A Model for Managing Intellectual Capital to Generate Wealth

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Abstract

In an increasingly competitive environment an organisation's intellectual capital is the key to its ability to generate wealth. The intangibility of intellectual capital makes it difficult to replicate and therefore it is a crucial differentiator in the business environment.

The objective of the research was to develop and test a model for the managing of intellectual capital. An examination of the literature provided the foundation for developing a model to illustrate the various facets an organisation must consider when managing intellectual capital.

The Intellectual Capital Management Model specifies that management of intellectual capital is derived from the corporate vision and strategy. Three sources of intellectual capital – human capital, internal capital and external capital – contribute to the outcomes essential to differentiate the organisation in the marketplace. Within each of the three sources of intellectual capital, aspects of intellectual capital management were identified and described, according to the research literature.

A case study approach was used to assess the extent to which an organisation was managing its intellectual capital. Nine chief executives of the independent business units in a large New Zealand company were interviewed to understand why and how they managed the company's intellectual capital. Additionally, 18 employees were interviewed and 44 employees were surveyed in a questionnaire, to determine their views about issues relating to intellectual capital, especially sharing knowledge within the company.

Findings indicated that although most of the aspects of the Model were present in the company, conscious management of intellectual capital was not occurring. Metrics was one characteristic frequently mentioned in the literature, but not evident in practice. Behavioural changes and socialisation were two characteristics that emerged strongly from the interviews, but were not widely addressed in the literature. From the perspective of the theoretical model greater attention should be given to behavioural changes and the importance of socialisation; and from the view of the practice model, management needs to address the issue of metrics.

Publications

Mitchell, H., & Viehland, D. (2009). Intellectual capital: The link to organisational strategy for sustainability. Australia and New Zealand Academy of Management (ANZAM) Conference, Melbourne, 1-4 December.

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Chapter 1: Introduction and Background

1.0 Introduction

In an increasingly knowledge-oriented world it is essential that organisations give greater recognition to their intellectual capital if they are to survive in the knowledge economy. Greater reliance on intellectual capital means it will be important for organisations to maximise the value of their intellectual capital and to continuously enhance it. An increasing number of organisations can be identified as knowledge intensive, for example, consulting firms, law firms, software developers, and similar organisations operating in the service sector that are totally reliant on their intellectual capital for the success of their business. However, all organisations require intellectual capital if they are to operate effectively and maintain sustainability.

Intellectual capital is critical to sustaining competitive advantage and is a valuable source of wealth creation. The value to a business of managing intellectual capital lies in recognising the potential to the organisation of the intellectual capital it has, and utilising it to open up opportunities for future growth. Considerable value resides in the depth and range of an organisation's capabilities and competencies and maximising those resources is essential for its development.

Difficulties linked to the replication of capabilities and competencies make an organisation's intellectual capital valuable and strategically important. Through the process of reverse engineering, the parts making up a product can be identified and copied. However, the capabilities and competencies of the original manufacturer of the product are difficult to replicate because the capabilities and competencies of the organisation are unique to it. Therefore, managing intellectual capital is vital if organisations are to survive in highly competitive markets (Stewart, 1997). Although complex to manage, it is important that management exploit the contribution intellectual capital will make to the future prosperity of the organisation.

Knowledge is the key to building intellectual capital. As the 20th Century came to a close, attention began to focus on the contribution knowledge makes to a business. There is a realisation that in the 21st Century it will be through knowledge that organisations will have the means to thrive in an increasingly competitive environment. Knowledge permeates all areas associated with operating a

business both internally and externally – employee knowledge, internal structural knowledge and knowledge of the external environment. Aggregating the knowledge constitutes an organisation's intellectual capital. Recognition of the value of intellectual capital, and accepting it as a means to generate wealth, points to intellectual capital being an area requiring greater attention by practitioners and academics.

The purpose of this research is to determine how intellectual capital is managed to enhance its potential to increase wealth. Organisations may be unaware of the extent and importance of their intellectual capital for future sustainability, and this research is designed to highlight the importance of intellectual capital. The research explores how intellectual capital is perceived by an organisation and how it is being managed. The question this thesis investigates is, "How does the approach taken by an organisation in New Zealand to manage intellectual capital align with the characteristics of an Intellectual Capital Management Model?" From an examination of models presented in the literature, (e.g. Peppard and Rylander, 2001; Firestone and McElroy, 2003), a model will be developed. It will provide the basis for comparing the approach elicited from the literature with that taken by a major industrial organisation in New Zealand for managing its intellectual capital.

Much of the early research into intellectual capital focused on exploring methods for identifying and measuring intellectual capital. As intellectual capital is a relatively new management concept it is an area requiring investigation. Models represent the activities of business, and provide a guide to organisations for a method to be considered when addressing the management of intellectual capital.

The organisation in which the research is undertaken is Carter Holt Harvey Ltd, an organisation that began its life at the beginning of the 20th Century. The focus of Carter Holt Harvey is the forestry industry and it has interests in pulp, paper and tissue, and wood products and timber for the construction industry. With over 15,000 employees the organisation is large by New Zealand standards. The founders of Carter Holt Harvey Ltd were forward thinkers, emphasising the importance of performance and leadership. The organisation is acknowledged for its innovative capability.

This chapter examines definitions and components of intellectual capital, illustrating how different authors perceive what is meant by intellectual capital. The value of intellectual capital as an intangible resource will be addressed and definitions for intellectual capital considered. The

relevance of resource-based and knowledge-based theories that relate to the managing of intellectual capital are discussed. This chapter concludes with an examination of the constituent element knowledge, including types of knowledge.

1.1 Definitions of Intellectual Capital

There has been a tendency in the literature to classify intellectual capital rather than define it. However, literature emerging in 2004 suggests there is a need to move beyond classification and determine a definition for intellectual capital (Carson *et al*. 2004; Kaufmann and Schneider, 2004; Marr and Chatzkel, 2004). With intellectual capital residing in all disciplines, it is suggested by Marr and Chatzkel (2004) that there should be an inter-disciplinary approach to the building of a theoretical framework to further the development of intellectual capital.

There is much to be gained from a theoretical perspective of blending the work of practitioners and academics to develop an appropriate theoretical structure (Chatzkel, 2004). Practitioners work in the real situation with a view to resolving specific issues. They recognise that it is through the skills, knowledge and expertise of people that organisations are able to operate. Knowledge resides in all areas of an organisation and the ability of the practitioner to take a holistic view of intellectual capital will add considerable value. Academics can assist through their research to elucidate concepts and provide structures to assist practitioners in determining how to deal with the situations that arise. Such an approach recognises the value of the work of both the practitioner and the academic in bringing together knowledge and expertise to develop a definition of intellectual capital that is realistic, while at the same time has an underpinning of sound theoretical thinking.

An examination of the definitions of intellectual capital illustrates how different authors perceive what is meant by intellectual capital. The definitions appear to have a similar foundation, but there are variations on composition. Knowledge is a dominant element in the definitions. Prior to 2004 definitions for intellectual capital were provided by, among others, the following authors.

Bradley (1997) defined intellectual capital as "the ability to transform knowledge and intangible assets into wealth-creating resources, both for companies and countries" (p. 53). Transforming knowledge is the critical point. Knowledge will only increase wealth if its importance is recognised and it is applied in a way that makes a difference to existing work practices. In Bradley's definition,

knowledge of people is recognised as being important. Bradley, when talking about intangibility defines it as a feature of future wealth creation.

The definition promoted by the Intellectual Capital Management (ICM) Gathering Group, and reported by Sullivan (1999) is, "Intellectual capital is knowledge that can be converted into profits" (p. 133). Achieving profit is the aim of business and while the definition may appear succinct it is in fact rather vague. It does not provide any indication of where the knowledge may be found or how conversion can be achieved.

In their definition, Carroll and Tansey (2000) state, "IC is best conceived as the knowledge and creativity available to a firm to implement a business strategy that maximises stakeholder value" (pp. 297-298). The definition is broad and designed in such a way that it refers to the benefits to be gained through the application of knowledge. It also recognises that the application of knowledge provides the opportunity to be more creative to enhance value, and thus the propensity to increase wealth.

Each of the above definitions point to intellectual capital having the ability to create wealth, generate profits, or enhance value. Bradley (1997) refers to the transforming of knowledge into intellectual assets (not identified), and the ICM Group to converting knowledge into profits, but neither indicates how this will be done. Alongside knowledge, Carroll and Tansey (2000) add "creativity" but do not expand on what this word encompasses. Although Carroll and Tansey (2000) hint at the involvement of management with the inclusion of "business strategy" in their definition, none of the other authors point specifically to any management activities taking place. Yet transforming or converting, or making knowledge available to generate wealth, however it is expressed, cannot be achieved without the intervention of management activities taking place to enable this to occur.

The view of Rastogi (2003) is that "The IC of an enterprise represents its holistic capacity and prowess to create value through exploitation of knowledge as the quintessential resource" (p. 228). This definition emphasises the importance of knowledge, and in the use of "holistic" and "prowess" it highlights the importance of taking an overarching view of intellectual capital and the application of management techniques to create value.

Definitions by the above authors take a conceptual approach to intellectual capital. Knowledge is identified as the "quintessential resource" thus emphasising its significance and the benefits it can bring when harnessed by management skills. It is evident in the terminology used that the outcomes of intellectual capital have the potential to provide value, and in so doing, to increase wealth.

Every business exists to increase wealth and intellectual capital is critical to achieving greater wealth. Wealth is associated with an abundance of riches. There is no specific indication of how wealth will emanate from intellectual capital, but if some form of action is not taken then intellectual capital by itself will not create wealth. The ability to transform intellectual capital to create wealth suggests that through taking action, presumably in the form of management, increased wealth can be attained. Words such as "ability" and "prowess" are linked to human capital and the level of knowledge contributions made by people will determine the extent to which an organisation benefits from its intellectual capital. The perception of value differs among people. Value, in relation to an organisation, can be assumed to refer to the enhancing of outputs through the input of knowledge in a way that will provide the potential to generate increased revenue. This is supported by Grant's (1996) view that knowledge accounts for the "greatest part of value added" (p. 377).

A number of other authors also promote definitions of intellectual capital but their perspective is more aligned with that of the practitioner (Stewart, 1997; Jordan and Jones, 1997; Klein, 1998). Although knowledge is included they extend their definitions by pointing to a range of attributes such as:

- Human intellect
- Experience
- Expertise
- Information
- Problem solving capability
- Managerial skills

The attributes are akin to a practitioner view of the need to elicit value expectations from intellectual capital. Everyone in an organisation is recognised as a contributor to knowledge by Stewart (1997). This is an important point. No matter the position of a person, everyone in some way or in other contributes to the operational system of an organisation. Too often only certain people are assumed to have relevant expert knowledge.

Each of the three authors just mentioned takes a different view of how intellectual capital impacts on an organisation. Stewart (1997) aligns himself with authors who point to intellectual capital as a means of creating wealth. On the other hand Klein (1998) points to intellectual capital being a determining factor in an organisation's competitive positioning. While not suggesting wealth *per se*, there is a subliminal message that an organisation's intellectual capital has the potential to favourably position it in the competitive environment with a resulting increase in wealth. Jordan and Jones (1997) regard intellectual capital as an important contributing factor to an organisation's operation, and refer to the importance of managerial skill. This provides a signal indicating the significance of managerial activities if benefit is to be achieved, and is a point of interest. What is being suggested is that setting in place systems, whereby maximum value can be gained through the effective management of an organisation's intellectual capital, the systems will direct an organisation towards having a greater opportunity of gaining a competitive advantage, and thus enhancing its wealth. The greater the managerial expertise, knowledge and analytical skills available to an organisation, the greater the capacity it has to effectively position itself to respond to a competitive environment.

The inclusion of the word "creativity" in the definitions of Carroll and Tansey (2000) and Jordan and Jones (1997) signal it is an important element in the composition of intellectual capital. Creativity encourages innovations from intellectual capital. When an organisation focuses on generating ideas that will produce innovations it enhances its potential for sustainability in the marketplace and thus its potential to increase wealth.

What is noticeable in the latter definitions is their applied nature. The applied approach signals that intellectual capital has an important contribution to make to an organisation's ongoing sustainability. This is where the link to managerial activities is critical. Therefore, the setting in place of a system whereby the effective management of the organisation's intellectual capital will enable it to create wealth, (Bradley, 1997; Sullivan, 1999), and gain a competitive advantage, (Klein, 1998), is critical.

From an examination of the definitions it is evident that authors are still attempting to determine what is meant by intellectual capital. Although no consensus has been reached on a definition for intellectual capital, there is agreement that intangibles make a significant contribution to the wealth of an organisation. It can be deduced that knowledge is a critical element by its inclusion in all definitions. The wealth-creating attributes of intellectual capital are explicit, but wealth will only be

created if an organisation has the capability to manage its intellectual capital effectively to this end. For the purposes of this research, intellectual capital can be defined as: the aggregate of knowledge available to an organisation from its human, internal and external capital as applied by management to its activities to enhance competitive advantage and increase wealth.

Intellectual capital is also expressed in the form of components. The following section will examine this perspective of intellectual capital.

1.2 Intellectual Capital Components

A number of authors have promoted their view of intellectual capital through the identification of the components that make up intellectual capital. Although they appear to have a similar foundation, there are variations in composition and vocabulary that may appear confusing and these differences will be examined. Most authors use three components but some add a fourth one. Table 1.1 provides the components of intellectual capital as classified by various authors.

1.2.1 Human Capital

Not surprisingly, given the importance of knowledge to intellectual capital, the largest component is human capital, with variations in terminology used. Ten authors in Table 1.1 identify human capital, as a component of intellectual capital. The term "human centred assets" (Brooking, 1996) suggests that through the use of assets people are valuable, but assets can also mean property that is owned. The assumption is that in using the term "assets" their contribution is in the form of skills and expertise, but that they are owned contradicts the need to pay rent for their services. Fletcher *et al*. (2003) refers to human resources and in doing so indicates the traditional approach of resources being along the lines of "land, labour and capital" as necessary to operate an organisation. They point to human resources being the classification given in the MERITUM guidelines on managing and measuring intellectual capital, e.g. "human, structural and relational resources" (p. 1). However, Fletcher *et al*. use the classification human capital later in the article. "Human centred assets" and "human resources" can be classified as variations on the term "human capital".

Table 1.1 Components of Intellectual Capital

Component of Intellectual Capital	Research Studies
Human Capital – knowledge contributed by people in an organisation	Edvinsson and Malone (1997), Stewart (1997), Roos *et al*. (1998), Allee (1999), Sullivan (1999) (ICM Group*), Saint-Onge (1999), Sullivan (1999), Harrison and Sullivan (2000), Joia (2000)
Alternative classification:	
Human Centred Assets	Brooking (1996)
Individual Competence	Sveiby (1997)
Human Resources	Fletcher *et al*. (2003)
Structural Capital – knowledge owned by the organisation	Edvinsson and Malone (1997), Stewart (1997), Roos *et al*. (1998), Allee (1999), Saint-Onge (1999), Fletcher *et al*. (2003)
Alternative classification:	
Infrastructure Assets	Brooking (1996)
Innovation Capital	Joia (2000)
Internal Structure	Sveiby (1997)
Structural Assets	Sullivan (1999)
Intellectual Assets	Sullivan (1999)*, Harrison and Sullivan (2000)
Structural Resources	Fletcher (2003)**
Additional Component:	
Intellectual Property Assets	Brooking (1996)
Process Capital	Joia (2000)
Customer Capital – Knowledge accessible to the organisation from customers	Stewart (1997), Saint-Onge (1999)
Alternative naming:	
Market Assets	Brooking (1996)
External Structure	Sveiby (1997)
External Capital	Allee (1999)*
Relationship Capital	Joia (2000)
Relational Resources	Fletcher *et al*. (2003)**

*Reference is made to the ICM Group definition - Intellectual Capital Management Group
** Reference is made to the European MERITUM Project definition - a project aiming to bring more rigour into intellectual capital research

Sveiby's (1997) use of individual competence focuses on the contribution of each employee rather than taking a holistic view of the contribution of employees. He points to "All assets and structures – whether tangible or intangible – as the result of human actions" (p. 8). Sveiby is stating that without the input of people – their knowledge, their ideas and the ability to innovate – the tangible assets would remain inert and that the functioning of an organisation relates more to the creation of knowledge structures than to material production. In the context in which he is writing, the word

"structure" describes intangible assets rather than tangible ones. What Sveiby identifies as intangible assets has become more commonly referred to as intellectual capital (Stewart, 1997).

Although the terminology may differ, there is consensus among authors that human capital comprises the collective expertise, skills and competencies, know-how, problem solving skills and innovative ability of people working in organisations. People who are innovative are those with talent and experience and who have the ability to generate ideas to create new products and services. These people are very valuable to an organisation because innovation is critical for ongoing sustainability and growth.

Within the context of human capital Edvinsson and Malone (1997) include values and culture. Those are two areas that have considerable impact on how well an organisation operates, and although other authors do not specifically mention those attributes they may well regard them as implicit. Every organisation has a culture. People are the creators of culture so it appears apposite that it should be included in the human capital component where Edvinsson and Malone (1997) have placed it. However, the culture of an organisation is something inherent to it alone. No two organisations have the same culture and while it is the people who work in an organisation who are creators of the culture, people from time to time leave yet the culture to a large extent remains intact. This points to culture belonging to the organisation, and Brooking (1996) places culture in "infrastructure assets".

1.2.2 Structural Capital

There is greater variation in terminology for naming the structural component of intellectual capital within the organisation. Structural capital is the term used by six of the authors in Table 1.1. Structural capital encompasses all that makes an organisation function – its processes, policies and procedures, organisational structure, technology, publications, inventions, etc. The structure of an organisation is of critical importance. When people leave the structure remains, but it continues to build as new people contribute to the structural capital. It is the structure of an organisation that provides continuity, and management has the responsibility to continue the building of structural capital. Structural capital is described as "the embodiment, empowerment, and supportive infrastructure of human capital. It is also the organisational capability, including the physical systems used to transmit and store intellectual material" (Edvinsson and Malone 1997, p. 35). This

description emphasises the importance of an efficient and effectively managed structure for the ongoing operation and viability of an organisation.

Fletcher *et al*. (2003) refer briefly to structural resources, which is the term used in the European MERITUM Project, as a component of intellectual capital, but later in their article Fletcher *et al*. use the term structural capital. [The MERITUM project was set up in Europe in 1998 to explore ways of measuring and reporting on intangibles.] Brooking (1996) refers to "infrastructure", Sveiby (1997) to "internal structure", and Sullivan (1999) to "structural assets". However, such differences can be regarded as minor points in descriptive terminology.

Brooking (1996) introduces a fourth component – intellectual property. Brooking views intellectual property as a valuable asset that is protected by law and points out that in order to gain value from intellectual property it requires intellectual property to be properly managed. Other authors appear to regard intellectual property as implicit within structural assets, and do not separate out intellectual property as an independent component.

People joining an organisation often stay a while. When they leave they take their knowledge with them. However, it is almost inevitable that they will have, in some way, contributed knowledge during their tenure and that knowledge will have become part of the organisation's intellectual capital. Therefore, that knowledge can also be identified as an inherent part of the internal make up of the organisation and placing it in structural capital is appropriate.

The Skandia AFS Market Value Scheme described by Edvinsson and Malone (1997) suggests a two-component approach to intellectual capital, i.e. human capital and structural capital. Structural Capital is divided into Customer Capital, and Organisational Capital. Although identifying terminology may differ, customer capital is positioned as a separate component by many authors (e.g. Allee, 1999; Fletcher *et al*. 2003; Stewart, 1997). Organisational capital is a term not previously used by other authors. The words structural and organisational can be regarded as having the same meaning. Therefore, the view of Edvinsson and Malone presents an interesting conundrum, and raises the question about what distinguishes structural capital from organisational capital.

The two-component approach taken by Edvinsson and Malone (1997) is the one followed by Roos, Roos, Edvinsson and Dragonetti (1998). However, the view of Roos *et al*. is that invisible assets and the knowledge of employees can be distinctly separated into thinking and non-thinking intellectual capital, i.e. human capital and structural capital, suggesting there is no reason to go beyond two components. It is the thinking element of intellectual capital that can place an organisation in a vulnerable position based on the premise that people are fickle.

The Intellectual Capital Management Group's view of intellectual capital, presented by Sullivan (1999), identifies two components, human capital and intellectual assets. Harrison and Sullivan (2000) also present it in this format. Intellectual assets are identified as paper. The paper perspective is "created whenever the human capital commits to paper (or any other form of media) any bit of knowledge, know-how, or learning" (Sullivan, 1999, p. 133). The influence of the ICM Group is evident in the article by Harrison and Sullivan (2000) when they promote codified knowledge as intellectual assets. The rationale for the components, put forth by both parties is somewhat obscure. When operating within the organisation people provide knowledge, some of which can be documented, but not all knowledge is codified.

For his identification of the components of intellectual capital, Sullivan (1999) promotes three – human capital, intellectual assets and structural assets. The structural assets identify "the 'hard' assets of the firm" (p. 133) that he regards as giving a more accurate and encompassing perspective of an organisation, for example, buildings, machinery and distribution capabilities. The view of Sullivan is similar to that of Roos *et al*. (1998) where they take a "thinking" perspective, i.e. intellectual assets, and a "non-thinking" perspective related to hard structural assets.

1.2.3 Customer Capital

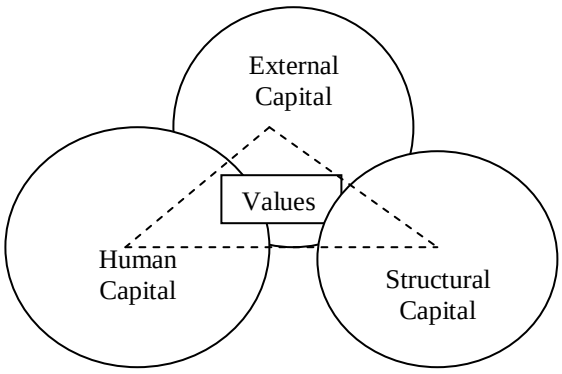
There are varying approaches to the third component – knowledge available to the organisation from customers and other external parties. Authors Stewart (1997) and Saint-Onge (1999) use customer capital, both being highly conscious of the importance of an organisation's customers. Stewart (1997) reports Saint-Onge stating that in an earlier discussion with Leif Edvinsson, he had said "Leif gave us the idea of structural capital … we gave him customer capital" (p. 76). However, Edvinsson and Malone (1997) are critical of Saint-Onge, who was at the time with the Canadian Imperial Bank of Commerce, suggesting the reason why he separates out customer capital is to promote the company and motivate employees and stakeholders.

The word "market" used by Brooking (1996) can be accepted as suggesting a range of external contacts and activities, as does the use of relationship by Fletcher *et al*. (2003). Sveiby (1997) uses the term "external structure". He points to the interaction of people working within an organisation, but also that building relationships with those external to it is important. Joia (2000) uses "relationship capital", but places it as a fourth component with the other three being human capital, innovation capital and process capital.

1.2.4 A Definitional Model of Intellectual Capital (Allee, 1999)

The model that fits best with the definition of intellectual capital used in this study is the one referred to by Allee (1999) as the "popular model of intellectual capital" (Figure 1.1). Allee states the components as being human capital, structural capital and external capital. She points to Sveiby (1997), Saint-Onge (1999) and Sullivan (1999) as all contributors to this model, or some variation of it. There is merit in her identification of the three components. Apart from human capital that meets a consensus of views on its content, the naming of the other two components provides the opportunity for organisations having differing operational activities beyond the basics to interpret the terms to fit their specific situation. However, Allee counters the three-component view of intellectual capital by adding 'values'. Her reasons for doing this are, (1) the value emerging from the flow of knowledge being converted into wealth, thus suggesting a monetary perspective and (2) to emphasise the importance of trust among individuals that suggests a social viewpoint.

Figure 1.1 Popular Model of Intellectual Capital



Key: ----- Flow of Knowledge

Source: Allee (1999, Fig. 1, p. 125)

A review of the literature relating to components of intellectual capital points to the evidence that three components adequately identify intellectual capital and this is supported by Carson *et al*. (2004), Hussi, (2004), Kaufmann and Schneider, (2004). From an organisational perspective there are three sources of knowledge available to provide its intellectual capital and they are, (1) the people currently working in the organisation, (2) the knowledge accumulated by the organisation, and available for supporting its activities, and (3) a varying range of sources of knowledge accessible to the organisation from external sources.

1.3 A Management Perspective of Intellectual Capital Components

In the previous section three components – human capital, structural capital and customer capital – provided a simple and straightforward identification of the components of intellectual capital. However, the component approach to intellectual capital discussed in section 1.2 emanates primarily from the accounting perspective. The approach was a way of identifying likely sources of intangible assets when seeking differences between book value to market value ratios, and led to exploration of the contribution of invisible assets/goodwill to the monetary value of the business.

This section emphasises a management perspective to the intellectual capital components. A review of the management literature suggests there are three sources of knowledge available to an organisation – human capital, internal capital (organisational values, operational activities, intellectual property) and external capital (all external knowledge sources beyond those of the customer).

1.3.1 Human Capital

The human capital of an organisation evolves as a result of the knowledge input from its employees. Since first using the term knowledge workers in 1959 and identifying them as residing at executive level, Drucker (1994) makes a shift in his approach to his interpretation of knowledge workers suggesting the knowledge of everyone has a contribution to make to the productivity and growth of an organisation.

