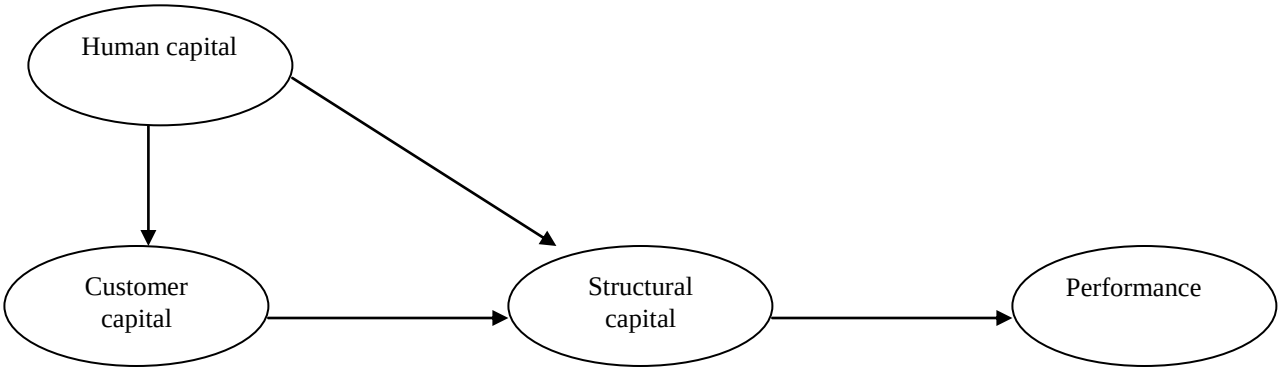
**Figure 2.9**
**Intellectual capital dimensions**

Intellectual capital is a multifaceted construct with several dimensions that are not developed in isolation as they show strong ties (Cohen and Kaimenakis, 2007; Jin Chen, 2004; Wang and Chang, 2005; Bontis, 2000). Cohen and Kaimenakis (2007) found that only human capital and organizational capital and human capital and customer capital directly interrelate in SMEs in the service industry. Bontis et al. (2000) and Chen et al. (2004) found that human capital does not have a direct relation to performance but through other capitals (Figure 2.10(a)).




Source: Chen et al. (2004)

**Figure 2.10(a)**
**The intellectual capital studies**




Source: Bontis (2000)

**Figure 2.10(b)**
**The intellectual capital studies**

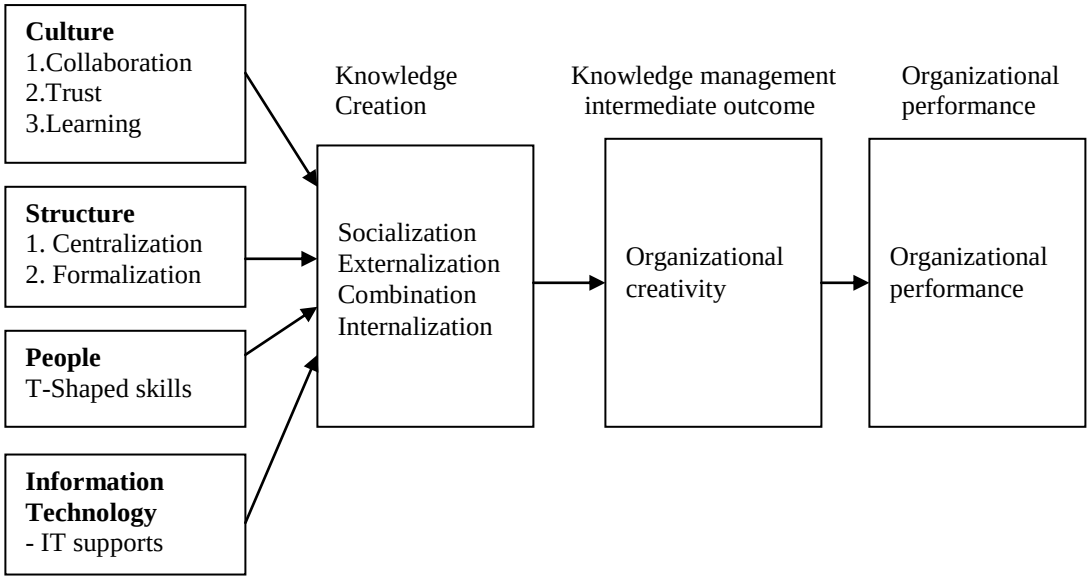
Bontis (2000) as in Figure 2.10 (b), also found that non-service industries in Malaysia have a better capability for transforming individual employee knowledge into non-human knowledge. In short, much of the intellectual capital in non-service industries is absorbed in the large capital outlays (i.e. machinery and equipment) found in construction and other manufacturing intensive industries whereby human capital has no direct impact

on performance but has an impact on other capitals, which, in turn, affect performance. This is supported by Stewart (2006) who suggests that structural capital is indeed a knowledge-based activity system that helps boost performance.

However, most intellectual capital studies have been conducted to investigate how the different types of intellectual assets that exist in the context of firms, interact with each other and the way these assets affect performance (Bontis, 1998; Bontis et al., 2000, Chen et al., 2004, 2005; Wang and Chang, 2005, Cohen and Kaimenakis, 2007).

From the perspective of the flow approach of intellectual capital, knowledge resources are flowing through its people, structure and relationship to create value. The flow process needs a mechanism to represent the basic operations of knowledge. In this study, knowledge sharing and innovation are identified as knowledge processes for intellectual capital that affects organizational performance. This relationship can be found in the input-process-output model by Hackerman and Moris (1978). The input-process-output is extended further by Lee and Choi (2003) as shown in Figure 2.11.

Lee and Choi (2003) further demonstrate this model by applying seven enablers, which they called knowledge enablers, to interconnect the knowledge management factors. The human interaction is limited to t-shaped skills rather than the social interactions among the people.




Source: Lee and Choi (2003)

**Figure 2.11**
**Knowledge management enablers**

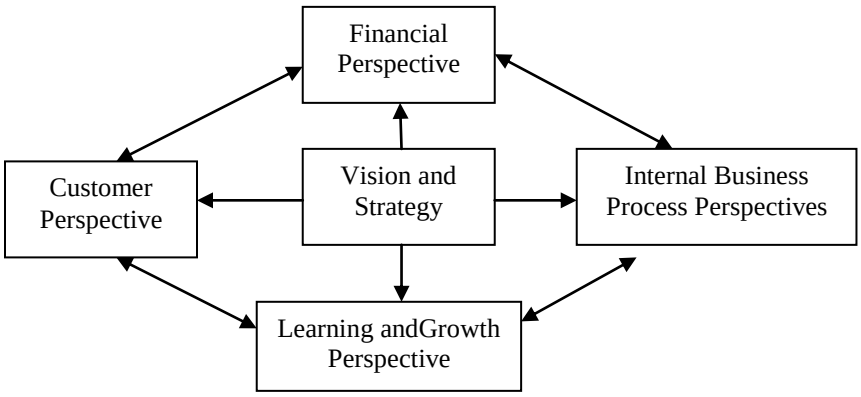
As IC was first discovered in the financial areas, most of the measurement of IC is contributed by the accounting fraternity. Sveiby (2000) suggests that measuring approaches for intangibles fall into four categories, namely: direct intellectual capital methods, market capitalization methods, return-on-assets (ROA) methods and scorecard methods (SCM), which are regarded as a Dollar Valuation of IC. Details are shown in Table 2.7.

**Table 2.7 Measurement of intellectual capital**

| Methods | Estimation |
|---|---|
| Direct intellectual capital (DIC) | Dollar value of intangible assets through its various components. |
| Market capitalization (MCM) | Calculates difference between a company's market capitalization and the book value of shareholder's equity |
| Return-on-assets (ROA) | Average pre-tax earnings of a company for a period of time divided by the average of tangible assets of the company |
| Scorecard (SCM) | Various components of IC are identified and indicators and indices are generated and reported in scorecards or in a graph |

Source: Sveiby (2000)

In addition to the Dollar Valuation of IC, researchers are also interested in using measures that are more accurate and faster than purely financial measures. Kaplan and Norton (1992) as cited in Tan et al., 2008, pioneered a model called the Balanced Scorecard, which measures organizational performance across four linked perspectives: financial, customer, internal business processes and learning and growth, as shown in Figure 2.12.




Source: Kaplan and Norton (1992) as cited in Tan et al (2008)

**Figure 2.12**
**Kaplan and Norton (1992)**

Several methodologies for measuring IC have been developed. These measuring techniques are still evolving. As the definition of IC is not well established, and neither are the standards for measuring and reporting, IC is still in its infancy, confused and unstructured (Bornermann et al. 1999). Therefore, there is plenty of scope for improvement and further development of measuring and reporting IC as either a dollar or non-dollar valuation.

The taxonomy of IC valuation over the years is further shown in Table 2.8.

**Table 2.8 Intellectual Capital Valuation**

| **Dollar Valuation** | | **Non-Dollar Valuation** | |
|---|---|---|---|
| Methods | Author(s) | Methods | Author(s) |
| Balanced Scorecards | Kaplan and Norton (1997) | Economic Value Added (EVA) | Bontis et al. (1999) |
| • Market Assets<br>• Human-centred Assets<br>• Intellectual property assets<br>• Infrastructure assets | Brooking (1996) | Market-to-book value<br>Market Value = Book value + IC | Dzinkowski, 2000<br>Lev and Fang, 2001<br>Guthrie, 2001<br>Seetharaman et al., 2002 |
| Skandia IC (112 metrics)<br>• Financial<br>• Customer<br>• Human<br>• Process<br>• Renewal and development | Edvinsson and Malone (1997) | Tobin's q | Luthy (1998) |
| IC indexes | Roos et al. (1997) | Value Added Intellectual Coefficient (VAIC) | Pulic (1998, 2000) |
| Invincible balance sheet<br>• Internal structure<br>• External structure<br>• Individual competence | Sveiby (1997) | Human resource costing and accounting | Johanson and Grojer (1998) |
| Market Value IC=HC+Innov Capital + Process Capital+RC | Joia (2000) | Accounting for the future (AFTF) | Nash (1998) |

Source: Tan et al. (2008).

Table 2.9 shows the summary of intellectual capital research by various researchers across the sectors and countries. A detailed taxonomy on intellectual capital studies is presented in Appendix 2.

**Table 2.9 Intellectual Capital Research**

| Major Area Research | Author |
|---|---|
| Defining and measuring constructs | Edvinsson and Malone (1997)<br>Skandia (1994)<br>Stewart (1997)<br>Sveiby (2000) |
| Business value of intellectual capital | Bontis (1998),<br>Bontis et al. (2000),<br>Torres (2006)<br>Cohen and Kaimenakis (2007) |
| Impact of intellectual capital on organization performance | Tsai and Ghoshal (1998) |
| Intellectual capital and relationship management | Agndal and Nilsson (2006) |
| Human capital and organizational performance | Seleim, Ashour and Bontis (2006),<br>Bontis and Fitz-enz (2002) |
| Benefits of intellectual capital | Boedker et al (2005) |
| Intellectual capital and organizational performance | Cabrita and Vaz (2006),<br>Cleary (2009),<br>de Castro and Saenz (2008),<br>Hong et al. (2008),<br>Huang and Hsueh (2007),<br>Marr et al. (2004),<br>Menor et al. (2007),<br>Tovstiga and Tulugurova (2007),<br>Wang and Chang (2005) |
| Intellectual capital and innovation | Chen et al. (2006),<br>Marr et al. (2004),<br>Wu et al. (2008) |
| Intellectual capital and knowledge sharing | Li and Zhu (2009) |
| Interactions among the dimensions of intellectual capital and business performance | Bontis (1998)<br>Bontis et al. (2000)<br>Bontis and Fitz-enz (2002)<br>Pablos (2002)<br>Wang and Chang (2005)<br>Cabrita and Vaz (2006) |

Source: compiled by researcher

## 2.5 The Mediating Variables

According to Pablos (2004), intellectual capital represents the "stock" of knowledge that exists in an organization at a particular point in time. Therefore, there must be a mediating mechanism that can process this "stock" of knowledge to generate products and profit. A few authors of intellectual capital have explored the mediating effects on the relationship between intellectual capital and performance. Wu et al. (2007) explored the mediating effect of dynamic capabilities on the relationship of intellectual capital and innovation performance. Lin and Chen (2008) investigated the effect of shared knowledge on the relationship of internal and external integration on innovation capability and product competitive advantage in Taiwan. Hsu and Fang (2009) investigated the mediating effect of organizational learning capability on the relationship of intellectual capital and new product development performance.

Intellectual capital and knowledge management cannot be pursued in isolation. They must interweave with other management considerations to make a sound, balanced and competitive enterprise (Wiig, 1997). Furthermore, from the practitioner's point of view, interconnecting variables may provide a clue as to how firms can enhance their strengths to improve their performance (Liao and Chuang, 2006). This combined system must be treated as a dynamic process.

It is important to align and choose knowledge management activities with the intellectual capital result that has been targeted. From the strategic perspective, IC can be used to create knowledge that enhances a firm's value (Tan et al., 2008). The key role of

knowledge as a source of competitive advantage is to produce IC in an efficient way (Marti, 2001 as cited by Tan et al. 2008). But knowledge cannot be created by computers, books, or direct explicit knowledge transfer (Roos et al. 1998).

According to Nonaka (1995), an organization's knowledge is created through the interaction of tacit and explicit knowledge. Nonaka and Takeuchi (1995) emphasize that the tacit personal knowledge possessed by individuals is most important for an enterprise to act intelligently. However, tacit knowledge must be transferred to explicit shared knowledge to be of general and lasting value. The interaction between tacit and explicit knowledge, when properly stimulated, can make a company's knowledge base grow exponentially. This is because knowledge is one of the few assets that grow most when shared (Tan et al. 2008). It is the key to enhance competitiveness (Nonaka, 1995). Carneiro (2000) examines knowledge management and its influence on innovation and competitiveness. IC is always referred to as a stock and knowledge management is often referred to as a flow (Bontis et al. 2002). The point is, when there is no knowledge sharing, there is no knowledge creation (Roos et al. 1998).

Knowledge creation leads to innovation. A few authors have highlighted that innovation is to be measured prior to measuring organizational performance to ensure a proper outcome for organizations. Therefore, in this process mechanism, in order to add value to IC, knowledge sharing and innovation will be included as mediating variables in the framework. As knowledge is flowing continuously in the organization, being shared among the employees and flowing vertically and horizontally, when knowledge is developed, innovation will prevail.

### 2.5.1 Knowledge

Knowledge is defined as information combined with knowledge, context, interpretation and reflection (Davenport, De Long and Beers, 1998). Data, information and knowledge are not interchangeable concepts (Alavi and Leidner, 2001; Davenport and Prusak, 2000; Grover and Davenport, 2001). It is important for the organizations to differentiate the distinction of these three concepts in order to reap the benefits of knowledge (McCampbell et al., 1999). Data is a set of discrete, objective facts of events; it does not contain inherent information. Information is a message meant to change the way in which a receiver perceives something. Information is data that contains meaning. Knowledge is broader, richer and deeper than data and knowledge (Davenport and Prusak, 2000). Table 2.10 presents a summary of these three concepts.

**Table 2.10 Summary of Data, Information and Knowledge**

| Data | Information | Knowledge |
|---|---|---|
| • Simple observations of the state of the world<br>• Easily structured<br>• Easily captured on machines<br>• Often quantifiable<br>• Easily transferable | • Data is endowed with relevance and purpose<br>• Requires a unit of analysis<br>• Needs consensus on meaning<br>• Human mediation necessary | • Value-added information from the human mind including reflection, synthesis, context<br>• Hard to structure<br>• Difficult to capture on machine<br>• Often tacit<br>• Hard to transfer |
| Example of data:<br>Real-time stock prices | Example of Information:<br>Analyst's report on a stock-uptrend or downtrend | Example of Knowledge:<br>Fund manager's decision to buy or sell stock |

Source: Davenport (1997)

Knowledge lies in human minds and only exists if there is a human mind to do the knowing (Widen-Wulff and Suomi, 2007). There are three dimensions of knowledge: width, depth and tacitness (Nooteboom, 1993). Knowledge can be created by intentional and resource-consuming efforts (Du et al., 2007). The neglect of knowledge based on people and ideas has undoubtedly reduced the corporate market place's capability for true innovation and sustainable competitiveness (Gamble and Blackwell, 2001).

Knowledge is classified into two types by Polanyi (1966, p.135-146) tacit and explicit. Explicit knowledge is the type of knowledge that can be easily documented and shaped (Choi and Lee, 2003). It can be created, written down, transferred and followed among the organizational units verbally or through computer programs, patents, diagrams and information technologies (Keskin, 2005; Choi and Lee, 2003).

Tacit knowledge is what is embedded in the mind (Choi and Lee, 2003), it can be expressed through ability applications and transferred in the form of learning by doing and learning by watching. Based on Polanyi (1966), all knowledge has tacit dimensions. It can be completely tacit, semiconscious or unconscious knowledge held in people's heads and bodies (Leonard and Sensiper, 1998). Tacit knowledge can be classified into two dimensions: technical and cognitive (Pathirage and Amaratunga, 2007). Technical encompasses information and expertise in relation to "know-how" while cognitive consists of mental models, beliefs and values. Tacit knowing is embodied in physical skills and resides in the body's muscles, nerves and reflexes and is learned through practice. Tacit knowledge is also embodied in cognitive skills (Leonard and Sensiper, 1998). While explicit is ready to be explored, it is difficult to extract tacit knowledge without the consent of the knowledge owner. Tacit knowledge and explicit knowledge complete each other and

they are important components of knowledge management approaches in organizations (Beijerse, 1999). Keskin (2005) found that tacit knowledge, explicit knowledge and performance are closely related, especially when the external environment is hostile. The great virtue of tacit knowledge is that it is automatic, requiring little or no time or thought (Stewart, 2000). He emphasizes that tacit knowledge tends to be local as well as stubborn because it not found in manuals, books, databases or files. It is oral. It is created and shared around a water cooler or during a coffee break. Tacit knowledge spreads when people meet and tell stories. As tacit knowledge remains hidden, unspoken and tacit, this knowledge can be either knowledge embodied in people and social networks or knowledge embedded in the processes and products that people create (Horvath, 2007).

### 2.5.2 Knowledge Sharing

Knowledge sharing can be defined as the activities of how to help communities of people work together, facilitating the exchange of their knowledge, enhancing organizational learning capacity and increasing their ability to achieve individual and organizational goals (Dyer and Nobeoka, 2000). Knowledge sharing can also be explained as a set of behaviours that involve the exchange of information or assistance to others and is separate from information sharing (Connelly and Kelloway, 2003). Knowledge does not flow automatically through organizations. Indeed, people's time and energy is limited and they will choose to do what will give them the best return given their scarce resources (Davenport and Prusak, 1998). Knowledge sharing is basically the act of making knowledge available to others within the organization (Ipe, 2003). Knowledge sharing in organizations is of great interest to the researcher and practitioner alike (Alony et al., 2007).

There are many reasons about why people share their knowledge. Table 2.11 shows the advantages of knowledge sharing.

**Table 2.11 Advantages of Knowledge Sharing**

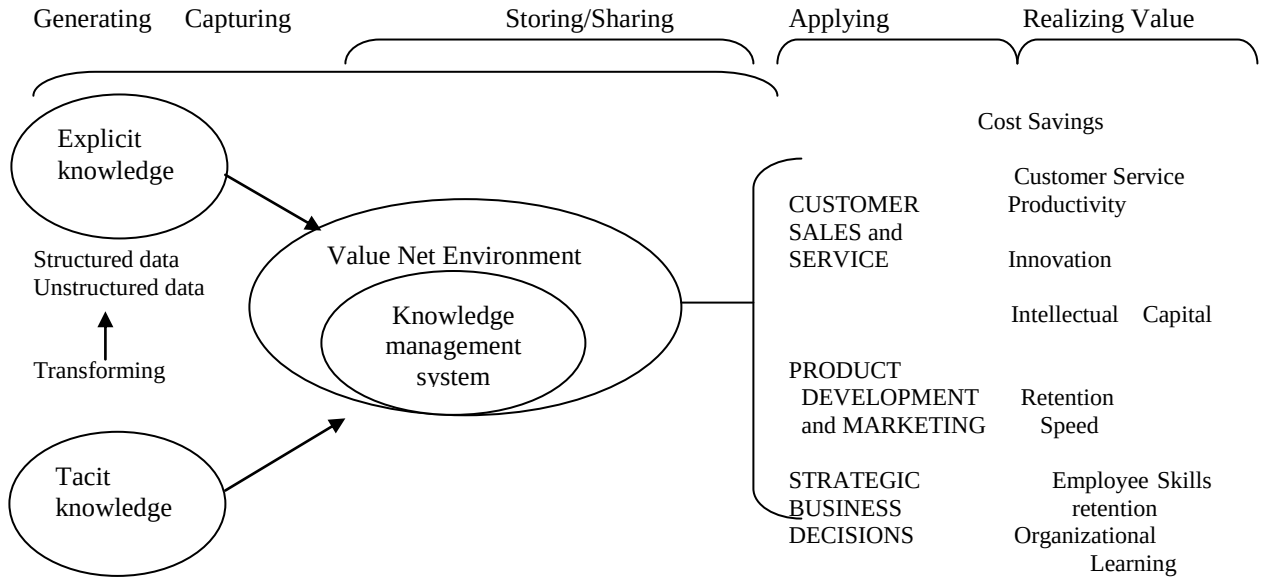
| Advantage | Authors |
|---|---|
| Reduces uncertainty | Gulati and Gargiulo (1999)<br>Tywoniak (2007) |
| Transform individual learning into organizational learning | Nonaka (1994) |
| Preventing the reinventing of the wheel | Bender and Fish (2000) |
| Create shared understanding | Nickerson and Zenger (2004) |
| Problem solving | Cross and Sproull (2004) |
| Decision Making | Harlow (2008) |
| Improves organizational performance | Lesser and Storck (2001) |
| Promoting competitive advantage | Argote and Ingram (2000) |
| Organizational learning | Argote (1999) |
| Innovation | Powell, Koput, and Smith-Doerr, (1996) |
| Survival | Baum and Ingram (1998) |

Source: compiled by researcher

Knowledge sharing is critical to a firm's success and often forms a key component of knowledge management programmes (Davenport and Prusak, 1998; Riege, 2005).

Much of the literature focuses on the tacit knowledge held by individuals rather than collective tacit knowledge. As tacit knowledge is valuable depending on the content of the knowledge, sharing one's knowledge with another could increase or add value to the knowledge itself (Leonard and Sensiper, 1998). In an organization, tacit knowledge takes

one of two forms: 1. Knowledge embodied in people and social networks, 2. Knowledge embedded in the processes and products that people create (Hedlunds et al., 20003). Effective knowledge management (KM) requires a symbiosis between explicit and tacit knowledge in line with the technology and human resource processes (Choi and Lee, 2003). In a commercial environment, knowledge must be put into work in three primary areas; customer needs, concern processes and body of knowledge (Gamble and Blackwell, 2000). If a business idea is to be successful, it has to deliver the value and profit as shown in Figure 2.13.

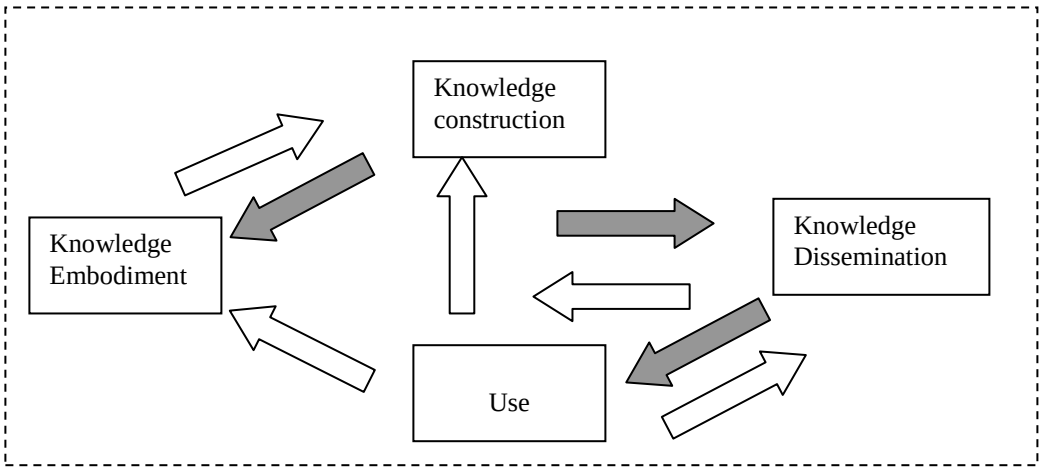



Source: Gamble and Blackwell (2000)

**Figure 2.13**
**Gamble and Blackwell Model**

Every member of the organization must understand how his or her work contributes to fulfilling customer needs and how the products and services of the enterprise provide customer value. Then members of the organization must understand how his or her work relates to the work of others. The last part of the process is the flow of knowledge that, to varying degrees, every person must understand something about the subject matter with which members of the organization deal. This requires a deeper knowledge of the relationships and meanings within both the enterprise and the outside world.

Knowledge must continuously circle and flow in the organization. As long as there is a stock of knowledge, during any period of time, there is a flow of knowledge (Stewart, 2000). McAdam and McCreedy (2000) commented that these two models of Gamble and Brickwell and Demarest, are too mechanistic and are not representative of knowledge flow in a real organization. They claimed that Demarest's knowledge management model (Figure 2.14) is more comprehensive, which views knowledge as being intrinsically linked within the social and learning processes within the organization.




Source: Mc Adam and Mc Creedy (2000)

**Figure 2.14**
**Demarest's Knowledge Management Model**

The model emphasizes the construction of knowledge within the organization, which is not limited to scientific input but is seen as including social construction knowledge. The model assumes that constructed knowledge is then embodied within the organization, not just through explicit programmes but through the process of social interchange. Then the process of dissemination of espoused knowledge throughout the organization and its environment. Lastly, knowledge is seen as being of economic use concerning the organizational outputs. The dark arrows show the primary flow direction while the light arrows show the more recursive flows.

All these knowledge management models have shown the process of knowledge in an organization. One significant issue is that knowledge flows continuously in the organization. This flow of knowledge needs to be supported by a process of knowledge sharing to ensure that the process of knowledge management is fully utilized.

Making knowledge available to others and capturing new knowledge as well, has been described by Nonaka (1991) as the spiral of knowledge. In Figure 2.15, Nonaka and Takeuchi (1999) examine the concept in terms of a knowledge spiral encompassing four basic patterns of interaction between tacit and explicit knowledge: socialization, externalization, combination and internalization.

| | Tacit | to | Explicit |
|---|---|---|---|
| Explicit to Tacit | From Tacit to Tacit produces:<br><br>**Socialization**<br>Examples: team meetings and discussions, collaboration | | From Tacit to Explicit produces:<br><br>**Externalization**<br>Examples: dialogue with team, answer questions, models, metaphors, stories |
| | From Explicit to Tacit produces:<br><br>**Internalization**<br>Examples: learn from a report, read from many sources and create new knowledge combining existing tacit knowledge with knowledge gained from others. | | From Explicit to Explicit produces:<br><br>**Combination**<br>Examples: share a report or document, training, shared database of information. |

Source: adapted from Marwick, A.D. (2001). Knowledge Management Technology, IBM Systems Journal. Nonaka and Takeuchi, 1999

**Figure 2.15**
**Knowledge Cycle Model**

McAdam and McCreedy (1999) identify this model as the knowledge category model. The model assumes that tacit knowledge can be transferred through a process of socialization into tacit knowledge in others and that tacit knowledge can become explicit knowledge through a process of externalization. This explicit knowledge can be transferred into the tacit knowledge of others through a process of internalization and that explicit knowledge can be transferred to explicit knowledge in others through a process of combination. These movements of knowledge along the tacit-explicit spiral are essentially events of knowledge sharing (Roos et al., 1998).

In fact, Boisot's Model (1987), in Figure 2.16, discusses the same things except Boisot considers knowledge as either codified or uncodified. When knowledge is diffused it refers to knowledge that is ready to be shared and undiffused refers to knowledge thatis not ready

to be shared. However, Leonard and Sensiper (1998) point out that knowledge does not necessarily need to be explicit in utilizing it. Knowledge can remain tacit but collective tacit knowledge leads to creativity and innovation (Leonard and Sensiper, 1998).

| | **Undiffused** | **Diffused** |
|---|---|---|
| **Codified** | Property Knowledge | Public Knowledge |
| **Uncodified** | Personal Knowledge | Common Sense |

Source: Mc Adam and Mc Creedy (2000)

**Figure 2.16**
**Boisot Model**

Nonaka's conceptualization of socialization, externalization and combination is of particular importance in explaining the process of knowledge sharing (Wah et al., 2005). Even though the SECI model is mostly known for knowledge creation the process is more towards knowledge sharing. The creation of organizational knowledge requires the sharing and dissemination of personal experiences (Gold et al., 2001). According to Roos et al. (1998), explicit to explicit knowledge transfer can only involve data; to have knowledge, data must be interpreted by the human mind.

Knowledge that resides in groups, teams or communities is a key source of under-leveraged know-how in most organizations. Communities of practice (CoP) are the nexus for sharing and transferring the valuable tacit knowledge possessed by individuals and groups (Kogut and Zander, 1992; Lesser and Storck, 2001), and they provide firms with a

vital source of organizational learning and incremental innovation as community members improve their practice through the continuous creation of knowledge (Wenger, 1998). This transfer of tacit knowledge is not to simply codify it but rather to share. In a smaller setting where CoP exists, the interaction is primarily in informal face-to-face discussions (Lave and Wenger, 1991). More commonly, people are unaware or are unable to articulate their tacit knowledge but storytelling during breaks and on the job helps individuals to interpret knowledge and events (Schenkel and Teigland, 2008). Tacit knowledge cannot be captured but can only be demonstrated through expressible knowledge and acts, tacit knowledge can be shared (McAdam et al. (2007).

Bontis et al. (1998) and Saint Onge (1996) regard tacit knowledge as the primary source of intellectual capital but Roos et al. (1998) believe that tacit and explicit knowledge should be balanced. There are two schools of thought regarding externalization and codification of tacit knowledge. One view espouses that tacit knowledge must be made explicit for sharing and the other regards tacit knowledge as always being tacit (McAdam et al., 2007; Nonaka and Konno, 1998). However, Polanyi (1966) suggests that as long the possessor of tacit knowledge knows a way to express the knowledge, she or he should be able to share it. Tacit knowledge sharing cannot be taught, trained or educated (Brockmann and Anthony, 1998), it can only be learned and facilitated.

Various authors commented that tacit knowledge sharing is very difficult due to perception, language, time, value and distance (Haldin-Herrgard, 2000; Nonaka and Konno, 1998; Bennet and Gabriel, 1999; Leonard and Sensiper, 1998). However, different methods like apprenticeship, direct interaction, and networking that include face-to-face social interaction are more suitable for supporting the diffusion of tacit knowledge (Haldin-

Herrgard, 2000). It can also be communicated by converting into words, models or numbers that anyone can understand (Desouza, 2003). The more tacit knowledge is shared, the harder is the imitation (Leonard and Sensiper, 1998).

All these processes involve joint social interaction with two or more actors whereby tacit knowledge that resides in the individual's mind is articulated and becomes explicit (Wah et al., 2005). The application and transfer of knowledge in knowledge sharing activities will also help to promote knowledge creation because of the improvement in the firms' absorptive capacity (Cohen and Levinthal, 1990). Therefore, people in the organization must be encouraged to communicate either orally or through written means (Roos et al., 1998). Knowledge sharing is also perceived to be the most essential process for knowledge management (Bock and Kim, 2002).

Knowledge sharing is different from knowledge transfer even though it is often used interchangeably (Renzl, 2008). Knowledge transfer is defined as has adopted a source and recipient generic model while knowledge sharing emphasizes the collective character of knowledge emerging from interaction and dialogue among individuals. Knowledge sharing is a reciprocal process of knowledge exchange and examines factors that help explain why individuals are willing to engage in this process and why it is a fragile process (Renzl, 2008). Knowledge sharing is critical to a firm's success and often forms a key component of knowledge management programmes (Davenport and Prusak, 1998; Riege, 2005). Sharing knowledge is power (Liebowitz and Chen, 2001). The goal of knowledge sharing is exploring a new knowledge and exploiting existing knowledge. There are reasons why knowledge sharing is important for the survival of almost all businesses (Gurteen, 1999), which are:

- Knowledge is an intangible product, which can easily slip through without being noticed.
- Continuous innovation is an application of new knowledge, which is the only sustainable competitive advantage.
- An organization might lose their knowledge when staff leave the organization.
- Expertise learnt and applied should be leveraged throughout the organization.
- Change could make the knowledge base erode sooner than anticipated.

Every employee in the organization has knowledge embedded in their mind as tacit knowledge, which is very difficult to be extracted directly (Ipe, 2003). As more and more companies realize that knowledge sharing gives them a competitive edge by leading to accelerated learning and innovation, knowledge management becomes increasingly important to the organization (Ipe, 2003). Reid (2003 as in Lin, 2006) stated that knowledge sharing creates opportunities to maximize an organization's ability to meet those needs and generate solutions and efficiencies that provide a business with a competitive advantage. Knowledge sharing enables managers to keep the individual learning flowing throughout the company and integrate it for practical applications. Christensen (2007) stressed that knowledge sharing is a process that is intended to exploit existing knowledge, especially in SMEs. He further elaborated that knowledge sharing is also a process of bridging organizational interdependencies. Not much of the literature or companies include knowledge sharing as part of their key components as knowledge sharing is considered difficult to measure (Christensen, 2007). However, the bottom line is that knowledge sharing is critical to a firm's success (Davenport and Prusak, 1998).

Nevertheless, the major problem with knowledge sharing is to convince, coerce, direct or otherwise get people within an organization to share their information (Gupta et al., 2000). For an organization, knowledge sharing is capturing, organizing, reusing and transferring experience-based knowledge that resides within the organization and making that knowledge available to others in the business. An interesting characteristic of knowledge is that its value grows when shared (Bhirud et al., 2005).

Studies in knowledge creation and knowledge sharing (Lee and Cole, 2003; Nelson and Winter, 1982, Nerkar 2003) show that knowledge creation is a path-dependent evolutionary process that involves the spread of recombining knowledge over time and that the innovation process can be effectively organized as an evolutionary process of knowledge sharing. Exploration of new knowledge has a more innovative focus than the exploitation of knowledge and the perspective is grounded and exposed in the literature that has a primary focus on innovation (Christensen, 2005). Exploiting existing knowledge is more concerned with how to mobilize organizational best practices, thereby enabling a more efficient application of both individual and organizational knowledge (Christensen, 2005). Knowledge sharing is one of the most important processes of knowledge management, which gradually evolves and improves the production system and its constituent elements. Therefore, knowledge sharing is closely related to the long-term performance and the competitiveness of a firm (Du et al., 2007).

However, sharing knowledge is not that easy. When knowledge is regarded as power, an individual will be reluctant to share their knowledge (Kinsey, 2007), especially the tacit knowledge, when they perceive that there are few rewards or when sharing is not recognized by the organization (Wah et al. (2005). It is very important for the organization

to provide a conducive organizational environment to encourage knowledge sharing where knowledge sharing represents a key enabler of improved business performance.

#### 2.5.2.1 Dimensions of knowledge sharing

The terms transfer and share are interrelated (Awad and Ghaziri, 2003). Knowledge transfer is a mechanistic term, which provides knowledge for someone else and the term share is an exchange of knowledge between individuals, between or within teams, or between individuals and knowledge bases, repositories and so forth. Knowledge sharing recognizes the personal nature of people's knowledge gained from experience (Awad and Ghaziri, 2003). While some authors interchange the terms knowledge sharing and knowledge transfer, Ipe (2003) stressed the difference between knowledge sharing and knowledge transfer even though it is not really visible. Knowledge transfer describes the movement of knowledge between larger entities within organizations such as between departments or divisions and between organizations themselves (Chakravathy et al. 1999; Lam, 1997). In contrast, knowledge sharing provides a link between individuals and the organization by moving knowledge that resides within individuals to the organizational level where it is converted into economic and competitive value for the organization (Hendriks 1999). This leads to the dissemination of innovative ideas and is considered critical to creativity and subsequent innovation in organizations (Armbrecht, Chapas, Chappelow and Farris, 2001), while between individuals it is a process that contributes to both individual and organizational learning (Andrews and Delahaye, 2000, Nidumolu, Subramani and Aldrich, 2001). In addition, Davenport and Prusak (1998) warn that the lack of knowledge sharing has proven to be a major barrier to the effective management of

knowledge in organizations. Dixon (2000) and Spender (1996) as cited in Riege (2005) showed five types of knowledge sharing or knowledge transfer, as shown in Table 2.12.

**Table 2.12 Types of knowledge transfer/knowledge sharing**

| | |
|---|---|
| Serial transfer | Tacit and explicit team knowledge is shared within the team to a different setting at a later time |
| Near transfer | The replication of explicit team knowledge in other teams undertaking similar tasks |
| Far transfer | The replication of tacit team knowledge in other teams doing similar tasks |
| Organizational know-how | Either tacit or explicit form, needs to complete a strategic task that occurs infrequently in organizations |
| Expert transfer | Team requires and seeks explicit expertise from others in the organization to accomplish a task |

Source: Dixon (2000)

However, Ford and Chan (2003) in explaining the four processes that characterize knowledge management, defined knowledge transfer as knowledge sharing. Meanwhile, Liebowitz and Chen (2001) emphasized the usage of Knowledge Management Assessment Tool (KMAT) the index summarized the successful knowledge-sharing criteria, which are:

- Leadership
- Culture
- Technology
- Measurement
- Knowledge management process

The American Productivity and Quality Center (APQC) report grouped its findings into six key areas that influence people's willingness to share knowledge:

- The relationship between knowledge sharing and business strategy
- The role of human networks
- The role of leaders and managers
- The fit with overall culture
- The relationship between knowledge sharing and daily work
- The institutionalizing of learning disciplines

Wah et al. (2005) believe that an individual will only become involved in knowledge sharing if the following conditions exist:

1. Opportunities to do so
2. Communication modality
3. Expectation of the benefits of members accrue
4. Expectation of the cost of not sharing knowledge
5. Context compatibility for those who shared
6. Motivation is a crucial precondition for knowledge sharing
7. Personal compatibility and liking
8. Opportunism (associated with transaction cost analysis)

According to Riege (2005), knowledge sharing goals and strategies are only mentioned in business strategies because of the difficulties in measuring the effectiveness of knowledge sharing and because management are unable to identify the barriers. There are three important elements of knowledge sharing, namely, individual, structure and technology. These will help an organization encourage knowledge sharing in the organization. The success of knowledge sharing in organizations is not solely dependent on

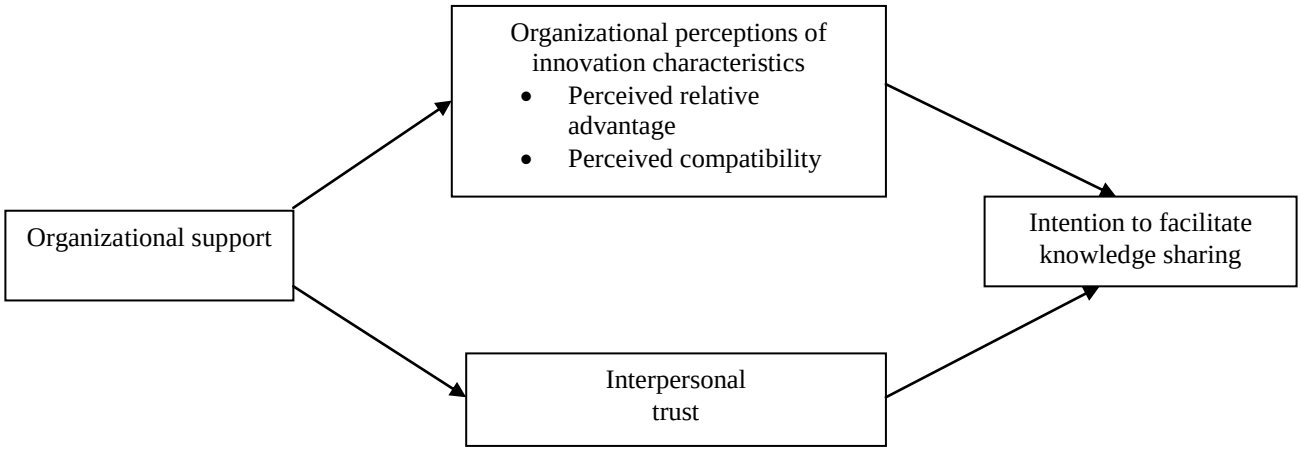
technological means but is also related to the behavioural factors – the individual and the culture of the organization (Warsham, 2001; Calantone and Cavusgil, 2002; Herzum, 2002; Liao 2003 as in Borges et al. 2007).

Ford and Chan (2003) also listed organizational culture elements as being key to the knowledge sharing process. These include:

- Trust
- Common cultures
- Vocabularies
- Frames of reference
- Meeting times and places
- Broad ideas of productive work
- Status
- Rewards that do not go to the knowledge owners
- Absorptive capacity in recipients
- The belief that knowledge is not the prerogative of particular groups
- Absence of the "not-invented-here" syndrome
- Tolerance for mistakes or need for help (Davenport and Prusak 1998)

Based on Abrams et al. (2003), as highlighted in Lin (2006), trust is the central characteristic of a relationship that promotes effective knowledge sharing and it determines the nature of the interactions and people's expectation. According to Steward (1998) in Laycock (2005), trust can be created in an organization through competence, communities and networks through shared commitment and compensation (tangible and intangible). In

Figure 2.17, Lin (2006) stated that organizational support is positively associated with organizational perceptions of innovation characteristics and interpersonal trust, which, in turn, are positively related to the organizational intention to facilitate knowledge sharing. Interpersonal trust is a key foundation for effective collaboration (Whitener et al. 1998) and is a salient factor in determining the effectiveness of knowledge sharing activities (William, 2001; Chowdhurry, 2005). According to Kelloway and Barling (2006), the best way to manage "knowledge workers" is to build trust.




Source: Lin 2006

**Figure 2.17**
**Knowledge and Trust Model**

Since tacit knowledge is difficult to codify, the key to knowledge-sharing is matching the type of knowledge with the right transfer method and will depend on three factors (Liebowitz and Chen, 2001; Dixon, 2000 (in Riege 2005)):

- Whether the task is routine or non-routine
- Whether the knowledge is related is tacit or explicit

- Any similarity between the originator and the receiver of the information

There are other factors that affect knowledge sharing. First, the organizational factors and interpersonal factors should be considered (Du et al., 2003). Trust and conflict are inherent issues of any organizational arrangement and are central for knowledge sharing (Du et al., 2003). In addition, group values, attitudes, norms and organizational climate should also be considered (Du et al. 2003). Most knowledge sharing studies have concentrated on the behaviour theory and motivation, which is believed to influence an individuals' knowledge sharing intentions. This shows how much knowledge sharing is related to organizational performance. Du et al. (2003) emphasize that knowledge sharing activities should be measured quantitatively and be linked to performance whereas most knowledge sharing studies concerned qualitative measures. The cost of knowledge management either IT or human resources is costly (Choi and Lee, 2003; Du et al., 2005). Therefore, most of small and medium-sized firms cannot afford to have or adopt knowledge management systems (Mc Adam and Mc Creedy, 1999). However, the knowledge sharing cost is bearable for SMEs (Du et al., 2003). Du et al. (2003) developed measures for knowledge sharing from the perspective of accounting and operation as shown in Table 2.13.