Employees bring with them banks of knowledge acquired during their lifetime. The content of each bank depends on education, skills, and life experiences. The longer an employee is involved with an organisation, the greater the volume of knowledge likely to be acquired about its routines, processes

and procedures, its products and customers. Loss of that knowledge can create difficulties. An example by Kurtzman (1996) illustrates what can occur:

> NASA spent $50b in 1960 to build a rocket, when it came to build another rocket there was no full set of plans, or tools or dies, and the engineers who built the rocket were now drawing Social Security or had died. … some intellectual content was preserved, but half of the total cost was simply lost. My estimate is that NASA knows about $15b less today about how to build a Saturn than it did in 1970. (p. 20)

The dilemma is that within organisations it is the employees who have the knowledge and this can be given or withheld according to the desire of the individual. Important questions for organisations are (1) how they maximise the benefit of the knowledge contribution of their employees, and (2) how to raise the knowledge level and productivity of employees.

Increasing the knowledge of employees is of benefit to an organisation. The higher the level of education, skills and experience an individual brings to an organisation, the greater the opportunity there is for an organisation to increase its learning. However, according to Senge (1990) there is no guarantee that an increase in organisational learning will take place. Encouraging a continuous learning process by those working in an organisation opens opportunities to develop the organisation's capabilities and competencies thus leading to future wealth. Learning through direct experience has validity. Experience is significant in the learning process. Considerable learning can occur through reading, or when an explanation for dealing with a situation is given, but it is in going through the experience that real learning occurs. All knowledge has relevance for the operational activities of the organisation, but experiential learning makes an important contribution.

Human capital inevitably brings a social dimension. With a focus that has tended in the past towards the financial aspects of intellectual capital, attention is now being drawn to what is identified as social capital. The make up of social capital emanates from the relationships among people working in concert. Through their interaction when people meet together there is an opportunity for knowledge to flow. The value of such relationships is in the trust that evolves between people, their connections through networking, and the values and reciprocity that develop (McElroy, 2002). In the transfer of knowledge, social interaction allows for the emerging of ideas providing an opportunity for them to be discussed. Organisations need to take greater cognisance of the value associated with social capital.

Although human capital is only one component of intellectual capital, it has a critical part to play. It is through the application of human knowledge that the other components are able to make an effective contribution to an organisation.

1.3.2 Internal Capital

Knowledge in the internal capital component of intellectual capital is knowledge embedded in the internal assets, and unlike human assets, is owned by the organisation. Tsoukas and Vladimirou (2001) provide the following collective perspective by stating: "Organisational knowledge is the individual capability members of an organisation have developed to draw distinctions in the process of carrying out their work" (p. 973). The capability of individuals to think through issues contributes to the systems that become part of the organisation's knowledge. Organisational knowledge is its heart. It enables the organisation to operate effectively and the continuous building of its knowledge facilitates its growth.

An organisation's internal assets form the ongoing entity and although employees come and go their knowledge is the contributing factor. This indicates the need for organisations to recognise the value of employee knowledge and the importance of managing it to enhance the organisation's capabilities for growth.

Tsoukas and Vladimirou (2001) explore the connection between knowledge and action, saying that knowledge enables people to organise material to make judgements and to take action. As a result of field observations of crews on aircraft carriers, Weick and Roberts (1993) state that success in coping with emergency situations is greatest when the activities of the crew are interrelated and when views produce a pattern of joint action. However, they point to the mind being dependent upon social skills stating, "when individual comprehension proves inadequate, one of the few remaining sources of comprehension is social entities" (p. 378). The example of the aircraft crew's ability to interrelate illustrates the importance social interaction that has the potential to add value.

That an organisation has a memory was an idea raised by Levitt and March in 1988. This memory emerges through organisational routines and procedures and forms part of the internal capital. People working together and sharing knowledge, along with the culture identifying how things are done in an organisation, all contribute to the internal capital. Levitt and March indicate that some parts of the organisation's memory may be more retrievable than others with availability related to

how recently it was accessed. Although memory is contributed by people in the organisation, the organisation is required to have systems in place to collect the knowledge, and enable it to be shared and utilised in a way that further adds to the organisation's memory.

The concept of organisational memory is now widely accepted in management circles. Internal capital builds and grows over time to become a valuable asset owned by the organisation. However, the knowledge required by an organisation is not limited to that resident in the organisation or that contributed by those who work there. Knowledge important for organisations to encapsulate into operational activity is also available from a range of external sources.

1.3.3 External Capital

Knowledge from external sources can make an important contribution to an organisation's intellectual capital. Customer knowledge is extremely valuable and there are benefits to be gained by working alongside customers and learning from them (Byrne, 1993; Kanter, 1996; OECD, 1996). The opportunity for sharing knowledge between the customer and the organisation has the potential to provide value and benefit to both parties. However, technology is changing the relationship between organisations and their customers (Evans and Wurster, 1997). Customers now have access to the same information as that available to an organisation, for example in the financial markets, thus providing them with possible ammunition for negotiation.

Suppliers tend not to be considered as sources of knowledge yet building good relations with them is essential. An organisation is the supplier's customer and they learn about the business and they know its requirements. This provides them with the opportunity to give information about other products, particularly those new to the market that may well be beneficial to the organisation.

Networking encompasses other organisations in the same industry, different industries, government departments, and business support organisations. Networking with other organisations can lead to working collaboratively, developing a partnership, or forming an alliance. It provides opportunities for the better utilisation of internal knowledge resources, while at the same time gaining access to the knowledge of the partnering organisation. The collaborative nature of alliances provides openings to knowledge that in normal circumstances an organisation would not be able to access. Working closely with external parties is an important aspect of developing and growing an organisation. Knowledge gained from the building of good relationships builds the external capital

that will have a positive impact on the internal capital, and also with knowledge gained, for the human capital.

Having explored in greater detail the components of intellectual capital the next section will examine the relationship between intellectual capital and value.

1.4 Intellectual Capital: The Link to Value and Wealth

From previous discussions it is implied there is an association between intellectual capital and creating value and wealth. The meaning of "value" can be interpreted in several ways but there is a tendency to think of it in monetary terms. There is also the underlying or environmental dimension whereby intellectual capital is significant in the context of an economy increasingly dominated by intangible value. The economist's definition of value is "a measure of the utility that ownership of an item brings to its owner" (Sullivan 1999, p. 134). In business there is anticipation of a future income stream, and it is at this point that there is a monetary link. Expectations are that when an organisation creates knowledge, the future income stream and current profits can be extracted from it. This thinking leads to a perception that the two basic intellectual capital functions are value creation and value extraction (Sullivan 1999). Value creation for sustainability emphasises the need to utilise an organisation's intellectual capital in the most efficient and effective manner. Value extraction involves reaping a sufficient degree of value to achieve the long-term goals of the organisation (Sullivan, 1999).

The economist's perspective is directed towards focusing on what can be gained from an economic good. Managing intellectual capital involves looking to create and extract value. It is necessary to ensure that an organisation's intellectual capital is working towards providing maximum development and benefit to meet not only the future needs of the organisation, but also for it to be successful in the constantly changing environment in which it operates. A report by the OECD (1996) considers there are four principal reasons making it difficult for knowledge indicators to come close to the comprehensiveness of traditional economic indicators. They are identified as: (1) no stable formulae for translating inputs to knowledge creation into outputs of knowledge; (2) difficulties of mapping knowledge creation; (3) the fact that new knowledge may not provide a net addition to knowledge stocks; and (4) obsolescent knowledge is unlikely to be documented.

Work carried out by Karl Erik Sveiby during the late 1980s highlighted the need for organisations to give greater attention to intangible assets, because it is through those assets that future organisational wealth will be created. Sveiby was referring to intellectual capital that encompasses all the knowledge available for making decisions relating to the management of an organisation. Although only having come to prominence in the last twenty years, recognition of the importance of intellectual capital goes back to the 1800s. Quintas *et al.* (1997) cite Senior in 1836 stating: "The Intellectual and Moral Capital of Great Britain far exceeds all the Material Capital, not only in importance, but in productiveness" (p. 386). It has taken a long time for the recognition of the value of intellectual capital to be realised as the underpinning criterion for an organisation's wealth creating ability.

Within the financial world in particular, the common terminology has been "intangible assets" not the term "intellectual capital". This points to intangible assets being the hidden contributor of value and wealth that establishes the position of an organisation within the marketplace. Intangible assets are different from the normally accepted capital assets traditionally acknowledged as the cornerstone of organisational wealth (Allee, 2000).

The divergence between book value and market value has for a long time puzzled investment analysts, but the widening gap has become more evident as a result of the burgeoning of organisations associated with the technology industry. Initially intangibles appeared on the balance sheet under the general rubric of goodwill. However, it is now recognised that an organisation's intellectual capital has a significant part to play in the difference between book and market value, and that the traditional approaches to management accounting practices should be amended to give recognition to the importance of intellectual capital (Guthrie, 2001). Companies in the vanguard of the response to this need include Skandia, Dow Chemical, and Price Waterhouse (Skyrme and Amidon, 1997).

A definition for intangible assets is given by Epstein and Mirza (2003) that states they are:

> Non-monetary assets, without physical substance, held for use in the production of supply of goods or services or for rental to others, or for administrative purposes, which are identifiable and are controlled by the entrepreneur as a result of past events, and from which future economic benefits are expected to flow. (p. 263)

Examples of intangible assets include management and marketing know-how, culture, trust, organisational learning, capabilities and competencies, educational levels of employees, brands, loyalty of customers, systems and processes and the efficiency and effectiveness of an organisation. There is then a vast array of intangible assets impacting on the operation of an organisation that is not prominent in the balance sheet. As stated above, however, traditional accounting methods have tended to ignore the importance of intangibles as a major contributor to the economic future of an organisation (Lev, 1997).

More informed financial reports may well become a trigger for managers to have a greater awareness of the value of their intellectual capital (Lev, 1997). Where insufficient valid information is available to an organisation there is greater difficulty imposed on it when seeking investment capital (Andriessen 2004). Therefore, an organisation that expounds the value of its intellectual capital through providing better symmetry of information about investment in, and the returns from intangibles opens the potential for greater opportunities to emerge in the market place. It also indicates that there is huge potential for stakeholders investing in it.

Market value heads the Skandia Market Value Scheme illustrating the Scheme's approach to intellectual capital (Edvinsson and Malone, 1997). The level immediately following shows financial capital and intellectual capital having equal ranking. From this it can be deduced that financial capital contributes along with intellectual capital to the market value of an organisation. From a management perspective the ongoing discussion around the difference between market and book value raises an interesting point. As a result of their involvement in the Skandia project, Edvinsson and Malone (1997) and Sveiby (1997) identified the difference between market and book value as being intellectual capital.

Creating wealth is associated with the desire to attain sustainable revenue and this is achieved through adding value to the products and services an organisation offers to its customers (Ireland *et al.*, 2001). Value, as perceived by customers, is the determinant of wealth creation. The source of value will increasingly be found in intellectual capital thus making it pivotal to an organisation and it is crucial that this is recognised when planning strategy.

It is important to actively manage intellectual capital in innovation-based organisations that have a strong drive for wealth creation (Murray, 2000). However, it is also important that organisations recognise they are charged with the responsibility of recognising and taking advantage of

opportunities when they arise. Flexibility to respond quickly is critical to the wealth creating process. Knowing what an organisation is capable of undertaking is extremely important in a highly competitive environment, as this provides the means through which emerging opportunities open the doors for wealth creation. The wider the range of knowledge resources and synergistic combinations that can be achieved, the greater the likelihood for unique value creation sets to emerge (Rastogi, 2003).

The intellectual capital of each organisation is unique. Its uniqueness makes it difficult to imitate and in the case of organisational based knowledge difficult to replicate. Where previously manufactured products were identified as the source of wealth, the proliferation of service, technology, and research-focused businesses are the ones attracting attention.

The more that is known about the resources in the organisation, the greater is the opportunity to gain benefit from them (Penrose, 1963). Resources have now taken on a degree of importance not previously acknowledged. From a knowledge contributing perspective, it is important for the organisation to look more critically at this frequently neglected resource. Too often there is a lack of awareness, not only of the vast array of knowledge that has been accumulated by an organisation but more critically, of the lack of recognition of its importance and value. With knowledge being identified as the greatest contributor to adding value, wealth is created by enhancing the value of products and services in response to the needs of customers (Penrose, 1963). Difficulties associated with the replication of an organisation's knowledge by another organisation emphasises the strategic importance of intellectual capital for an organisation's future development and prosperity.

It is not specifically the knowledge of people that has strategic importance, but the ability of the organisation to manage that knowledge to use it in a way that will build the intellectual capital. Therefore, it is essential that managers rise to the challenge of integrating the skills and experience and culture of the organisation to develop its position in a way that will make it difficult for other organisations to replicate (Jordan and Jones, 1997).

Intellectual capital has a value that is not matched by the other resources of an organisation. Recognising it as a key provider of future wealth requires management to have in place supportive mechanisms enabling cross fertilisation of knowledge to occur. However, there is power attached to knowledge in that it can be sold, or given away. The 'original' owner retains the knowledge, but can lose legal ownership of it to either an employer or a purchaser (Allee, 1997). It is important

organisations are aware of their vulnerability with regard to the selling of knowledge because of the impact it may have on the ability to maintain their competitive position. Organisations looking to maintain a sustainable competitive advantage will view their intellectual capital as a prime value-creating asset.

1.5 The Relevance of Resource-based and Knowledge-based Theories

Over the last twenty years, the resource-based theory of the firm has highlighted the role and nature of organisational resources (Bess, 1998; Conner and Prahalad, 1996; Wernerfelt, 1984). In the resource-based view, it is the combination of both tangible and intangible resources that leads to firm profitability and competitive advantage. Although of more recent vintage, knowledge-based theory had its antecedents in the work of Edith Penrose (1963) where she discussed the internal resources of the firm when she argued that businesses could aspire to more productive activity from their resources if only they had more knowledge of those resources. Some 30 years later, the full realisation that the application of knowledge to resources could result in a major contribution to an organisation's intellectual capital was formalised as knowledge-based theory. In this view, the main source of profitability and competitive advantage lay in the combination of intellectual and tangible assets (Harrison and Sullivan, 2000).

1.5.1 Resource or Asset?

Economists initially had a problem over the idea of knowledge as a resource, because unlike other resources it increases in value with use rather than diminishing. This puts it into the category of an asset by virtue of its ability to increase in value (Clarke and Rollo, 2001). As with other management terms, there have been tendencies to use "resource" and "asset" interchangeably without drawing distinctions between them. Spender (1996) argued that it was possible at times to regard knowledge as an asset, but questioned whether this view fitted with aspects of knowledge that might be contrary to how assets were expected to perform. He referred to knowledge being seen to be "non-rivalrous" in that when shared with others its value was not in any way diminished. Bradley (1997) also viewed knowledge as an asset, but he regarded human resources as being rivalrous (having an opportunity cost), and intellectual capital as non-rivalrous (it could be in many places simultaneously). According to Godfrey and Hill (1995), the reason that intangibles are identified as assets is their ability to display the qualities of strategic assets, and Mouritsen (1998) pointed to intellectual capital being a strategic asset.

It appears that in general, authors in the more traditional mode tend to refer to knowledge as a "resource", while those who have entered into the knowledge arena in the last 10-15 years refer to "knowledge assets". Does this mean that by regarding employee knowledge as an asset the organisation has ownership of it? If explicit knowledge is the issue then that knowledge has become part of the internal capital and can be regarded as an asset. However, it can become similar to other assets in that its value diminishes as new knowledge emerges. On the other hand if the knowledge has remained tacit then the organisation does not have ownership of it. Employees take tacit knowledge with them when they leave the workplace each day, or permanently. This suggests that employee knowledge is a resource only available to an organisation as long as the person is an employee.

Hence, it is evident that many authors identify knowledge as a resource that has considerable value for an organisation. Knowledge is required for every activity and has the potential to increase wealth. There are mixed opinions with regard to it being an asset because of the connotations around the meaning of the word. While it may be regarded as an asset that organisations need to have to function, it does not have the commonly accepted characteristics of an asset. It is the human element that places the knowledge asset in a situation of unreliability, thus making it a vulnerable asset over which an organisation does not have complete control.

1.5.2 Resource-based Theory

Both the resource-based and knowledge-based approaches have generated interest amongst writers such as Davis and Botkin (1994), Foss (1996), and Grant (1997). Barney (1991) argued that firms were heterogeneous bundles of imperfectly mobile resources whose characteristics could predict organisational success. Firms could develop viable strategies by nurturing internal competencies and applying them to an appropriate external environment (Barney, 1991). This argument was extended in the 1990s by people like Hamel and Prahalad (1989) and Grant (1997), who emphasised the value of intangible resources that were rare, imperfectly imitable, and non-substitutable (Martin, 2008).

Under the influence of resource-based theory, the emphasis in strategy has shifted from a product/market positioning perspective to one based on resources and capabilities that can be leveraged across a range of products and markets (Barney, 1996; Grant, 1996). Resources create competitive advantages because each firm accumulates unique bundles of resources that can

potentially sustain a competitive advantage if they are difficult to substitute, replicate, imitate or transfer to other firms (Barney, 1996; Carlisle, 2000; Grant, 1996). If the precise form of a particular resource is difficult to specify, and its precise effect on performance difficult to isolate, it is said to be *causally ambiguous*. Causal ambiguity is an attribute of some resources that makes it more likely that they can sustain a competitive advantage (Carlisle, 2000).

Arguably knowledge is a resource that meets this criterion. Explicit knowledge can be codified, replicated and transferred, but applications of explicit knowledge may still be causally ambiguous (Carlisle, 2000). Tacit knowledge is by definition unarticulated and hence less amenable to transfer. It is a human resource and manifest only in human use. The resource-based view suggests that firms exploit their human resources by developing organisational capabilities to deploy them in uniquely advantageous ways. Over time this leads to the development of *core competencies*. Competencies are strengths in doing particular things well, such as for example, manufacturing engines. Organisations exploit knowledge by building these capabilities and competencies. Core competencies based on knowledge may be sustainable for a time in resource-based terms until or unless they are superseded by developments elsewhere. All knowledge is thus vulnerable, but tacit knowledge is less readily appropriated than is explicit knowledge or information (Carlisle, 2000).

1.5.3 Knowledge-based Theory

The knowledge-based view sees the primary rationale for the firm as the creation and application of knowledge (Spender 1996). Knowledge that is embedded in organisational routines and professional competence, and is unique and difficult to imitate, has become the most important strategic resource and capability for building competitive advantage, particularly within networks. A firm is likely to have a competitive advantage when based on its strategic architecture, its resources and combinations of resources that together produce a greater return than they would alone, it can implement a knowledge strategy that generates returns and benefits in excess of those of current competitors (Barney, 1991; Ordonez de Pablos, 2002)

Grant (1996) argues that additional organisational capabilities for managing knowledge processes are required. He states that the capability for integrating knowledge from a wide range of disparate sources is an example of a key capability of this type. Organisational knowledge-based capabilities draw upon tacit as well as explicit knowledge. They are culturally bounded and contextually dependent. It is for these reasons that cost, and differentiation advantages stemming from the

application of knowledge-based capabilities, cannot normally be installed overnight by competitors. Furthermore, even when knowledge itself can be made fully explicit and transferable, its effective application in one cultural setting does not ensure its successful exploitation in another, if the capability that enables its exploitation cannot also be readily transferred. In this knowledge-based view, therefore, knowledge creates a cost advantage in enabling the organisation to deploy its productive resources more efficiently (Carlisle, 2000).

Table 1.2 drawn up by Pemberton (1998) is useful at this point to illustrate the emergence of resource management leading through to his perception of the position of knowledge in the resource mix. By virtue of including knowledge, Pemberton views it as a resource. However, it should be noted that he places a question mark beside Knowledge and Knowledge Management illustrating uncertainty about his view of their positioning in the table. What is useful is that Pemberton illustrates the changing focus on different resources throughout the twentieth century.

Table 1.2 Evolution of the Management of Organisational Resources

Resource	Management Function	Period of Emergence	Causes of Emergence of Resource Management
Capital	Financial Management	1920s	Growth, capital shortages, depression
People	Manpower Management	1930s	Social forces, unions, strikes, new skills needed in industry
Raw Materials	Materials Management	1940s	Forecast of shortages in the post-war period
Land and Buildings	Facilities Management	1950s	Optimal use of space for offices, labs, schools, etc. needed
Information	Information Management	1960s	Control needed for information, data, and paperwork "explosions"
Documents/ Procedures	Service Management	1970s	Improvement needed in fabrication and delivery of goods and services
Information Technology	IT Management	1980s	Dramatic growth in computing and telecommunication and sharing of information via networks and PCs
Knowledge?	Knowledge Management?	1990s	Continuous development of new knowledge needed to create new products and maintain competitive edge in a global economy?

Source: Pemberton (1998, p. 59)

Spender (1999) emphasised the importance of focusing on revenue resources where knowledge would be employed both in their generation and protection. Furthermore, to ensure value is added,

the co-ordination and management of the knowledge, know-how and experience of all concerned is essential.

The resource-based literature recognises knowledge as providing the source of sustained competitive advantage. This is evident when organisations are encouraged to look to learning to gain new knowledge and integrate it into organisational activities in order to gain a competitive advantage. Allee (1997) cites Laurence Prusak as saying: "The only thing that gives an organisation a competitive edge – the only thing that is sustainable – is what it knows, how it uses what it knows, and how fast it can know something new!" (p. 8).

There is a relationship between resource-based and knowledge-based theories suggesting they are inextricably entwined if growth and profit are to be achieved (Penrose, 1963). The views of Bess (1998), Collis and Montgomery (1999) and Conner and Prahalad (1996) support this. Foss (1996) reflecting on what is emerging from contributors to economic and organisational theory indicates they all appear to consider the importance of a knowledge perspective on the firm. Some contributions come from the resource-based literature, while others are "explicitly evolutionary in focus" (p. 470) but there is agreement on the need to take a knowledge-perspective of the organisation. Foss (1996) cites Dosi *et al.* (1992) referring to the function of the firm as a "repository of distinct productive (technological and organisational) knowledge, and as an entity that can learn – and grow – on the basis of this knowledge" (p. 470). Foss (1996) refers to the use of key words such as capabilities, competencies, learning, social knowledge and tacit knowledge in the works of Coase (1937) and Penrose (1963).

According to Bess (1998), those who take a knowledge-based view are required to redefine the purpose of the company, and he cites Kogut and Zander (1996), Nonaka and Konno (1998) and Teece (1998), as relevant sources. They regard the organisation as offering a shared space through which a community emerges providing the means for sharing and creating the knowledge that is crucial to sustaining a competitive advantage. This signals a move in the thinking of theorists to giving greater prominence to the importance of knowledge in the contribution it can make to the growth of the organisation.

As this section makes clear, at the centre of intellectual capital is knowledge and hence it is important to consider definitions and types of knowledge as they relate to the business environment. The following section will examine those areas.

1.6 Knowledge – Definitions and Types of Knowledge

In an economy where intangibles have overtaken physical assets as drivers of growth and competition, the relative importance of knowledge has been transformed. Emerging from the discussion about intellectual capital, it is evident that the people contribution of knowledge is critical. Employee knowledge, knowledge residing within the structure, and knowledge gathered through contact with the external environment are the strands that provide connections linking the components of intellectual capital.

Over the centuries, businesses have existed and wealth has been created as a result of people applying their knowledge. Yet in the first half of the twentieth century, negligible recognition was given to the knowledge contribution of people to business, other than perhaps those at the highest levels of management (Penrose, 1963; Drucker, 1994). This pointed to the increasing division developing between 'brain work' and physical work within both the economic and social environments. Drawing a line between physical and mental labour is just not possible, because almost every operation needs both physical and mental effort (Machlup, 1962). It became the norm to refer to labour that was either predominantly physical as blue-collar, or mental as white-collar work. However, since then the make-up of the employment force has moved markedly to white-collar occupations and to higher levels of qualifications. This is identified by Wurzburg (1998) reporting that, "Between the 1980s and the 1990s, the average annual growth in white collar high-skilled employment across the OECD countries was 2.9%, and 1.6% for white collar, low-skilled employment" (p. 36). Over a similar period there was an average decline in blue-collar high-skilled employment of 0.8%, with blue-collar low-skilled employment declining by an average of 0.3%. The changing of the balance towards white-collar occupations, while likely to include rising levels of education, also indicates the growing recognition of the importance of knowledge in the workplace.

1.6.1 Definitions of Knowledge

A large number of definitions of knowledge have emerged over the years and only a few can be discussed. It can be seen in Table 1.3 that the authors selected provide a range of differing approaches for defining knowledge.

Table 1.3 Knowledge Definitions

Author	Definition
Nonaka (1994, p. 15)	Justified true belief.
Grant (1996, p. 377)	Explicit knowledge, which can be written down, and tacit knowledge which cannot.
Allee (1997, p. 42)	Knowledge is experience that can be communicated and shared.
Darling (1997, p. 10)	A validated platform for action, the combination of intellectual intangibles needed to run an organisation.
Marshall (1997, p. 94)	Information is transformed into knowledge when a person reads, understands, interprets and applies the information to a specific work function. Knowledge becomes visible when experienced persons put into practice lessons learned over time.
Davenport and Prusak (1998, p. 5)	Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices, and norms.
Tsoukas and Vladimirou (2001, p. 979)	Knowledge is the individual ability to draw distinctions within a collective domain of action, based on appreciation of context or theory, or both.

There are differing interpretations and perspectives in the knowledge definitions, but there are similarities in their intent. With the exception of Nonaka (1994), who stays with traditional epistemology, the definitions suggest actions taking place in some form or other. Allee (1997) and Davenport and Prusak (1998) include the word experience(s), but Allee goes further by indicating "experience that can be communicated and shared". Experience provides understanding and know-how and is an important contributor for the effective operation of a business. Darling (1997), and Tsoukas and Vladimirou (2001) include action and application as key factors, implying the ability to understand and think beyond the information or situation as it occurs, and to take action for the advancement of understanding. But it is Marshall (1997) who spells out how information can move to a knowledge state that has the capacity to give value. What is common among the definitions of knowledge and those for intellectual capital is the identifying of action taking place. This is a critical aspect of knowledge from the perspective of business. Knowledge that is allowed to remain static or not encouraged as a contribution from people will negate the opportunity of adding value. People are generally willing to give their knowledge if invited/encouraged to do so.