**Table 2.13 Knowledge Sharing Measurement**

| **Variables** | |
|---|---|
| 1. The expenditure on inter-units and inter-organizational training | To facilitate knowledge transfer among different persons and different units in the firm, absorb knowledge from other firms and speed knowledge adoption. |
| 2. The expenditure on collaborative trials and experiments of non-RandD departments | New knowledge of doing job is accumulated and shared increasingly, resulting in improved or innovative ways of doing the job and leading to better organizational performance. |
| 3. The expenditure on intentional activities for communication and transferring knowledge | The intentional activities for communicating and transferring conceptual and operational knowledge, experiences and skills in a company can accelerate the process of knowledge sharing (Ingram and Simons, 2002). |
| 4. The frequency of importing workers | Importing workers from outside and implementing job rotation will stimulate the blend of different knowledge at different levels. |
| 5. The frequency of job rotation | Knowledge sharing occurs automatically in job rotation (Ortega, 2001) within an organization and workers' mobility. |
| 6. The expenditure on collaborative RandD | RandD has been used to illuminate knowledge transfer. The process of RandD not only creates knowledge but also implies communication among different workers and units,which facilitates knowledge sharing and transfer. |

Source: Du et al. (2003).

Table 2.14, by Ipe (2003), summarizes the ideas of other authors' on motivation factors that influence knowledge sharing between individuals, which can be divided into internal and external factors.

## Table 2.14 Summary of Internal and External knowledge

| Internal | External |
|---|---|
| • Knowledge as Power<br>o If an individual perceives that power comes from the knowledge they possess, it is likely to lead to knowledge hoarding instead of knowledge sharing (Davenport 1997, Gupta and Govindarajan 2000).<br>o Politics of information (Blackler, Crump and McDonald 1998) when knowledge is perceived as a source of power in an organization.<br>o Blackler – because knowledge is always situated within a particular context, it is natural that culture and power dynamics within the context affect the way knowledge is perceived and used.<br>• Reciprocity (mutual give-and-take)<br>o Can facilitate KS if individuals see that value-added to them depends on the extent to which they share their own knowledge with others (Hendriks 1999, Weiss 1999).<br>o Empirical evidence for the relationship between reciprocity and knowledge sharing indicates that receiving knowledge from others stimulates a reciprocal flow of knowledge in the direction of the sender both horizontally and vertically in organizations (Shulz 2001).<br>o Reciprocity is also thought to be a motivator of knowledge sharing in CoP where KS results in enhancing participants' expertise and providing opportunities for recognition (Bartol and Srivastava 2002 Orr 1990).<br>Negative aspect of reciprocity:<br>▪ Fear of exploitation | • Relationship with recipient<br>o Relationship is based on:<br>▪ Trust<br>▪ Power and status of recipient<br>o Ghosal and Bartlett (1994), trust is one of four primary dimensions in an organization that influences the actions of individuals.<br>o Huemer, van Krogh and Roos (1998) trust is more important as trust facilitates learning and the decision to exchange knowledge under certain conditions is based on trust.<br>o Kramer 1999 – trust is a critical factor that influences the way knowledge is shared within these communities.<br>o Trust is further emphasized by Andrews and Delahaye (2000), Roberts (2000), Read (1962), and Zand (1972).<br>o The power and status involved in exchanges influence, to some extent, whether and how knowledge is shared (Krone, Jablin and Putnam 1987, O'Reilly 1978.<br>o Huber (1982)<br>▪ Low status and power individuals direct info to those with more power and status<br>▪ High power and status individuals direct info to peers, not to lower status and power.<br>• Rewards for sharing<br>o This is supported by Gupta and Govindarajan 2000, Quinn et al. 1996. Tissen, Andriessen and Deprez 1998, McDermott and Odell 2001.<br>o Bartol and Srivastava (2002) proposed different types of KS and reward<br>**Mechanisms of KS**<br>Suggested that the first 3 should be given monetary rewards while informal is to be given intangible incentives such as enhancing the expertise and recognition of individuals.<br>Individual contribution to databases<br>Formal interactions with and between teams<br>Knowledge sharing across work units<br>Knowledge sharing through informal interactions |

Source: Ipe (2003)

Jacobs and Roodt (2007) compiled a literature overview concerning the knowledge sharing questionnaire in which they found a lack of relationship or culture of knowledge sharing behaviour as shown in Table 2.15.

**Table 2.15 Summary of knowledge sharing dimensions**

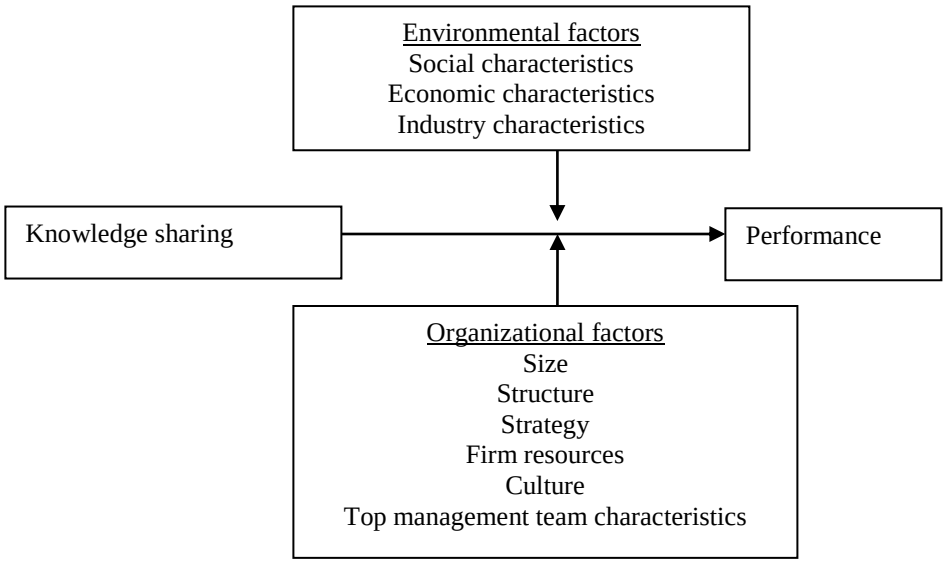
| Selected conditions, methods, outcomes and importance | Author(s) |
|---|---|
| Trust (questions 12,19,22) | Bartol and Srivasta (2002),<br>Husted and Michailova (2002),<br>Yang and Wan (2004) |
| Reward, recognition and incentive systems (questions 1,2) | Bartol and Srivasta (2002),<br>Chua (2003),<br>Husted and Michailova (2002),<br>Mc Dermott and O'Dell (2001),<br>Yang and Wan (2004) |
| The likelihood of others doing likewise(reciprocity) question 13,20,23) | Chua (2003) |
| Support from and to managers (question 4,14) | Mc Dermott and O'Dell (2001) |
| No fear that career development is in danger if admit mistakes and failures (questions 5,18,21) | Husted and Michailova (2002 |
| Supportive organizational culture (question 15) | Gupta et al. (2000),<br>Haldin-Herrgard(2000),<br>Husted and Michailove (2002),<br>Mc Dermott and O'Dell (2001) |
| Informal gathering and social events (question 7,8) | Yang and Wan (2004) |
| Training, workshops seminars conferences (question 3,6) | Gupta et al. (2000),<br>Husted and Michailove (2002),<br>Yang and Wan (2004) |
| Performance appraisal, merit pay, promotions (question 17) | Bartol and Srivasta (2002), |
| Improve business performance and success (question 9) | Gupta et al. (2000) |
| To stay competitive and become innovative (question 10,11) | Chua (2003), Gupta et al. (2000),<br>Haldin-Herrgard(2000),<br>Husted and Michailove (2002) |

Source: Jacobs and Roodt (2007)

While knowledge sharing literature has conceptually emphasized the importance of motivating people to share their knowledge empirically, the role of employee motivation for knowledge sharing reports mixed results (Husted et al., 2005). In fact, Bock and Kim (2002) found that motivational factors were negatively correlated to knowledge sharing.

#### 2.5.2.2 Models of knowledge sharing

Du et al. (2007) emphasize that environmental and organizational factors are important factors in the relationship of knowledge sharing and performance as shown in Figure 2.18.



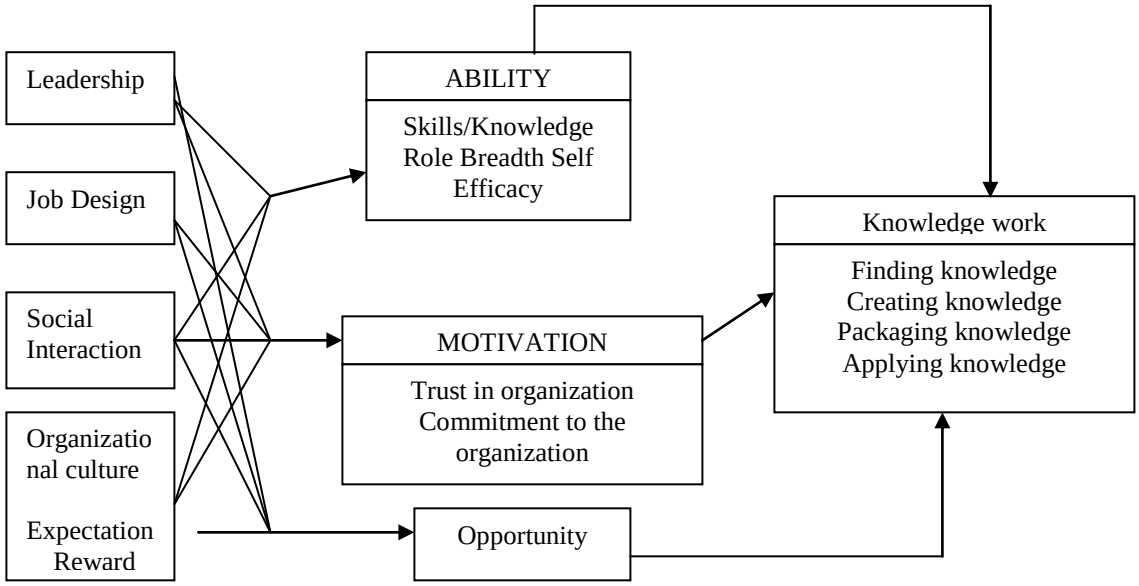

Source: Du et al. (2007)

**Figure 2.18**
**Integrative framework on knowledge-sharing-performance relationship**

Employees are likely to engage in knowledge work to the extent that they have the ability, motivation and opportunity to do so (Kelloway and Barling, 2006). In addition,

organizational characteristics such as transformational leadership, trust, job design, social interaction and organizational culture are identified as potential predictors of ability, motivation and opportunity, as shown in Figure 2.19.

In this framework, leadership, job design, social interaction and culture (organizational expectations and reward structure) are identified as potential predictors of ability and motivation.

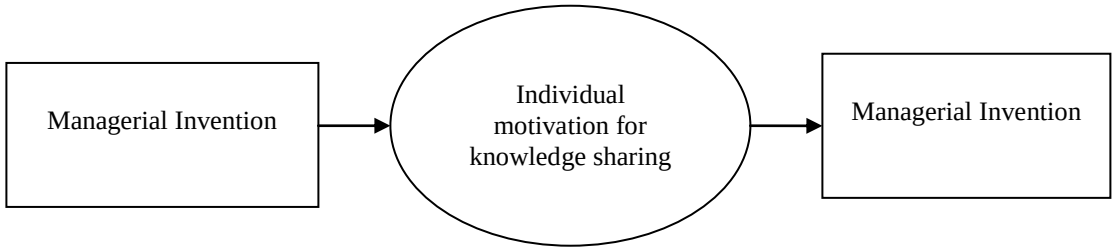



Source: Kelloway and Barling, 2006

**Figure 2.19**
**Knowledge Work Model**

Another important element in knowledge sharing is network, which encourages people to work less formally, therefore, relationships rely more on cooperation and collaboration (Laycock, 2005). As shown in the case of Buckman Laboratories, it is human networks, not IT networks that are fundamental for effective knowledge sharing. Knowledge sharing is notably a people thing, not a technology thing (Laycock, 2005).

Husted et al. (2005) studied knowledge sharing from the perspective of extrinsic and intrinsic motives. They also investigated the role of motivational factors that influence knowledge sharing behaviours. These two motives are investigated separately, as shown in Figure 2.20.



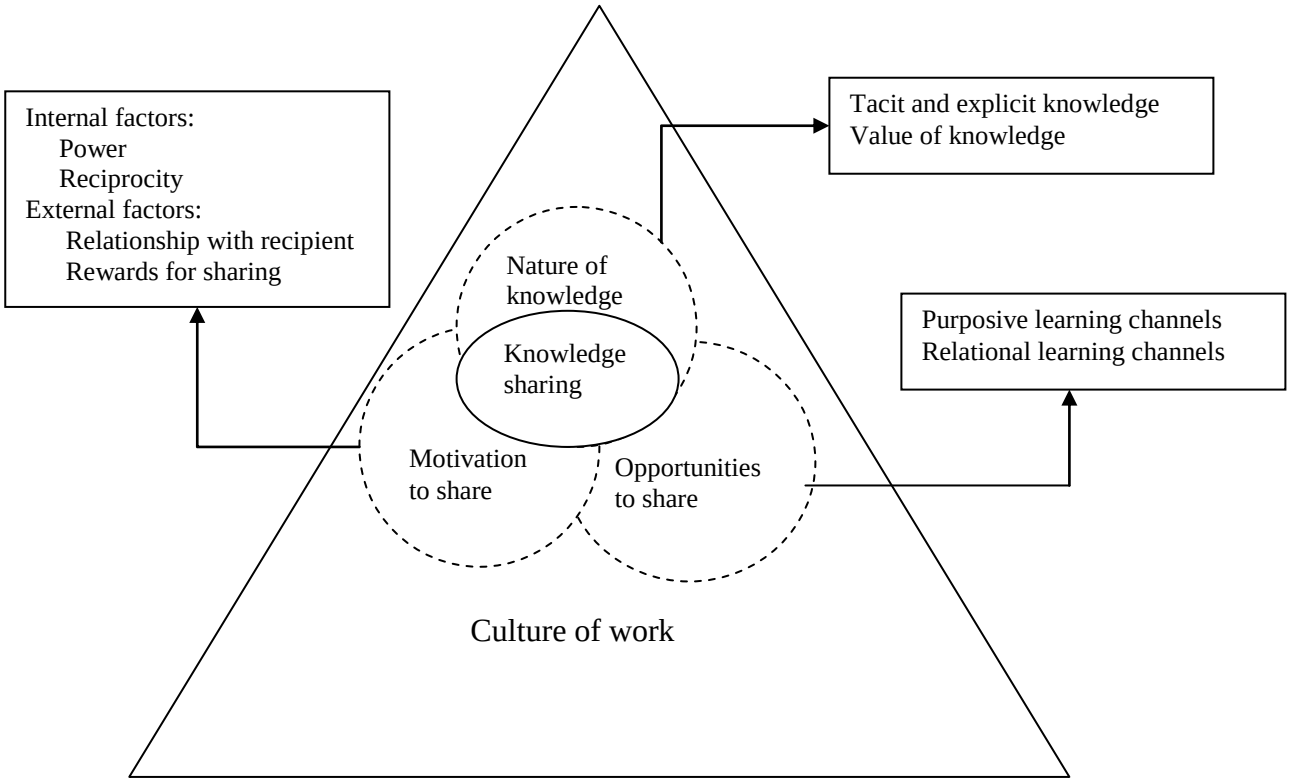

Source: Husted et al. (2005).

**Figure 2.20**
**Husted Model of Motivation for Knowledge Sharing**

To facilitate knowledge sharing, incentives, in terms of rewards, regardless of tangible and intangible should be given. People are motivated to engage in knowledge sharing if they receive something in return for the knowledge they share (Christensen, 2005). However, Bock and Kim (2002) found that expected rewards are not significantly related to the attitude towards knowledge sharing. Nevertheless, expected association and contribution are significantly related to attitude towards knowledge sharing. Intrinsic rewards actually exist and the challenge of fostering and improving knowledge sharing is to become better at supporting situations yielding intrinsic rewards such as the social rewards while extrinsic rewards are governed through the control and authority, as emphasized by Blau (1964) as cited in Christensen (2005).

Marshall (2000), as in Lim and Klobas (2000), suggested offering financial incentives to employees to share their knowledge and further suggest that dedicated staff needed to manage the system and ensure that it contains only up to date knowledge. Knowledge is not to be given for free – the sharing of knowledge is to be balanced by returning some type of reward such as money, bonus, organizational efficacy, promotion, social acceptance and informal acknowledgments (Ipe, 2003). Intrinsic rewards which is a favour that makes us grateful would definitely be stimulating, providing comfort (absence of pressure from others), behavioural confirmation by self, behavioural confirmation by others, status, and allowing the improvement of non-tangible resources (such as skills and competencies) without a reduction in any of the other functions.

In Figure 2.21, Ipe (2003) identifies various factors that influence knowledge sharing between individuals in an organization.



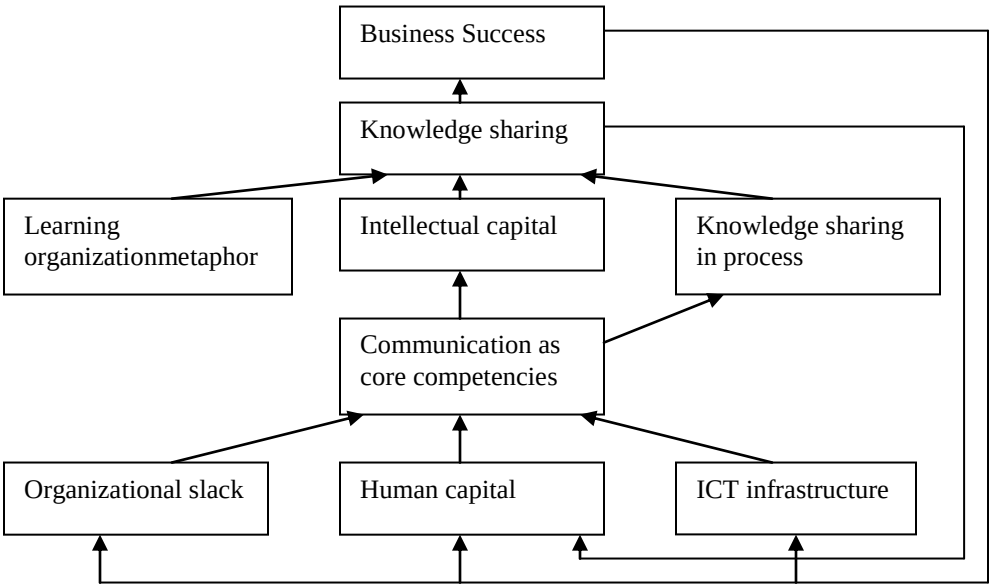

Source: Ipe (2003)

**Figure 2.21**
**Factors that influence knowledge sharing between individuals in the organization**

Ipe (2003) then extended the model in Figure 2.21 whereby, nature of knowledge, motivation to share and opportunities to share are embedded within the culture of the work environment. This model supports a statement by Stenmark (2001) that people are not likely to share knowledge without strong personal motivation.

Widen-Wulff and Suomi (2003, 2007) develop their knowledge sharing models based on knowledge sharing companies in their research on insurance companies in Finland. Figure 2.22 shows the knowledge sharing model. The model is supported by hard information resources, core competencies, soft information resources and behaviour as the internal

information environment, which are the key elements in the knowledge sharing model, while the external environment is seen as an outcome of knowledge sharing outputs.




Sources: Widen-Wulff and Suomi (2003)

**Figure 2.22**
**Knowledge Sharing Model**

Figure 2.23 shows the knowledge sharing process as suggested by (Widen-Wulff and Suomi, 2007). The model is further enhanced by separating between the internal and external environment.

The basic foundation of knowledge sharing is organizational slack, human capital and technology (ICT). Organizational slack is defined, as time is important because it gives the employees an opportunity to share knowledge with others while human capital will ensure different kinds or types of knowledge to circulate in the organization. The ICT

infrastructure or technology will help the speed of information. All these basic resources are needed if knowledge sharing is a goal (Widen-Wulff and Suomi, 2003). The next step of this model is communication. Communication is an important channel to transfer knowledge. Language and communication is considered to be highly important for the creation of trust in an interpersonal relationship, which is essential for further knowledge sharing (Yap and Chai, 2005). The next step is to add soft information resources, which include learning organizational metaphors, intellectual capital and knowledge sharing in process. Learning is a basic business practice. Intellectual capital is the knowledge and knowing capability of a social collectively such as an organization, intellectual community or professional practice (Nahapiet and Ghosal, 1998). At this level, knowledge from hard and soft information resources is well blended to create the knowledge sharing capabilities. According to Widen-Wulff and Suomi (2007), when knowledge sharing capabilities is combined with organizational resources, it is called "internal information environment" or "information culture".

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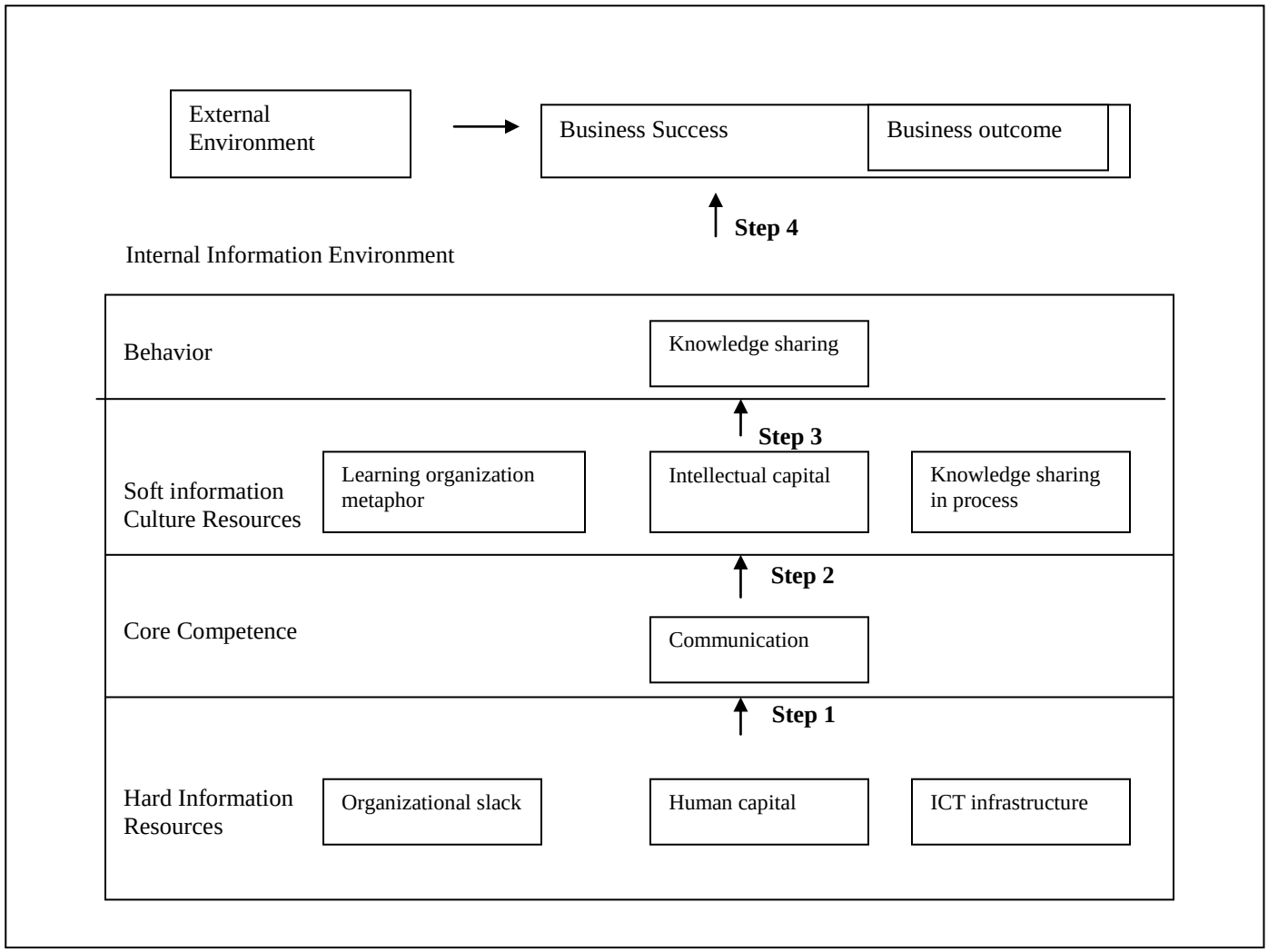



Source: Widen-Wulff and Suomi, 2007

**Figure 2.23**
**Knowledge Sharing Process**

The informal knowledge sharing network has gained recognition in knowledge management research. Organizations acknowledge that the majority of individual knowledge transfer does not follow formal structures or processes but depends a lot on the interpersonal relationships between people developed through informal interactions

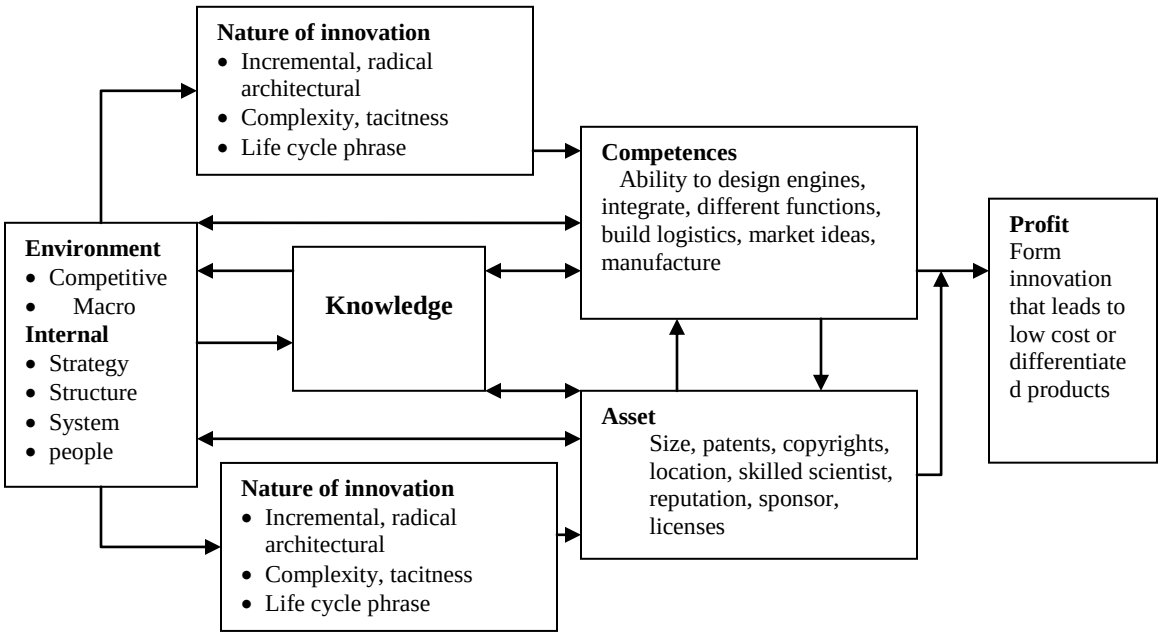
(Nirmala and Vemuri, 2009). Based on their research in applying knowledge management, particularly knowledge sharing, four aspects must be adhered to; knowledge capturing, mentoring, rewards and recognition, competency development and communities of practice. However, the human resource practices in many SMEs are often not conducive to the creation and exchange of knowledge (Gray, 2006). Therefore, many authors agreed that SMEs are not ready for knowledge management even though they are known for their only strength – open communication – knowledge sharing. The study of knowledge sharing is presented in Appendix 2.

### 2.5.3 Innovation

Peter Drucker (1985) refers to innovation as "the purposeful and organized search for changes and the systematic analysis of the opportunities such changes might offer for economic or social innovation". He also highlighted that innovation is "the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth". Based on Nonaka and Takeuchi (1995), " *to explain innovation, we need a new theory of organizational knowledge creation....The cornerstone of our epistemology is the distinction between tacit and explicit knowledge...the key to knowledge creation lies in the mobilization and conversion of tacit knowledge"*. Innovation is also defined as "the adoption of an idea or behavior, whether a system, policy, program, device, process, product or service, that is new to the adopting organization" (Damanpour, 1991). Innovation is the process of creating a commercial product from an invention (Hitt et al, 2005). Innovation is creating or improving upon a new or existing product and selling it on the market. Innovation is making products visible

to the eyes of customers while fulfilling their needs. Innovation can deliver four types of benefits besides cash: knowledge, brand, ecosystem and culture (Andrew and Sirkin of Anonymous, 2007). However, the most important reason for innovation in an organization is to make profit (Afuah, 2003).

Firms make profits by offering products or services at a lower cost than their competitors or by offering differentiated products at premium prices that more than compensate for the extra cost of differentiation (Afuah, 2003), as shown in Figure 2.24.




Source: Afuah (2003)

**Figure 2.24**
**Innovation Model**

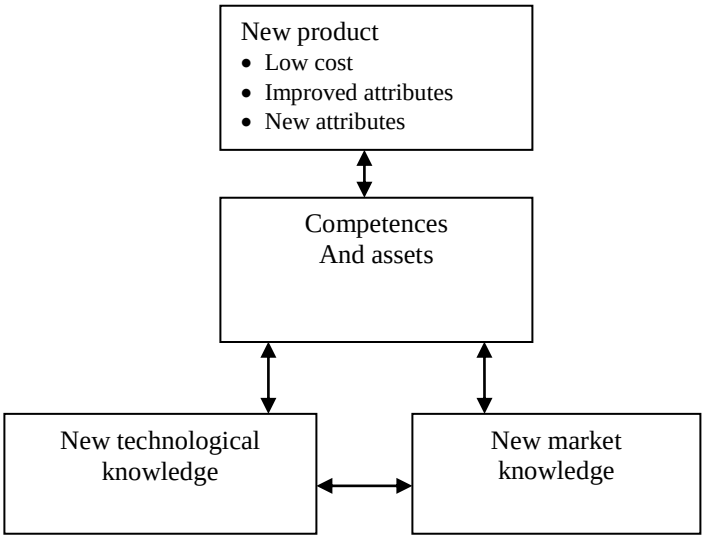
A firm will get involved in innovation by the impact of its environment and internal environment. Internally, a firm should be supported by its strategy, structure, system and people. Competences and assets are the function of technological and market knowledge as

innovation is the use of new technological and market knowledge to offer to a new product or service that customers will want (Afuah, 2003).

In addition, an organization needs to get new ideas from various sources to support their organizational creativity:

1. Consumers – the feedback and complaints from consumers will trigger ideas to fulfil the needs and want of the customers.
2. Existing products and services – existing products and services will give new ideas to entrepreneurs to further improve and upgrade their products and services from time to time.
3. Distribution channels – members of distribution channels are also excellent sources of market information because of their familiarity with the needs of the market.
4. Government – government regulation and support can be a source of new product ideas that push entrepreneurs to be innovative and creative (Hisrich and Peters. 2008).

These sources of ideas are frequently used by entrepreneurs. Figure 2.25 shows the flows of ideas by Afuah (2003).




Source: Afuah (2003)

**Figure 2.25**
**Sources of Ideas**

Damanpour et al. (2007) describe innovation type as administrative and technical innovation. Administrative innovations are defined as those that occur in the administrative component and affect the social system of an organization; while technical innovations are defined as those that occur in the operating component and affect the technical system of an organization. This could be the adoption of a new idea pertaining to a new product or a new service, or the introduction of new elements in an organization's production process or service operations.

Innovation can be broadly interpreted through three major forms of innovation, which were identified by the Australian Bureau of Statistics (Hine and Ryan, 1999):

1. Product (major or radical and incremental).

2. Process, known as both technological innovation and non-technological. Technological comprises new products and processes and significant technological changes of products and processes.
3. Non-technological innovation refers to changes that occur within an organization that are not directly attributable to products/services and production methods.

Bloch (2007), however, states that the word "technological" should be removed from product and process innovation as these innovations still require significant movements in functions or uses, especially for the less R & D intensive firms.

Table 2.16 illustrates the different types of innovation (Trott, 2005).

**Table 2.16 Types of Innovation**

| **Type of Innovation** | **Example** |
|---|---|
| Product innovation | The development of new or improved product |
| Process innovation | The development of a new manufacturing process |
| Organizational innovation | A new venture division, introduction of new accounting procedure |
| Management innovation | TQM systems |
| Production innovation | Quality circles, Just-in-time (JIT) |
| Commercial/Marketing innovation | New financing arrangements |
| Service innovation | Internet-based financial services |

Source: Trot (2005)

Although not all firms should be innovative in the same manner, several scholars have suggested that innovation needs to be directed at new products, or services, new organizational structures or administrative systems, new process technologies or new

programmes pertaining to organizational members, as these typically occur simultaneously (Garcia and Calantone, 2002; Trott, 1998). Product innovation is defined as the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses (Trott, 1998). Product innovation occurs when a new or improved product is introduced to the market while process innovation is an adoption of new ways of making products or services (Maravekalis et al., 2006). Therefore, there is a strong correlation between product and process innovation. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics (Maravekalis et al., 2006; Bloch, 2005).

The innovation process has been identified for radical, incremental, really new, discontinuous and imitative innovations, as well as for architectural, modular, improving, and evolutionary innovation (Garcia and Calantone, 2002) that are also known as innovation categories. Meyer (1984) delineated three categories of innovations based on two dimensions: the type of technology employed; and its effects on the established consumption pattern as shown in Table 2.17.

**Table 2.17 Innovation Categories**

| **Technology Or Approach** | Low | High | |
|---|---|---|---|
| | Incremental Innovation | Distinctive Innovation | High |
| | Distinctive Innovation | Breakthrough Innovation | Low |

**Consumption Pattern**

Source: Meyer (1994)

Incremental innovations refer to improvement over the existing processes and procedures, which do not require new technologies or changes in customer behaviour; incremental innovations can easily be defined as products that provide new features, benefits, or improvements to the existing technology in the existing market.

Incremental innovation is important on two main counts:

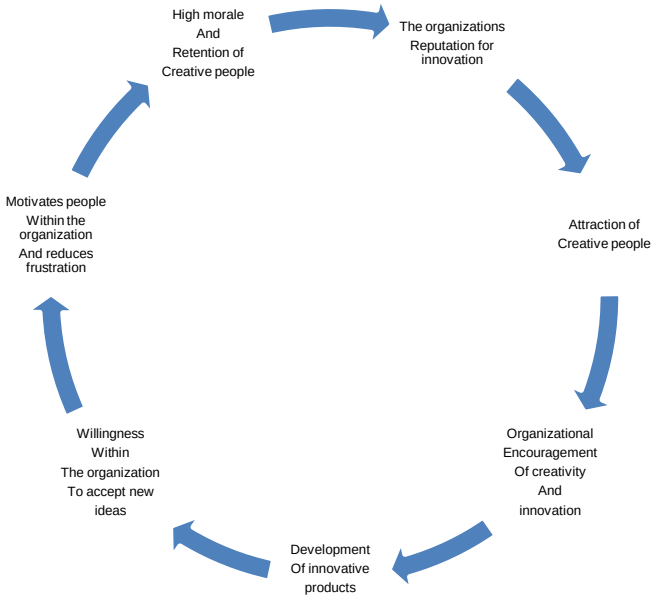
1. As a competitive weapon in a technologically mature market.
2. As streamlined procedures based on existing technology that can help alert a business in good time to threats and opportunities associated with the shift to a new technological plateau.

For many firms, incremental innovations are the lifeblood of the organization. Distinctive innovation refers to improvements over the present processes and procedures, which require new technologies or involve a certain degree of behavioural change, and breakthrough innovation includes improvements based on new technologies or approaches that require substantial adjustments in both the delivery systems and customer behaviour. The dynamic nature of most markets makes it almost impossible to find a firm that does not engage in innovation, either continuously or periodic (Hurley and Hult, 1998). The radical innovation is also known as disruptive innovation while incremental innovation is known as sustaining innovation.

Radical innovation has been defined as innovations that embody a new technology that results in a new market infrastructure (Colarelli, 1998; Ettlie and Rubenstein, 1987). Often, radical innovations do not address a recognized demand but instead create a demand previously unrecognized by the consumer. This new demand cultivates new industries with

new competitors, firms, distribution channels and new marketing activities (Garcia and Calantone, 2002).

Different factors influence the organizational environment in the innovation process. Developing a reputation for innovation helps propagate a virtual circle that reinforces the company's abilities (Trott, 2005). Figure 2.26 illustrate the innovation circle.




Source: Trott, 2005

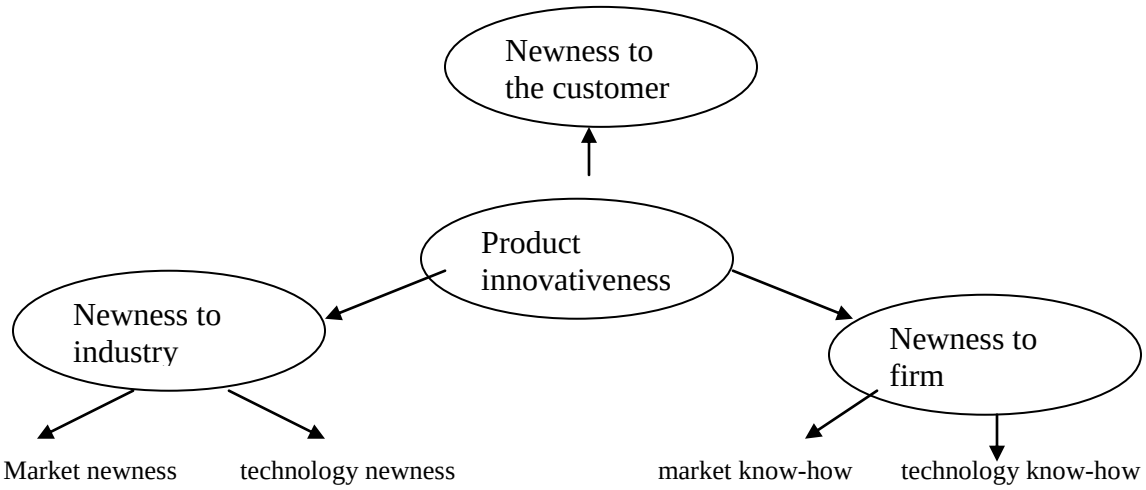
**Figure 2.26**
**Circle of innovation**

This circle can be viewed as a specific example of Michael Porter's (1985) notion of competitive advantage. Porter argued that those companies who are able to achieve competitive advantage – above the performance in an industry sector – are able to reinvest this additional profit into the activities that created that advantage in the first place, thus creating a virtual circle of improvement, or so called competitive advantage (Trott, 2005).

#### 2.5.3.1 The Difference between Innovation and Innovativeness

There are many interpretations of innovation that have resulted in the interchangeable use of the constructs 'innovation' and 'innovativeness' to define innovation types (Gracia and Calantone, 2002). However, this could be due to the different perspectives of the research on innovation by scholars that have been addressed to different issues and different communities such as engineering, marketing, product management and R&D (Garcia and Calantone, 2002). Innovation, as defined by Organisation for Economic Co-operation and Development (OECD) , is an iterative process initiated by the perception of a new market and/or new service opportunity for the technology-based invention, which leads to development, production and marketing tasks striving for the commercial success of the invention (Garcia and Calantone, 2002). This iterative process implies varying degrees of innovativeness and, thus, necessitates a typology to describe different types of innovations, which results in a variety of different innovations typically called "radical innovations' for products at the early stages of diffusion and adoption and 'incremental innovations' at the advanced stages of the product life cycle. 'Innovativeness' is most frequently used as a measure of the degree of 'newness' of an innovation (Garcia and Calantone, 2002). New product is very subjective; new to the world, new to the adopting unit, new to industry, new to the market, and new to the consumer. From a macro perspective, 'innovativeness' the paradigm shift in the science and technology and/or market structure in an industry. From a micro perspective, 'innovativeness' is the capacity of a new innovation to influence the firms' existing marketing resources, technological resources, skills, knowledge capabilities or strategy. A new innovation in a developing

country might be considered obsolete in a developed country (Darroch, 2003). Garcia and Calantone (2002) proposed an operationalization of innovativeness based on the typology discussed above. Figure 2.27 illustrates the innovation typology.




Source: Garcia and Calantone (2002)

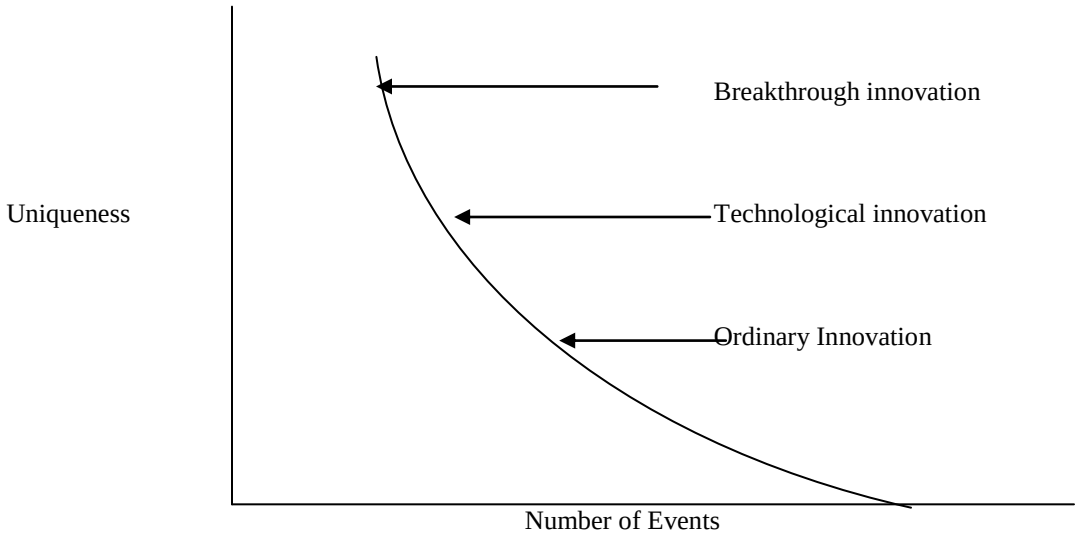
**Figure 2.27**
**Innovation Typology**

Product innovativeness does not equate to firm innovativeness. Firm or organizational innovativeness has been defined as the propensity for a firm to innovate or develop new products. Innovativeness of a product that a firm markets or adopts is not a measure of organizational innovativeness. Many firms have taken an innovation strategy of imitating and improving upon existing products or technologies, which have been described by Miles and Snow (1994) as analyzer strategies.

Radical innovations are innovations that cause marketing and technological discontinuities on both a macro and micro level. Incremental innovations only occur at a micro level and

cause either a marketing or technological discontinuity but not both. Really new innovations cover the combinations in between these two extremes.

According to Hisrich and Peters (2008), innovation can be of varying degrees of uniqueness. Figure 2.28 illustrates the different degrees of innovation.




Source: Hisrich and Peters. 2008

**Figure 2.28**
**Innovation Level**

With little uniqueness, innovation is labelled as ordinary innovation. Technological innovations are when the new products are produced with significant technological advancement. Breakthrough innovation is when new products are produced with some technological change.