The definition by Davenport and Prusak (1998) is criticised by Firestone and McElroy (2003) and Tsoukas and Vladimirou (2001), who question the lack of distinction between information and

knowledge. However, information can be the trigger for action with knowledge being the ability to evaluate the information and to make sense of it.

There is a dilemma over the use of information and knowledge from the perspective that in common usage they are frequently used interchangeably. Data, information and knowledge are often presented in a hierarchical format suggesting that each flows from the other. The meaning of data is generally given as "raw facts". Information is identified as data that has been put into context. Knowledge occurs when meaning is applied and conclusions can be made. From the definitions, information is something that is actionable. Information can be identified as the message, and knowledge is present when the person receiving the message has the ability to take action. As far as Machlup (1962) is concerned, the phrase "knowledge *and* information" is redundant, and he makes the decision to use the word 'knowledge' wherever possible.

When two people are given the same data it may have meaning for one person but not for the other. Also different people can take different meanings from the same message. Knowledge allows people to do something as a result of receiving and processing information if they have prior knowledge of that topic on which to base their understanding of what the message means, thus allowing action to take place.

The idea of value arising from the flow of knowledge through the organisation and its conversion to create value is considered by Allee (1997). The concept of flow of knowledge suggests movement in one direction, but in reality the action of knowledge exchange generates a knowledge flow that goes in many directions. The knowledge flow in an organisation, regardless of the level at which it is occurring, has no importance if there is no recognition of it having the ability to contribute value. It requires the ability of management to be able to extract from the knowledge flows the knowledge that indeed has value from that which does not. Knowledge has to be applied in a way that provides the potential to add value. It is important to move thinking away from the traditional value chain, which is regarded by Allee (1999) as "a product of a mechanistic view closely associated with the industrial age and providing a linear view of business" (p. 129). Unfortunately knowledge does not exist linearly, thus making it difficult to capture and enable it to be used in a way that will add value.

It is from individual knowledge and the collective knowledge of people that knowledge develops within an organisation, and is at the root of what has become known as intellectual capital. Without

knowledge, an organisation is unable to function and, therefore, cannot exist. There are different types of knowledge and they will now be examined.

1.6.2 Types of Knowledge

Although definitions of knowledge are numerous and accorded justification by virtue of the perspective of each author and how, when and where, each is determining the application of knowledge, the literature tends to focus on two forms of "knowledge" – tacit knowledge and explicit knowledge. Tacit knowledge is knowledge residing in the head of a person and cannot easily be expressed or codified. Explicit/codified knowledge is knowledge that is written down, for example, organisational procedures, or scientific formulae.

Polanyi (1958; 1967), a major knowledge philosopher, points out that the nature of personal knowledge makes it difficult to express. Addressing issues of tacit knowledge, he suggests that while some tacit knowledge can be expressed, there is some that is ineffable, i.e. incapable of being expressed. This is where he introduces implicit beliefs, defining them as "the beliefs held in the form of our conceptual framework" (1958, pp. 286-287). To illustrate his view Polanyi refers to the work of Levy-Bruhl, and Evans-Pritchard, saying that the implicit beliefs of primitive Africans are revealed through their use of language and their understanding of events. Those beliefs are held within the bounds of the society in which they live yet in the eyes of those foreign to that society the beliefs are incomprehensible. The introduction of implicit knowledge provides a third classification to the types of knowledge.

From an organisational perspective that there is a third category of knowledge is of importance. Providing the conditions are right to elicit the knowledge, implicit knowledge opens an avenue for organisations gaining access to some aspects of tacit knowledge. Articulation of knowledge through the implicit pathway provides the opportunity for it to become explicit. Explicit knowledge is of importance to organisations because it is knowledge that is in a format that enables intellectual capital to build.

Recognising the value of implicit knowledge Tsoukas and Vladimirou (2001) and Firestone and McElroy (2003) are critical of Nonaka (1991) and Nonaka and Takeuchi (1995). They declare the latters' approach to be too simple because it is concerned only with tacit and explicit knowledge without taking into consideration of Polyani's introduction of implicit knowledge.

Nonaka (1991) uses the word articulation (externalisation) to indicate the converting of tacit knowledge into explicit knowledge, and internalisation to illustrate using explicit knowledge as a means through which an individual's knowledge can be increased. Here, Nonaka is signalling his belief that tacit knowledge can be made explicit. Nonaka developed four approaches to knowledge conversion and they are (p.99):

Socialisation – sharing of tacit knowledge between individuals
Externalisation – expressing of tacit knowledge and translating it to be understood by others
Combination – converting explicit knowledge into complex sets of explicit knowledge
Internalisation – referring to conversion of explicit knowledge into the organisation's tacit knowledge.

Nonaka, working with Takeuchi developed what is known as the SECI Model (Socialisation, Externalisation, Combination, Internalisation) of conversion, Figure 1.2 below:

Figure 1.2 Nonaka's Modes of Knowledge Creation

From \ To	Tacit knowledge	Explicit knowledge
Tacit Knowledge	Socialization	Externalization
Explicit Knowledge	Internalization	Combination

Source: Nonaka (1994, Fig. 1, p.19)

The SECI Model has had a major influence, particularly at an organisational level and in literature relating to knowledge management. However, several authors (e.g. Snowden, 2002; Smart *et al*., 2003; Firestone and McElroy, 2003) are critical of the SECI Model for its assumption that tacit knowledge can be transferred, when in effect what has been dealt with is implicit knowledge. Hence, its critics argue, the SECI model does not take cognisance of implicit knowledge. Although Nonaka and Takeuchi (1995) do not acknowledge the existence of implicit knowledge, and its association with tacit knowledge, Nonaka was *au fait* with the work of Polanyi. Nonaka (1994) refers to, and quotes, Polanyi, indicating familiarity with his work. The SECI Model arrived early

on the knowledge scene. It created interest and ready acceptance as being definitive by those seeking to identify ways in which knowledge can be made available

The OECD (1996) views knowledge as know-what, know-why, know-how and capable of interpretation as knowledge termed as knowing. In their research Cook and Brown (2005) examine knowledge and knowing, stating that knowledge is something possessed, and knowing is practice, and indicating that they are complementary. The importance and value of knowledge lies not just in its possession, but also in its ability to take the knowledge to an actionable state.

It is essential to utilise the know-what, the know-how, and the know-why knowledge of people in a value creating way. Know-what according to Gamble and Blackwell (2001) is knowledge that can be codified and available for use by those who need it. Know-how is the second stage relating to the ability to retrieve the knowledge and to use it at the right time. Knowing why takes knowledge to a level of greater importance because it involves changing the culture and beliefs of people in the organisation. From the perspective of an organisation, it is critically important to be able to convert the knowledge of their employees in a way that will provide benefit to both the organisation and the employees.

Research by Barth (2005) examines knowledge types and their properties and his work is useful for organisations looking to maximise their access to knowledge to build intellectual capital. Consideration is given to explicit, tacit and implicit knowledge, identifying respectively their value, how the knowledge can be leveraged and who has ownership of the knowledge. This approach provides organisations with an understanding of the expectations of knowledge, and how it might be managed to allow an organisation to maximise the benefits to be gained from knowledge available to it. Table 1.4 below has been designed by Barth (2005) to illustrate knowledge types and their properties.

From an organisational perspective, Bahra (2001) suggests that there has been a greater focus by the Western world on explicit knowledge, and that tacit knowledge has tended to be overlooked. He believes that tacit knowledge is at the core of Japanese competitiveness. The nature of society in Japan is such that it is contextual in its associations and, therefore, bounded within its business environment. Japanese organisations stress the importance of working together, sharing of knowledge, skills and experience within the organisation, and developing co-operative relationships

with external parties. This compares with the Western world where there is reliance on written expression, i.e. learning by the book.

Table 1.4 Knowledge Types and Properties

Key Information and Intellectual Assets	What is their value?	How to leverage?	Who owns the asset?
Explicit: - transaction data - work products (docs) - research notes, etc - e-mail and correspondence - patents and intellectual property	Valuable	Collect	Organisation
Tacit: - experience - expertise - relationships - reputation	Invaluable	Connect	Individual
Implicit: - conversations - trust - values	Intangible	Cultivate	Community

Source: Barth (2005), Table 28.1 p. 349

Roos *et al*. (1998) argue that tacit and explicit knowledge should be regarded as complementary to each other, with neither being afforded greater importance. The views of Bahra (2001) and of Roos *et al*. (1998) point to perceptions that can arise when examining differences between cultures about how organisations perceive their future. Because explicit knowledge is codified knowledge it can be viewed as providing the definitive way for doing things. But as new knowledge becomes available and a better way to do something emerges, the question arises as to whether the existing codified knowledge is up-to-date. Frequently it is not. Tacit knowledge encompasses experience, is judgemental, and is dynamic. With acquisition of new knowledge, changes in thinking and knowing take place. The contribution made by tacit knowledge, that in the right environment and context can become implicit, has a great deal to offer.

Gamble and Blackwell (2001) promote several other kinds of knowledge and in doing so they widen the scope of understanding of knowledge and advance the realisation there are many perspectives of knowledge. The ways of viewing knowledge make people aware that some knowledge does not change while other knowledge is in a constant state of change. Also that factual knowledge provides a base on which decisions can be made to proceed in a situation while procedural knowledge lets people know what should be done. Abstract knowledge has many

applications, and that specific knowledge has only one. The kinds of knowledge suggested by Gamble and Blackwell are as follows (p. 64):

- Static knowledge
- Dynamic knowledge
- Declarative knowledge (knowledge of facts)
- Procedural knowledge (knowledge of how to do things)
- Knowledge that is abstract (in that it may apply to many situations)
- Knowledge that is specific (in that it applies only to one situation).

Although all forms of knowledge are important in the business context, there is a particular desire to try to convert tacit knowledge into explicit knowledge, with the aim of generating value and benefit to the organisation. Although it is possible to identify the mechanical processes of a job, the skill, experience, level of expertise, general background and education of the giver of the knowledge required to carry out the task will not pass from the expert to the novice. Not all the tacit knowledge that people have is valuable, nor does all tacit knowledge need to be captured. With a high degree of knowledge held by a person being identified by Polanyi (1958) as ineffable, the point is raised about the necessity of passing on all knowledge beyond the process involved. Following a recipe to make a cake may be straightforward, but identifying the correct texture of the mixture to ensure success emerges through practice and development of the appropriate skills.

The individual knowledge of people along with collective knowledge developed as a result of employee interaction can provide a 'knowledge hub' through which the organisation is able to operate. Encapsulated in the competencies of employees is their knowledge, skills, and expertise providing the know-what, how and why so essential to the organisation. Yet it is difficult, if not impossible, to transfer such knowledge from a tacit to explicit form. For organisations to function, knowledge is the oil upon which they depend. Knowledge infiltrates every activity throughout the organisation, and to maximise its value it is necessary for management to find ways of tapping into that knowledge base and to create new knowledge for the development and expansion of their core competencies.

From an organisational perspective there is vulnerability around intellectual capital. Organisations do not own the people they employ, they rent people for a period of time (Stewart, 1997). Organisations have access to the knowledge of people while they are in their employ and the rent

paid for their services is in some form of monetary compensation. People can, and do leave an organisation at any time taking their knowledge and skills with them, thus placing organisations in the position of being susceptible to the whim of their employees. However, it is frequently the case that the contribution of an employee goes unrecognised or is not acknowledge until the person has left, and subsequently a knowledge gap is realised.

1.7 Outline of the Study

Chapter One provided definitions and perspectives on intellectual capital with the views of authors discussed. Intellectual capital has also been expressed through the use of components such as human capital, structural capital, structural assets, internal assets and internal capital. There is agreement on naming the human dimension, but as is evident, varying terminology is used for identifying the other components. From an examination of the perspectives of each theorist, intellectual capital can simply be identified as human capital + internal capital + external capital.

The value of intellectual capital to an organisation was considered and the consensus is that it is of great value and is the key to generating wealth.

The resource-based theory and the knowledge-based theory were examined. No matter which theory is espoused, it is evident there is recognition that the knowledge of people in an organisation is what adds value to products and services and when aggregated is an organisation's intellectual capital.

The critical component of intellectual capital is knowledge and a few of the many definitions of knowledge are discussed. In some of the definitions it is identified that there is a distinct action component to the definition of knowledge as it relates to business. Types of knowledge, tacit, explicit and implicit, were examined along with the notion of converting tacit knowledge to explicit knowledge.

Chapter Two will examine the literature relating to intellectual capital and organisational strategy and will include an exploration of the difficulties associated with the measuring of intellectual capital. Issues relating to the managing of intellectual capital will be addressed and consideration given to the link between managing intellectual capital and innovation. Intellectual capital models by various authors relating to the management of intellectual capital will be considered and the

development of a Model for Managing Intellectual Capital derived from the literature will be presented.

Chapter Three identifies the method used to carry out the research and discusses the rationale for undertaking a case study approach. The data collection methods are identified and the instrument design and protocols are outlined. A summary of the research questions is provided and the case to be studied is identified.

Chapter Four presents the findings of the research. A discussion of the responses by the chief executives is provided along with a range of their responses. This is followed by the responses of the interviewed employees and those employees who completed the questionnaire. Examples of the responses from each of the employee groups are provided.

Chapter Five discusses the findings of the research and is divided into three parts. Part one discusses the responses to all but three of the questions put to the chief executives. Part two examines and compares the responses to the three questions to the chief executives with questions of a similar nature asked of the employees. Part three discusses the remaining questions put to the employees.

Chapter Six presents the conclusions of the study and the contribution made to research. The conclusions cover an understanding of intellectual capital and the adequacy of the Model. This is followed by the contribution the study has made to the understanding of issues relating to intellectual capital. Finally, areas for future research are identified.

Chapter 2: Literature Review

2.0 Introduction

This chapter provides the theoretical framework for undertaking the research. The importance of intellectual capital as an integral part of strategy is considered and issues associated with measuring intellectual capital are addressed. A discussion will follow about management of intellectual capital taking into account capabilities and competencies, knowledge creating and knowledge sharing, and other associated issues. Innovation is critical for the ongoing sustainability of an organisation in a competitive market, and the link between intellectual capital and innovation is discussed. Various intellectual capital models are considered, and the chapter concludes with the development of a Model for Managing Intellectual Capital derived from the literature.

2.1 Intellectual Capital and Organisational Strategy

2.1.1 Strategy

The notion of strategy is frequently linked to the Chinese General Sun Tzu who saw having a strategy as being an imperative for success (Michaelson, 2001). Many centuries passed before strategy became part of organisational planning. An organisation's vision declares why it is in business, and its goals and objectives determine how the vision will be achieved. There is no apparent consensus on a definition for strategy (Chaffee, 1985). Simply put it can be defined as a plan that is designed to achieve an aim. Chaffee identifies three models of strategy: (1) linear that is methodical and directed in its approach, (2) adaptive that constantly scans the environment assessing opportunities and risks, and (3) interpretive that is an emerging approach having its basis in social contract. Thompson (2001) states: "Strategies are means to ends" (p. 9). Strategies are the means through which organisations attain their objectives. However, Thompson also refers to the importance of constantly reviewing strategies to meet changing environmental conditions.

Traditionally strategy had a long-term perspective but increasingly this approach is viewed as being detrimental to the agility and flexibility needed in today's environment. In the technology industry,

for example, there are no set rules and organisations that do well are those that know when to enter the market and seize opportunities (Teece, 1998). Strategy is not negated as a result of changing conditions, but the approach taken may require it to be considered in a way that provides the desired outcomes for the particular organisation and the environment in which it operates. In other words, it can be iterated.

Strategy sets the direction for achieving the goals and objectives by determining how various activities will be undertaken. Traditional timeframes provided the basis upon which the theory of the firm has been established. In today's environment, alternative approaches may be necessary to accommodate the increasing number of knowledge-intensive organisations (Peppard and Rylander, 2001).

Whereas previously there was an assumption of stability in the environment, there is now greater volatility and the speed of change suggests that strategies of even a year's duration may no longer be applicable. Operating with short-term strategies may well be an appropriate management approach to deal with events in a volatile environment. It also means that the accepted traditional rational approach to strategy requires supplementation by an emergent dimension. Chaffee (1985) points to the emergent approach as being one that suits the needs of organisations where they are constantly adapting to environmental changes, and takes an interpretative perspective involving social interaction and co-operation emphasising that intellectual capital is derived from people.

2.1.2 Strategy and Intellectual Capital

Regardless of the type of business in which an organisation is engaged, its intellectual capital will be a key determinant of its survival in the marketplace. The significance of intellectual capital lies in the fact that it is "valuable, rare, inimitable, and nonsubstitutable" (Bollinger and Smith, 2001, p. 10). Intellectual capital and its management are of concern to all kinds of organisations from manufacturing to service. Although recognition of intellectual capital is most evident in technological and research based industries, all organisations must come to understand the competitive and indeed, survival potential inherent in strategies for the management of their intellectual capital. It is not always acknowledged that manufactured products incorporate considerable intellectual capital in the systems and processes involved in their development and assembly (Stewart, 1997). It is essential for manufacturing businesses to become more aware of the

value of the intellectual capital encapsulated within those systems and processes, and its potential to provide them with an advantage over their competitors. Businesses are dependent on the link between strategy planning and managing intellectual capital that is essential for survival and ongoing sustainability.

In whichever way the market is perceived, the value of an organisation's intellectual capital is a strong determinant of its future survival. Intellectual capital is a core resource for developing a strategy. The strategic alignment between the two should be such that it maximises the intellectual capital capability, otherwise the strategy will be unable to provide the desired outcome. Where there is alignment between intellectual capital and strategy, there is greater potential for achieving a competitive advantage (Snyman and Kruger, 2004).

It is critical that organisations take a holistic view of their intellectual capital and are aware of where key elements of it reside. Concurring with the view of Penrose (1963) regarding the importance of intangible resources, the power of resource-based strategies is illustrated by Collis and Montgomery (1995), and cited by Marr *et al*. (2003), when they point to the return generated by, for example, the Disney Corporation and the Sharp Corporation, thus stressing the need for management to give closer attention to such strategies. The Disney Company has successfully utilised its knowledge to build its business around animation that has extended beyond the film industry to include theme parks, soft toys and videos. Sharp Corporation built its business on the knowledge it developed for liquid crystal display (LCD) (Collis and Montgomery, 1995).

If intellectual capital is so important when designing a strategy this inevitably raises the question about whether there should be a method for measuring its contribution in order to provide a portfolio on which to draw when strategy planning occurs. The following section addresses issues associated with measuring intellectual capital.

2.2 Measuring Intellectual Capital

As intellectual capital is a new concept for many organisations and one that may be difficult to embrace, identifying ways of measuring it are likely to appear daunting. The old adage says, that if it can be measured, it can be managed, but as intellectual capital is an intangible asset there are questions around how it can be measured and managed. There are many difficulties associated with what is in the minds of people, how they think and how they might apply that thinking. How does

one measure the level of knowledge of another? Also in practice, the cliché that what is measured can be managed does not always apply. Not only do many activities go unmeasured, but also this does not appear to have any detrimental effect on management activity. In any case, the introduction of metrics to every sphere of management may result in a stifling of initiative. Although management does need some way of assessing activities, time taken to go into considerable detail may not always reveal information that is useful. So what does this mean for the measurement of intangibles? Bearing in mind that it is not possible to measure everything, organisations may well need to take a broader perspective on measurement systems, to encompass all areas relating to strategy so that decisions are based on what is revealed. Failure to do so is likely to negate the value of the strategy. There is a need to understand the purpose of measurements and design them according to their purpose and relevance. Managers are not generally comfortable if they do not have clear information about business activities. Therefore, it is important they know what information they require, and what they want to do with it before they can decide what to measure, and how it can be measured. A number of authors have examined the issues of metrics and their relationship with intellectual capital (e.g. Sveiby, 1997; Bontis, 2004; Martin, 2004).

Although complementary in nature, it has been suggested that firms neither measure nor manage intellectual capital properly (Lester, 2001). The work of Sveiby (1997) and Edvinsson and Malone (1997) illustrates that the emerging interest in the value attached to intangible assets has led to the need to determine ways in which intellectual capital can be measured and managed. The approach to measuring intellectual capital has tended to come from an accounting and financial perspective, and this is reflected in the strong financial focus in much of the early literature (Bontis, 2004). Acknowledging this, Guthrie (2001) suggests it is time for the traditional approaches to management accounting practices to adopt methods appropriate to the contemporary environment by giving recognition to the importance of the knowledge-based intangibles. Having in place some metrics for measuring intellectual capital will provide results of value when developing the organisation's strategy. Marr *et al.* (2003, p. 442) identify the following reasons for doing so:

To help organisations formulate their strategy;
Assess strategy execution;
Assist in diversification and expansion decisions;
Use these as a basis for compensation; and finally
Communicate measures to external stakeholders.

To have value, measurements require meaning and a means through which to make comparisons that can reveal situations needing to be addressed. There are conflicting views on the issue of measurements. Sveiby (1997), for example, avers that the designing of metrics for intellectual capital is not difficult, whereas Riahi-Belkaoui (2003) declares that this is indeed a difficult task. Designing metrics for measuring intellectual capital is a complex task and traditional approaches to measuring tend not to provide meaningful information. As a result intellectual capital has heralded a new era of measurement activity bringing with it difficulties not previously encountered. Two examples of measurement systems for intellectual capital are considered. These are the Skandia method, designed for that organisation but has been adapted by other organisations to meet their needs, and the Kaplan and Norton (1992) Balanced Scorecard, which while not specifically designed to measure intellectual capital has been taken on board by a great number of organisations for this purpose.

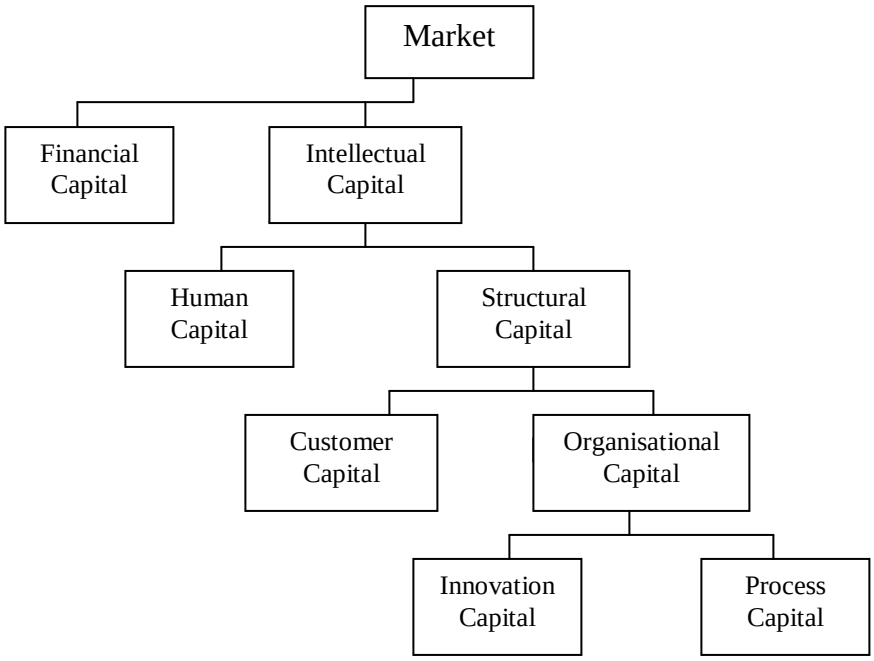
2.2.1 The Skandia Navigator

The Skandia Corporation's Business Navigator programme was headed by Leif Edvinsson and developed on the basis of concepts promoted by Sveiby in 1988. Under market value financial capital and intellectual capital are sub-divisions of intellectual capital. From intellectual capital two areas are classified as indicators of intangible assets to form a base on which to build the measurement model – human capital and structural capital. Sub-divisions of structural capital show customer capital and organisational capital, with innovation capital and process capital subsections of organisational capital (see Figure 2.1). All the areas identified as capital indicate the importance of each element and when combined, contribute to the market value.

The Skandia approach provides a financial, customer, human, process perspective and although not shown in the figure, took into consideration renewal and development as part of the value-added principle. Ratios and percentages displace to some extent monetary measures, so that a greater number of numerical measures can be used. For an organisation, the scheme identifies the importance placed on market value, and links that to financial capital and intellectual capital ranking at the same level. Areas identified by the scheme as contributors to intellectual capital cascade from intellectual capital. Human capital is very clearly identified and ranks alongside structural capital, and this is logical as people are the contributors to the structural capital. When examining the components of intellectual capital – human capital, structural capital and customer

capital as identified by Stewart (1997) and Saint-Onge (1999) and other authors using a variation in terminology, it is hard to see the reason for placing customer capital in a subordinate position to human and structural capital when it represents external sources of intellectual capital. It is also interesting that organisational capital and process capital need to be placed subordinate to structural capital. They relate to the activities within structural capital and it would be expected that structural capital encompassed measurements covering the range of organisational activities. A similar comment could be made regarding the innovation capital. However, reasons for this could include such as being able to readily identify innovations and to have a set of metrics that measure costs surrounding them, and to assess the value to be gained from existing and new innovations.