The breakthrough innovation often establishes the platform for future innovations in a certain area while technological innovations are very meaningful as they offer

advancement and improvement in the product/market area. Ordinary technological is the extension of technological innovation in improving products or services for market use. The market has a stronger effect on innovation that is market pulled rather than technology, which is technology pushed (Hisrich and Peters., 2008).

Hisrich and Peters (2008) summarizes these innovations as shown in Table 2.17.

**Table 2.17 Types of innovation**

| Type of innovation | Uniqueness | Number of events |
|---|---|---|
| Breakthrough innovation | Extremely unique | New product with some technological change. Few products.<br><br>Example: computer, aeroplane |
| Technological innovation | Moderately unique | New product with significant technological advancement. Occurs frequently compared to breakthrough<br><br>Example: short-message signal (SMS), GPRS of hand phone |
| Ordinary innovation | Less unique | New product with little technological change. Occurs most frequently<br><br>Example: gloves, stationery |

Source: Hisrich and Peters (2008)

However, according to Drucker (1986), innovations do not necessarily have to be technical. Some innovations might be the improvements of certain aspects of products or services to meet the needs and wants of customers, which is referred to as social innovation. An example of this innovation is insurance and health policy.

### 2.5.3.2 Creativity and Innovation

Creativity is about coming up with ideas, however, it is innovation that takes these ideas and turns them into action. Therefore, creativity is the food of innovation. Gurteen (1998) has listed the differences between creativity and innovation as shown in Table 2.18.

**Table 2.18 The difference between Creativity and Innovation**.

| Creativity | Innovation |
|---|---|
| Process of generating ideas | Process of shifting, refining and critically implementing the ideas |
| Divergent thinking | Convergent thinking |
| Generation ideas | Putting them into action |

Source: Gurteen (1998)

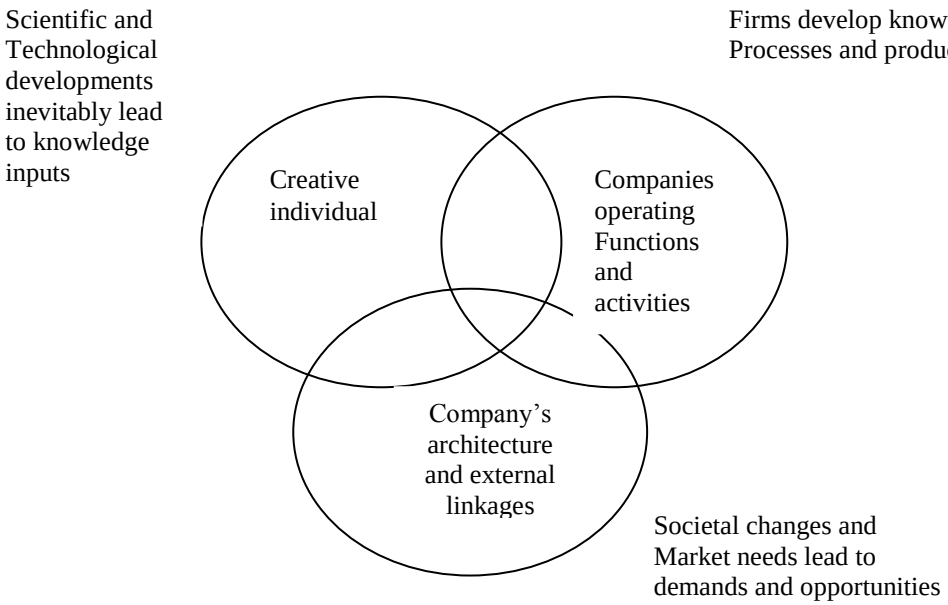
According to Davenport and Prusak (2000), ideas are free. Ideas to innovate can come from various sources as mentioned by Drucker (1986):

1. The unexpected sources – sources of innovation might be derived from unexpected success, unexpected failure or unexpected events which trigger ideas and creativity in firms.
2. The incongruity – the uneasiness of customers in dealing with their daily lives could give firms ideas to create something new for the customers. For example: paying bills on the Internet.
3. Process need – opportunity is the source of innovation. Ideas could be derived from the market information.

4. Changes in industry or market changes that caught everyone unaware – the effect of globalization that has an impact on the industry.
5. Demographic changes –population change is one of the innovation sources in meeting consumers needs.
6. Changes in perception, mood and meaning – trend and lifestyle are among the sources of innovation under this source of innovation.
7. New knowledge, scientific and non-scientific – knowledge-based innovation is the "superstar" of entrepreneurship. Innovation that is based on this source is unique as the competitors could have a hard time to imitate the innovation.

#### 2.5.3.3 Innovation Process

Innovation does not exist without going through a process. The model as shown in Figure 2.29 explains how innovation can be nurtured and developed in an organization (Trott, 2005). The process is important in ensuring that an organization is capable of nurturing and producing innovativeness.




Source: Trott (2005)

**Figure 2.29**
**Innovation Process**

Scientific and technological development may help an individual acquire the necessary knowledge that will lead him/her to be creative. A firm will then develop its knowledge, processes and product in line with its functions and activities. Once the firm's architecture and external linkages are in line with societal changes and market needs it will lead to demand and opportunities. These three parts are overlapping and need each other in developing an innovation. The source of innovation lies in people – individual employees' willingness, ability and interest in contributing to the company's well being (Horibe, 2007). Hitt et al. (2005) emphasized that innovation should be the main pillar of entrepreneurship regardless of whether it is radical or incremental. Entrepreneurship and innovation are important for young and old and for large and small companies, for service companies as

well as manufacturing companies and high-technology ventures (Thomke, 2003). Globalization has left most companies in an uncertain environment, thus, it is difficult to predict the future. Therefore, companies have to develop strategies to overcome this uncertainty. Capitalizing on their capabilities while acquiring resources allows companies to take the necessary action to react and adapt to the dynamic environment and be proactive. Companies have to be entrepreneurial and innovative (Hitt et al., 2005). Innovations are critical to a company's efforts to differentiate their goods and services from competitors in ways that create additional or new value for customers (Katilla and Ahuja, 2002). Innovation is always regarded as being a part of the strategic competitiveness of an organization that allows it to be competitive. Companies operating in diverse industries are using innovation as a competitive strategy.

#### 2.5.3.4 Innovation Models

Terviovski (2001) adopted the Continuous Improvement and Innovation Management (CIAM) framework to measure SME's innovation and performance for 115 manufacturing SMEs in Australia. CIAM utilizes 57 variables, which are loaded into five constructs, namely:

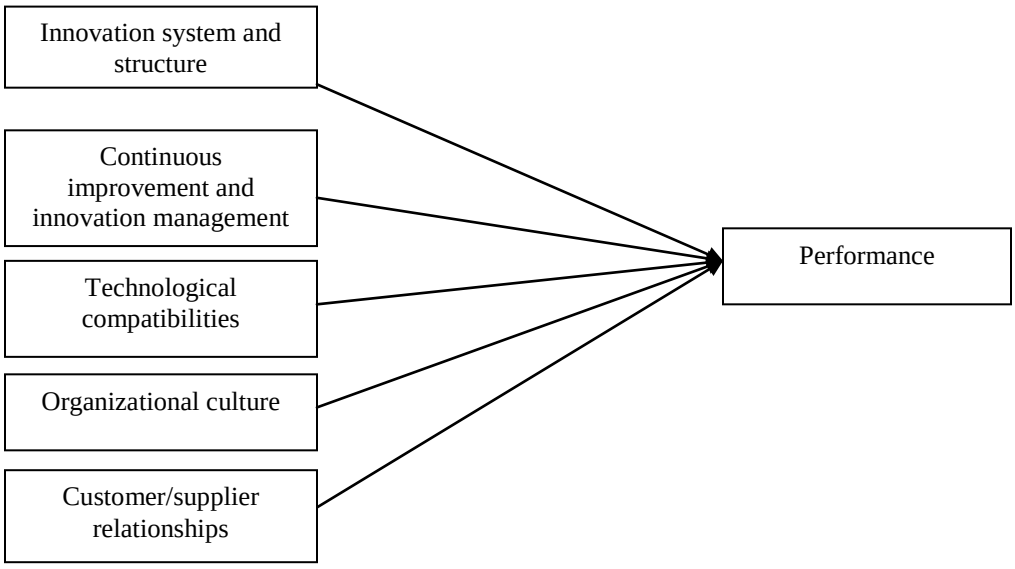
1. innovation system and structure
2. continuous improvement and innovation management strategy
3. customer and supplier relationships
4. organizational culture
5. firm's technological compatibilities

Firm performance is measured by:

1. new product
2. product configuration
3. product innovation
4. improved work methods
5. reduction in waste of resources
6. increased market opportunities
7. increased quality
8. increased delivery-in-full-on-time

In a study by Terziovski (2001), organizational culture and technological compatibilities are not closely related to SME performance or the other variables. However, regression analysis on individual items showed that core technologies and organizational objectives are the key drivers of new ideas and information as part of the continuous improvement and innovation management system (Terviosvki, 2001). Terviosvki, however, did not explore knowledge in-depth but just generalized knowledge as ideas and information.

Figure 2.30 shows the innovation management system that leads to performance.




Source: Terziovski, (2005)

**Figure 2.30**
**Innovation Management System**

Subramaniam and Nilakanta (1996) pointed out that when innovativeness is measured in multidimensional constructs, it shows a significant different effect on the outcomes. They highlighted that in measuring innovation in multidimensional measures, the following must follow suit:

1. Any valid measure of innovativeness must be based on adoptions of several innovations.
2. In addition to the number of innovations adopted, the time of adoption of each innovation must also be considered.
3. The consistency of adoption patterns over time must also be measured (either late or early).

Keizer et al. (2002) classified variables that can be considered as possible predictors of innovation efforts of SMEs as external variables and internal variables. External variables

refer to the opportunities an SME can seize from its environment. Internal variables refer to the characteristics and policies of SMEs. The variables found in the review are summarized in Table 2.18.

**Table 2.19 Summary of literature review about variables influencing innovative efforts of SMEs**

| **External Variables** | **Internal Variables** |
|---|---|
| **Collaboration with other firms:**<br>• Collaboration with suppliers to overcome size constraints with suppliers leads to low formalized relations that could be difficult to achieve over long distance (Lipparini and Sobrero, 1994)<br>• Close working relationship with suppliers and customers in co-design and co-makeship (Birchall et al. 1996; Davenport and Bibby, 1999; Keeble et al. 1999; Docter and Stokman, 1988)<br>• Customers are the main source of improved technology for SMEs in the USA (Le Blanc et al., 1997)<br>• Strategic alliances as an integral part of the firm's development plan (Forrest, 1990; Cooke and Wills, 1999)<br>**Linkages with knowledge centres**:<br>• Contributions by professional consultants, university researchers and technology centres (Le Blanc et al., 1997; Hoffman et al., 1998; Oerlemans et al., 1998)<br>• Contributions by innovation centres and Chamber of Commerce (Oerlemans et al., 1998)<br>**Utilizing financial resources or support regulations**:<br>• Availability of RandD funding (Le Blanc et al., 1997; Birchall et al., 1996; Hoffman et al., 1998)<br>• Government financial aid (Dutch Ministry of Economic Affairs, 1993) | **Strategy**:<br>• Explicit strategies to increase and stimulate internal creativity and risk taking behaviour (Birchall et al., 1996; Carrier, 1994).<br>• Sound day-to-day and strategic management practices (Anonymous, 1999)<br>• Strategies to implement state-of-the-art production technology and automation (Aronson, 1998; Abdul-Nour et al., 1999)<br>**Structure**:<br>• Application of project management structures (Larson et al., 1991, Meer et al., 1996)<br>**Technology policy**:<br>• Planning for future (Docter and Stokman, 1988)<br>• Number of technology policy instruments used by the firms (Oerlemans et al., 1998)<br>**Level of education**:<br>• Level of education of founder/manager and employees (Docter and Stokman, 1988)<br>• Presence of qualified engineers (Le Blanc et al, 1997; Hoffman et al., 1998)<br>**Investments in RandD**:<br>• Percentage of sales volume invested in RandD (Birchall et al., 1997)<br>**Geographical location**:<br>• Rural or urban location (Hoffman et al., 1998) |

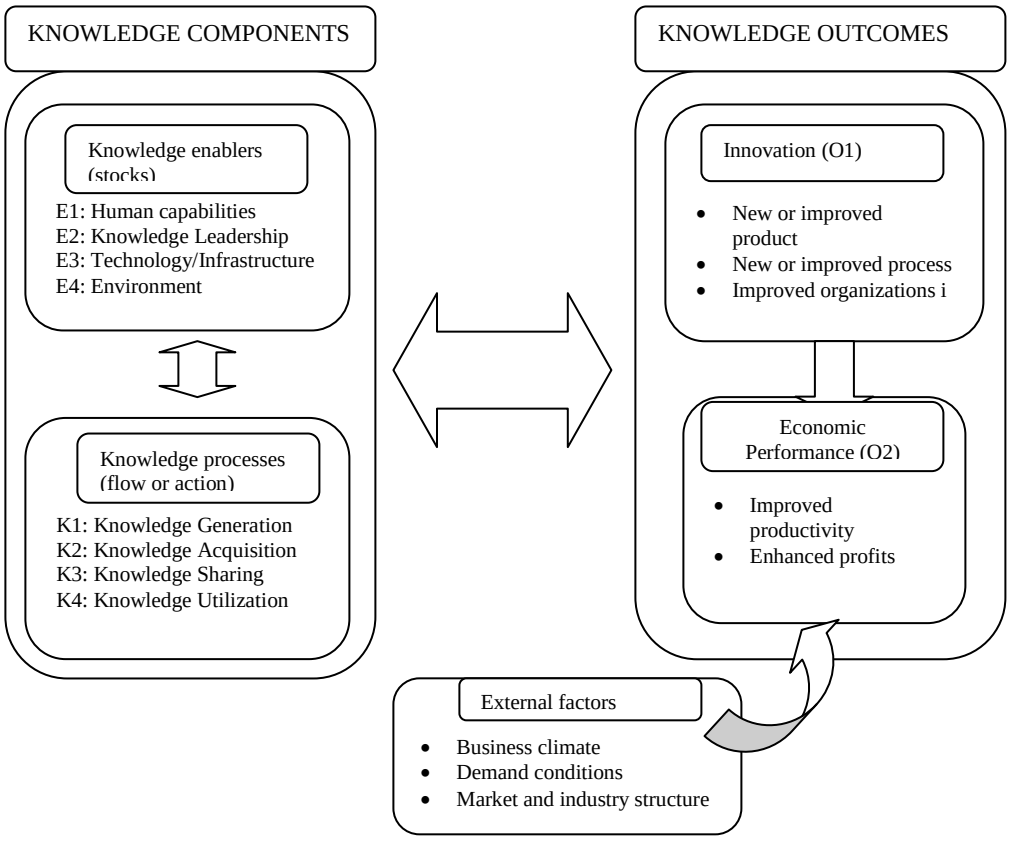
Source: Keizer et al (2002)

Soderquist et al., 1997 (as cited in Terziovski, 2001), investigated continuous improvement and innovation practices in French SMEs, which was the extension of Birchall et al. (1996). This study presented a macro-level comparison of factors affecting managing of innovation in SMEs in the UK, France and Portugal. The top nine sources of innovation were found to be:

1. The introduction of new products and/or services
2. Continuous improvement of work processes
3. Radical change, e.g. through Business Process Reengineering
4. Increased focus in marketing/sales efforts
5. Reduction in indirect staff numbers
6. Improvement on staff competence
7. Improved quality of products and services
8. Improving the quality of management
9. Efforts to improve supplier performance.

Shapira et al. (2006) proposed the knowledge content components and knowledge outcomes framework for knowledge economy measurement as shown in Figure 2.31. In knowledge components there are two main variables, namely, knowledge enablers (stock) and knowledge processes (flow or actions). A knowledge enabler is regarded as the input stock variable while knowledge processes generate knowledge and make use of knowledge. There is a two-way flow between enablers and processes, which is interdependent. Knowledge outcomes are the target of knowledge efforts, which result in innovation and

then economic performance. The economic performance is influenced by external factors such as business climate, demand conditions and market and industry structure.




Source: Shapira et al. (2006).

**Figure 2.31**
**Knowledge Content Components and knowledge outcomes**

However, most of the studies done on SMEs do not rigorously test the strength of the relationship between SME practice and performance (Terziovski, 2001). Therefore, there is a need to further test the SME practices of other variables and performance in searching for a stable framework that is practical for SMEs.

#### 2.5.3.5 Determinants of Innovation

Few authors have done empirical studies on innovation and proposed various determinants of innovation. The determinants are management support for an innovative culture (MS), customer/market focus (CF), communication/networking – internal and external (CN), Human resources strategies that emphasize innovation (HR), teams and teamwork (TM), Knowledge management, development and out-sourcing (KN), Leadership (LS), Creative development (CD), Strategic posture (SP), Flexible structures(FS), Continuous Improvement (CI). It was found that the most important determinant of innovation was managemet support for innovation for an innovative culture which is the responsibility of top management to nurture and cultivate the innovative environment in the organization (Read, 2000). Table 2.20 shows the determinants of innovation by several authors

Appendix 3 presents the taxonomy of innovation by previous authors.

## Table 2.20 Determinants of innovation

| Authors | MS | CF | CN | HR | TM | KN | LS | CD | SP | FS | CI | TE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atuahene-Gima (1996) | X | X | | X | X | | | | | | | |
| Balbontin et al. (1999) | X | X | X | | | | X | X | | | | |
| Yamin et al. (1999) | | | | | | | | | | | | |
| Spivey et al. (1997) | X | X | X | X | X | | | | | | | |
| Tang (1999) | X | | X | | | X | X | | | | | |
| Sirilli and Evangelista (1998) | | X | | | | | | | | | | X |
| Nobel and Birkinshaw (1998) | | | | | | | | | | | | |
| Ozsomer et al. (1997) | | | | | | | | | X | X | | |
| Soderquist et al. (1997) | | X | | | | | | | | | X | |
| Cho (1996) | | | X | X | X | | | | | X | | |
| Zhuang et al. (1999) | X | | | | | | | X | | | | |
| Kusunoki (1997) | | | | | | | | | | | | |
| Hurley and Hult (1998) | X | | | | | | | | X | | | |
| Keogh (1999) | | | | X | | X | | | | | | |
| Muffatto and Panizzolo (1996) | | | | | | | | | | | | |
| Subramanian and Nilakanta (1996) | | | | | | | | | | | | |
| Shaw (1998) | | X | X | | | X | | | | | | |
| Birchall et al. (1996) | X | X | X | | | | | | | | X | |
| McGourty et al. (1996) | X | | X | | | | | | | | | |
| Zien and Buckler (1997) | X | X | X | | X | | | | | | | |
| Total | 9 | 8 | 7 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |

Source: Read (2000)

## 2.6 Organizational Performance

Organizational performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives) (Ali, 2006). According to Tvorik and McGiven (1997), organizational performance is always focused on two areas: economic perspective and organizational perspective. The measurement of firm performance can include financial measures (Subramaniam and Nilakanta, 1996), as well as tangible and intellectual capital (Sveiby, 2001). Measuring organizational performance compares the expected results with the actual results, investigating deviations from plans, assessing individual performance and examining the progress being made towards meeting the targeted objectives (Hashim, 2007). A single measure may fully explicate all aspects of the performance (Snow and Hrebiniak, 1980 as cited in Liao and Chuang, 2006). It is best to show the perpetual measures of firm performance that correlate strongly to more traditional objective measures including sales growth, net income growth and return on investment (Talon et al. 2000). While the economic perspective emphasizes the firms' performance position, the organizational perspective builds on the behavioural and sociological paradigms of the firm. The external environment conditions and industry structure are largely assumed to shape the firm's performance. However, recently, other streams of research emphasize a "resource-based" bundle of capabilities perspective on organizational performance has evolved to characterize the firm's evolution and strategic growth alternatives (Dierickx and Cool, 1989; Dosi, 1988 as cited by Tvorik and McGivern, 1997). From their study, they inferred that the firm is a repository of skills and capabilities exhibiting aligned resources and leadership styles that mobilize the firm through the creation of a shared vision. These synergistic and symbiotic relationships

provide the firm with the essential strategic leverage to pursue innovation with the expectation of increasing competitive advantage. The resulting innovation enables the generation of new skill sets that evolve from the combination of the firm's synergism of past accomplishments and the existing knowledge base.

However, there is no single measure to measure performance (Ali, 2006), especially in small and medium enterprises. Xia et al. (2007) in their study on SMEs in Singapore propose that variance in organizational performance is explained by six dimensions of firm resources, which are:

1. Technological resources
2. Owner/top managers' managerial skills and capability
3. Employees' skills
4. Employees' professional/technical knowledge
5. Firm's internal relationships
6. Firm's external relationship.

Measuring organizational performance in SMEs is different than large organization, SMEs are characterized by their smaller firm size and consequent limited abilities (Taticchi et al., 2008). Furthermore, SME owners and managers are usually well aware of the local market and the client demands and, hence, the relation with the clients and the after-sales services are often more intensive compared to large organizations (Taticchi et al. 2008). This is generally complemented by less bureaucracy (Vinten, 1999) and shorter internal lines of communication (Winch and McDonald, 1999), which guarantee a greater speed in

the problem resolution and decision making. Small businesses should strive for simplicity and keep their performance measurement system focused and simple (Ali, 2003). Taticchi et al. (2008) argue that there is not a specific measurement of performance that suits SMEs and suggest that an integration of measurements of performance be applied to SMEs. However, such an application is still very new to SMEs. Several authors have summed up the measurements of organizational performance on different items as shown in Table 2.21.