Figure 2.1 Skandia Market Value Scheme



Source: Edvinsson and Malone, Intellectual Capital (1997, p. 52)

Examples of the approaches to measurements developed for the Skandia Market Value Scheme (Sveiby, 1997, pp. 167-169) and relating to competence, internal and external structures, are as follows:

Ratio of support staff to professionals	Sales per professional
Profit per professional	Sales per support staff
Level of education	Training and education costs
Stability (age and length of time employed)	Turnover

Research and development expenditure	Customer contribution
Customer demographic change	Time in training

The minutiae of detail required in the measurements being suggested is also apparent in other projects, such as illustrated in research undertaken by Liebowitz and Suen (2000) when they examine work undertaken by the ICM Group study (1998) and by the Canadian Association of Management Accountants (1999). The wide range of metrics these systems offer provides organisations with a range of measures to start the process of finding ways of measuring their intellectual capital.

Intellectual capital statements, such as those of Skandia, serve as a means of communication as well as of measurement but as yet no accounting formula has been developed that can deliver a result specifically relating to intellectual capital. However, it is recognised that the approach taken by Skandia does provide a better appreciation of future value creation, and that such insight offers greater opportunity for moving employees towards an understanding of what and how they contribute to value creation. Nevertheless, there are still difficulties associated with measuring intellectual capital that have yet to be resolved.

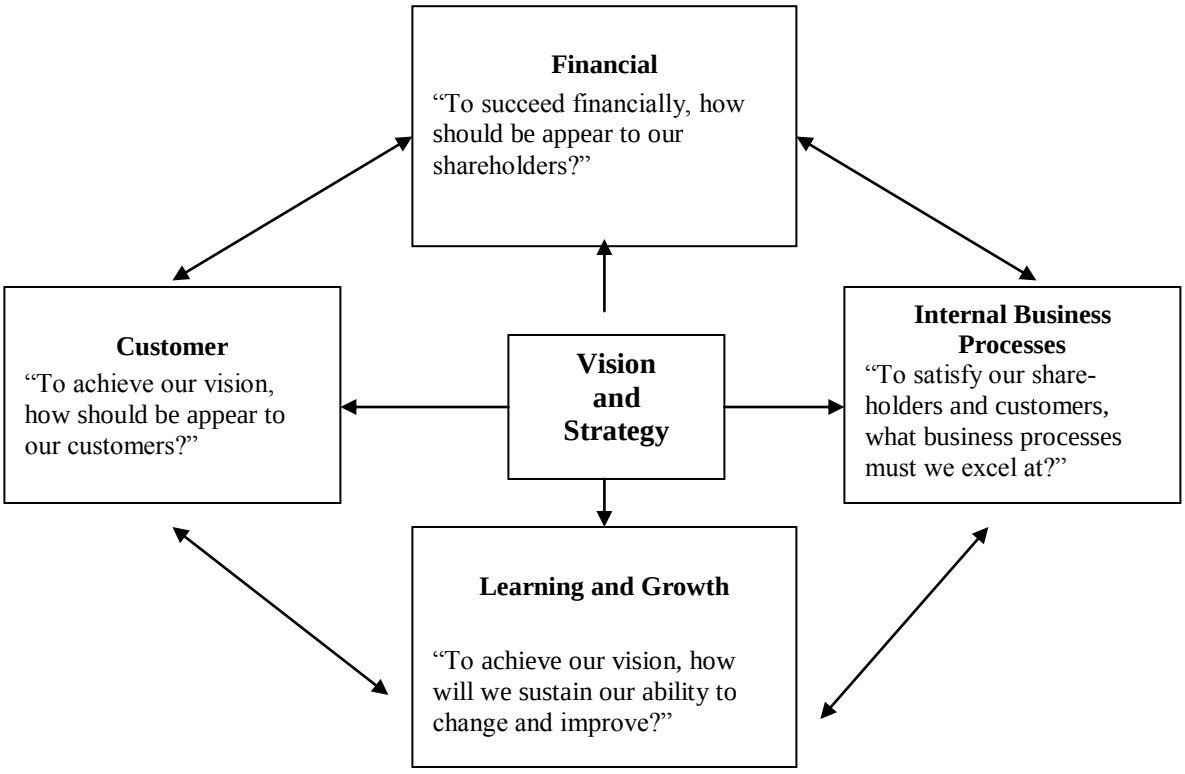
2.2.2 The Balanced Scorecard

Although not specifically associated with or designed for measuring intellectual capital, Kaplan and Norton's (1992) Balanced Scorecard introduced a method through which a company's strategic objectives could be measured. Kaplan and Norton regarded traditional financial measures as producing signals they termed 'misleading' for the demands of the current competitive environment. The Balanced Scorecard provides a set of measures enabling management to obtain a quick and comprehensive view of what is happening in the business (see Figure 2.2). The Scorecard provides four different perspectives from which to choose measures: financial, customer, internal business and learning and growth.

Unlike traditional measures that take a historical perspective, the Scorecard focuses on what is currently happening and directs the outcomes towards future success. The Scorecard emphasises the necessity of having appropriate measurement and acknowledges that metrics are an important part of the management process.

There is a similarity between the Scorecard and the Skandia Market Value Scheme in the areas identified for measurement. However, although not specifically identified in the Scorecard, there is a strong focus on innovation in learning and growth, and also within that sector there is recognition of the critical contribution made by knowledge workers. The various sectors in the Scorecard stress the importance of complementing financial measures with operational ones to provide a more balanced view of activity. They also provide a perspective enabling management to observe an organisation's short-term activities, and how they link with an organisation's longer-term strategy. This provides very useful information for an organisation and signals that when **making decisions** affecting the short-term, the long-term impact should also be taken into account. Recognising the knowledge value contribution there is potential in the Scorecard to determine the positioning and level of intellectual capital within the organisation and from this, gaps can be identified.

Figure 2.2 The Balanced Scorecard



Source: Kaplan and Norton, (1996, p. 76)

The Balanced Scorecard subsequently achieved widespread acceptance around the world. The Fosters Brewing Group, Australia, looked to the Balanced Scorecard as the means through which to

improve what was then a declining situation for the organisation. Fosters focused on working together, recognising the contribution made by people through their background, knowledge and skills that would enable the organisation to achieve the value creating position they desired (Bose and Thomas, 2007). The Balanced Scorecard was adapted to meet the requirements of their business and in doing so formed the basis on which they developed their approach to performance enhancement in a constantly changing environment (Bose and Thomas, 2007). This example illustrates the adaptability of the Balanced Scorecard.

Lim and Dalimore (2004) provide examples of organisations introducing non-traditional measurements by looking at different ways of measuring human and customer capital. The Bank of Melbourne, for example, has developed and implemented a human resources Balanced Scorecard. Other organisations such as John Danks & Son, the Royal Australian Navy, and Toyota Australia, are using the Balanced Scorecard results to identify whether their strategic visions are translating into outcomes. Those examples provide evidence that there are organisations addressing issues relating to the input to organisational activities by their people that will enhance the value of their intellectual capital, and illustrates the adaptability of the Balanced Scorecard.

Allee (1999) is critical of the Balanced Scorecard. In her opinion, it does not encompass the hidden assets for companies trading at a point considerably more than their book value, because it focuses on a balanced model rather than on creating value. However, the very title of the Scorecard indicates that its purpose is to provide a balanced perspective of an organisation's position rather than focusing purely on financial aspects. This is an approach that has much to commend the Balanced Scorecard because it is sufficiently flexible for it to be applied to various situations.

The Skandia and Balanced Scorecard models are useful in their provision of non-financial measures, although the link between financial and non-financial is fairly specific (Petty and Guthrie, 2000). A difference between the two models is that the Skandia system tends to focus more on metrics relating to human capital, with the Scorecard looking to customer capital. The Balanced Scorecard highlights in a general sense the value of intellectual capital but there is no indicator to provide the actual impact of intellectual capital on the organisation's activities (Chaudry, 2003). However, this does not mean to say that an organisation cannot move from a general to a more specific recognition of its intellectual capital.

Roos *et al*. (1998), and Allee (1999) have suggested that knowledge flow indicators are likely to provide more information than that given by stocks. While recognising that measuring knowledge flows is a difficult challenge it is still possible to do this using input-output techniques, and flows of embodied knowledge (Organisation for Economic Co-operation and Development, 1996).

The MERITUM Project (1998), involved researchers from several European countries. The aims of the Project were to create a classification scheme for intangibles and assess their relevance to capital markets, identify best practices for measuring intangibles, and to determine reporting guidelines. The intention of the project was to undertake an in-depth examination of the position of intangibles, and to provide substance for developing greater interest and recognition of the intangible assets as an avenue for wealth creation.

In 1999 the OECD co-sponsored an International Symposium on Measuring and Reporting intellectual capital to consider guidelines for the measurement and reporting of intellectual capital (Guthrie, 2001). Results of research presented at the Symposium involving "more than 1,800 companies, and case studies, and experimentation in 125 companies in several OECD member countries" (p. 32), indicated that companies in Europe were at that time ahead of other countries in measuring and reporting intellectual capital.

Guthrie (2001) refers to the complexity associated with classification of traditional accounting practice, which he states, "does not provide for the identification and measurement of these "new" intangibles in organisations, especially knowledge-based organisations" (p. 29). He indicates that traditional intangibles, such as brand equity, patents and goodwill only appeared in financial statements "when they met stringent recognition criteria" (p. 30).

Although research by Bontis (2004) takes a national perspective on intellectual capital, he suggests implementing a mapping system for identifying intellectual capital that has relevance for organisations. Mapping identifies the "who, where and what" of intellectual assets, and provide evidence of sources of value to the organisation. Measurements should be seen as important, and be related to what is revealed as a result of the mapping (Hatten and Rosenthal, 2001).

From the above it is evident that considerable work has been undertaken to determine ways in which intellectual capital can be measured. However, there are difficulties to be overcome when trying to identify metrics that meet the needs of management. Barriers to measuring intellectual

capital include "reasons not to calculate and reasons not to report" (Kennedy, 1998, p. 123). However, barriers are also likely to relate more closely to difficulties associated with finding measurements that provide meaning and value for management. There is a plethora of methods available to organisations that enable them to identify measurements specific to the requirements of their business. Measurement should not be undertaken for measurement's sake, but should have relevance to what is strategically important, and should provide value both to the strategy and to the growth of the organisation.

It is apparent from the literature that it is important organisations focus on a few relevant measures that are critical for the success of their business. They also need to acknowledge that the business environment has a tendency towards volatility; thus over time these measures will vary. Although measuring intellectual capital is fraught with difficulties, considerable work is being undertaken to determine methods to assist organisations to identify the value of their intellectual capital. The competitive environment is a constant challenge for management, but it is the role of management to provide the appropriate environment to enable the value of intellectual capital to grow. Finding relevant metrics for managers to assess performance is important.

The interest in managing intellectual capital came about as a result of progressive managers recognising that the viability of a business depended on the competitive quality of its intellectual capital (Wiig, 1997). Issues associated with the managing of intellectual capital will be examined in the following section.

2.3 Managing Intellectual Capital

Managing intellectual capital is about recognising that intangible assets represent a major share of value and that they offer new opportunities for the organisation (Stewart, 1997). The very nature of intangibles makes them different from tangible assets and organisations and will involve taking a different approach to their management. It is not apparent in traditional strategy models that management of intellectual capital is taken into consideration. However, operating in a constantly changing economic environment that is intensely competitive, there is a need for organisations to allow for greater agility and flexibility in their planning and to give greater consideration to the management of intellectual capital. This is particularly so for knowledge intensive business ventures.

An effective management approach identifies where the most valuable facets of the intellectual capital are positioned, brings relevant connections together and makes them available for planning the organisational strategy. Managing intellectual capital is complex. With the success of an organisation's strategy closely linked to its level of intellectual capital, it is important that the management of intellectual capital is developed to provide a framework for maximising the leveraging of intangible assets (Chatzkel, 2000). It is also essential that the strategy be communicated throughout the organisation as it involves the linking together of all the threads of knowledge that permeate the organisation.

From an organisational perspective there is vulnerability around intellectual capital because organisations do not own the people they employ. Organisations rent people for a period of time (Stewart, 1997). However, organisations have access to the knowledge of people while they are in their employ, and the rent paid for their services is in some form of monetary compensation. When people leave an organisation they take their knowledge and skills with them and all too frequently it is not until an employee has left that the knowledge gap is realised. Knowledge depreciates in value as new knowledge overtakes the old. However, it can be argued that without having a previous knowledge base, understanding new knowledge may be difficult to comprehend. From an organisational perspective it is important to be constantly renewing knowledge, but where metrics are concerned the depletion in the value of knowledge should also be taken into consideration. This will ensure that an organisation is aware that its intellectual capital has similarities with other assets and management needs to take this into account when planning for the future.

Although managers should recognise that intellectual capital is pivotal to the success of the organisation, this recognition must lead to action. It is the ability of the organisation to manage that knowledge, and to use it in a way that will build the intellectual capital that is critical. Therefore, it is essential that managers rise to the challenge of integrating the skills, experience and culture of the organisation to develop its capabilities and competencies to a point that will make it difficult for other organisations to replicate them. This can be achieved through implementing an intellectual asset management capability as a result of developing a portfolio that identifies the intellectual assets (Sullivan, 1999).

Various authors promote different approaches to the managing of intellectual capital, for example, Roos *et al*. (1998), Bahra (2001) and Peppard and Rylander (2001) favour a holistic perspective.

Rastogi (2003) states that the taking of a holistic perspective "May properly be viewed as the holistic or meta-level capability of an enterprise to co-ordinate, orchestrate, and deploy its knowledge resources toward creating value in pursuit of its future vision" (p. 230). A less controlling and more systems-oriented perspective is suggested by Saint-Onge (cited by Chatzkel, 2000). This can be achieved by reconfiguring the organisational structure in a way that "places importance on the interdependence between individual, structural and customer capital" (p. 103) thus providing opportunities for greater interaction amongst the various groups.

It is through the process of renewing, organising and transforming knowledge assets that the organisation defines its future capabilities and maximises the value of its intellectual assets. There is a need for organisations to constantly review what has been done with the aim of doing things better, abandoning activities no longer relevant, and replacing them with new ones (Rastogi, 2003). Organisational knowledge that has been in existence for a time should be reviewed to determine whether it is still providing the value that it originally contributed. There is also the point that new employees bring with them different perspectives that offer the potential for creating knowledge. Renewal should also be regarded as a way of promoting organisational sustainability through constantly re-evaluating its currency for its ability to sustain and to enhance the organisation's positioning within the marketplace.

Commitment is involved in managing intellectual capital. This begins with an understanding of the purpose and direction of the organisation and the realisation that intellectual capital as a strategic asset links to the organisational performance. This in turn is linked to the contribution of the individual employee. To gain value from intellectual capital, strong management skills are required to persuade employees that their contribution impacts on the organisation's ability to continue to keep ahead of its competitors. Therefore, it is necessary for management approaches to focus on the development of the organisation's capabilities by recognising that the capabilities and competencies, and the intellectual capital within them, will place the organisation in a position to compete in a dynamic environment.

2.3.1 Capabilities and Competencies

The organisation's strategy is a determinant of the capabilities and competencies required to take it forward. Teece *et al*. (1999) indicate that by the late 1980s and early 1990s, several writers (e.g. Dierickx and Cool, 1989; Chandler, 1990; Prahalad and Hamel, 1990) were putting forward

suggestions on how a firm's capabilities could adapt to an environment that is rapidly changing. Emphasising their importance Chandler (1990) states that (p. 596):

> … organisational capabilities became even more central to the competitiveness of enterprises, industries, and economies, as expansion into new geographical and product markets became the primary routes to growth for the modern industrial enterprise, and as such multinational and inter-industry expansion intensified competition in many markets.

What is the difference between capabilities and competencies? There is a tendency for people to use the terms interchangeably thus causing confusion (Allee, 1997). Capabilities and competencies can be distinguished by illustrating the nature of the supporting activities associated with capabilities. Capabilities are the ability to take new products quickly to market, or to modify or customise a product, and the ability to integrate technologies. Competencies are seen as being the actual knowledge, skills and expertise forming the core of the organisation and setting it apart from its competitors. According to Allee "*Core knowledge competencies* and *core performance capabilities* are two distinct, yet critically interrelated aspects of organisational identity" (p. 21) and she distinguishes them by stating (p. 21):

> *Core performance capabilities* are those processes and functions that enable a company to deliver high-quality products and services with speed, efficiency, and high customer service. Core performance capabilities are generic to the success of many enterprises.
> *Core knowledge competencies*…are those domains of expertise, knowledge, and technical knowledge that are unique to a particular type of business. They form the *content* or *subject* matter of the enterprise.

Allee (1997) points to core knowledge competencies being unique and "forming the *content* or *subject* matter of the enterprise" (p. 21). This interpretation clearly identifies the important relationship between capabilities and competencies that is crucial for the ongoing viability of an organisation.

The capabilities and competencies of an organisation provide the foundation for generating success, because it is through its competencies that an organisation produces its unique identity. Edith Penrose (1963) when writing about *The Theory of the Firm* suggested to organisations that they should focus on the activities promoting their core competencies. Nevertheless, it was another thirty

years before Prahalad and Hamel (1990) highlighted the importance of the contribution made by a highly skilled workforce to productivity and growth, and to the collective assets of the organisation. Hence, they observed that (p. 82):

> Core competence does not diminish with use. Unlike physical assets, which do deteriorate over time, competencies are enhanced as they are applied and shared. But competencies still need to be nurtured and protected; knowledge fades if it is not used. Competencies are the glue that binds existing businesses. They are also the engine for new business development.

Prahalad and Hamel refer to core competencies being the "wellspring of new business development" (p. 91). Employees give continuing rather than diminishing value, thus identifying them as a different resource from land and capital. Three tests for identifying core competence are put forward by Prahalad and Hamel (1990). First, the customer's perception of value must be such that there will be considerable benefit from the product. Second, the product must be competitively unique and difficult for competitors to imitate. Third, it might provide the basis for access to new markets.

Organisations need to fully comprehend the contribution made by their capabilities and competencies so that they can utilise them in a way that will provide maximum competitiveness. It is through its capabilities and competencies that an organisation can identify its competitive positioning in relation to other competitors in the industry. Therefore, it is important to fill competency gaps. Organisations should not allow competency levels to decline (Hatten and Rosenthal, 2001). Analysing the skills, experience, and education of employees is essential. This will reveal gaps in capabilities and competencies that will enable action to be taken to upgrade the abilities of employees as necessary. Competitive advantage results from the inability of competitors to readily replicate an organisation's resources. Difficulties associated with replication make capabilities and competencies critical elements for an organisation's future survival.

It is suggested that the core competencies of the organisation can be identified through access to the flow of knowledge, and the ability to absorb the knowledge to create something new (Preiss, 1999). However, if this approach is to be effective, it is critical to have the capability of replicating knowledge within an organisation to make it available to those who require it. This in turn highlights the need to know where the knowledge is, thus requiring a sound understanding of who, what and where that critical knowledge resides.

Using maps to track where critical knowledge is located in an organisation, is suggested by Stewart (1997) and Davidson and Voss (2002). Stewart points to the effectiveness of such maps in that the onus is put on employees to fill the gaps to raise their competency level. The usefulness of maps is that they reveal to employees the importance of constantly looking to develop their skills and expertise. However, this method does require organisations to take responsibility for making training opportunities available to employees and in doing so increases the competency contribution. Mapping was used to track intellectual capital in a long established organisation (Heng, 2001) and in an organisation to track value creation (Marr *et al*., 2004).

Often costs are cited as being the barrier to providing training, but well designed training programmes bring rewards through the enhanced abilities of employees. When considering costs, organisations do not always take the view that they are investing in themselves, but any outlay for education and training should be regarded as an investment because of expected future returns (Machlup, 1962).

A further point in relation to capabilities and competencies is differentiation (Spender, 1999; Perez-Bustamante, 1999). It is what an organisation can offer that is different from that of other organisations that is important, be it in the design of a product, its construction, or the service offered that is attractive to customers. The ability to differentiate can make a major difference in the competitive environment.

It is important to realise that an organisation may need to seek elements of competency from external sources to complement its own abilities. Strategically this makes sense if the costs to the organisation are such that it is unrealistic for it to develop those competencies. This also applies to the availability of capabilities within the organisation where it may, in certain situations, be prudent to utilise external expertise (Tidd, Bessant and Pavitt, 2001). That the core competencies are critically important is not questioned, however, organisations must avoid the unintentional loss of their core competencies resulting from decisions made for outsourcing parts of their operations to other providers. The term used for loss of competencies and capabilities is "hollowing out", and some long established organisations are reported as having reduced their asset base to such an extent that the organisations may well disappear (Hatton and Rosenthal, 2001). Therefore, it is important to recognise that outsourcing could unwittingly undermine the value of the organisation's ability to maintain its competitive advantage.

It is essential that there is a capability for managing both systems and processes, and this capability in management needs to extend through all the related areas of activity if they are to be effective. Every activity must be included as they are all in some way interlinked and dependent. Identifying through mapping the capabilities and competencies that impact on the business is an approach that can be taken to garner information about where the critical elements in the systems and processes are situated. Successfully managing the organisation's intellectual capital resources is critical, because the primary value associated with capabilities and competencies is in the intellectual capital emanating from them.

There is considerable benefit to an organisation in recognising the importance of developing an idiosyncratic competence. Core competencies are built up over a long period of time and failure to maintain investment in their development will disadvantage the organisation as new markets emerge. The intellectual capital embedded in an organisation's capabilities and competencies distinguishes it from the offerings of other organisations. Intellectual capital acts as a differentiator and emphasises the importance of knowledge embedded in the capabilities and competencies. Therefore it is essential that organisations recognise the importance of encouraging knowledge creation, and knowledge sharing as an approach to developing their intellectual capital and thus enhancing competitiveness.

2.3.2 Knowledge Creation and Knowledge Sharing

This section examines the contribution of knowledge creation and knowledge sharing to an organisation's intellectual capital.

2.3.2.1 Knowledge Creation

Knowledge is a product of learning. Learning is acquired through a range of modes including life experiences, observation, reading, education, practice, training, reflection, research and social interaction. In whatever way it is acquired, knowledge derived from learning will add to the knowledge bank of an individual. In turn, the knowledge can be applied to the work situation, thus increasing the collective intellectual capital of the organisation. Organisations that understand the need to improve their capabilities and competencies recognise the importance of learning.

The view of many authors is that intellectual capital will be the key feature of companies in the future, and in order to survive, and to be successful, companies must be continually create knowledge (e.g., Nonaka, 1991; Drucker, 1994; Bender and Fish, 2000; Bhatt, 2002). This recognition of the importance of creating knowledge has contributed to the success of Japanese companies. Japanese employees traditionally have entered into a lifetime association with one company, and this has engendered a culture promoting identity and loyalty. It is associations such as these that that have provided the means through which Japanese companies can tap into the knowledge of their employees for the creation of products, and points to the importance placed on recognising employees as generators of knowledge creation (Inkpen, 1996).

For organisations wanting to move forward, and to enhance their competitive position, making knowledge available is fundamental (Nonaka, 1991; Inkpen, 1996; Nonaka and Konno, 1998). According to Nonaka (1994) organisations that are continually creating knowledge are doing so "by reconstructing existing perspectives, frameworks, or premises on a day-to-day basis" (p. 19). His view is based on the point that "Any organisation that dynamically deals with a changing environment ought not only to process information efficiently but also create information and knowledge" (p. 14). There is validity in what Nonaka is saying. As people work and interact there is a flow of knowledge that can generate questioning and new thoughts about how things are done and from this new knowledge can emerge.

These views point to the organisational importance of information and knowledge. However, from this there follows the need to recognise what aspects are important by analysing the available information and knowledge. This will determine how the resulting knowledge can best be integrated into systems and processes. Knowledge should have meaning and relate to the current activities being undertaken, but any such meaning must also fit the beliefs and perspectives of employees if there are to be successful outcomes. Furthermore, if knowledge is solely dependent on existing knowledge then it is likely ideas will be scarce (Haapasalo and Kess, 2001).

There can be difficulties associated with determining whether knowledge is new, and it is often hard to distinguish between creating knowledge and applying it. People are all unique in their thinking. People respond differently due to background, education and experiences; therefore, there is an inevitable viewing of things from different perspectives. Being creative in one's thinking about existing knowledge leads to the desire to explore reasoning to determine new outcomes and the

creation of knowledge. Organisations should find ways in which this can be extended to the corporate level.

There is evidence in the literature that Japanese firms have tended to be more willing to make an investment in knowledge creation and that they appear more accepting of taking incremental steps in the development of knowledge (Inkpen, 1996). This incremental change approach can be linked to a perceived quest for quick results. Inkpen indicates in America there is a tendency for organisations to separate out knowledge that will enable them to take major steps forward. Taking such an approach can escalate costs well beyond the cost of the original research investment with returns that are less than satisfactory. The incremental approach by Japanese organisations may well have placed them in a more favourable position for assessing cost-benefit trade-offs (Inkpen, 1996).

2.3.2.2 Knowledge Sharing

As a catalyst for organisational growth, the sharing of knowledge is vital to an organisation. Knowing who in the organisation has the relevant knowledge is important to the operation of the organisation, and sharing that knowledge is necessary. A knowledge creating company is one that is a 'living organism' (Nonaka, 1991). When sharing knowledge, the organisation is constantly evolving, and the development of ideas and knowledge creation is intended not solely to generate products, but also as a source of ideas for redesigning the organisation, its structure, its systems and its processes. Knowledge creation can promote the complete rethinking of how an organisation operates. The greater the knowledge embedded in a product or process, the greater the likely value of that product or process. It also suggests that the greater the knowledge embedded in products or processes, the more difficult it is for potential rivals to be able to replicate them.

It has been stated by Allee (1997) that, "Knowledge expands with use" (p. 123). This points to the knowledge phenomenon that enables people, when sharing their knowledge, not to lose what they have given, but in fact to be able to increase their knowledge as a result of reciprocity through the act of sharing. Encouraging knowledge sharing is viewed as important. As employees' knowledge is increased, so in turn will that knowledge be transferred to the activities in which the employees are engaged. Such actions will generate value to the organisation. Where there is good interaction in the workplace this provides employees with the opportunity to discuss "know-what" and "know-how" practices that can direct the organisation towards a sustainable future.