**Table 2.21 The measurement of organizational performance**

| Construct | Measurement |
|---|---|
| Intellectual Capital | Financial(Wang and Chang, 2005; Bontis et al., 2000 )<br>Innovation (Cohen and Kaimenakis, 2005; Wang and Chang, 2005; Mertins et al., 2001; Stewart, 1997) |
| Innovation | New product/services (Mertins et al., 2001;Deshpande et al., 1993; Gold et al., 2001; Nahapiet and Ghosal, 1998; Motwani et al., 2005) |
| Knowledge Sharing | Improving innovation (Husted et al., 2005)<br>Financial (Liao and Chuang, 2006, Lee and Choi, 2003) |

Source: Ali (2003)

The method of measuring organizational performance in knowledge management can be categorized into four groups: financial measures, intellectual capital, tangible and intangible benefits and balanced scorecards.

Most authors recognize the significance of intellectual capital as a resource underpinning organizational performance (Marr et al.2004). Stewart (2000) listed the measurement of intellectual capital towards organizational performance: human capital, structural capital and customer capital in Table 2.22.

**Table 2.22 Measurement of intellectual capital towards organizational performance**

| Capital | Measurements |
|---|---|
| Human capital | 1. Innovation – number of new products/services produced<br>2. Employee attitudes<br>3. Tenure, turnover, experience, learning<br>4. Skills, talents, training |
| Structural capital | 1. Valuing stocks of knowledge<br>2. Working capital turns<br>3. Databases at estimated replacement cost |
| Customer capital | 1. Customer satisfaction<br>2. Measuring alliances between employees and customers<br>3. Loyalty/retention rate |

Source: Stewart (2000)

The existing approaches to the measurement of intellectual capital can be classified according to a double criterion: either organizational level only versus components identified, or non-monetary valuation versus monetary valuation (Montequin et al. 2006). According to Boedker et al. (2005), intellectual capital is best measured or predicted by non-financial indicators rather than financial as it focuses on future financial performance. For SMEs, innovation can be measured by counting the number of products and process innovations introduced in the past two years (Yap et al., 2005).

As this study looks at the outcome of knowledge sharing and innovation, the specific measure developed and validated by Deshpande et al. (1993), Lee and Choi (2005) and Capon et al. (1992) will be adopted. Organizational performance can be measured using sales, sales growth and profitability (return on sales) similar to Hendreckson and Psarouthakis (1992). They cite return on sales as an effective basis for evaluating small firms (Calatone et al., 2002), Lee and Choi (2003), Bontis (1998) and Gold et al. (2001).

Venkatraman and Ramanujam (1986) identify organizational performance as a broad construct, which includes operational performance (market share), financial performance (ROA, ROI) and other firm performance indicators and suggest that whenever possible, measures of both financial performance and operational performance should be used as indicators of firm performance.

By measuring the organizational performance and the capabilities or resources of the organization, an organization will be able to assess their position and goals.

### 2.6.1 The Relationship between Intellectual Capital and Organizational Performance

Intellectual capital is the firm's most important asset that is embedded in the organization. It is also termed as an organizational resource and represents the strength and ability of the firm to compete with its competitors. The impact of intellectual capital on organizational performance can provide another competitive advantage for the firm. The intellectual capital refers to the summation of all the knowledge and capabilities of every employee, and which brings about performance and creates wealth for the enterprise (Huang and Hsueh, 2007). There are different definitions and classifications of intellectual capital due to different research backgrounds. For this study, intellectual capital is divided into human capital, structural capital and relational capital in accordance with the definitions of Bontis et al. (2000), Hubert (1996) and Edvinsson and Sulivan (1996). Most of the studies of intellectual capital test the intellectual capital independently against performance (Bontis et al., 2000; Wang and Chang, 2005, Huang and Hsueh, 2007; Bramhandkar et al. 2007; Huang et al. 2007; Liao and Chuang, 2006). Human capital has

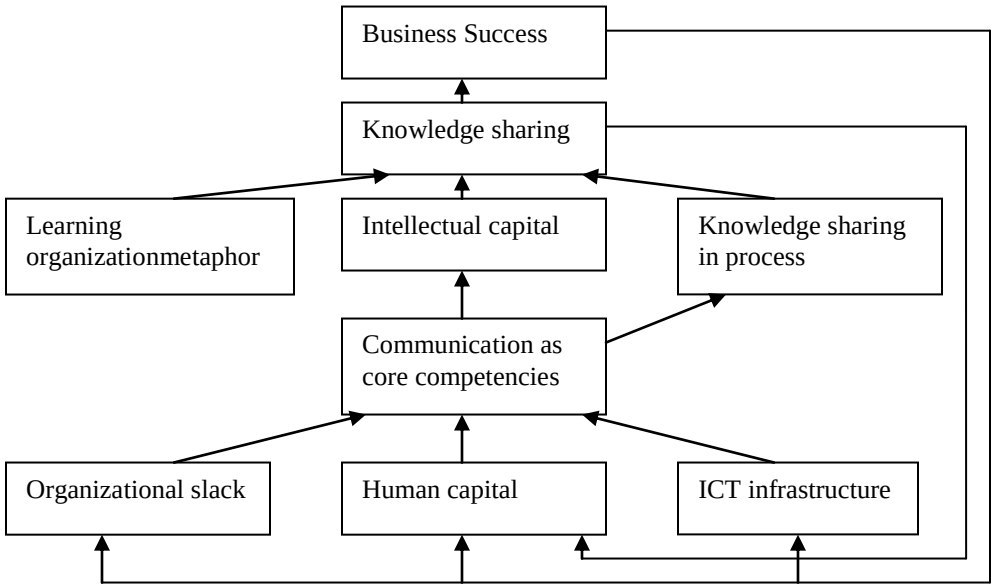
an indirect relationship to performance while structural capital and relational capital have a direct impact on performance. Different industries have a different emphasis on the intellectual capital dimension. Human capital can be more important in an industry requiring expertise built up over time. Structural capital can be vital in industries that demand an extensive IT infrastructure or strong corporate culture. Relational capital can be more essential in an industry requiring close supplier contact, close customer contact or strong brands, or that require substantial regulatory compliance. According to Bramhandkar et al. (2007), regardless of how financial performance is measured, better intellectual capital management is associated with better returns.

### 2.6.2 The Relationship between Intellectual Capital and Knowledge Sharing

Knowledge is important in intellectual capital that needs to produce higher-valued assets. Intellectual capital is tacit – and tacit knowledge cannot be sold no matter how much someone is willing to pay (Stewart, 2000; pp.74). People develop and use tacit knowledge before they formalize or codify it. However, Awad and Ghaziri (2004) stress that knowledge management is not intellectual capital, as clearly defined by Wiig (1997):

- Intellectual capital focuses on building and governing intellectual assets from a strategic or enterprise governance perspective.
- Knowledge management has a tactical or operational perspective in facilitating and managing knowledge.

Widen-Wuff and Suomi (2003) found that intellectual capital needs a process mechanism, which is knowledge sharing, to have an impact on business performance, as in the research in Finland (Figure 2.32).




Source: Widen-Wuff and Suomi (2003)

**Figure 2.32**
**Knowledge sharing Model**

Ruta and Macchitella (2008) highlight that the three dimensions of intellectual capital – human capital, social capital and organizational capital – can influence the motivation of individuals to share their knowledge with other members within the organization. Koenig (1998) stresses that in order for knowledge to be circulated evenly in the organization, it must be supported by social capital, which comprises culture, trust, knowledge behaviour, human capital and the structural capital of the processes, resources, technology and metric.

### 2.6.3 The Relationship between Knowledge Sharing and Organizational Performance

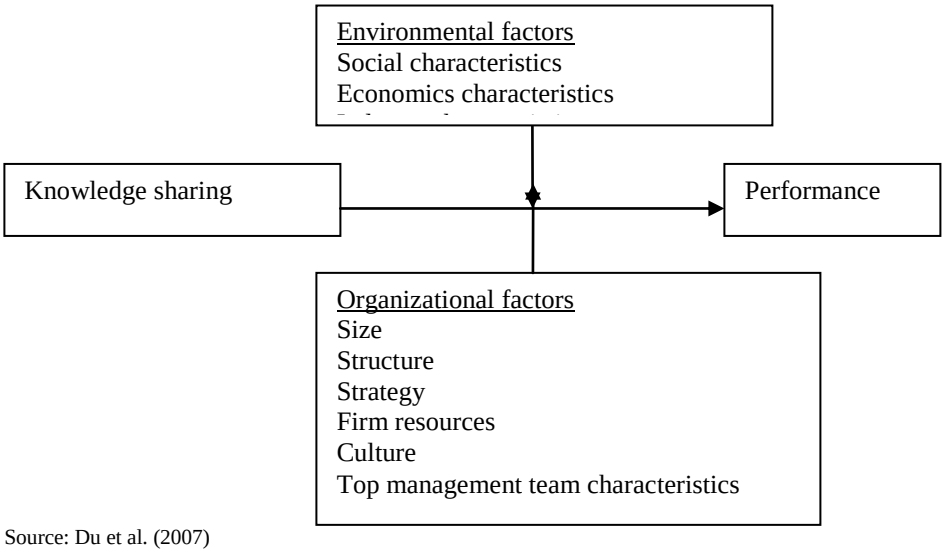
Knowledge sharing is the behaviour of disseminating and assimilating one's acquired knowledge with other members within one's organization (Zheng and Bao, 2006). Knowledge, especially tacit knowledge is valuable compared to explicit knowledge. Tacit knowledge can be either knowledge embodied or knowledge embedded (Horvath, 2007). Embodied knowledge resides in people's minds while knowledge embedded is shown in products, processes or documents. The value of tacit knowledge is only known through its outcomes – innovation and organizational performance (Cavusgil et al., 2003). It is argued that the most effective means to transfer valuable tacit knowledge is actually not to codify it, but rather to transfer it through an implicit mode (Schenkel and Teigland, 2008). In SMEs the knowledge management model, which is based upon knowledge sharing – through constant and open communication (often the SMEs strength) – the making explicit of often buried or tacit knowledge held by all employees (Gray, 2006). In Figure 2.23, Gold et al. (2001) emphasize that knowledge infrastructures such as technology, structure and culture, along with knowledge acquisition, conversion, application and protection, are essential organizational capabilities for higher organizational performance. They believe that these key infrastructures enable the maximization of social capital.

**Table 2.23**
**Knowledge Infrastructure**

| Infrastructure | Context |
|---|---|
| Structural infrastructure | Norms, trust |
| Cultural dimensions | Shared context |
| Technological dimensions | Technology-enabled ties |

Source: Gold et al. (2005)

Technology dimensions are part of effective knowledge management and include business intelligence, collaboration, distributed learning, knowledge discovery, knowledge mapping, opportunity generation as well as security (Gold et al., 2005), while structure is important to optimize the knowledge sharing process within the firm. The most significant hurdle of knowledge management or knowledge sharing in particular is organizational culture. Shaping the culture is central to a firm's ability to manage its knowledge. Husted et al. (2005) reveal that extrinsic motivators, such as reward (monetary incentives), are related to knowledge exploitation while intrinsic motivators such as self-fulfilling tasks are related to knowledge exploration. Pathirage and Amirutanga (2007) highlighted studies by Grant (1996), Zander and Kogut (1995) that suggest that tacit knowledge can be integrated externally through relational networks that span organizational boundaries that are paramount for superior performance. The relationship is shown by Du et al. (2007) in Figure 2.33.



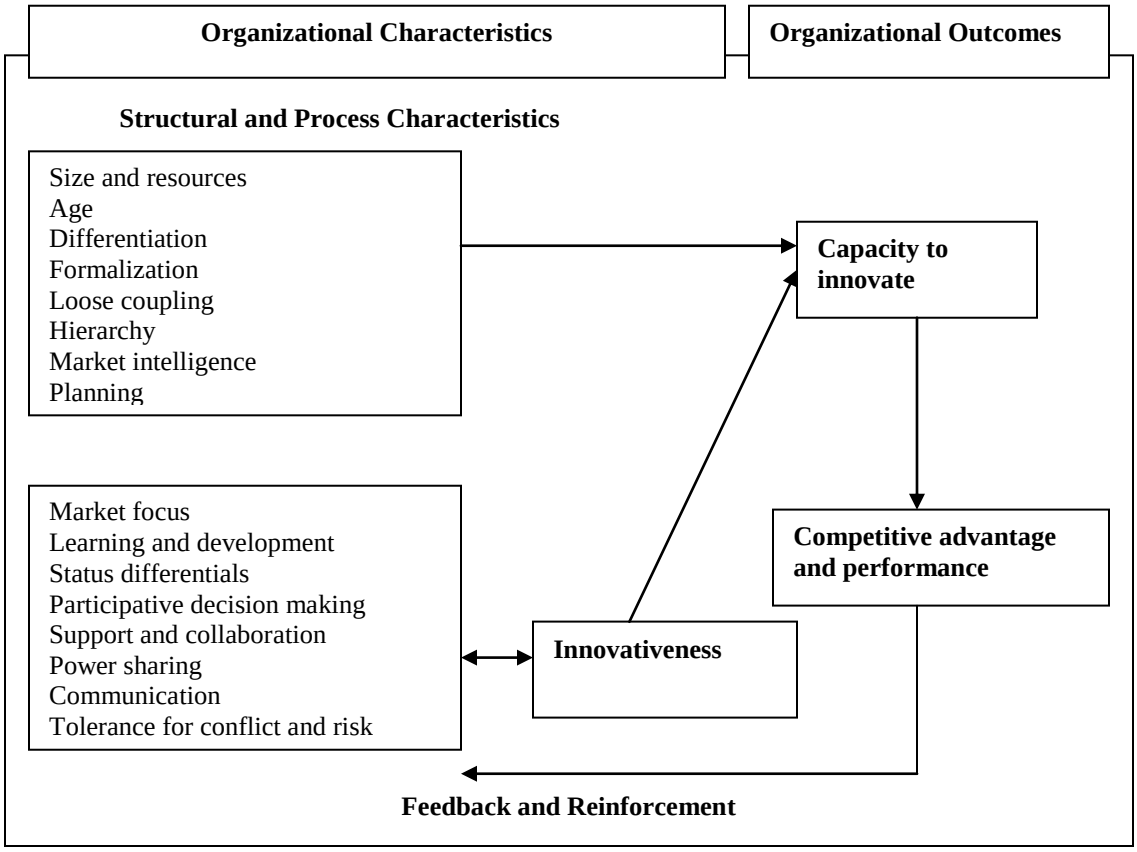

Source: Du et al. (2007)

**Figure 2.33**
**Integrative framework on knowledge-sharing-performance relationship**

Knowledge sharing is divided into two forms: donating knowledge (communicating to others what one's personal intellectual capital is) and collecting knowledge (consulting colleagues in order to get them to share their intellectual capital) (Weggeman, 2000; Van de Hoof and Van Weenen, 2004). These two processes evolve together in the knowledge sharing procedure and are always followed by controversy and interaction, and dialectically collective enquiry among colleagues, especially for tacit knowledge (Fernie et al.,2003).

### 2.6.4 The Relationship between Innovation and Organizational Performance

The innovation type has a significant impact on business performance, especially incremental innovation (Oke et al., 2004). Deshpande et al. (1993) found that innovativeness is an important determinant of organizational performance even after the culture has been controlled. Previous studies on innovation and organizational relationship indicated mixed results, some positive, some negative and some showed no relationship at all (Capon et al. 1990, Atuahene-Gima, 2001). Figure 2.34 shows the relationship between organizational characteristics that influence organizational outcomes.




Source: Hurley and Hult (1998)

**Figure 2.34**
**Hurley and Hult Innovation Model**

The relationship between innovation and organizational performance has been found by many researchers (Hurley and Hult, 1998; Kohli and Jaworski, 1993; Keskin, 2006; Atuahene-Gima, 2001; Damanpour; 1991, 1996). Damanpour et al. (2007) argued that the association between innovation and firm performance depends on the performance measurement and the characteristics of a given organization. Furthermore, different types or different combinations of innovation may also result in divergent organizational performance (Lee and Chen, 2007). Innovation has demonstrated a strong and influential relationship with SMEs performance (Wolff and Pett, 2006; Montequin, 2006).

Danneels (2002) emphasized that product innovation should be utilized in investigating the impact on organizational performance. This is further supported by Montequin et al. (2006) in studying innovation in SMEs. Lin and Chen (2007) found that 53.5% of SMEs of in the manufacturing and service industries in Taiwan engaged in a combination of radical and incremental innovation. Innovativeness is an important direct driver of performance (Hult et al. 2004). Table 2.24 shows the impact of innovation on organizational performance.

**Table 2.24 Impact of innovation on organizational performance**

| Author(s) | Performance Measurement | Conclusion |
|---|---|---|
| Authene-Gima (1996) | Respondents rated the degree of innovation success on a 12-point scale in terms of market share; sales, growth and profit objectives; cost-efficiency, etc. | The potency factors affecting innovation performance differ between service and manufacturing firms. |
| Yamin et al. (1999) | 27 items based on four dimensions; marketing effectiveness, asset management, operation efficiency and financial performance. | Innovative companies are more profitable,although highly innovative companies may not necessarily outperform innovators. |
| Subramaniam and Nilakanta (1996) | Effective measures (revenue generation focus) such as market share and sales. | The results show that innovativeness does improve organizational performance. |

### 2.6.5 The Relationship between Intellectual Capital, Knowledge Sharing and Organizational Performance

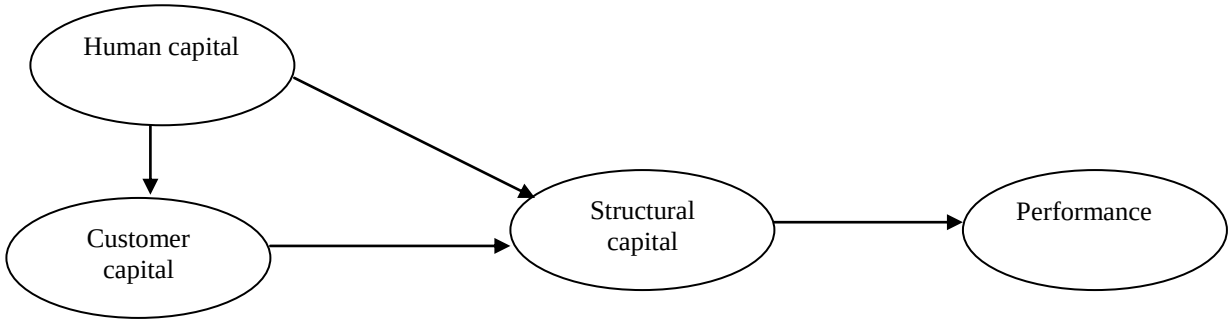
Knowledge management as perceived from the intellectual capital approach is primarily geared towards building up structural capital (Huysman and Witt, 2002). Structural capital ensures that human capital and social capital flourishes (Huysman and Witt, 2002). Yang (2007) found that knowledge sharing facilitates the collective individual

knowledge, thus, leading to organizational effectiveness. Saint-Onge (1996) suggests that tacit knowledge exists in each segment of intellectual capital:

- Human capital: this is in the mindsets of individuals.
- Structural capital: the collective mindsets of employer and employees that shape the culture of the organization.
- Customer capital: this is in the mindsets of the employees and customers, which shape their perceptions of the value provided by any given product or service.

### 2.6.6 Intellectual Capital, Innovation and Organizational Performance

There is a significant relationship between market orientation, customer orientation and even entrepreneurial orientation and organizational performance. (Hurley and Hult, 1998; Kohli and Jaworski, 1993; Keskin, 2006; Atuahene-Gima, 2001; Damanpour; 1991,1996; Wolff and Pett, 2006; Montequin, 2006, Appiah-Adu and Singh, 1998). In addition, Garcia and Calatone (2002) suggest that single construct "product innovation" for technological-based projects can be utilized as a mediating or moderating variable or even to split innovation into product type categories. Bontis et al. (2000) and Chen et al. (2004) show the relationship of structural capital and organizational performance, which indirectly shows the innovation capital relationship to organizational performance as in Figure 2.35.




Source: Bontis (2000)

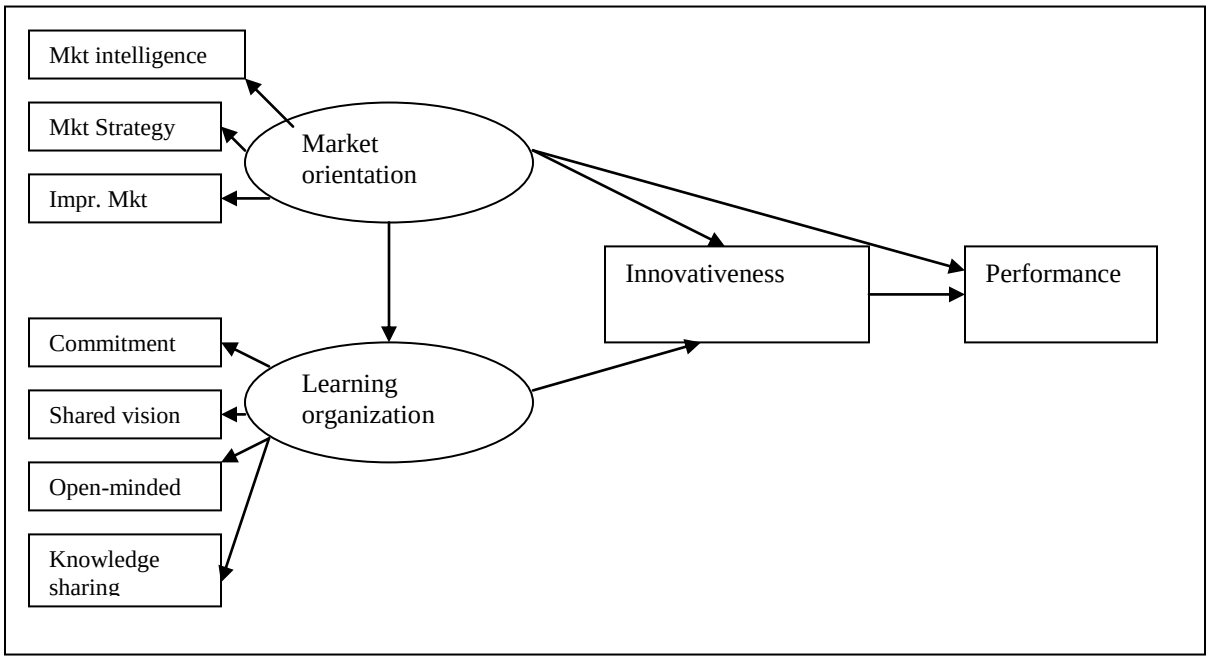
**Figure 2.35**
**Intellectual capital Model**

There is a positive relationship between market orientation and customer orientation on performance in small firms (Verhees and Meulenberg, 2004); Montequin, 2006). However, most researchers focused on the effect of market orientation, entrepreneurial orientation, customer orientation and even human capital separately on organizational performance (Hurley and Hult, 1998; Kohli and Jaworski, 1993; Keskin, 2006; Atuahene-Gima, 2001; Damanpour; 1991, 1996; Wolff and Pett, 2006; Montequin, 2006). Appiah-Adu and Singh (1998) found that customer orientation through innovation has a positive impact on organizational performance. Entrepreneurial orientation positively affects innovation and, thus, leads to higher performance of the SME (Avlonitis and Salavou, 2007), which is in line with other researchers.

### 2.6.7 Intellectual Capital, Knowledge Sharing, Innovation and Organizational Performance

Keskin (2006) suggests that market orientation, which is a part of the customer capital of intellectual capital, has an indirect effect on the firm's performance in SMEs

whereby the firm's innovativeness has a positive impact on firm performance. In addition, innovativeness is influenced separately by market orientation and learning organization for higher organizational performance. Figure 2.36 shows the model.

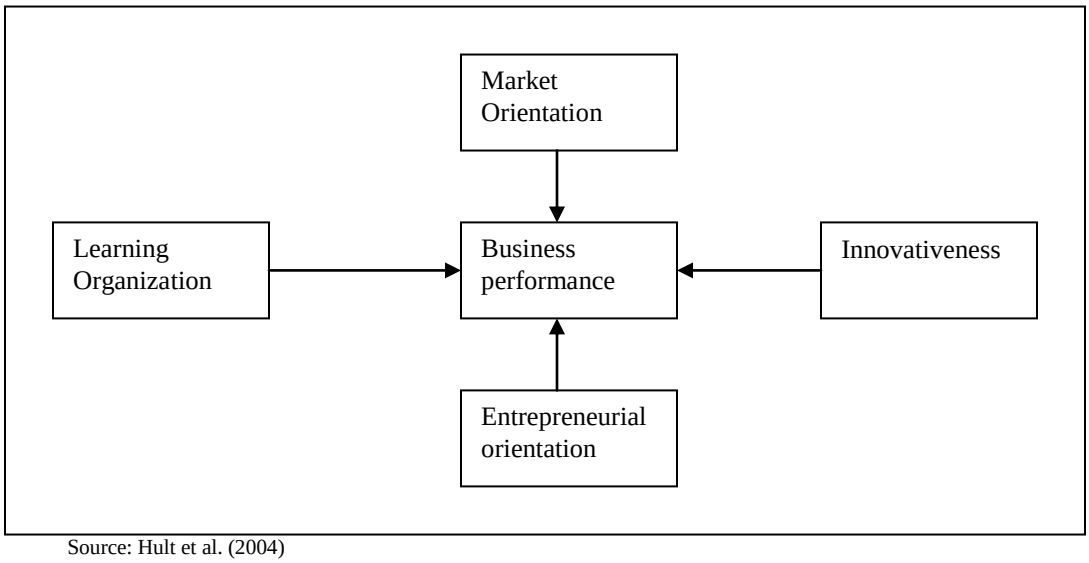



Source: Keskin (2006)

**Figure 2.36**
**Keskin's Market orientation Model**

Based on his research, Keskin (2006) suggested that tacit knowledge sharing should be incorporated into the framework, as in SMEs tacit knowledge sharing is the foundation of an SME's innovativeness. In addition, tacit knowledge sharing frequently takes place in SMEs (Pathirage and Amaratunga, 2007). Horvath (2007) suggests that tacit knowledge is the source of innovation and is often found in the tacit knowledge of people in the organization. Hult et al. (2004) found a direct relationship of market orientation,

entrepreneurial orientation and innovativeness but not learning organization towards business or organizational performance, as in Figure 2.37.

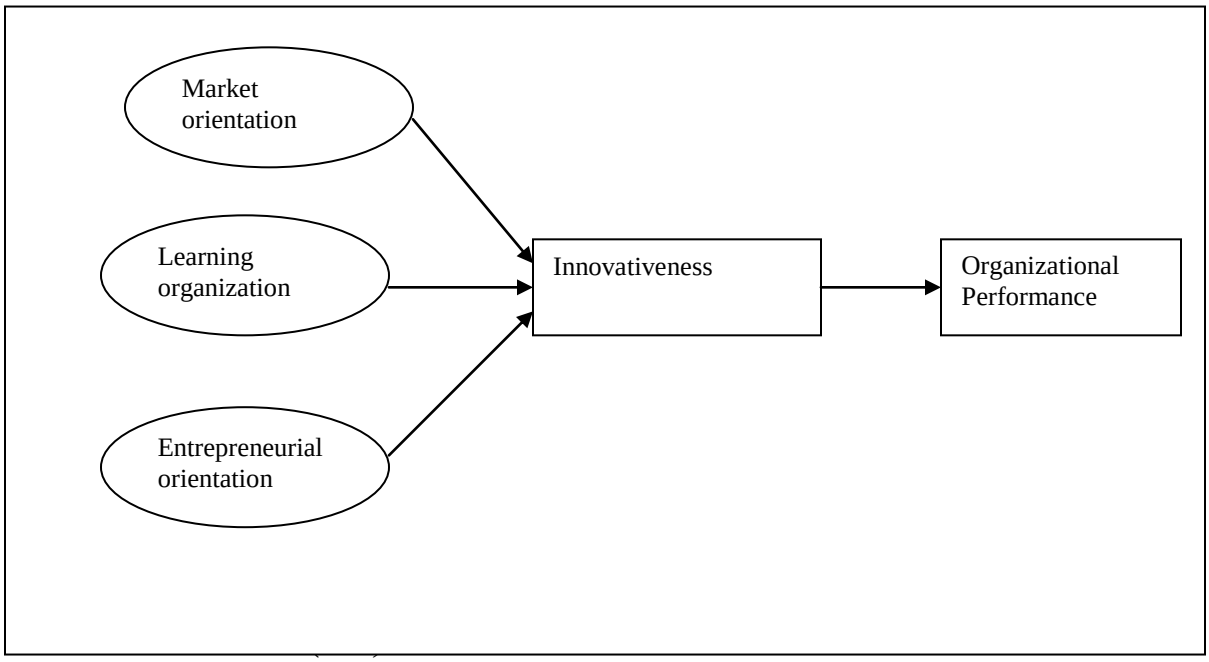



Source: Hult et al. (2004)

**Figure 2.37**
**Hult Market Orientation Model**

Hult et al. (2004) found that innovativeness mediates the relationship between market orientation and organizational performance and between entrepreneurial orientation and organizational performance, especially learning organization, which needs constructs like innovativeness to affect organizational performance.

Innovativeness supported by market orientation, learning organization and entrepreneurial orientation is likely to be more effective, thus, generating competitive advantages for organizations (Hult et al. 2004). The model is shown in Figure 2.38. The knowledge management process capability (KMPC) enhances the firm's performance through innovation (Liao and Chuang, 2006).




Source: Hult, Hurley et al. 2003

**Figure 2.38**
**Hult and Hurley Market orientation Model**

## 2.7 The Relationship between Intellectual Capital and Innovation

Human capital's "output" is innovation, which is the structural capital's efficiency (Stewart, 2000). An innovative organization requires an organizational culture that constantly guides organizational members to strive for innovation and a climate that is conducive to creativity (Ahmed, 1998). Yap et al. (2005) state that culture is important for the organization to produce greater innovation and that the leadership culture and attitude commonly manifested in the strategic priorities of the firm may influence the level of innovation (Yap et al. 2002). McAdam and McClelland (2002) found that there is a strong correlation between the culture of continuous improvement and innovation in SMEs. Innovation, creativity, motivation and learning are processes that need support from many

levels in the organization (Widen-Wulff and Suomi, 2007), especially from the management. Motwani et al. (1999) found that the structure of the organization is important to innovation as it supports innovation in SMEs for both the product and process of innovation. Schein's (1985) model depicts the levels of organizational culture, namely, artefacts, values and basic assumptions and their interaction. Hatch (1993), in Martins and Terblance (2003), criticized Schein's model for not including the patterns of interaction between people, roles, technology and the external environment, which represent a complex environment that influences the behaviour in organizations. As innovation provides the competitive edge for organizations, Martins and Terblance (2003) stress that the organizational culture model must have the basic elements of organizational culture (shared values, beliefs and the behaviour expected of members of an organization) that influence creativity and innovation in two ways:

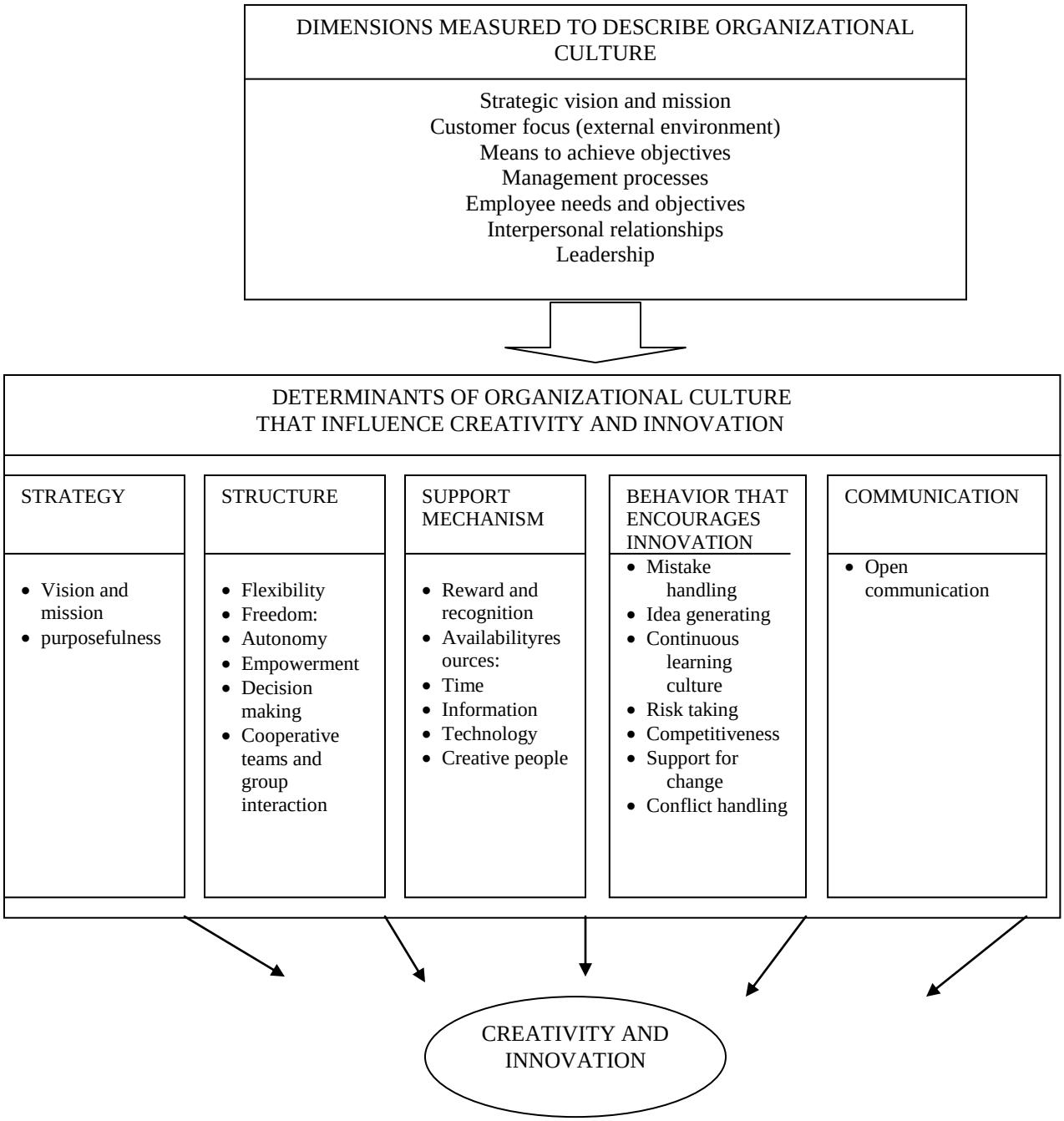
- Through socialization processes in organizations, individuals learn what behaviour is acceptable and how activities should function.
- The basic values, assumptions and beliefs become enacted in established forms of behaviour and activities and are reflected as structures, policy, practices, management practices and procedures.

Martins and Terblanche (2003) proposed that certain elements are important in organizational culture to support creativity and innovation in the long term. The elements are:

- Strategy – an innovation strategy is a strategy that promotes the development and implementation of new products and services (Robbins, 1996).

- Structure – organizational culture has an influence on the organizational structure and operational systems in an organization (Armstrong 1995).
- Support mechanism – the literature study revealed that rewards and recognition and the availability of resources, namely, time, information, technology and creative people, are mechanisms that constitute this role.
- Behaviour that is rewarded reflects the values of an organization.
- Intrinsic rewards like increased autonomy and improved opportunities for personal and professional growth may support the innovation process (Shatow 1996, Amabile and Gryskiewicz 1987). Management should be sensitive to which method of reward and recognition will inspire personnel in their specific organization to be more creative and innovative (Tushman and OReilly 1997). However, innovative companies rely heavily on intrinsic rewards compared to less innovative companies that rely on extrinsic rewards (Avlonitis and Salavou, 2007).
- Information technology as a support mechanism is an important resource for successful innovation (Shattow, 1996).
- Behaviour that encourages innovation, i.e. values and norms that encourage innovation manifest themselves in a specific behavioural form that promotes or inhibit creativity and innovation.
- Communication. An organizational culture that supports open and transparent communication based on trust will have a positive influence on promoting creativity and innovation (Barrret 1997, Robbins 1996).
    - Communication is human nature; knowledge sharing is human nurture (Lim and Klobas, 2006).

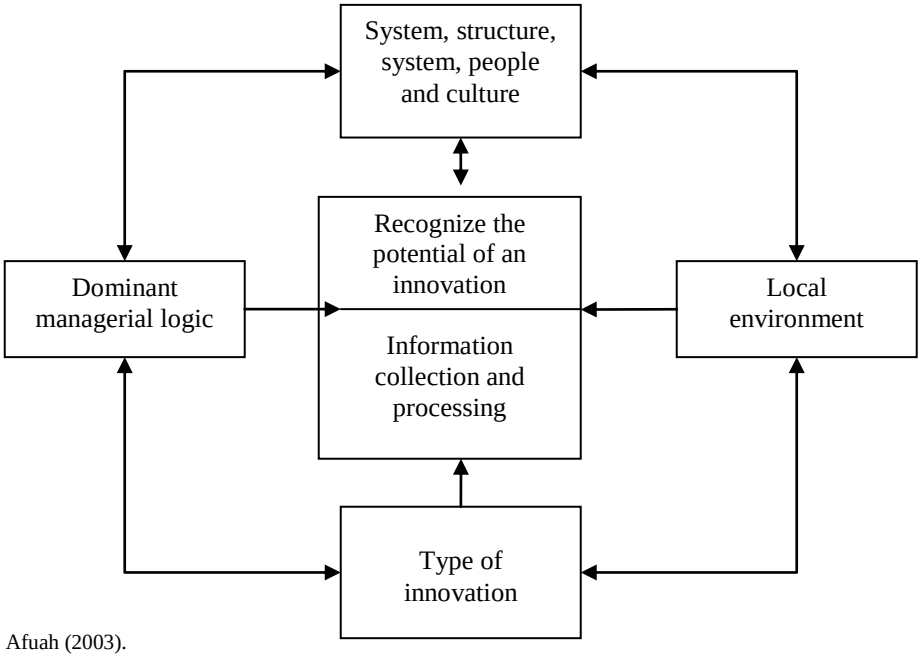
In Figure 2.39, Martins and Terblanche (2003) proposed a new organizational model that supports creativity and innovation.




Source: Martins and Terblanche (2003)

**Figure 2.39**
**Martin and Terblance's Innovation Model**

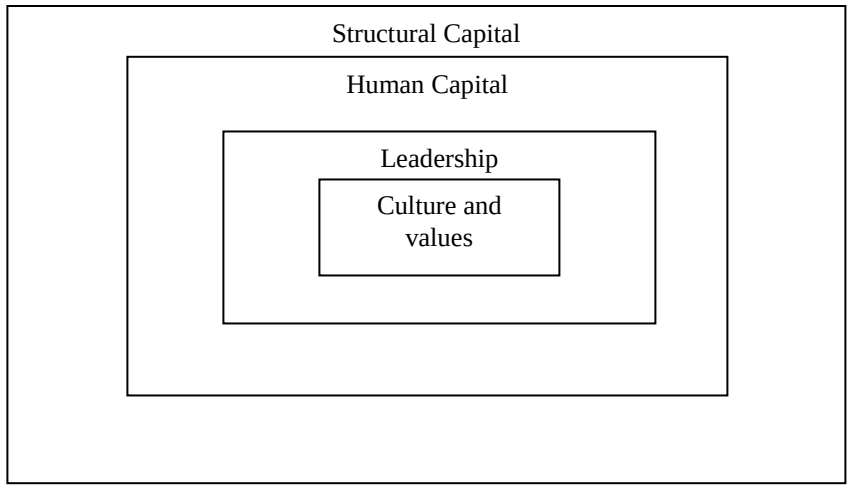
This model is further supported by Afuah (2003) as he links strategy, structure, system, people and culture with dominant managerial logic (leadership), local environment (culture) and type of innovation in recognizing the potential of an innovation. Figure 2.40 shows Afuah's Innovation Model.




Source: Afuah (2003).

**Figure 2.40**
**Afuah's Innovation Model**

Figure 2.35 shows the model derived from the Model of the Canadian Imperial Bank by Herbert Saint-Onge (1996), and which stresses two dimensions of knowledge, explicit and tacit (Sanchez-Canizares et al. 2007). A firm's ability to recognize the potential of an innovation rests on the way it collects and processes information and is a function of the four factors as shown in the model in Figure 2.41.




Source: Sanchez-Canizares et al. 2007

**Figure 2.41**
**Intellectual capital and culture**

Innovation models and innovation structures take different shapes in different cultures (Pohlmann, 2005). Leadership is important in an innovation culture (Ahmed, 1998). It is the task of organizational leaders to provide the culture and climate that nurtures and acknowledges innovation at every level (Ahmed, 1998). This is particularly important for SMEs as owners should lead and encourage, and nurture the innovation culture of SMEs (Avlonitis and Salavou, 2007). According to Edwards, surprisingly few studies examine the embeddedness of innovation in SMEs (Oakey 1993, Shaw 1998, Panniccia 1998, Freel 2000, Jensen and Greeve 2002), which shows that SMEs are capable of engaging in innovation and developing their competitive edge. The ability to innovate is increasingly viewed as the single most important factor in developing and sustaining

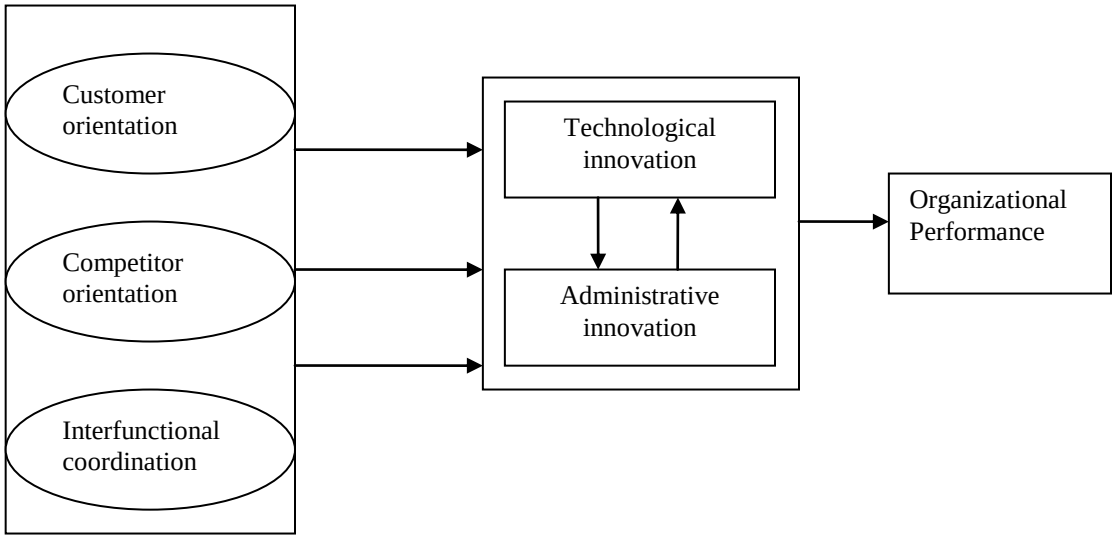
competitive advantage (Tidd et al., 2001). Davenport and Bibby (1999) state that small to medium-sized enterprises (SMEs) increasingly need to develop their innovation capabilities beyond their technical innovation. Globalization has encouraged innovation to be a prerequisite for SMEs to operate in the more competitive global markets (Gunasekaran et al., 1996). Although there are a number of studies on continuous improvement in SMEs (Gunasekaran et al., 1996; Bessant and Caffyn, 1997; Bessant and Francis, 1999) there is a relative paucity of in-depth studies on innovation implementation in SMEs (McAdam, 2000). Furthermore, according to Caputo et al. (2002) the relationship of SMEs and innovation is not an easy one, as SMEs have a number of unique features such as scarce resources, low market influence and informal communication, which differentiates them from large firms (Hadjimanolis, 2000). The innovation process traditionally involves huge financial resources and is quite risky (Caputo et al., 2002). Moreover, innovation, which allows diversification strategies, may be better pursued by large organizations rather than SMEs. Traditionally, SMEs demonstrated poor ability in innovating products and processes (Caputo et al. 2002). Most innovation studies focus on large organizations, and the findings may not be transferable to SMEs (Humphreys et al., 2005). However, several European Union studies have shown that SMEs appear to be innovative (Caputo et al., 2002).