Although the concept of knowledge sharing is commendable, the process itself can be problematic. Bender and Fish (2000) point out that people may transfer data or information, but "the knowledge itself has to be created in the head of the individual" (p. 3). In this event there is a range of ways in which knowledge can be shared.

2.3.3 Knowledge-sharing Techniques

Those involved in the transfer of knowledge need to share the same language, education and experience if they are to understand and benefit from knowledge sharing (Snowden, 2002). This suggests value will be lost if the knowledge shared does not have meaning for those to whom the knowledge is intended. Experts can be guilty of using technical language and industry-specific acronyms that may unwittingly generate lack of understanding and confusion for the recipient of knowledge ostensibly being shared. Although the educational level and knowledge of recipients is important when knowledge is shared, experts skilled in assessing the level of an audience can impart knowledge in a way that will enable an audience to gain an understanding of the topic, and in doing so have increased their knowledge.

The value of stories as a means through which knowledge sharing can take place is frequently referred to by authors such as Brown and Duguid (1991), Boje (1991) and Connell, Klein and Meyer (2003). The telling of stories in primitive societies is a valuable approach for passing knowledge through generations. In today's business environment stories are powerful tools that can illuminate the minds of listeners and drive home an important point. Stories reveal experiences that are used to illustrate situations and experiences to engender desired behaviour, or point to the non-acceptance of undesirable behaviour.

Stories may be subtle or forthright depending on the importance of the message and the knowledge being imparted. They present a powerful medium through which to share knowledge, because the context in which the knowledge is presented can provide recipients with greater understanding of what is being said and therefore of putting the knowledge into practice. Story telling has an added advantage in that stories beget stories. As one person tells a story so others will tell of their experiences resulting in a wider sharing and gaining of knowledge. From an organisational perspective Boje (1991) refers to story telling as being the "preferred sense-making currency of human relationships among internal and external stakeholders" (p. 106). Organisations should look to the value of stories as an approach for knowledge sharing.

Although there have always been groups that have come together as a result of a common interest and to share experiences and knowledge, nowadays organisations recognise that there is considerable value to be gained from encouraging the setting up of interest groups. One major example is Communities of Practice, which go back to the "guilds" of the Middle Ages, that brought together self-employed individuals through the common thread of plying the same craft to discuss their business, and to socialise (Wenger and Snyder, 2000, Brown and Duguid, 1998).

The power of communities lies in the common specialist language and passion of participants for their field of work that strengthens the desire to enrich their own development through the sharing of their knowledge. Those involved may not regard themselves as part of a community, but through working together, and sharing their knowledge and know-how, they generate a considerable knowledge base that can lead to the spiral of knowledge and creativity. The value of social interaction within communities is emphasised by Brown and Duguid (2000).

Recognising the importance of communities of practice for knowledge share, they are being encouraged by organisations. People join a group because they have a specific expertise that they wish to share with others, or they simply have an interest in its activities. Knowledge and practice is discussed and shared. However, a feature of them is that people tend to enter and leave a community of practice at will, for example when a person's expertise is no longer has valid, or interest has waned. If organisations are looking to formally develop communities of practice they may not reap the return anticipated, especially if they are unaware of the fluidity of membership traditionally associated with them. They also need to accept the trade off between input (resources provided) and output (resources not measurable), and it is important insularity does not lead to outdated knowledge.

Although not identified as communities of practice *per se*, cross-functional teams and work groups enabling personnel to work collaboratively, and to share knowledge and know-how, may be loosely termed communities of practice. The interaction occurring amongst team members has a high potential for sharing knowledge, generating ideas, and resolving problems, and their value is greater than the sum of the parts.

A more informal approach for knowledge sharing is the network of contacts people develop throughout their working life. There will often be no pattern to the network, instead it will be an

amalgamation of people encountered while operating in a wide variety of activities, and work associated events, through which knowledge sharing has taken place.

Knowledge from external sources can make an important contribution to an organisation's intellectual capital. Customer and supplier knowledge is extremely important and there are benefits to be gained by working closely with both groups, and learning from them (Kanter, 1996; OECD, 1996; Teece, 1998). Working collaboratively with other organisations, provides the opportunity for exchange of knowledge not previously accessible that may well have the potential to add considerable value to an organisation. Building good relationships with external parties is critical.

The act of sharing knowledge develops a more dynamic environment. It has the ability to create its own momentum, and provide the opportunity for knowledge creation upon which the future success of an organisation is determined (Mitchell, 2005).

2.3.4 Issues Associated with Managing Knowledge

It has been identified above that creating and sharing knowledge are critical to an organisation's ongoing sustainability and competitiveness. Not every person reacts favourably to the idea of sharing their knowledge and managers need to be aware of reasons why behavioural patterns may impede the introduction of a knowledge-sharing culture.

Robbins, Millett and Waters-Marsh (2004) define organisational culture as "A system of shared meaning held by members that distinguishes the organisation from other organisations" (p. 498). They point to culture being the social bond that keeps the organisation together and develops the behaviour and attitudes of employees. Culture is an important aspect of an organisation, and a culture that does not unite its people in a common goal to achieve the organisation's vision is an inhibiter of organisational development.

Culture influences behaviour and attempting to make a transition from a culture where sharing is not the norm, to one that emphasises the importance of sharing can be traumatic for those involved (King and Anderson, 2002). Difficulties associated with knowledge sharing are evidence of a reluctance to change entrenched approaches to work. Making cultural changes takes time, but critical elements for being successful in making the change are communicating why change is

necessary, its mode of implementation, the impact on people, and inviting people to participate in the change process. In every group there arises the elements of status and power that can create difficulties, but it is important to move existing behavioural patterns towards the desired outcome (King and Anderson, 2002).

To establish a culture of knowledge sharing, management needs to give credence to the importance of knowledge, and to see that people are valued for their contribution. This is likely to require the changing of existing employee and management behavioural patterns, such as knowledge hoarding, to behaviours that embrace knowledge sharing as an accepted and normal activity. Appropriate leadership is essential to the creating and sharing of knowledge. A transformational style of leadership provides an encouraging and empowering approach and is one that is apposite. An example of such a leadership style was that of Robert Buckman, of Buckman Laboratories (later Bulabs), Memphis, Tennessee, who transformed the operational activities of the organisation when in the 1980s he set in process the move towards a knowledge sharing entity. Systems were established by the Buckman organisation for the transference of knowledge to provide their many companies in the United States, and around the world, with access to the knowledge of experts in problem solving situations (Buckman, 2004). The transformation established a proactive knowledge-sharing environment. This said, not everyone can aspire to the visionary status of a Buckman and hence, more everyday, but effective approaches need to be developed.

Encouraging sharing will involve action at the most basic level such as making clear that the sharing of knowledge will not result in threats to individual employment. Concern about job security brings with it a strong resistance to sharing knowledge. Darling (1997) gives the example, "this stuff about knowledge sharing is nothing more than me dumping what I know in a pool so I will become dispensable" (p. 11). The issue of job security is an important one as people can think that if they have shared their knowledge they no longer have control over certain areas of their work and therefore, are vulnerable to losing their position. Managing the process involves recognising the knowledge attributes of employees, being supportive, and acknowledging success. Sharing knowledge to promote development and growth extends benefits to employees by enhancing their value not only at a personal level, but also making them a more valuable employee. When socialising in the work place or at some work-related function, the subject of conversation frequently turns to what people have most in common, and that is work. However, non-work related

conversations should not be regarded as time wasting – they are in fact worthwhile as builders of trust. In all of this, trust is a factor of fundamental importance.

Robbins *et al.* (2004) define trust as "A positive expectation that another won't act opportunistically" (p. 362). Lack of trust arises from not having confidence in the source of the knowledge, or preferring to be the creator of knowledge rather than reusing existing knowledge (Michailova and Husted, 2003).

Where a poor level of trust exists, motivation is likely to be low and people will be reluctant to share knowledge, and will impact on the operational activities of the organisation. Such behaviour restricts the flow of knowledge, and affects the quality of knowledge that is likely to be imparted. This raises difficulties around how to assess the knowledge that is available, and whether it can be verified for accuracy. In the end it may be necessary to make a judgement with regard to the truthfulness of the knowledge that is based on the intention of the organisation (Nonaka and Takeuchi, 1995). In an organisation where there is a strong affinity amongst employees, and where they are united in their commitment to the organisation, there will be a high level of trust. This highlights the need for sound leadership qualities in management. A trusting environment promotes a greater sharing of knowledge. The higher the level of trust, the greater the openness and good intent there will be amongst people, and this in turn will generate a higher level of sharing. However, it takes time to build trust. A further issue can be difficulties amongst employees from different cultures. This is a situation that may well need to be addressed by organisations as the number of multi-cultural workforces increase.

The level of trust among people is symptomatic of the type of culture existing in an organisation. It will be beneficial to all involved by making sure that people from other cultures are welcomed and integrated into the workplace. Trust is encouraged to develop through good communication. The longer a person is known, the higher the level of trust that is built up, and familiarity with the source of knowledge generates a greater acceptance of that knowledge.

An impediment to knowledge sharing that can arise is that people are not interested in sharing. There is the "knowledge is power" syndrome. Allee (1997) refers to the old knowledge equation "knowledge = power – so hoard it" (p. 10), but with today's extensive use of technology and the impact it has on organisations, the old equation is rapidly being put to rest. "Today, the new knowledge equation is knowledge = power – so share it and it will multiply" (p. 10). Where there

are people who regard knowledge as a powerful weapon, they are in effect a threat to an organisation. A further issue raised by Kluge *et al*. (2001) is the "not invented here" syndrome explained as "the tendency to neglect, ignore or, worse still, disparage knowledge that is not created within your own department" (p. 33). This situation can also arise through a mistrust of external knowledge. Where such situations exist management should review the organisational culture, and where necessary, to turn it into one that is all encompassing and caring in order to encourage sharing.

Loss of knowledge when resignations, promotions and redundancies occur also has a detrimental effect on an organisation, and on the employees who are still working in it. Too often it is realised that valuable knowledge has been lost because it was not captured and/or passed on. It is important to codify as much of the organisational knowledge as possible.

When there is a reluctance to share knowledge, the introduction of an incentive system may provide a way of changing behaviour. Several authors suggest the use of incentives to encourage sharing knowledge and to counter knowledge hoarding behaviour (e.g. Wenger and Snyder, 2000; Kankanhalli *et al*., 2002; Laupase, 2003). Factors to be considered in such circumstances are reciprocity, repute, and altruism (Davenport and Prusak, 1998). Reciprocity considers the situation of expectation of return payment for previously having given knowledge. Whether there is an anticipated equal value, or not, knowledge shared through reciprocity may not be the issue, but recognition for being a sharer of knowledge may be. To be known as a source of valuable knowledge, and being willing to share it, enhances an employee's reputation. From an altruistic perspective the knowledge sharer may be someone who is happy to receive a 'thank you'.

Any system in which incentives are offered for sharing knowledge is likely to be perceived in subjective terms, and extremely difficult to be seen as fair and equitable by other people. A system where there is greater visibility of the value of sharing, e.g. through successful outcomes, is likely to have greater acceptance. Research carried out by Wenger and Snyder (2000) reported a personnel evaluation system at the World Bank that places reliance on intrinsic benefits such as being a member of a community of practice with the opportunity to solve problems, coming up with new ideas, and building relationships with those who share a common passion. The approach taken by the World Bank illustrates how people can be encouraged to share without the necessity of monetary incentives. Kankanhalli *et al*. (2002) found that few organisations are using incentives, but suggests that career advancement, and empowerment offering more responsibility and

autonomy to employees will lead to greater sharing of knowledge. Laupase (2003) identified 85 per cent of interviewees in a research project as being in agreement with the statement that "rewards motivate them to share their knowledge because they believed that they need to be rewarded for contributing their 'valuable' experience." (p. 96). Those who did not agree felt that this use of rewards would "create disharmony within the firm" (p. 96).

The situation around incentives for knowledge sharing is complex. It is important to provide as many opportunities as possible for sharing and accessing knowledge, as this will send appropriate signals with regard to sharing. At the same time, any attempt to enforce knowledge sharing is likely to have a detrimental effect on the organisational culture and relationships amongst people. Identifying best practices is an approach that can be taken, because sharing knowledge with other employees about how a problem was resolved opens the avenue for positive interaction and can encourage knowledge creation (Mitchell, 2003). Regular meetings for the purpose of sharing work-related experiences also provide an avenue for knowledge creation and sharing that generates a collaborative environment, and one from which everyone can see the benefits (Mitchell, 2005).

Attempts to capture and codify knowledge for the purpose of sharing it across an organisation presents difficulties, but nevertheless many organisations strive to do this. Tacit knowledge, as discussed in Chapter One, cannot be made explicit, yet it is essential that organisations capture and codify as much knowledge as possible about processes and procedures, scientific formulae, and reports. Codifying such knowledge provides the opportunity to make it available, if and as appropriate, to employees to enable them to enhance the carrying out of their activities (Wiig, 1999). Although capturing knowledge may be important, Snowden (2003) refers to the loss of content involved in codification, saying "we always know more than we can say and we will always say more than we can write down" (p. 3). This clearly indicates that no matter how keen an organisation is to codify knowledge, there will only be partial representation of what is known.

There is growing concern over the ethical and legal issues relating to organisations seeking to capture, share and transform knowledge into intellectual capital (McCann and Buckner, 2004). Intellectual capital initiatives are intended to make it easier for knowledge to move around inside and outside the organisation, and McCann and Buckner indicate "This can be threatening to say the least when intellectual capital, as well as intellectual property, moves openly across boundaries" (p. 2). It is essential when sharing knowledge with external parties that employees are aware of associated ethical and legal issues that may adversely affect the organisation.

Brooking (1996) points to the importance of maximising the availability of knowledge, and illustrates this by referring to a survey carried out by the Swiss Gottlilieb Duttweiler Foundation. It was found that only about 20 per cent of knowledge present within a company is actually used and therefore, there is considerable potential in the untapped 80 per cent. The future of an organisation depends on its intellectual capital to provide it with a competitive advantage. It is important that within the intellectual capital strategy there are plans for the effective management of knowledge at all levels of the organisation, but particularly so at the operational level. This will ensure that there is maximum value in the aggregation of the knowledge that makes up the organisation's intellectual capital.

The following section discusses innovations as outcomes from the management of intellectual capital.

2.3.5 Managing Intellectual Capital to Promote Innovation

In a report issued by the OECD (1996) it was pointed out that traditional theory identifies innovation as a process of discovery that follows a linear path emanating from scientific research to implementation. Contrary to what has been previously thought, innovation assumes many guises, and the process is not necessarily linear.

Although there are many definitions of innovation, a useful one has been provided by Kanter (1996) who defines it simply as "the creation and exploitation of new ideas" (p. 94). As a definition it is succinct and easy to remember. According to Drucker (1998), "innovation is work rather than genius. It requires knowledge. It often requires ingenuity. And it requires focus." (p. 157). He identifies sources of innovation as coming from unexpected occurrences, incongruities, process needs, industry and market changes, demographic changes, changes in perception, and new knowledge. This points to the importance of organisations being constantly alert to what is occurring in their industry. It also requires foresight and vision to recognise the potential of opportunities, and to have the ability to take them through to a successful conclusion.

How innovative an organisation is determines its future. Innovative organisations become recognised as forward thinkers often resulting in respect within their industries that can lead to further opportunities. Skyrme and Amidon (1997) make an important point about innovation:

"*Being more adept at innovation*. … can move knowledge creation beyond simply an 'ideas factory' into fully exploited knowledge in new products and services" (p. 28).

Many innovations emerge through incremental progression rather than as a major breakthrough producing an amazing new product. Therefore, organisations should be constantly questioning what they are doing, and how they are doing it, and the reconfiguring of specialist knowledge can lead to new innovations (Grant, 1996). Complexity results from integrating and reconfiguring of existing knowledge often resulting in chaos through the development and promotion of new innovations.

Research in New Zealand conducted by Darroch and McNaughton (2002) emphasises the link between knowledge sharing and innovation. The research involved 443 organisations in New Zealand with over 50 employees. It was found that managing an organisation's intellectual capital impacts on both incremental and radical innovation. Finding time for innovation, and encouraging group behaviour supportive of innovation, while bringing mixed results, did show a positive effect. The results of their research illustrate that being aware of information changes in the marketplace, working in partnership with international customers, using technology for knowledge dissemination, and being flexible and opportunistic, positively impacts on innovation.

It is a truism that the source of innovation is people, but as Stewart (1997) points out, "smart individuals don't necessarily make for smart enterprises" (p. 76). He refers to a comment by Betty Zucker, "Universities are a collection of brilliant people, but not an example of collective brilliance. Because there is little knowledge flow, the university is not intelligent as a whole" (p. 76). Stewart then compares this with the average intelligence of people working in McDonalds, and refers to that organisation as being intelligent because they "modularised and standardized their knowledge" (p. 76). This points to recognising that systems and processes also have an important part to play by giving attention to how knowledge is managed and disseminated.

Managing intellectual capital places the organisation in a position to understand the value of the knowledge available to it, and to direct that knowledge to creating innovations. Accessing and understanding intellectual capital, and the rate at which it can be converted into innovations, is critical (Preiss, 1999). There are many factors involved in the innovation process, not least of which involves the cost associated with the allocation of resources. Vision, foresight, understanding the core competencies, and having an environment in which employees are given support and encouragement are all essential of a managing the process (Brand, 1998).

Innovations, no matter their size or complexity, may require the hiring of new employees and moving into new markets. Therefore, from a management perspective understanding what might be involved is essential.

Much has been written about the comparative strengths of new entrant versus established organisations, and large versus small organisations in relation to innovatory behaviour (Quinn, 1985; Kanter, 1996; Ireland *et al*, 2001). Although a case can be made for all these alternatives, as Kanter (1996) observed, "The culmination of innovation production is transfer to those who will exploit the innovation or embed it in organisational practice" (p. 119).

Organisations do not innovate in isolation. Interaction with their customers and suppliers, and with other organisations enables them to add to their knowledge. Working collaboratively on innovation with other organisations has many advantages. Through working together both Alcoa (Aluminium) and Audi created a "revolutionary aluminium frame for automobiles" (Stewart, 1997, p. 155). Alcoa benefited through ongoing development of new alloys and technologies suitable for other markets. Audi gained additional prestige and a premium price for their cars, and met the requirements of German laws that cars can be recyclable.

Protection of innovations is important. Although an organisation might not possess the property rights for all its knowledge assets, it can have property rights for its innovations, rights that are vested in intellectual property. Intellectual property is the knowledge defined in patents, licences, copyrights, trademarks, trade secrets, designs, or know-how over which a company has gained legal protection. A system for the protection of intellectual property from a global perspective is developing through various unilateral, bilateral, and multilateral arrangements (Narayanan, 2000). It is important that organisations familiarise themselves with the situations pertaining to other countries, and look to the various accords regarding the protection of intellectual property. Otherwise as Rivette and Kline (2000) reported, "Companies that don't claim their stake in the future will wake up and discover that their competitors own all of the patents they need to be on the Web" (p. 3).

Core capabilities and competencies are difficult to replicate. However, organisations need to be aware that through reverse engineering, a purchaser of a product can gain considerable knowledge about it. Owners must take an active approach to protecting intellectual property because if the owners do not assert their rights others will have no reservations over negating them (Brooking,

1996). Value can be gained from patents by licensing the innovations, thus providing an opportunity to generate additional revenue, and create a market asset.

Intellectual property has the potential for generating greater value than bricks and mortar. The manufacturing arm of the organisation can be sold, but the rights to the intellectual property, if held in a separate company, can be retained to provide ongoing wealth. To emphasise the importance of intellectual property, Davis and Harrison (2001) prepared a five-level model for its management. Level one is defensive, meaning instigating protection, level two relates to cost of protection, with level three bringing realisation that through the protection of products intellectual property has value in its own right and can generate wealth. At level four, companies recognise the strategic implications of their intellectual property and begin to take a more sophisticated approach to its management. Organisations reaching level five tend not only to regard their intellectual property as strategic assets, but also to be interested in "using IP as a tool for creating the future of the firm as well as defining the technology future of their particular industry" (p. 123). Greater attention should be paid to managing intellectual property to ensure the return on investment is maximised.

Recognising the importance of intellectual capital, and the wealth that can be generated from it, will encourage organisations to put in place a plan for its management. The following section examines intellectual capital management models developed by various authors.

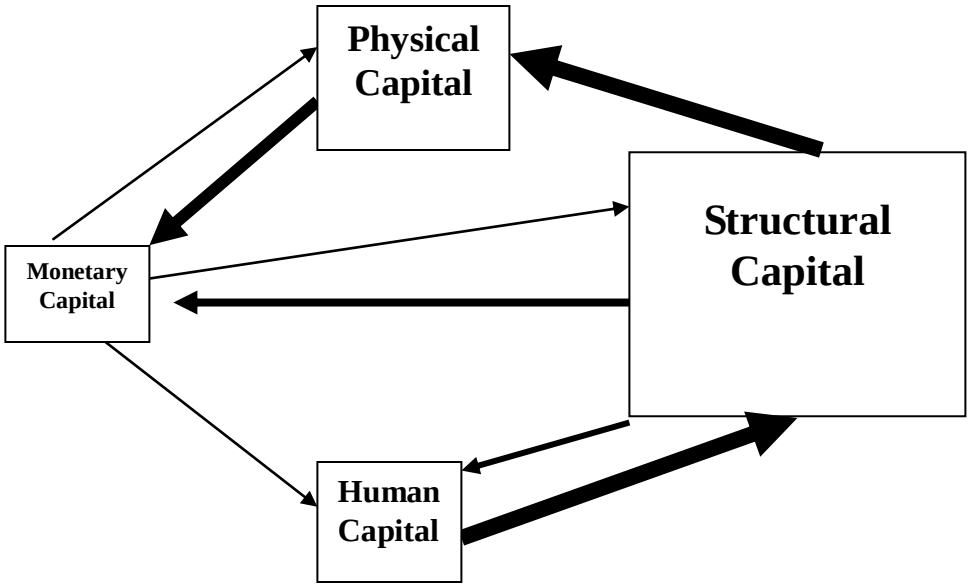
2.4 Intellectual Capital Management Models

The intellectual capital models discussed in this section indicate the various approaches taken by authors to illustrate how intellectual capital can be managed within the organisation. Providing a conceptual view, the models suggest management activities that assist in promoting the value of intellectual capital to enhance competitive advantage and generate wealth. From this analysis, a Model for Managing Intellectual Capital will be derived as one of the principal research outcomes of this study.

The AP*i*ON Navigator model (Figure 2.3) (Peppard and Rylander, 2001) emphasises value creation, value extraction, and the implementation of a growth strategy. The design of the model illustrates "four forms of capital and the arrows represent the transformations between them. The size of the boxes and arrows show their relative importance to value creation; the larger a box or an arrow the

larger its importance" (p. 230). The research to develop the AP*i*ON Navigator model was undertaken for a software company in Ireland (AP*i*ON) and revealed that factors critical to success were a common language, an understanding of the drivers of value creation, and the "*crucial importance of structural capital": (p. 232).*

Figure 2.3 The AP*i*ON Navigator



Source: Peppard and Rylander (2001), Fig. 1, p. 231

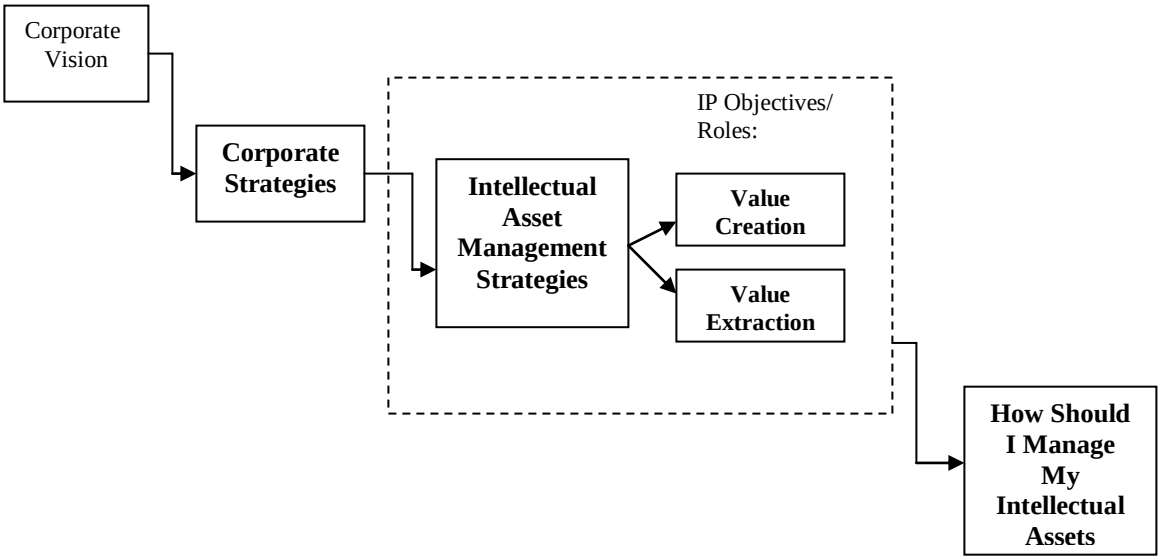
The small size of the box for monetary capital does not mean that generating revenues is not important, but that it is simply less important than having the right knowledge, processes and systems for creating value through new products. At AP*i*ON physical capital is the source of new products that are in fact intangible, for example, processes and structures, and customer relationships. A critically important aspect of the model for AP*i*ON is the transformations occurring between structural capital and physical capital. Peppard and Rylander state: "The company does not have any physical assets of importance for value creation … That arrow [between structural and physical capital] thus represents the transformation of structural resources" (p. 231).