Motwani et al. (1999) explored the management of innovation in French SMEs and found that both the way of managing and the structure that supports innovation are important to innovation in both products and processes (Abbot et al, 2006). Oke et al. (2004) found that SMEs focus more on product innovations than service and/or processes, and that the majority of SMEs focus predominantly on incremental innovations. SMEs vary in their interest and approach to innovation because of differences in their sources of capital

(Susman et al., 2006; Hadjimanolis, 2000). The type of innovation that SMEs pursue also depends on whether their industry is emerging (where radical innovation is more likely) or is mature (where incremental innovation is more likely) (Nooteboom, 1994). The innovation in products, processes or services of varying types and degree can be appropriate for different SMEs in different industry sectors or product life cycle stages (Susman, et al.2006), and product innovation is more important for small firms (Damanpour, 1996). Avermaete et al. (2003) found that there is a significant relationship between product innovation and process innovation in small companies (Schmidt, 1990). SMEs have at some point undertaken some form of incremental innovative initiatives, often supported by local authority grants (Humphreys et al, 2005). Therefore, there is a need for SMEs to increasingly innovate to survive and compete in global and niche markets, especially as many SMEs focus on projects and product development aspects of innovation (Humphreys et al, 2005). Therefore, there is a need for studies on how innovation is implemented within the constraints and characteristics of SMEs (Humphreys et al. 2005). Most innovation studies relate to large organizations yet large organizations are frightened of innovation as it is linked to risk (Ahmed, 1998). Yap et al. (2003) found that the interpersonal skills of employees in SMEs are an important advantage of SMEs in innovation. Culture is a primary determinant of innovation (Ahmed, 1998). The extensive discussion of culture and innovation in SMEs should be supported by other factors such as infrastructure and leadership whereas culture should be a central nucleus. In the intellectual capital model, culture is the central nucleus of the model.

Furthermore, Han and Kim (1998) found that innovation improves the relationship of market orientation and performance. Jaworski and Kohli (1993) found a positive

empirical result of the mediating effect of innovation on the relationship between intellectual capital and organizational performance as shown in Figure 2.42.




Source: Jawoski and Kohli (1993)

**Figure 2.42**
**Intellectual capital and Innovation Model**

Deshpande and Webster (1993) found a causal relationship between market orientation, innovation and performance. Innovation is observed separately from intellectual capital. This is because with intellectual capital, innovation is being observed as innovation capacity and results of the innovations obtained by means of commercial rights, intellectual property, managerial secrets, etc.

## 2.8 The Relationship between Knowledge sharing and Innovation

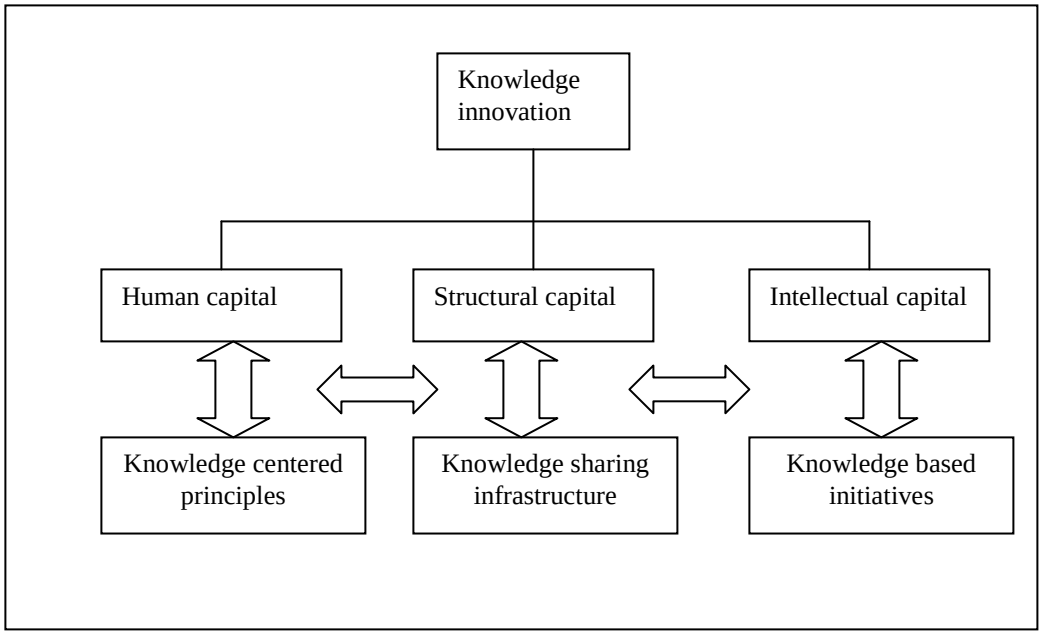
An individual's tacit knowledge does not contribute much to an organization (Leonard and Sensiper, 1998). However, if this tacit knowledge is shared and combined to

become collective tacit knowledge, then it will lead to creativity and innovation (Leonard and Sensiper, 1998). The concept of tacit knowledge is very important in the context of innovation and its diffusion (Nooteboom, 1993). The process of innovation depends heavily on knowledge (Nonaka and Takeuchi, 1995). Nonaka (1998) further explained that tacit knowledge consists partly of technical skills – the kind of informal, hard to capture in the terms of "know-how". Nooteboom (1993) refers to this tacit knowledge, "know-how", of the small business as craftsmanship. Innovation is a distinction drawn in communication (Pohlmann, 2005), which is the root of knowledge sharing. Liao and Chuang (2006) found that knowledge sharing has a significant relationship with innovation. Knowledge sharing promotes the innovation development relative to competitors and creates innovation of novelty. Innovation is the use of new technology and market knowledge to offer new products or services that the customers want (Afuah, 2003). Darroch and McNaughton (2002) state that many studies reported aspects of KM as antecedents of innovation but none explicitly examined this relationship. However, Nooteboom (1994) stresses that the concept of tacit knowledge is important in the context of innovation. Therefore, it is important to activate knowledge sharing activity in order to transfer and share tacit knowledge in the organization. Birchall et al. (1999) cite seven sources of innovation among which are process needs, changes in industry or market structure and new knowledge. Innovation is a social process that requires people who are good at different roles to collaborate and work in units performing different functions to integrate their unique expertise through working together (Tang, 1999). Innovative organizations rely on multiple sources for ideas. Knowledge and skills form the basis of competence to innovate (Tang, 1999). Cavuslgil et al. (2003) state that innovation which depends on knowledge

where firms that create and use knowledge rapidly and effectively are able to innovate faster and more successfully than those that do not. Based on the research of a few successful organizations, he determined that tacit knowledge transfer boosts innovation, as tacit knowledge is more difficult to transfer and deploy across borders than explicit knowledge and is harder for competitors to replicate or imitate. Darroch and McNaughton (2002) suggested that knowledge sharing can be viewed as an organizational innovation that has the potential to generate new ideas and develop new business opportunities through socialization and that the learning process of knowledge. Interaction between individuals is essential in the innovation process (Gold et al., 2001). Darroch (1995) suggested that implementing various knowledge management initiatives, including knowledge sharing, to identify and exploit organizational knowledge is important to organizational innovation and organizational performance.

Knowledge sharing has been identified as a positive force in creating innovative organizations (Yang, 2005). Knowledge sharing can also be viewed as an organizational innovation that has the potential to generate new ideas and develop new business opportunities through socialization and the learning process of knowledge workers (Lin, 2006). Innovative firms develop new products through creating and sharing knowledge (Koskinen, 2005). In addition, generative innovative ideas rely on the knowledge of existing artefacts and practices (Ward et al. 1999). Knowledge sharing has been identified as a positive force in creating innovative organizations, especially when there is a more positive social interaction culture (Connelly and Kelloway, 2003; Yang, 2007). The process of innovation depends heavily on knowledge (Gloet and Terziovski, 2004), therefore, knowledge sharing is important in innovation in SMEs. Innovation requires competencies

in both idea generation and idea implementation (Yap et al, 2005). Calantone et al. (2002) found that intra-organizational knowledge sharing in which elements of organizational learning influence a firm's innovativeness lead to higher firm performance. Innovation requires competencies in both idea generation and idea implementation (Yap et al. 2005). Looking into the relationship of knowledge and innovation, Goh (2006) proposed an integrated management framework for managing knowledge and innovation called Knowledge Innovation, in relation to perspectives on knowledge-centred principles, knowledge sharing infrastructures and knowledge based initiatives (Figure 2.43).



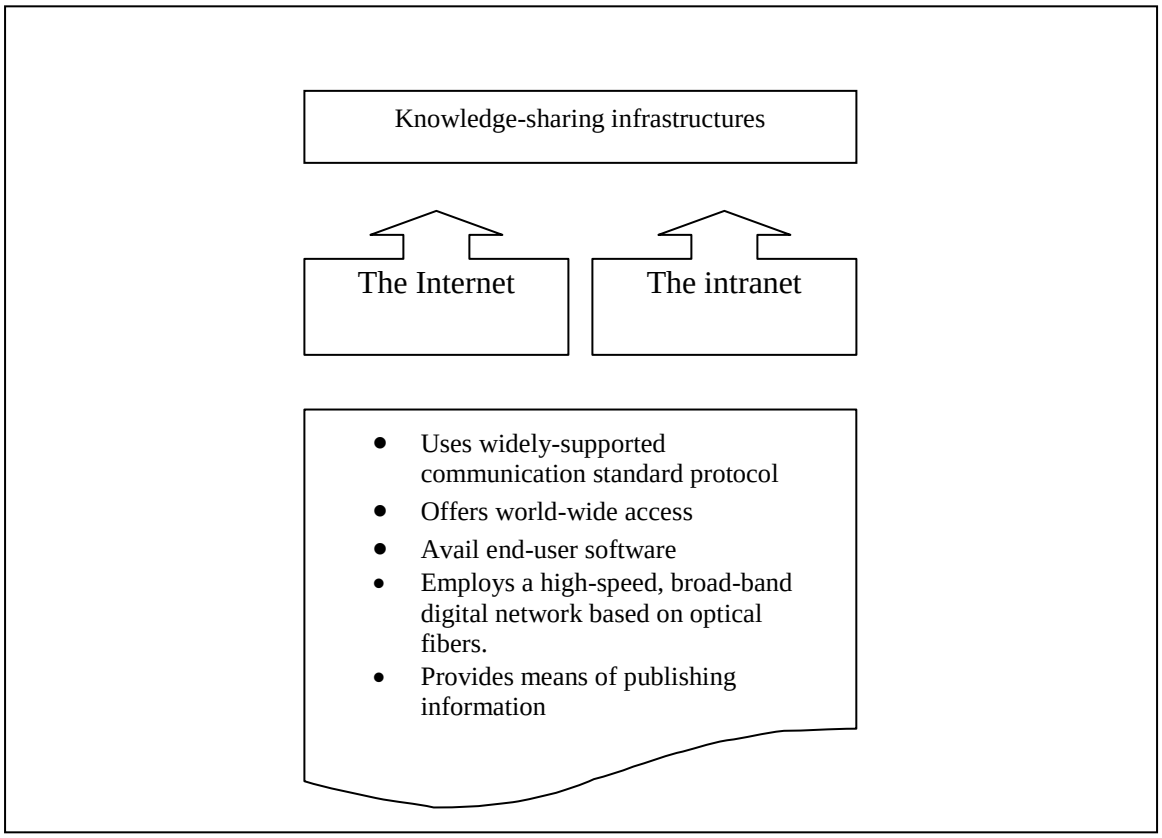

Source: Goh (2006)

**Figure 2.43**
**Knowledge Innovation Model**

By developing this framework, in terms of perspectives on knowledge centred principles, knowledge sharing infrastructures and knowledge based initiatives; the objective is to focus on how organizations could better fulfil their roles in these strategic areas. The

role of information technology in the knowledge sharing process, even though very dependent on resource constraints, is important, especially to promote a flow of innovations. Today, a basic technology infrastructure is affordable by SMEs and is definitely a necessity in knowledge sharing processes, especially the use of the intranet.

Figure 2.44 shows the knowledge-sharing infrastructure.



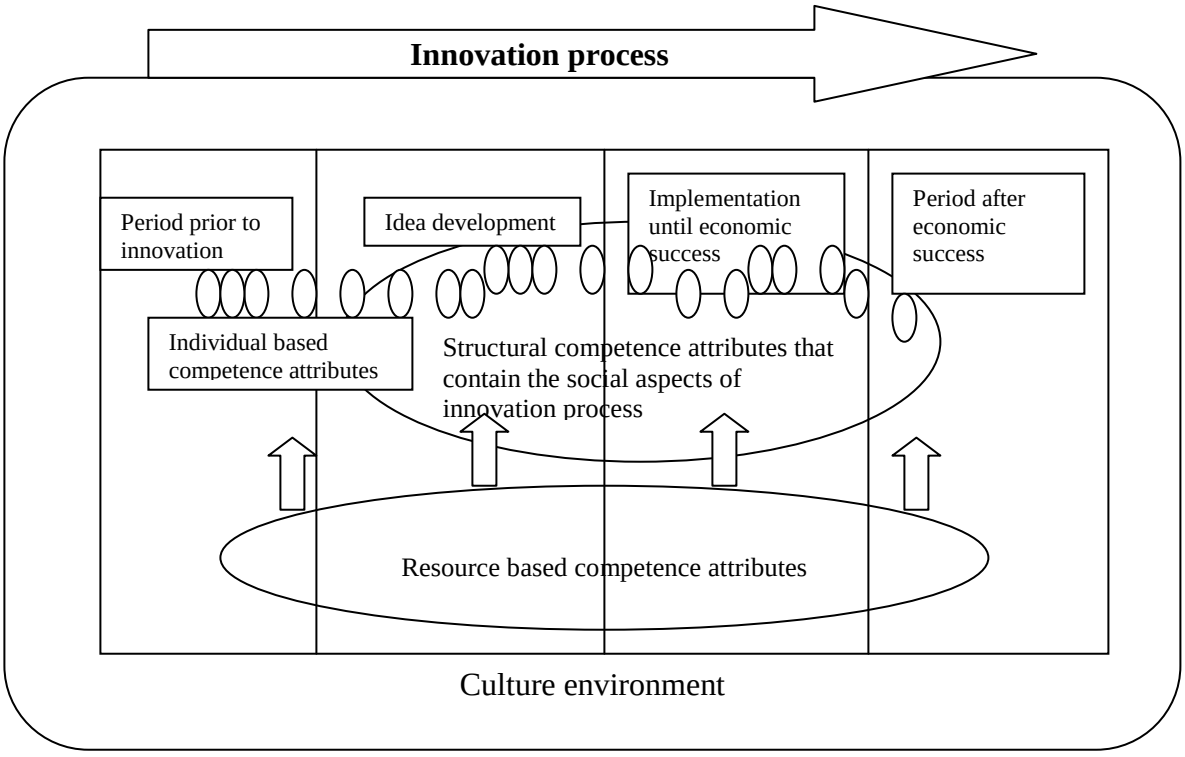

Source: Goh (2006)

**Figure 2.44**
**Knowledge sharing infrastructure model**

Because end-users are familiar with browser interfaces, information can be shared across different local area networks and computer platforms and published information is instantly available over the entire network (Goh, 2006).

Successful organizations are those that are able to start a virtual cycle between applying knowledge to and learning from work, especially innovation-related projects (Nonaka and Takeuchi, 1995). Using the SECI model in creating and sharing knowledge (Nonaka and Takeuchi, 1995), it is information and, more importantly, the exchange of information or knowledge sharing that first spark and later sustains the innovation efforts (Tang, 1999). The interaction between employees is aligned to the strategic objectives of the organization and the actual content of the knowledge shared will be very much influenced by the nature of the business of the organization (Bhirud et al. 2005). Hence, knowledge sharing is an important ingredient of innovation. Yap et al. (2005) stresses that a firm needs to forge its network efficiently, especially in sharing common knowledge to foster innovativeness in the firm. In addition, communication and common language is important to create trust in an interpersonal relationship (Yap et al. (2005).Trust is one of the important elements in knowledge sharing that exist in the social network. This social network can be further explored in terms of knowledge and innovation as well. In Figure 2.45, Taatile et al. (2006) proposed a model of the social aspects of the innovation process of economic innovation, emphasizing the social structure and social innovation networks, which are:

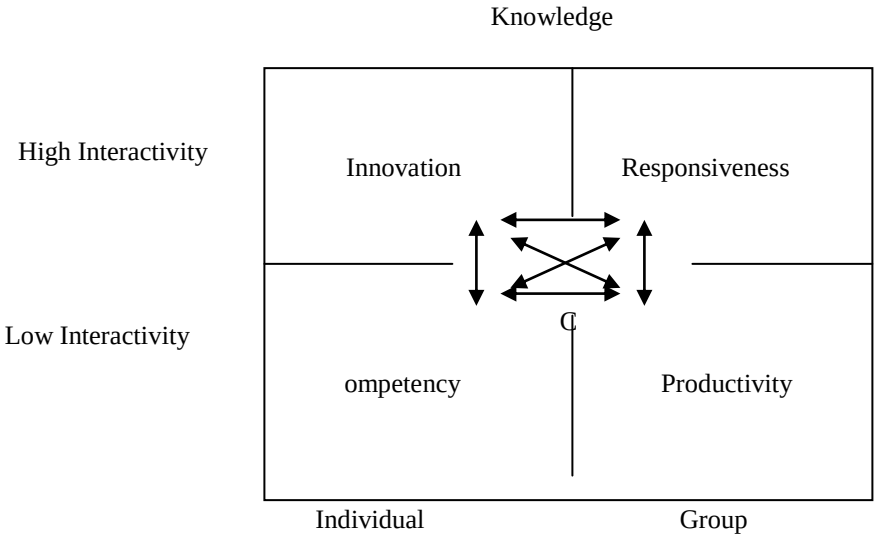
- Period prior to the idea
- Idea development
- Implementation culminating in economic success
- Period after economic success




Source: Taatile et al. (2006)

**Figure 2.45**
**Social aspects of innovation process Model**

In addition, Koenig (1998) suggests that knowledge management enhances knowledge sharing and collaboration (Figure 2.46). The result of which would be innovation in areas of high interaction and individual knowledge, competency in areas of low interaction and individual knowledge, responsiveness in areas of high interaction and group knowledge and productivity in areas of low interaction and group knowledge.




Source: Koenig (1998)

**Figure 2.46**
**Collaboration and Interaction Innovation Model**

The ability of SMEs to innovate and improve continuously is related to the employees' skills and knowledge (Nonaka, 1991). However, Chan et al. (2006) argue that although SMEs' strive for innovative ideas in products and services, the organizational members find it difficult to transform or verbalize what they know into comprehensible formats to be shared among team members.

## 2.9 Gaps in the study

Based on the literature review discussed earlier, there is a great demand for a new framework for intellectual capital that suits SME in Malaysia. This need can be seen from the taxonomy presented in Appendix 1, Appendix 2 and 3.

Conceptually, intellectual capital needs to be integrated with knowledge sharing and innovation as discussed by Montequin et al. (2006). However, most empirical studies, investigate these variables separately. Intellectual capital has not been explored extensively, especially in SMEs. The gaps are summarized below:

1. Intellectual capital is explored extensively in large organizations but not in SMEs.
2. Intellectual capital needs another mechanism to ensure the flow of knowledge within the organization.
3. SMEs are known to be poor in practicing a complete knowledge management due to cost and expertise. However, SMEs commonly practice knowledge sharing through informal interactions.
4. Knowledge in SMEs is tacit by its nature and this tacit knowledge is almost impossible to make explicit. However, tacit knowledge can be transferred through knowledge sharing.
5. Innovation is prevalent in small firms. Innovation is resource-dependent. Therefore, intellectual capital should be treated as an antecedent of innovation.
6. Creativity is derived from tacit knowledge, the link between tacit knowledge sharing and innovation must be explored, particularly in an SME setting.
7. A comprehensive or complete framework of intellectual capital (internal resources and external resources) to achieve higher organizational performance via knowledge sharing and innovation has never been developed.

Based on the gaps discussed above, the need for a new framework to suit SMEs should be developed.

## 2.10 Summary

This chapter reviewed the literature concerning the variables of the framework proposed. There is a considerable amount of literature in the field, which begins with the definition of organizational performance, intellectual capital, knowledge sharing and innovation. However, there has been little theoretical or empirical literature review of intellectual capital in entrepreneurship, particularly in small and medium enterprises. As knowledge has become the main capital in a knowledge-based economy, the development of intellectual capital for small and medium enterprises is important in helping the entity be competitive.

The next step is to place intellectual capital in the context of small and medium enterprises. This context is important because small and medium enterprises have not been adequately explored in terms of their organizational resources, especially concerning knowledge management. It is very challenging to incorporate intellectual capital, knowledge management, particularly knowledge sharing and innovation in this scenario. By studying intellectual capital and implementing it in small and medium enterprises, and comparing it in the literature, it is hope to produce a suitable model of intellectual capital for small and medium enterprises.

Frameworks were explored to give the researcher a comprehensive view and appreciation of intellectual capital. The researcher then identified the gaps in the literature in order to highlight the importance of further research in this field.

In Chapter Three, intellectual capital is outlined in the context of Malaysian Small and Medium enterprises. This will provide the basic/foundation of the study for the researcher to explore in more depth the literature and empirical evidence in Malaysia.