The large arrow in the model from physical capital to monetary capital illustrates the transformation to sales. Sales, in this situation, refer to the transformation of resources to provide processes and structure that will have the effect of promoting customer relationships. Other areas of importance are the relationship of structural capital to monetary capital, where expectations are to generate

revenues from customised solutions, and the arrow from human to structural capital that indicates that product development will be through structural capital (processes). The arrow from structural to human capital illustrates that people working on projects are increasing their knowledge through knowledge creating initiatives.

The model, determining the Roles for Intellectual Capital (Figure 2.4), from Harrison and Sullivan (2000) refers to the importance of company context, in which the value of intellectual capital is expressed through the vision of the organisation. It is designed to identify roles for intellectual capital and to help management to determine how best to interpret the model and how to adapt it to particular requirements. Harrison and Sullivan refer to the "defensive" and "offensive" roles played by intellectual capital, for example the defensive role is "litigation avoidance" and "design freedom" (p. 142), and the offensive role, "revenue generation…creating standards in new markets…obtaining access to new markets" (p. 142). Activities in the model start with the corporate vision that expresses the context in which it operates, and determines a strategy to create value for, and extract value from, the intellectual assets with the role of intellectual properties representing "*current value*" (p. 142). They end with management pondering how to manage intellectual assets.

Figure 2.4 Determining the Roles for Intellectual Capital



Source: Harrison and Sullivan (2000), Fig. 2, p.142

The common theme of the models put forward by Peppard and Rylander (2001) and Harrison and Sullivan (2000) is that of creating value from intellectual capital. The very large box assigned to

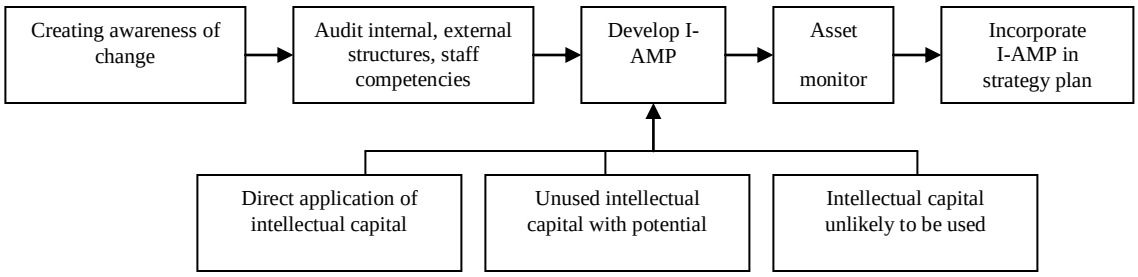
structural capital in the AP*i*ON Navigator emphasises the importance to the organisation of creating value from the knowledge transformation process. Identifying the import of the structural capital is a logical assumption, because the structure of the organisation provides the hub around which all activities occur. The organisation is the ongoing entity that accumulates the knowledge contribution of the people who work, or have worked, for it. While emphasising the importance of the transformation activity and the part played by structural capital, the model appears to detract from the knowledge input of people, who make value creation possible, even allowing for the support of the organisational mechanisms. The AP*i*ON model conveys an abstract view by not identifying any features beyond what can be identified as a definitional approach. Having said that, AP*i*ON, with an understanding of the content of each area and operational activity required, appears to have gained considerable benefit from following the model. This is also a valuable illustration of the everyday implementation of the threads surrounding intellectual capital and its management.

The Harrison and Sullivan (2000) model (Figure 2.4) points to the role of management, first in recognising the importance of intellectual capital, and then in making a concerted attempt to maximise value creation. Their approach suggests a logical progression, with the starting point being the organisation's vision, followed by the corporate strategy, and then looking to the intellectual assets to create value. Management is then left to determine how the organisation is going to achieve the goal of value creation, because there is no specific guidance on how to reach the desired outcome, and no apparent suggestions are forthcoming.

In this regard, Klaila and Hall (2000) promote the establishment of an Intellectual Asset Management Portfolio (I-AMP), putting forward five steps for its development that are illustrated in Figure 2.6, developed from the description provided in the paper.

The model starts with recognising the need for change, examining the relationships between the internal structures, and competencies of the organisation. At this point the Intellectual Asset Management Portfolio can begin to be developed using three steps – current application of intellectual capital, what intellectual capital is currently unused but has potential, and the discarding of intellectual capital that is of little value to the organisation. A monitoring system is established and finally, the Portfolio is incorporated into the strategy plan. The model focuses on what should be done to identify the areas where intellectual capital resides within an organisation. However, it does not have a starting point linked for example, to the vision of an organisation, nor does it go forward to suggest how the Portfolio can be the focus for generating wealth.

Figure 2.5 Intellectual Asset Management Portfolio (I-AMP)

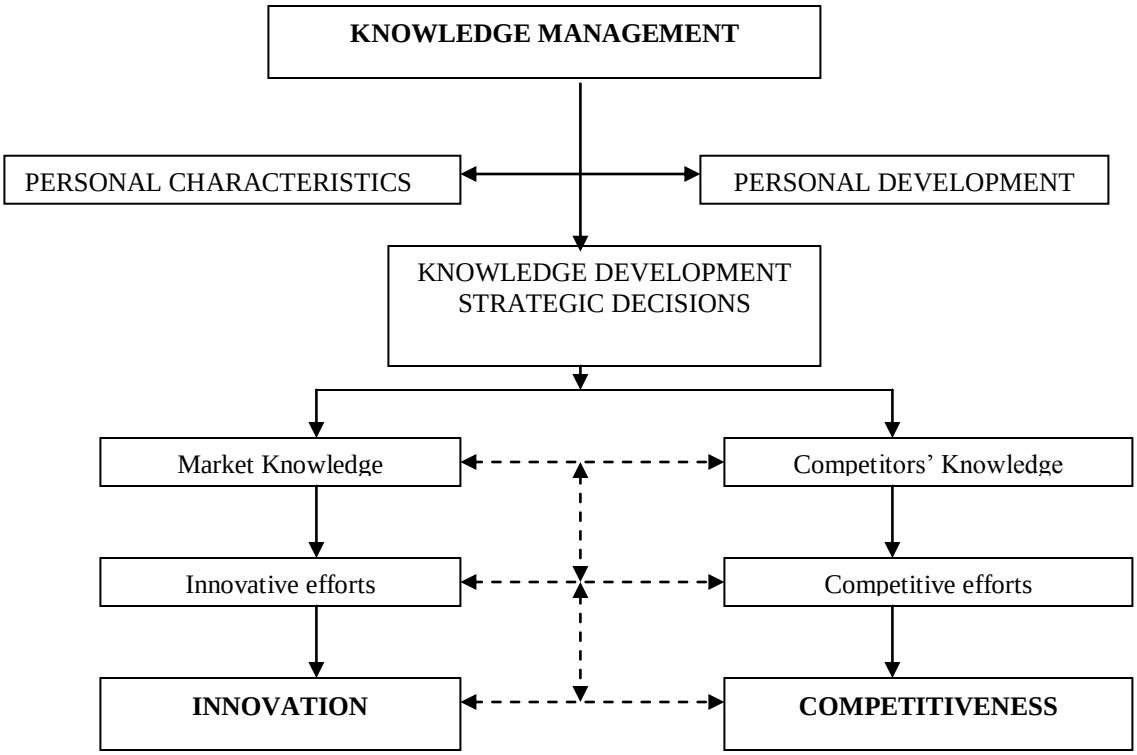


Source: Adapted from Klaila and Hall (2000)

With only a relatively few intellectual capital management models having emerged from the intellectual capital literature, insight into managing intellectual capital was extended into the knowledge management literature. Knowledge is an integral part of intellectual capital, and with a focus by some authors (e.g. Carneiro, 2000; Firestone and McElroy, 2003; Wenger, 2004) on knowledge management it was felt appropriate to explore the models they have produced to see if the models can be adapted to fit the needs of an intellectual capital model.

The focus of Carneiro's (2000) model is on working towards innovation and competitiveness, and on highlighting the importance of intellectual capital, knowledge development and motivation. An abridged version of Carneiro's (2000) model is shown in Figure 2.6. He points to the need for co-ordinating abilities and aptitudes, and for capturing, transferring and leveraging knowledge to create a holistic view. Carneiro's model places importance on personal characteristics (education, attitudes, values, creativity) and personal development (professional experience, training, information technology). The model points to knowledge development strategic decisions that include investment in knowledge development, knowledge worker involvement, and the need for modern information technology. Having an understanding of market knowledge and competitors' knowledge is also identified as being of importance. The model links those with the need for innovation in order to sustain the organisation's competitiveness.

Figure 2.6 Influence of KM on Innovation and Competitiveness (abridged)



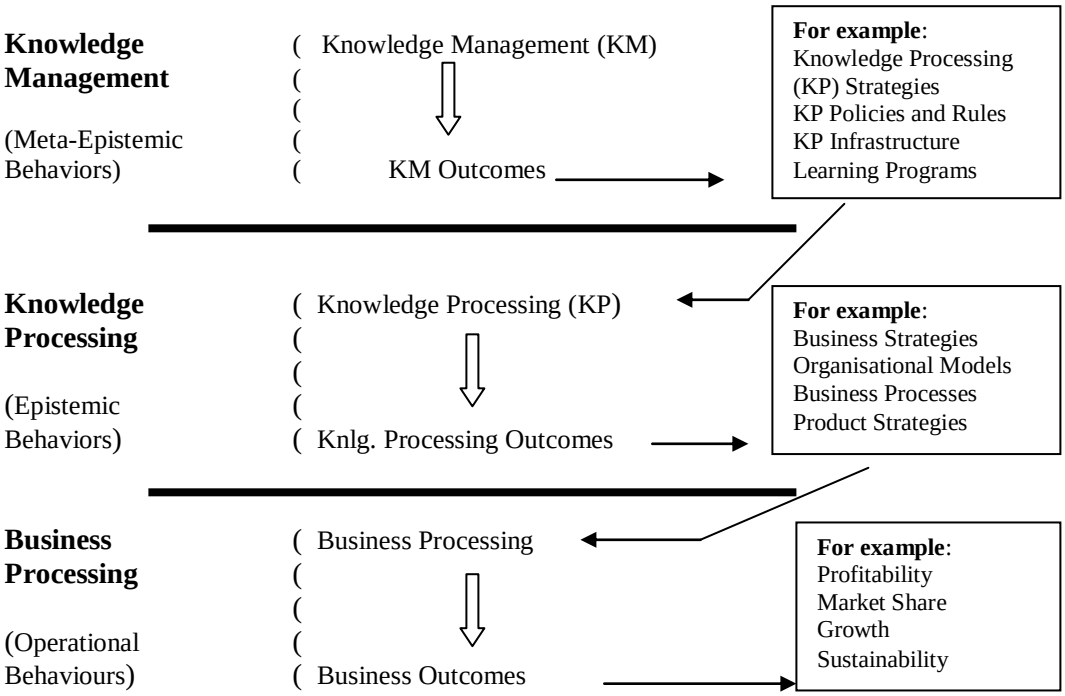
Source: Carneiro, A. (2000), Figure 1, p. 96

Firestone and McElroy (2003) refer to knowledge processing as being concerned with creating and sharing knowledge. Reference is made to the influence of culture on decisions about operating business processes, and to business processes impacting on outcomes because they are "performed and managed by agents" (p. 49). Firestone and McElroy introduce the concept of the knowledge life cycle as being at the heart of what they term "new knowledge management" (p. 193). They state that it is essential that a framework for knowledge management portrays "how knowledge is produced and integrated in human social systems" (p. 235) and this is illustrated by using 'meta-epistemic behaviours' in the model. Their model (Figure 2.7) illustrates the management of knowledge processing and business processing to enhance processing activity.

The Firestone and McElroy model highlights the linkages of knowledge management and knowledge processing to outcomes and provides examples of what they are along with how they link to the succeeding stages. Final outcomes emerge in business processing, and relate to wealth being able to be generated through profitability, market share, growth, and

sustainability. The model illustrates outcomes that are in line with those anticipated as a result of managing intellectual capital.

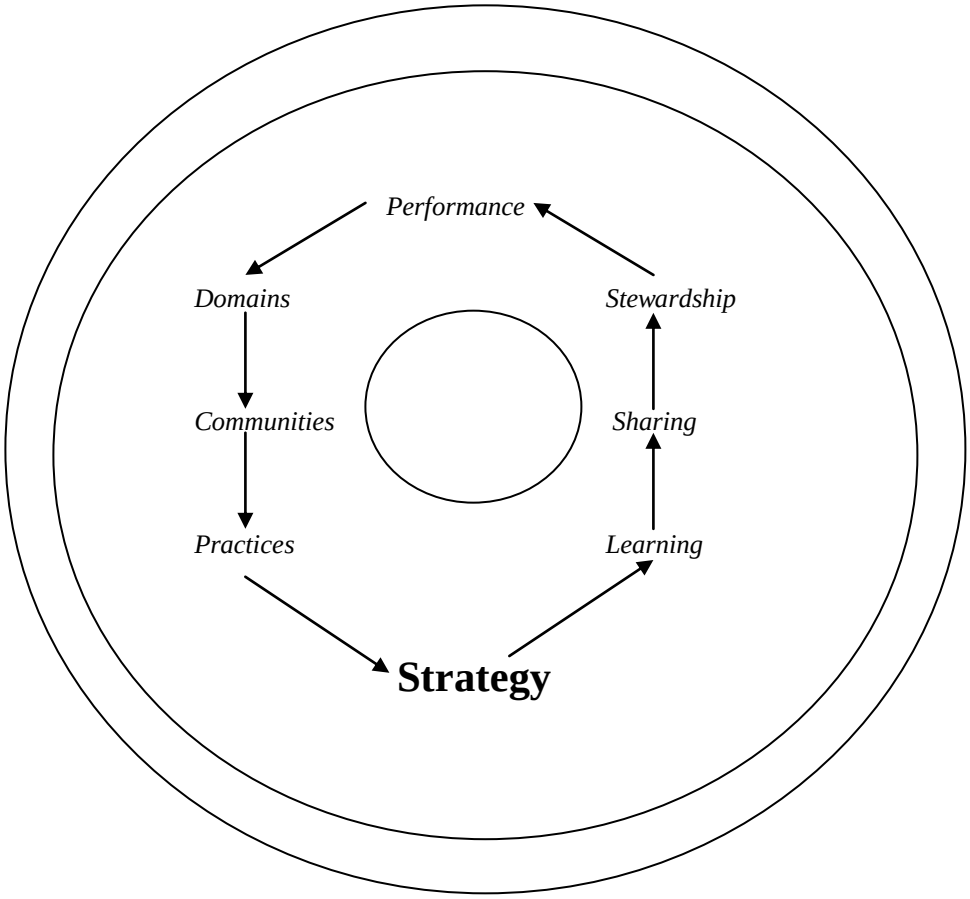
Figure 2.7 The New Knowledge Management Reference Model



Source: Firestone and McElroy (2003, Fig. 6.6, p. 210)

The strategic perspective that is taken by Wenger (2004), points to the importance of knowledge management and to the value of sharing knowledge through communities of practice. In Wenger's "doughnut model of knowledge management" (p. 2), Figure 2.8, the analogy with a doughnut arises from the hole in the centre to illustrate that "knowledge management is primarily the business of those who actually make the dough – the practitioners" (p. 1). The model suggests to managers the need to view knowledge management in an organisational context. Wenger points to the importance of integrating knowledge management in business processes and cultures saying, enablers such as technology, sharing knowledge and databases, "do not *do* knowledge management" (p. 1). The model depicts activities that are important to developing intellectual capital such as sharing, learning, performance and practices, and associates them with strategy. It also indicates that the process is an iterative one.

Figure 2.8 The Doughnut Model of Knowledge Management



Source: Wenger, E. (2004), Fig. 1, p. 2

What emerges from an examination of these intellectual capital and knowledge management models is that they give little specific or even general guidance about what to consider when developing a process for managing intellectual capital. However, there are useful lessons to be gleaned from the various approaches that have been taken.

The AP*i*ON model presented by Peppard and Rylander (2001) is made up of definitional elements. It produces no immediately visible direction or examples on which to base a management approach, beyond structural, physical, monetary and human capital. This makes it necessary to understand the construction and content of the various elements before embarking on the intellectual capital management process. Although Harrison and Sullivan (2000) point to the company vision as a

starting point, and take account of strategies, the conceptual approach around value creation and extraction leaves management without any guidance about what to consider and take into account when developing the management process. The model suggested by Klaila and Hall (2000) provides steps to be followed when developing a process to supply information about an organisation's intellectual capital. It does not take into account the other aspects of the business, such as the people aspect or its external activities. Nor does the model take into consideration the wider perspective of integrating intellectual capital into the organisation's strategy. Beyond suggesting a process for identifying valuable intellectual capital it does not offer wider guidance on managing intellectual capital.

The model of Harrison and Sullivan (2000) does point to the need for a corporate perspective when viewing intellectual capital, thus indicating its critical contribution when planning strategy. The Klaila and Hall (2000) model also illustrates the importance of intellectual capital to strategy planning, and in doing so provides a process to be followed that will identify intellectual capital of value to the organisation. Both models reveal the importance of positioning intellectual capital at corporate level, thus acknowledging its value, and emphasising that a holistic approach should be taken to its management.

These and other knowledge management models provide some guidance to an organisation looking to manage its intellectual capital. However, the models, taken individually, do not present sufficient information to cover the spectrum of activity that must be considered when addressing the management of intellectual capital. The model provided by Firestone and McElroy (2003) offers a useful list of outcomes that can act as a guide for areas to be addressed. It does not include any reference to innovations, the outcomes of which generate wealth, or specifically to human capital as a contributor of knowledge. However, the human contribution is acknowledged through reference to epistemic behaviours, illustrated at each level of the model. Carneiro's (2000) model suggests a wider perspective, by taking into account the people aspect, innovation, and the need to be aware of the external environment. Wenger's (2004) doughnut approach highlights strategy, but takes a broad perspective on areas to be addressed. No specific reference is made to the people contribution, nor does it make any reference to external associations. It is a simple model providing management with limited guidance. The models of Carnerio (2000), Harrison and Sullivan (2000), Klaila and Hall (2000), and Wenger (2004) indicate a link between the knowledge embedded in the organisation's intellectual capital and its strategy. Although these models are focused at the

operational level rather than at the corporate level, they do provide direction to areas that should be addressed when looking to manage intellectual capital.

2.5 An Intellectual Capital Management Model

From the intellectual capital and knowledge management models discussed in section 2.5, a consolidated model, which provides a foundation for the management of intellectual capital, is presented in Figure 2.9. The fundamental reason for managing intellectual capital is to increase the potential to generate wealth and create value. Through actively managing intellectual capital, organisational expectations are that innovations will emerge that will produce intellectual property. In this event, wealth is generated from the return on investment from successful innovations and income from the licensing of intellectual property to other organisations.

An organisation's vision is critically important. The vision is the conceptual view of how the founder, or, as organisations evolve over a long period of time, the current chief executive, determines its purpose and the direction it will take to achieve its purpose. The vision will include the need for an organisation to generate wealth and create value. This is true for both profit and not-for-profit organisations. In the case of the latter it is particularly apposite because generating wealth enables not-for-profit organisations to operate more effectively within their area of social or cultural responsibility. The ability to generate wealth and enhance the creation of value is, therefore, critical for every organisation (Firestone and McElroy, 2003; Marr *et al*. 2004). The Harrison and Sullivan (2000) model links the corporate vision to value creation and value extraction. A central point of the Balanced Scorecard (Kaplan and Norton, 1996) is vision and strategy, thus recognising the importance of an organisation's vision, and the need to have in place a strategy to provide the direction to achieve the vision's aims.

Strategy identifies the activities to be undertaken to achieve the corporate vision (Teece, 1998; Thompson, 2001). A critical element of strategy planning is to fully understand the extent and availability of an organisation's resources, and in particular its intellectual capital, thus creating an important connection between intellectual capital and strategy. The models of Carnerio (2000), Harrison and Sullivan (2000), Klaila and Hall (2000), Firestone and McElroy (2003), and Wenger (2004), all include strategy.

To achieve an organisation's vision, and to provide input for the development of its strategy, the components of intellectual capital requiring to be managed are human capital, internal capital, and external capital. Innovations that create wealth are the expected outcomes of managing intellectual capital. Therefore, through the management of human capital it is important to develop an environment of knowledge sharing and knowledge creation that encourages ideas to flow, and innovations to emerge (Bhatt, 2002; Kanter, 1996; OECD, 1996; Priess, 1999). Learning opportunities through ongoing education and training programmes to increase knowledge and competency of employees is an essential part of the management of human capital process (Senge, 1990; Stewart, 1997). To compete effectively in a marketplace that is becoming increasingly competitive it is essential to have in place a programme of continuous improvement of employee competencies. Carnerio's (2000) model points to personal development, and the importance of innovation, with the Firestone and McElroy (2003) model, and that of Wenger's model including learning. Wenger's (2004) model also identifies the sharing of knowledge.

Managing the internal capital of the organisation inevitably incorporates a number of areas that need to be considered. Organisational capability is critical and it is something that cannot be readily replicated because each organisation's capability is unique (Allee, 1997; Prahalad and Hamel, 1990; Spender, 1999). An organisation's structure impacts on how effectively it will operate. How systems and processes are managed determines efficiency and effectiveness. From the intellectual capital perspective, the process of mapping knowledge (Davidson and Voss, 2002; Heng, 2001; Stewart, 1997) is essential for finding knowledge of potential value for the organisation. Firestone and McElroy's (2003) model includes structure referring to it as "organizational models". Although the terminology may vary, Firestone and McElroy (2003), Klaila and Hall (2000), and Wenger (2004) include systems and processes in their models.

Identifying the level of organisational performance is an essential activity for effective management of resources. Approaches to metrics when relating to intellectual capital pose difficulties that have not been completely resolved. However, a number of authors indicate the importance of implementing a system that enables an organisation to measure its intellectual capital (Bontis, 2004; Guthrie, 2001; Hatten and Rosenthal, 2001; Martin, 2004; Sveiby, 1997). The only model specifically mentioning performance, and by implication the need for a method for measuring it, is

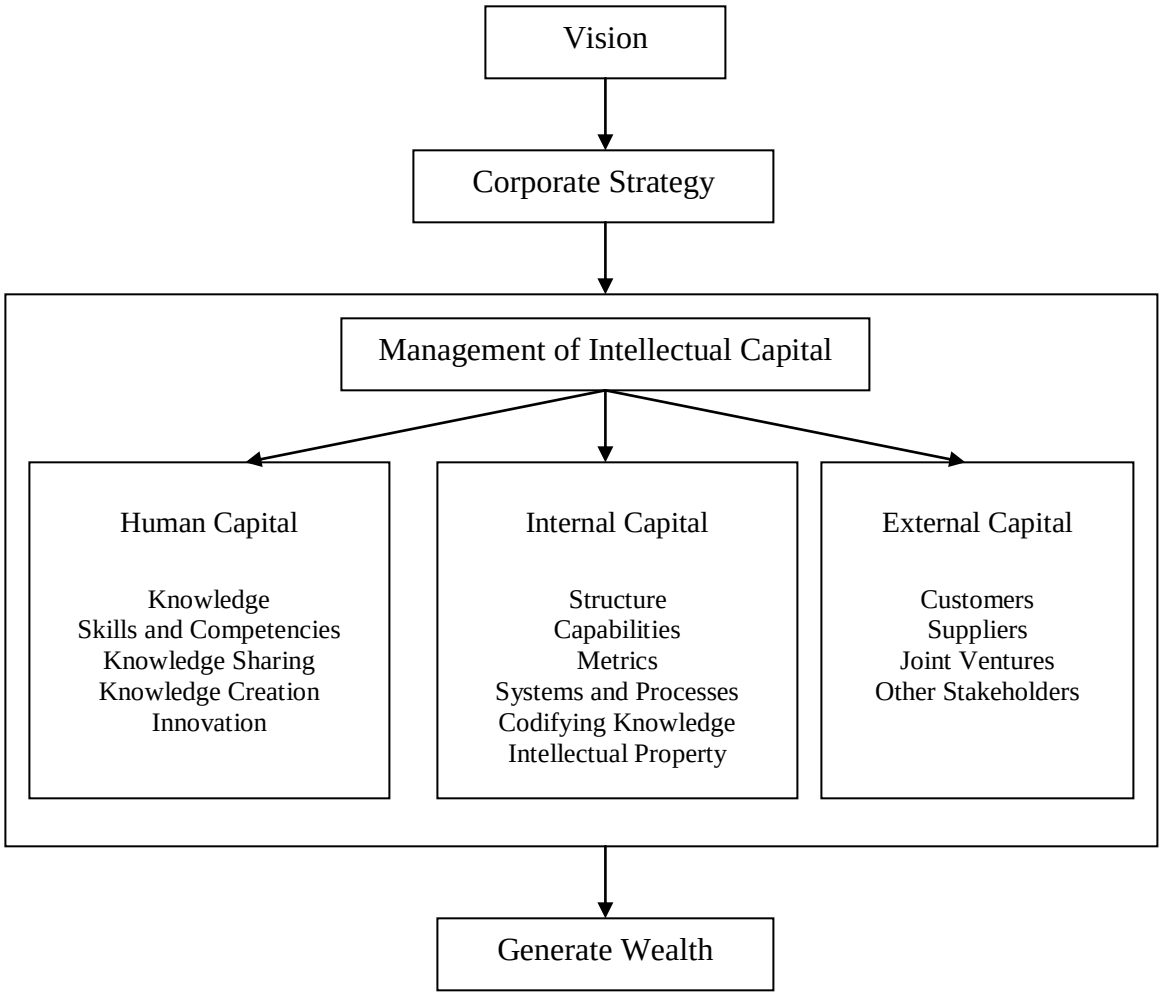
the one presented by Wenger (2004). The Firestone and McElroy (2003) model includes business processes and it is likely that metrics will be part of those processes.

When innovations are developed it is important for them to be protected through patents, trademarks, trade secrets, and copyright (Davis and Harrison, 2001; Narayanan, 2000; Rivette and Kline, 2000). Organisations have a responsibility to manage their intellectual property not only for protection against infringement, but also to maximise the value to be gained from it through royalties by, for example, licensing production elsewhere. Although Harrison and Sullivan (2000) refer to intellectual asset management strategies in their model, they do not specifically identify intellectual property.

The third component, external capital, considers the contribution to an organisation's intellectual capital of its relationships with external parties. Good customer relationships are critical to the success of an organisation (Perez Bustamante, 1999; Saint-Onge, 1999; Stewart, 1997). Networking through interacting with other organisations is identified as important by Kanter (1996), OECD (1996), and Teece (1998). It is also important to take cognisance of other stakeholders in the community. Organisations are also looking to enter partnerships or joint ventures with other organisations (Darroch and McNaughton (2002), and in doing so provide the opportunity to share knowledge that will be mutually beneficial. None of the models include any reference to external capital.

The Intellectual Capital Management Model illustrated in figure 2.9 takes a holistic perspective. It leads with the organisation's vision, identifies the need for a corporate strategy and links strategy to the management of intellectual capital. Within the intellectual capital management framework are the areas, human capital, internal capital and external capital. These areas require to be managed to provide a comprehensive view of the intellectual capital available for developing the direction of the corporate strategy that will lead to the vision of wealth generation.

Figure 2.9 Intellectual Capital Management Model



2.6 Chapter Summary

Strategy provides direction for an organisation to achieve its objectives. The difficulties associated with the ability to replicate intellectual capital, make it an organisation's most important asset. Intellectual capital has a major impact on the development of an organisation's strategy for the reason that it will reflect the organisation's positioning in the competitive market. Intellectual capital is also a determinant of the value and growth of an organisation.

The nature of intellectual capital as an intangible asset has prompted interest in developing ways of measuring it. Although many approaches to this practice have been put forward, there are still difficulties associated with identifying a satisfactory method of measurement.

Management of intellectual capital was explored, and issues such as the contribution of knowledge, and the skills and expertise of staff were discussed. The importance of creating and sharing knowledge was linked to the level of innovation taking place in an organisation. It was emphasised that it is through its innovation that an organisation is able to maintain its competitive position and sustainability in a changing economic environment.

From an examination of the literature, and of models developed by various authors, a model for the management of intellectual capital was derived. The derived model will provide a basis on which to align the approach taken by a New Zealand organisation to the management of its intellectual capital.

Chapter 3: Research Design

3.0 Introduction

With a growing interest in the use of intangible assets to grow businesses, the purpose of this study is to explore the management of intellectual capital. This research discovers how the intellectual capital of a major organisation is managed, what issues are involved, and whether recognition is given to the importance of intellectual capital within the scope of the Intellectual Capital Management Model. The extent to which knowledge sharing, innovation and metrics for intangibles are present are areas addressed in the questions to participants.

Intellectual capital has come to the attention of organisations through the writings of a number of authors during the 1990s (e.g., Amidon, 1997; Brooking, 1996; Stewart, 1997; Sveiby, 1997). Those authors pointed to the importance of managing intellectual capital to maximise the potential of the intangible assets in an organisation, thus sparking interest in an area that previously had received negligible attention. The message is that to effectively gain from their intellectual capital, organisations need to manage it. The research question in this thesis identifies whether the research findings from an examination of intellectual capital management in a large New Zealand company align with the model developed from the literature. A series of questions drawn from the literature and linked to the research question are designed to elicit information to determine the extent to which alignment occurs. Questions will be put to senior management (Appendix I) of the organisation concerned (Carter Holt Harvey Ltd) focusing on areas related to the management of intellectual capital. Questions will be put to employees (Appendix II) to determine the extent of knowledge sharing and innovation in the company.

This chapter explains how the research question was fully developed for data collection, provides the rationale for the method of inquiry, explains the data collection process, discusses how the data analysis was carried out, and describes instrument design and protocols. Finally, the process followed for the selection of the organisation in which the research will be undertaken is identified.

3.1 Research Question

The central question examined in this study is "How does the approach taken by an organisation in New Zealand to manage intellectual capital align with the characteristics of the Intellectual Capital Management Model?"

3.2 Identifying the Research Method

When undertaking research it is necessary to determine the method of enquiry that is appropriate to the question. Quantitative research and qualitative research, alternatively viewed as the positivist and interpretivist approaches, or a mixture of quantitative and qualitative methods of inquiry, are particularly apt for research in the area of social sciences (Creswell, 2003). The positivist approach is based on the traditional scientific method and seeks to prove hypotheses and test theories in situations where absolute truth, or a form of it can be seen to exist. Research questions are closed-ended. There is no direct contact with research participants, thus signalling an unbiased approach. Surveys are frequently used in quantitative research and questionnaires are the means through which data are collected. Using a statistical approach, the focus is on measuring and analysing relationships amongst constants and variables. Results are expressed in mathematical terms.

Qualitative research can be conducted using a variety of methods, for example, narrative research, grounded theory, and case studies (Creswell, 2003). In qualitative research, a verbal approach as opposed to a mathematical one is used. Important variables are identified and interactions with constants illustrated. Inquiry is usually undertaken on the site of the participants, examining the context in which participants are situated. The process is participative and questions are open-ended. Quantitative research is interpretative and emergent with assumptions based on the perceptions of participants rather than seeking to test something. This is frequently comprised of an interpretivist approach, where the aim is to provide a sense of understanding of a situation and to document social reality.

Qualitative inquiry enables social phenomena to be viewed holistically (Lincoln and Guba, 1985; Patton, 1990; Cohen and Manion, 1994; Yin, 1994; Creswell, 2003; Janesick, 2003). Commenting

on the holistic nature of qualitative design Janesick (2003) states that it does not go out to prove something or to control people. Rather it views relationships within systems, and is "concerned with the personal, face-to-face, and immediate" (p. 57). The human informant is an effective means through which to gather data and to view it holistically, and in context (Janesick, 2003). One virtue of having a human informant is that any interaction between researcher and subject occurring is likely to be unpredictable. However, the real value of qualitative data is that it is detailed, offers thick descriptions, provides in-depth inquiry, and gives the opportunity to elicit direct quotations that capture personal experiences and perceptions (Patton, 1990). As a result, qualitative analysis is particularly suitable for undertaking research in socially oriented environments.

Using the quantitative approach to explore a new area such as intellectual capital may be restrictive in the sense that questions put to participants are predetermined and could fail to reveal views and experiences that can arise from qualitative research. Quantitative research is number-based and answers "what-type" questions without giving the researcher the reasoning behind the response. Qualitative research is word-based and answers "how" and "why-type" questions, thus providing the researcher with explanations and a rationale for the responses of the subjects. The flexibility of qualitative research, for example employing interviews and case studies, affords the opportunity to gain insight into the thinking of the participants, and as such is more suitable for exploratory research into an emerging area of interest. It is for this reason that the qualitative method of inquiry was chosen for this study. One of the most effective elements of the qualitative approach is the case study.

3.3 Case Study Approach

The justification for a case study lies in this definition: "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident." (Yin, 1994, p. 13). Inquiry through a case study reveals what is happening in the real life situation, and provides researchers with the opportunity to visibly explore what is actually taking place in an identified environment. When endeavouring to undertake inquiry into a real situation, Tsoukas (1989) regards case studies as being "the most representative of these research designs" (p. 551).

The appropriateness of the case study, the research methodology undertaken for this thesis, is highlighted by Patton (1990) who points to the need for "Studying real world situations as they unfold naturally" (p. 40), also emphasising the importance and value of looking at everyday life and ordinary events in their natural settings. The value of case study methodology as an appropriate approach for examining contemporary issues in real life situations is promoted by a number of authors (e.g. Lincoln and Guba, 1985; Miles and Huberman, 1994; Cohen and Manion, 1994; Yin, 1994; Stake, 2003; Denzin and Lincoln, 2003; Gubrium and Holstein, 2003). In this research, a case study can provide a high level of understanding of the views of those in industry on issues surrounding intellectual capital, and implications for managers can best be revealed through taking a case study approach.

Gummesson (1991), citing Yin (1984), refers to the ability to distinguish "between three types of case study research: exploratory, descriptive, and explanatory" (p. 75). The case study method is valuable when undertaking explanatory or exploratory research, and it provides an examination of what is occurring because the case study provides a perspective on what is a likely future scenario (Gummesson, 1991). For researchers interested in organisational-related topics, case studies are particularly useful for exploratory research. It is also pointed out by Gummesson that from such studies questions and testable hypotheses can be formulated for the undertaking of further research. He acknowledges the views of Kjellen and Soderman (1980), who regard case research as an opening for generating theory, and a means through which change can be initiated. Gummesson's view is supported by Stake (1995), when he refers to the apparent tendency for researchers of business topics to use the case study method. Two principal uses of the case study method are suggested by Stake. They are the ability to "obtain the descriptions and interpretations of others" and use of the interview as "the main road to multiple realities" (p. 64).

Yin (1994) states that the case study method it is not "soft" but is remarkably hard, saying, "Paradoxically, the softer a research strategy, the harder it is to do" (p. 16). He goes on to say, "The purpose of a case report is not to represent the world, but to represent the case" (p. 156). A further view is provided by Stake (2003) who states that the "case study is defined by interest in individual cases, not by the methods of inquiry used" (p. 134).

With case studies widely linked to the undertaking of qualitative research, a key question for consideration is the number of cases to be considered when undertaking case study research. Eisenhardt (1989) promotes the importance of case studies and although favouring the use of

multiple cases (up to 10), acknowledges Yin's (1984) observation that numerous levels of analysis can emerge from a single case. Challenging Eisenhardt's view regarding multiple cases, Gibb and Wilkins (1991) claim that in most instances, researchers use only one case. Eisenhardt, they say, "seems to lose the essence of case study research" when suggesting that the more cases studied the better it will be for generating theory. In their view "the careful study of a single case leads the researcher to see the new theoretical relationships and question old ones" (p. 614). The number of cases should be linked to the aim of the study, and one case is adequate if it meets the objectives (Hamel, Dufour and Fortin, 1993). Walsham (1993) and Yin (1994) are supportive of the single case saying that it may be exploratory, or a pilot case prior to undertaking a longer or more detailed study. Yin (1994) points to a single case being "analogous to a single experiment" (p. 38) and that it can "help refocus future investigations" (p. 39). Gillham (2000) states: "single cases can carry a powerful argument" (p. 101) and that a contextual example can be an organisation at a cross roads in its operational structure.

A single case can be justified when it is indicative of what is happening in the area of enquiry. One case explored in considerable depth can often reveal more about a topic or research question than multiple cases with less depth. Although the study of additional cases may add to the findings by confirming what is happening in other organisations, most researchers tend to adopt a single case (Gibb and Wilkins, 1991). When multiple cases have been employed it may be possible that a point can be reached where any further data gained will turn out to be repetitive. The number of cases relies on the discretion of the researcher in determining the amount of new information likely to emerge by increasing the number of cases researched. In this thesis, a single case was deemed to be appropriate, not least owing to the fact that the diverse profile of the organisation concerned resulted in nine different case studies in de facto terms.

In intellectual capital research a number of authors undertake their research using the case study method. In doing so they examine the issues in order to understand what is occurring at grass roots level before formulating theoretical models. The method demonstrates the importance to interview and observe what is happening in an every day context (Gummesson, 1991). To reiterate, when developing theories it is critical to understand what is occurring in the real situation and case studies are a means for doing this.

Well-known and frequently referenced cases used in the discussion of the development and management of intellectual capital in organisations are those of Skandia (Sveiby, 1997), Dow

Chemical (Stewart, 1997), and 3-M (Brand, 1998). Revelation of what is taking place in these organisations served as a foundation for the interest in research into the development of intellectual capital in the work of a number of authors (e.g. Skyrme and Amidon, 1997; Allee, 2000; Harrison and Sullivan, 2000; Bollinger and Smith, 2001). From an examination of research methods for inquiry into intellectual capital, there is a consensus that a greater amount of empirical research should be undertaken (Marr and Chatzkel, 2004). The case study in this thesis provides a framework to examine the management of intellectual capital in the context of a real situation.

The indicators are that the selection of one organisation in which to undertake case study research is apposite. For this research, the organisation selected is one that is large by New Zealand standards, and offered the opportunity to undertake research into its various business units in order to obtain a balance of views.

3.4 Data Collection Methods

In this study, two methods of data collection were employed – interviews with both senior management and employees, and a questionnaire to those employees who were not involved in the interviews. Nine senior managers of selected business areas were interviewed to discuss the management of intellectual capital. Eighteen employees were interviewed to gain an insight into their perspectives about knowledge sharing. To obtain a wider sample of employee views, 70 questionnaires, using the same questions as those asked in the employee interviews, were distributed to other employees in the selected business areas.

Interviews based on well crafted and, where appropriate, open-ended questions can serve as a critical source of evidence. It is important for the interviewer to be able to evaluate the responses during the interview, particularly to seek opportunities for further explanation. Key participants are often critical to the success of a case, as they not only provide the case investigator with insights into a matter, but can also suggest sources of corroboratory evidence and initiate access to these sources (Yin, 1994). The use of the questionnaire for non-interviewed staff was an efficient way to expand the scope of the research. It gave a level of anonymity not available to participants in the interviews and provided questionnaire participants the opportunity to freely express their views. Questions for the interview and questionnaire were drawn from the literature (see Table 3.1) and designed to encourage interviewees to talk about the various issues put to them.

Prior to commencing each interview, an Information Sheet providing details of the research and identifying the interviewer as a doctoral student at Massey University were given to each interviewee (Appendices III and IV). The Information Sheet also covered the issue of confidentiality of responses by participants. Agreement to interviewing taking place and the recording of the interview required a Consent Form (Appendix V) to be signed by each participant before commencement of the interview. To preserve confidentiality, participants are identified by a code when reporting the results. Issues relating to data security and access were addressed prior to commencement of the interview, and in accordance with the relevant Massey University policies. All interviews were tape recorded and transcribed by the researcher.

The research was undertaken in three parts:

Part I – interviews with senior management. To answer the central question relating to how intellectual capital was managed, 14 questions were asked of nine senior managers. The list of questions prepared for the interviews (Appendix I) acted as a guide for the interviewer to ensure that all points of the research were covered. The senior management interviews commenced with a structured question relating to the components of intellectual capital, with subsequent questions presented in an unstructured manner. This method is conducive to inviting and encouraging discussion, and provided the interviewer with the opportunity to explore issues as they emerged. The time allocated to each interview was approximately one hour.

Part 2 – interviews with 18 employees from various business areas. The time scheduled for each interview was 20 minutes, with questions that focused on knowledge sharing. The intention was to select two participants from most business areas, but where an area was too small to make a viable selection, additional participants were selected from larger business areas. Participants were selected in the following manner. Employees from the business areas having surnames starting with, or closest to, the letters 'H' and 'S' in the alphabet were selected. When more than one person's name matched the criteria, the first person in alphabetical order was selected.

The limitations of interviews as a source of data include the likelihood of an element of bias occurring as a result of subtle changes in the way in which questions are posed, and also in responses between interviewer and interviewee. Such events can affect results and it is important that researchers endeavour to mitigate the situation (Bordens and Abbott, 1991). To lessen the likelihood of bias, the researcher sought to ensure questions and reasons for them were fully

understood. In order to avoid misinterpretation of reactions to questions and the responses given, clarification of the views of the respondents was sought when appropriate.

Part 3 – survey of 70 employees, asking the same questions used in the employee interviews. The purpose was to gain a wider but less in-depth perspective on employee views. Participation in the survey was through self-selection on the basis of interest and willingness to participate in the research. The personal assistants to senior management in the various business areas were given the surveys. They notified employees of the survey and its purpose, and invited participants to take part. There was a risk of some bias occurring in the responses by self-selecting participants, in that their approach to responding to the questions may have been directed towards a positive or negative perspective. For the researcher, the responses from self-selecting participants provided the opportunity for opinions to be given in an anonymous situation. While the researcher must take cognisance of the possibility of bias, the responses have the potential to provide material that in other circumstances might not have come to light.

An Information Sheet (Appendix IV) identifying the researcher as a doctoral student at Massey University was attached to the 70 questionnaires for distribution to survey participants. An envelope addressed to the researcher was provided. Completed surveys were returned in sealed envelopes to the personal assistants who passed them to the researcher.

3.5 Instrument Design and Protocols

From an examination of the literature, a number of points arose that provided the opportunity for an investigation into how an organisation in New Zealand was managing its intellectual capital. Questions were developed and collated to form those to be asked of the participants in the research. Table 3.1 provides a list of the questions and their link to the literature.

Table 3.1 Summary of Questions to Research Participants

Questions to Senior Management	Link to Literature
1 Which of the following equations identifies intellectual capital? (Examples in handout)	Chapter 1, Brooking (1996), Stewart (1997), Sveiby (1997).
2 Where would you say the value of the company resides?	Chapter 1, Penrose (1963), Sullivan (1999), Carroll and Tansey (2000), Clarke and Rollo (2001), Lev (1997).
3 What processes have been followed to	Chapter 1, Penrose (1963), Sullivan (1999), Carroll

identify where the value is?	and Tansey (2000), Clarke and Rollo (2001), Guthrie (2001).
4 How does the company manage intellectual capital, i.e., is there a strategy in place to manage intellectual capital?	Chapter 2, Collis and Montgomery (1995), Sullivan (1999), Klaila and Hall (2000), Bollinger and Smith (2001), Riahi-Belkaoui (2003).
5 Do you think that through the management of intellectual capital an organisation can become more innovative?	Chapter 2, Quinn (1985), Brand (1998), Rastogi (2003).
6 What internal and external networks are used to acquire knowledge that will benefit and add value to the company?	Chapter 2, Brown and Duguid (1991), OECD (1996), Lester (2001).
7 How do employees increase their knowledge?	Chapter 2, Senge, 1990, Brown and Duguid (1991), Drucker (1994), Bender and Fish (2000).
8 What are your views on offering incentives to share knowledge?	Chapter 2, Davenport and Prusak (1998), Wenger and Snyder (2000), Kankanhalli *et al*. (2002).
9 To what extent is knowledge codified in the organisation, and what systems are in place to allow for the flow of knowledge?	Chapter 2, Wiig (1997), Wiig (1999), Snowden (2003).
10 What methods are in place for measuring intellectual capital?	Chapter 2, Kaplan and Norton (1992), Sveiby (1997), Marr (2003), Bontis (2004), Martin (2004).
11 How does the company plan to create knowledge for the development and growth of intellectual capital?	Drucker (1994), Inkpen and Dinur (1998), Bender and Fish (2000), Clarke and Rollo (2001).
12 The goal of CHH is to become more innovative. Do you think the dividing up of the organisation into smaller companies has created a more innovative environment?	Chapter 2, Quinn (1985), Kanter (1996), Ireland *et al*. (2001).
13 Have new products/processes increased as a result of ideas promoted by staff?	Chapter 2, Carnerio (2000), Kluge *et al*. (2001).
14 How is the intellectual property of the company managed?	Chapter 2, Teece (1998), Rivette and Kline (2000), Davis and Harrison (2001).
Questions to Employees	
1 What are your views on the dividing up of CHH into numerous companies?	Chapter 2, Kanter (1996), Ireland *et al*. (2001), Tidd *et al*. (2001).
2 What challenges do you face working in an innovative environment?	Chapter 2, Kanter (1996).
3 How do you increase your own knowledge?	Chapter 2, Senge (1990), Drucker (1994), Spender (1999), Brown and Duguid (2000).
4 What difficulties do you think arise through expecting people to share their knowledge?	Chapter 2, Nonaka (1991), Clarke and Rollo (2001).
5 Where does the most effective exchange of knowledge take place?	Chapter 2, Brown and Duguid (1991), Allee (1997).
6 Should incentives be offered to encourage the sharing of knowledge?	Chapter 2, Wenger and Snyder (2000), Gamble and Blackwell (2001).
7 How do you go about obtaining knowledge when you require it?	Chapter 2, Brown and Duguid (1991), OECD (1996), Lester (2001).

8 What is your job title?	
9 What is your highest educational qualification?	

3.6 Data Analysis

After the interviews, the researcher transcribed the recorded interviews. An iterative reading process was then undertaken, with the first reading of the interview transcripts providing a general overall perspective of issues of interest and emergent themes. This approach enabled the researcher to reflect on the views of the respondents. Using the Intellectual Capital Management Model (Figure 2.9) each characteristic in the model was given a code. Responses were coded to relate to the characteristics of the Model and to sub-themes. With management issues affecting all areas of business, it was deemed likely that responses would frequently cross-reference to various characteristics in the Model. Transcribing and analysis of the data from employees followed a similar format to that for senior management. Composition of the questions in the survey was such that participant responses were expected to be in sentence format, and would follow the pattern carried out for analysis of the responses of the interviewed employees. Where employee responses (interview and survey) were relevant to the various components in the model, they were cross-referenced to the appropriate component.

3.7 Design of the Instruments

The interview questions were designed to encourage interviewees to talk about the various issues put to them. A list of questions was prepared for the interviews with senior management and employees as a guide for the interviewer to ensure that all the areas the researcher wished to explore were covered. The list also ensured that all interviewees were asked the same questions and in the same order. Bordens and Abbott (1991) advise that interviewers can utilise both structured and unstructured approaches by commencing with structured questions and moving to unstructured ones. This approach was adopted and was found to be conducive to inviting and encouraging discussion, thus providing the interviewer with the opportunity to explore issues as they emerged.

The method employed for questioning employees during the interview was similar to that taken for the senior managers. Questions to staff principally related to issues associated with knowledge sharing and the interviews lasted for about 20 minutes. The same questions put to interviewed

employees were used for the 70 staff being surveyed. Sufficient space was given on the survey document to enable respondents to express their views.

All interviews were tape recorded and transcribed by the researcher.

3.8 Identifying the Case to be Studied

Selecting the case to be studied began by reading the 2000 and 2001 annual reports of 38 large organisations in New Zealand. The reasoning behind this approach was to determine whether in these reports intellectual capital was acknowledged as having, or adding value to the organisation. Recognition of intellectual capital value could be presented in specific terms or in more general discussion, by referring to the work of the organisation and/or by acknowledgement of the value of the people who work for the company. The reports typically provided a letter by the Chairman of the Board and/or Chief Executive Officer of the organisation, followed by a presentation of the annual accounts.

The Annual Report 2000 for Carter Holt Harvey Ltd stood out by virtue of the amount of information about the organisation and its people. The Annual Report had 78 pages, 40 of which were about the organisation and its people. In the letter from the Chairman and Chief Executive Officer they wrote, "Our intangible assets, such as our people and their knowledge, have the potential to create more value … Innovation requires us to think differently about our business … Our aim is to develop leaders who think innovatively and strategically" (Whineray and Liddell, 2000, p. 4). Frequently appearing throughout the report are the words, "intangible assets", "intangible skills", "knowledge", "talent", "innovation", "technology", "creating value", and "know-how", along with numerous photographs of the people working for the organisation.

An investigation was then made of the 1999 and 2001 Annual Reports of Carter Holt Harvey Ltd. Once again the letters by the Chairman and CEO emphasised the importance of people for their experience and knowledge. The 1999 report states: "the strength of Carter Holt Harvey lies as much in our people and their capabilities as in our physical assets" (Whineray and Liddell, 1999, p. 5). On page 17 of the 1999 report it was stated that, "The goal is to use our technical knowledge and production capability to make our customers more competitive in their markets. The more we become part of their success, the less dependent we will be on pricing alone to build volumes". This comment aligns with the thinking of Amidon (1997) when referring to organisations that have

reached what she terms fifth-generation business stage in that they recognise the importance of the success of their customers, and their customers' customers.

The 2001 Annual Report continued the trend of focusing on innovation, knowledge, experience, leadership, and technology. However, in the 2001 report an interesting development emerged. A new structure was introduced "that will encourage more innovation and enable our best people to apply their leadership skills by running their own businesses" (Whineray and Liddell, 2001, p. 3). A decision had been made to redesign six business groups into 33 smaller business units. The business units were registered as separate companies within the Carter Holt Harvey Ltd organisation. The purpose was that, "Smaller operations also have the edge in terms of responding quickly to market opportunities, understanding their customers and having an entrepreneurial outlook" (Whineray and Liddell, 2001, June, p. 5). According to Kanter (1996), breaking down an organisation into smaller business units allows for greater interaction, flow of knowledge and flexibility, and is the way that organisations wanting to become more innovative are moving. Kanter identifies Hewlett-Packard as an example of an organisation that follows this practice.

Interest generated as a result of the 1999-2001 Annual Reports of Carter Holt Harvey Ltd led the researcher to contact Carter Holt Harvey Ltd to request permission to undertake field research to investigate the management of intellectual capital. An approach to the Chief Executive Officer, Mr Chris Liddell, led to permission being granted to carry out the research and a senior member of staff was appointed to liaise with the researcher. Selection of the business units was made after considerable discussion, and at the request of the researcher for a mix of 'old' and 'new' business units.

Nine business units were identified to participate in the research – six in New Zealand and three in Australia. The business units in New Zealand were three established business units divided up in the restructuring and three completely new business units. Of the three business units in Australia, one business unit was the result of the division of a larger one, the second had a joint-venture association with a European organisation, and the third was a newly established business unit. All three Australian business units were sited in Melbourne. The sizes of the business units varied considerably with the new ones inevitably having fewer staff. The title of Chief Executive Officer was applied only to the person leading the corporate organisation of Carter Holt Harvey Ltd, Mr Chris Liddell. Those heading up the business units had the title Chief Executive. Information about the business units visited during the period of the research in 2002-2003 was taken from the various

Annual Reports and the organisation's or business units' Websites. The business units in which the research was carried out are as follows:

1. **Ecopine, Auckland (staff 1,253)**

   The focus of Ecopine was on producing high quality timber and plywood products, primarily for the New Zealand, North American, and Asian markets.

2. **Experko, Melbourne (staff 251)**

   This business unit was the leading supplier of disposable hygiene products to the away-from-home and tableware markets, under the Deeko and Hygenex brands.

3. **Fibre-Gen, Auckland (staff 13)**

   This business unit specialized in developing new fibre-based building materials, and also provided technical support to the company's wood products business.

4. **Forest Genetics, Rotorua (staff 17)**

   Forest Genetics was in the tree nursery business to commercialise the company's investment in Pinus radiata genetics and biotechnology, and aimed to be the leader in Australasia's softwood forestry tree stock business.

5. **Global Licensing and Innovation, Melbourne (staff 3)**

   This business unit generated income by licensing value-added intellectual property to customers around the world. The company dealt in high performance technologies and innovation and aimed to secure mutually beneficial licensing agreements with other innovative technology producers.

6. **Mariner7, Auckland (staff 17)**

   Mariner7 provided human resources services to Carter Holt Harvey and to external companies, assisting in performance management, leadership development and recruiting. Mariner7 helped other companies to drive business performance through their people, using the power of the Internet. Tools were developed to align the performance of individuals to organisational objectives through personal key accountabilities and behaviour-based interviews that enabled companies to select the best candidates.

7. **New Ventures, Auckland (staff 39)**

New Ventures was a corporate venture capitalist business unit specializing in generating and capturing business ideas and turning them into real businesses. New Ventures also oversaw the company's i2B ideas generation programme. The i2B (Ideas to Business) was about transforming Carter Holt Harvey staff into innovators and entrepreneurs.

8. **Packaging New Zealand, Auckland (staff 1,037)**

This business unit provided corrugated cases, folding carton and multiwall paper bag packaging for a wide range of industries in New Zealand. Major end-use segments included the kiwifruit, apple, dairy, fish, meat, beverage, fast food and industrial segments.

9. **Sancella, Melbourne (staff numbers not identified)**

Sancella manufactured and marketed feminine hygiene and adult incontinence products in Australia and New Zealand. The company was in a joint-venture operation between Carter Holt Harvey and SCA, a Sweden-based company operating throughout Europe in similar markets.

In 2000, Carter Holt Harvey Ltd celebrated 100 years in business. Francis Carter, Alexander Harvey and Robert Holt, who established the business at the turn of the 20th century, were men of vision. They realised the opportunities that would open up as New Zealand established itself as a nation. The 2000 Annual Report (p. 3) describes the founders as:

> … innovative thinkers, quick to adopt new technologies and processes and to see and exploit new opportunities. Between them they created businesses that became leaders in their markets. They were hard workers, encouraging performance by example. Our founders' personal qualities of innovation, leadership and performance remain the building blocks of Carter Holt Harvey today.

By 2000, the organisation had over 15,000 employees, 29 main sites in New Zealand and 27 sites in Australia. It had developed business in Chile, and new market opportunities were opening up in India and China. Their forestry assets enabled it to develop businesses in wood products, pulp and paper, tissue and packaging. The qualities of innovation, leadership and performance sought by the founders remained strong and the organisation had a strong commitment to its employees, the environment, health and safety, and the sponsoring of partnerships in the community.

The overall picture of Carter Holt Harvey Ltd as at 21 March 2002 is given in Table 3.3 with business units examined in this research identified in italics.

Table 3.2 Carter Holt Harvey Ltd – Companies in 2002 as a Result of Restructuring

Forests	**Wood Products**	**Pulp and Paper**
Forest Resources	Pinepanels	Kinleith
Forest Fibre Solutions	Radius	Tasman
Forest Genetics	*Ecopine*	Paperboard
Woodmetrics	Futurebuild	Fullcircle
Lodestar	Woodlogic	
	Innovision	
	Interion	
	Fibre-Gen	
Tissue	**Packaging**	**Distribution**
Consumer Tissue	Packaging Australia	Carters
Experko	*Packaging New Zealand*	BJ Ball Papers
Treasures Babycare	Chile Packaging	Raleigh Paper
Fiji Tissue		
Sancella		
Emerging Businesses	**Group Services**	
Mariner7	There are 12 Service Businesses	
Global Licensing & Innovation		
New Ventures		
Oxygen		
Biogrid		

Source: 2002 Annual Report of Carter Holt Harvey

The following chapter presents the findings from the analysis of the data.

3.9 Chapter Summary

From an examination of the literature relating to business research, the case study method was identified as appropriate for this thesis. The research question asked was, "How does the approach taken by an organisation in New Zealand to manage intellectual capital align with the characteristics of an Intellectual Capital Management Model?" The literature review highlighted a number of issues surrounding the management of intellectual capital, and questions relating to these issues were incorporated into the research to provide support for the principal question.

The interview instrument included fourteen questions for senior management, designed to inform the researcher about views relating to managing intellectual capital. Nine questions were put to

employees by interview and survey including seven questions that focused principally on knowledge sharing, with two questions providing demographic information. Eighteen employees were interviewed and 70 questionnaires distributed for additional employees wishing to take part in the research.

The analysis of the data collection involved the identification of themes and sub-themes and was undertaken using a coding method to link themes with sub-themes derived from the Intellectual Capital Management Model.

The business identified for this case study was determined as a result of analysing the annual reports of 38 New Zealand organisations with interest focusing on reference being made to intellectual capital. Carter Holt Harvey Ltd was the organisation selected for the study on the basis of its focus on innovation, knowledge, and leadership.

Chapter 4: Research Findings

4.0 Introduction

This Chapter presents the findings of the research into the question, "How does the approach taken by an organisation in New Zealand to manage intellectual capital align with the characteristics of a Model for Management of Intellectual Capital?"

The Chapter begins with presentation of the results from interviews of the chief executives of the business units at Carter Holt Harvey. For the purposes of confidentiality it should be noted that the [C1] – [C9] identification of chief executives does not correspond with the order in which the companies are listed in Chapter Three. Fourteen questions in total were presented to the chief executives.

Findings from the interviews and survey of the employees will then be presented. The employees interviewed are identified as [IE1] … [IE18], and the 44 questionnaire respondents are identified as [QE1] … [QE44]. The same nine questions were put to all employees whether by interview or questionnaire.

The i2B Project (Ideas to Business) is mentioned by several respondents and background about the project will be helpful for the reader. In line with the development of an innovative culture, the i2B Project was set up by Carter Holt Harvey Ltd in 2000 to provide an avenue for staff to submit ideas that may have the potential for future development. The submission of 509 ideas in 2000 and 1,500 entries in 2001 proved the project to be of great interest. A detailed process was designed to ensure each idea was examined. A response indicating acceptance or decline and giving a reason was instigated. Because of the overwhelming number of entries in 2001, along with resource constraints, the project was terminated in 2002.

4.1 Responses by the Chief Executives Interviewed

Intellectual capital is a relatively new concept and, as illustrated in the literature, there is considerable discussion about what intellectual capital encompasses. To elicit their views and to determine their understanding of intellectual capital, the first question was divided into two parts.

Both parts related to commonly identified components of intellectual capital. Examples of what the components might include were offered.

Question 1 (a): Which of the following equations do you think identifies intellectual capital?

(i) Human capital + Structural capital = Intellectual Capital

(ii) Human capital + Internal capital + External capital = Intellectual Capital

The role of "human capital" as a separate component in (i) and (ii) was readily accepted. All respondents identified the importance of people as the prime initiators of intellectual capital and identified people as a key asset. One respondent referred to the organisation being "financially poor a few years ago but is now doing reasonably well through our people", and indicated that when employees leave the workplace there is a great loss of knowledge. Reference was made to intellectual property and intellectual capital not being on the balance sheet, but money was being made from know-how and knowledge, thus pointing to the importance of people.

For seven of the chief executives, (ii) was the preferred choice. Two chief executives were accepting of either (i) or (ii). Table 4.1 illustrates views expressed by respondents.

Table 4.1 Responses to Question 1 (a): Which of the following equations do you think identifies intellectual capital?

(i) Human capital + Structural capital = Intellectual Capital

(ii) Human capital + Internal capital + External capital = Intellectual Capital

Respondent	Comment
C5	It is easier to work through it when divided up in the way presented in equation 1(ii).
C6	Customers are intellectual capital? I can understand they would be, especially when you have partnerships with your customers. That relationship is in fact a capital. I hadn't thought of it as a capital before. This changes my interpretation and I think it adds value to developing relationships. This new thinking will link in particularly well with a project being undertaken, and you [the interviewer] have added some value to it.
C7	From my perspective I think customers are a key part of what you call intellectual capital … because of their understanding of the market place.
C8	Equation captures everything.
C9	Either 1(i) or (ii). To me customers and suppliers aren't assets you own. You definitely have control of your internal assets.

Question 1 (b): Should intellectual property be shown as a separate factor?

Eight respondents regarded the logical position of intellectual property is within the internal capital component, with one indicating it as a separate component. Views expressed are given in Table 4.2.

Table 4.2 Responses to Question 1 (b): Should intellectual property be shown as a separate factor?

Respondent	Comment
C4	Part of your internal assets.
C5	I would certainly group it there [within internal assets].
C6	As a sub-set of intellectual capital, by default it is built into internal assets.
C9	I think separately.

Question 2 Where would you say the value of the company resides?

Although not always identified in the first instance, ultimately all respondents acknowledged the central importance of people. Three respondents, while mentioning people, first indicated product, customers, physical assets, brands and processes as creating value.

One respondent referred to know-how technology and the view was promoted that the organisation had the ability to build a billion dollar asset. Alternatively the organisation could put its knowledge and know-how to use, letting someone else do the building - there was overcapacity in the industry so why build a new plant? Another respondent said with new technology people would not be required to the same degree in the future, but technology also meant people were relieved of the more repetitive tasks and available to undertake other work.

Customers, potential customers, and distributor networks were all identified as providing considerable value, with customer value being linked to the interaction with them, and the people within the business units. Two respondents pointed to the considerable value embedded in brands because of their intangible value, and that they facilitate differentiation from other companies. The same two respondents also pointed to the company having in place programmes designed to ensure the value of the business is increased through its systems, processes and its people.

Table 4.3 provides examples of responses.

Table 4.3 Responses to Question 2: Where would you say the value of the company resides?

Respondent	Comment
C1	Our product, our customers and our people. All the things that sort of drive value we have backed up with very strong people, and capability in systems to ensure that we can keep delivering value to the market.
C3	It is to do with the human asset – people.
C4	People - the value of my business is the knowledge of my employees. Very much human capital.
C5	Relationships with customers. Knowledge of the people. If we took all the people out of the business today and said, can I bring in new people with the same qualifications you would lose something in that translation.
C9	A significant proportion of value is in the brands but maintaining the value of the brands lies within the people and processes.

Question 3 What processes have been followed to identify where the value is?

Although the varied perspectives of the respondents illustrate the differing perceptions regarding where value is positioned in the business, people were identified as a key asset. Having in place sound human resource policies, procedures and employment approaches along with empowering people to take responsibility and accountability were identified as important. Rewarding people appropriately is a key element providing the foundation for a strong focus on staff development. One respondent identified that the business unit has a clear view that if people are its core asset then the investment around, and into people, is very substantive.

The importance of the training process was referred to, as was a staff development process using a matrix that provided the means through which leadership potential could be demonstrated and observed. There was a proactive approach to identifying talent and moving people into new opportunities allowing them to grow. One respondent observed that the business unit was driven by the capabilities of the people, and focused on extracting values from those capabilities. Another respondent referred to the importance of working with people to get the best out of them. This involved understanding the type of business and its structure, and filling the required roles with appropriate people.

A respondent stated that the business unit was looking at the performance of the business, and placing qualitative measures on the brand, indicating a short-term value perspective of performance

on the deliverables. One respondent pointed out that the business unit had in place robust processes covering quality and risk management.

Table 4.4 illustrates examples of the responses.

Table 4.4 Responses to Question 3: What processes have been followed to identify where the value is?

Respondent	Comment
C1	When we started, methodologies were advocated by the venture capital guys. Now we look at customers and revenue, distributor channel, and capability of our people.
C2	People are a key asset. HR policies, procedures and employment approaches. Decentralised empowering people to take responsibility and accountability.
C5	Take barriers out of the way of people so that they can be successful dealing with your profitable and non-profitable customers. Fixing systems and processes and encouraging all people to do well. Wherever there is accountability and responsibility so then you get ownership.
C7	The pressure is on to perform and deliver financially. We are looking at proven implementation.
C8	We see the value in our balance sheet in various ways. We have a number of processes in terms of our planning and the way we go through and value our current assets.

Question 4 Does the company have a strategy in place to manage intellectual capital? If so, what is it linked to, and what processes are in place to measure its success?

There was an element of uncertainty in the responses to this question. One respondent did say that a strategy for holding intellectual capital between the business unit and external research organisations was in place. Two respondents felt that perhaps there was a strategy implicitly sitting within the overall strategy for the business units. Some evidence of this can be found in another response that intellectual capital strategy would be woven into all parts of the overall strategy of the organisation. However, responses tended to move away from the discussion of strategy, indicating that a strategy for managing intellectual capital had probably never been considered.

Two respondents said that reviewing processes was necessary because the tenor of business was constantly changing, and it was important to be vigilant in order to manage what was occurring. Reference was made to constantly enhancing existing products and services as a result of identifying the real source of value, then making things happen. Three respondents focused their

attention on processes around promoting and adding value to their offerings and pointed to the importance of continuously advancing their understanding of what was required and expected.

Examples of responses are given in Table 4.5.

Table 4.5 Responses to Question 4: Does the company have a strategy in place to manage intellectual capital? If so, what is it linked to, and what processes are in place to measure its success?

Respondent	Comment
C1	Not a stated strategy per se. We have an almost unstated strategy that we will protect our intellectual property. We are now increasingly reluctant to use external people to create intellectual capital unless we have them sign basically that they are giving away their intellectual property to us and then they have no claim.
C2	I don't think we have a strategy as such. We have a cohesive, overarching strategy on intellectual property.
C8	No strategy but a number of processes. We have got to become more careful and more protective of our assets and recognising the value in the marketplace.
C9	Not a strategy specific to intellectual capital.

Question 5 Do you think that through management of intellectual capital an organisation can become more innovative? If so, can you explain how this can happen?

Overall, the respondents were in agreement that as a result of managing intellectual capital an organisation could become more innovative. However, two respondents added qualifiers relating to conditions allowing innovation. One of the respondents said that although the business unit set the outcomes or expectations, and provided the appropriate environment, support, and necessary training, ultimately it was the individual who had to take accountability and responsibility to engage in innovation. Continuing, the respondents said that it was necessary to create an environment for intangible activities to move to tangible outcomes, and to provide sufficient incentive for the behavioural change to occur. The second respondent pointed to a tendency for everyone to be quite insular, thus almost creating a silo effect. The respondents indicated that an environment to improve the situation was needed.

Comments from other respondents were varied. Reference was made to the importance of creating a strong identity for the company, by branding its name and product with a view to gaining recognition as a technology innovator. This was seen as particularly important for Carter Holt Harvey Ltd as an organisation associated with the traditional forestry industry. One respondent referred to the company as providing a good example of innovation through the processes of extracting value from the research providers, and in doing so creating further value. However, another respondent said that there was not a lot of time to think about innovation and suggested that it might be useful to have a separate structure to promote ways to bring innovation into the operating arm of the organisation. Another respondent mentioned how the situation had changed, saying that three years previously there was no discussion about innovation, and that it was not valued.

The i2B programme was referred to on several occasions and the programme had been a useful avenue eliciting ideas that could lead to new businesses. One respondent suggested that cross-pollination and fertilisation of ideas through the management process provided the means for facilitating exchange of ideas that had the potential for triggering new products. Another respondent stated that a greater return from the idea could not be realised until it was applied and leveraged in a different and unique way that made it innovative. It was pointed out by several respondents that the commercialisation aspect of innovation was vital, with an important aspect of this being to ensure there was a good return when new products were launched into the marketplace.

Response examples are given in Table 4.6.

Table 4.6 Responses to Question 5: Do you think that through management of intellectual capital an organisation can become more innovative? If so, can you explain how this can happen?

Respondent	Comments
C1	Absolutely. We are a manifestation of that. It is not always seen as intellectual capital but if you go back to how we will be valued by external parties then our distribution channel is seen of value.
C7	Yes. Exploiting to the maximum the intellectual capital to add value.
C9	Absolutely. Systems and information, and people trained how to do things makes the company a lot more innovative, or the capacity to be more innovative.

Question 6 What internal and external networks are used to acquire knowledge that will benefit and add value to the company?

Respondents pointed to networking occurring both within the corporate organisation (and among the business units) and outside organisations. Undertaking co-operative research, working alongside a complementary organisation, and developing relationships with strategic partners were mentioned. Although customers and suppliers did not receive much mention, some respondents may have included them in external networking without making specific reference to them. Respondents who mentioned networking with customers/suppliers were those whose jobs took them out to meet customers and suppliers to discuss work related issues. However, several respondents who previously were remote from customers were finding, as a result of the restructuring, they were then closer to their customers. They were realising the importance and value of getting alongside their customers, and anticipated greater networking opportunities. Other networking approaches, such as the social side of conferences, were regarded as a good approach as it was often easier to elicit useful information about what was going on in the industry.

All respondents signalled the importance of networking as providing the opportunity to hear about activities being undertaken by other organisations, as well as increasing the knowledge available to them. Table 4.7 indicates the range of ways networking was seen as a means of acquiring knowledge.

Table 4.7 Responses to Question 6: What internal and external networks are used to acquire knowledge that will benefit and add value to the company?

Respondent	Comment
C2	Consulting basis, government agencies, alliances and partnerships with customers and suppliers. Industries – identical, similar, or very different.
C4	Internal network – we participate in formal meetings, also informal communication. Externally, contracts with research providers who are effectively our suppliers, informal communication with research providers.
C5	Conferences, study tours of other people's organisations to see other ways of doing things - it is amazing what is picked up. Training opportunities – local and American, Industry Training Organisation.
C7	Word of mouth. Presenting at conferences and mingling afterwards. CRIs in NZ and Australia, industry organisations – people are proud of what they do and want to share. University contact.
C8	Magazines, visiting customers or similar type businesses we are not competing with, trade shows, industry functions, cross industries, and strategic alliances.

Question 7 How do employees increase their knowledge?

This question examined the perceptions of the chief executives about how employees increase their knowledge. For six respondents, networking featured strongly as a way in which employees could increase their knowledge, and another alluded to networking without specifically stating the connection. One respondent mentioned that a very good way of helping employees increase their knowledge was involving them in projects, and seconding them to special projects in other businesses. Networking externally was accomplished through contact with customers and suppliers. Attendance at conferences was seen as an opportunity to gain knowledge and make contacts. However, when papers were presented there was a tendency to take a fairly broad approach to avoid compromising the confidentiality and sensitivity associated with research. The range of approaches identified is listed below.

Networking	Reading magazines books	Internet/intranet,
Debate	Team meetings	Strategic planning
Projects	Conferences	Site visits
Exhibitions	Present papers	On the job training
Training	Sharing ideas	Job rotation
Seminars	Research	Interacting with people

Examples of responses are provided in Table 4.8.

Table 4.8 Responses to Question 7: How do employees increase their knowledge?

Respondent	Comment
C1	Universities and university students. We can tap into various academics to test themes and iron out problems. We bring in experts who are reputable and provide credibility to work alongside staff.
C4	Key driver through networking. We have a concept where there is 10% of time to explore new developments – in the development plan. Training. Through R&D you are learning all the time on the job.
C6	Productivity has tripled in last three years due to knowledge gained on the job – on the job learning, and training. Externally, everybody should get out and be involved in something, conference at least once a year. Self study, self-initiatives, web work.
C8	My philosophy is to share information and ensure it is distributed as widely as possible. Email, newsletter, sub-groups, e.g. on innovation, visiting speakers, meetings.

Question 8 It has been suggested there should be some form of reward for staff sharing their knowledge. What are your views?

Responses revealed that six of the chief executives were not in favour of giving rewards for sharing knowledge, two regarded the giving of rewards as having some merit, and the remaining respondent was undecided.

Reasons provided by respondents not in favour of giving rewards were mainly based on the premise that it is the responsibility of employees to share their knowledge, and that this was an expectation when people were recruited. The company paid the wages and the employee had a responsibility to contribute their expertise. A comment was made that it was through the contribution of employees that businesses were kept viable, and what they were doing was protecting their own jobs for the future.

Although rejecting the notion of giving a specific reward for sharing knowledge, several respondents acknowledged the importance of recognition when it was justified. The approach taken by one supporter of a non-monetary perspective was to send a team member to other sites telling them of the suggestions put forward by his/her team. Employees regarded recognition by their peers as being more valuable than actual payment for the suggestion.

The views of one respondent, who expressed reservations about the giving of rewards, were based on whether in the giving of rewards they would become an expectation. This said, it was acknowledged that when there was a significant contribution to the business unit this should be recognised, but in general the sharing of knowledge should be part of the job.

Respondents in favour of rewarding employees for their contributions see this as an important way to motivate people to come forward with ideas. It was also felt appropriate to reward when their contribution provided substantial benefit to the business unit. As pointed out by one respondent, people will hold on to an idea they think has value if they are not going to receive any reward.

A suggestion was made that when it came to sharing ideas, rewards could be given if it was possible that a weighting mechanism to measure their value could be put in place. However, the dilemma for respondents advocating rewards was determining how such a system should work. Measuring, and then determining what the reward should be, was fraught with difficulties, and tended to colour thinking by the respondents about the viability of such a system.

The respondent who was undecided said that while a programme for knowledge sharing would be a good investment, he was not sure that this should include rewards for sharing.

The response given by five chief executives are given in Table 4.9.

Table 4.9 Responses to Question 8: It has been suggested there should be some form of reward for staff sharing their knowledge. What are your views?

Respondent	Comment
C1	Would I put a system in to encourage people to share ideas and share knowledge? No way, because I would expect that is part of the job, and if they are not that sort of person, and they don't share knowledge, then I don't want them working for me.
C4	Sharing ideas I would not necessarily have it rewarded separately and specifically as part of the broader programme that we run now.
C5	My view is, isn't that why we pay them? Is that not the reward?
C7	I think there should be. Some businesses are nearing commercialisation. Should that be rewarded, I believe so.
C8	I do believe there is a lot of value in giving some benefits. I also believe that it is the nature of their role. You can sit on either side of the fence. If you want people to come forward with those ideas the business wants, you need to incentivise people.

Question 9 To what extent is knowledge codified, and what systems are in place to allow for the flow of knowledge across the company?

Responses reveal that the level of codification varied considerably across the business units. Several respondents mentioned information about products being captured, and this was particularly evident in business units where patenting was involved. One respondent mentioned the value of benchmarking as an opportunity to raise the standard of operation, and putting appropriate processes in place. Benchmarking would also bring in the need for greater attention to codification. It was also acknowledged that while notes were taken at some company meetings, at others this did not occur, with some loss of knowledge.

One respondent expressed concern about the lack of codified knowledge. Within the company, archived information related to brand history, but in general there was insufficient attention to codifying other aspects of the business. Reference was made to the necessity of knowing why

something did not work, and where this was recorded, so that the wheel was not reinvented. Too often when working on a project a chance encounter with another staff member revealed that the company had been down that path before and suddenly a great deal more information had become available.

Recognition was given by all interviewees for the need to codify knowledge, particularly in situations where a great deal of the knowledge was tacit, and concern was expressed over the risk of loss of knowledge for the business units when people leave.

Two respondents made reference to a document management system being used. One of the respondents indicated that the business unit had a CRM system meshed with their document management system, and also has under development a system to capture information about the performance of ideas.

Table 4.10 provides examples of responses to the question.

Table 4.10 Responses to Question 9: To what extent is knowledge codified, and what systems are in place to allow for the flow of knowledge across the company?

Respondent	Comment
C1	Any comments that are made about our product or suggestions for improvements, we capture and put into a spreadsheet. It is reviewed monthly and priorities are then scoped in terms of business case analysis to see whether we should take it forward. We use the database called E-project, which is essentially a total capture of documents, information, news clippings, etc. so it becomes essentially our corporate memory.
C3	Knowledge is codified from the point of view that it becomes a standard operation procedure. It is the way we capture a lot of the small incremental changes in the system.
C5	Our knowledge is too tacit and we want to get more of it written down. Designs and things we can register are obviously written down. There is a hell of a lot of tacit knowledge and it is a real risk to the organisation that if those people leave, then who is there coming up behind them that has similar knowledge?
C8	We try to do it. We have a number of processes like product development and marketing processes. I get passionate about capturing historical information but a lot of it gets lost. We need to know why something didn't work so that we don't reinvent the wheel. We have a lot of knowledge that is not captured effectively.

Question 10 What methods are in place for measuring intellectual capital? If you don't have any methods what indicators do you use?

There is a close association between managing and measuring, and it was regarded as relevant to put to the chief executives a question about measuring intellectual capital. Five of the business units stated they had no methods in place for measuring intellectual capital. However, four chief executives indicated they did undertake some measuring such as customer numbers, new product development and measures relating to the health of brand equity. The organisation's annual reports refer to the introduction and use of the balanced scorecard. Three chief executives referred to the balanced scorecard in their responses but did not associate its use to measuring intellectual capital.

Response examples are given in Table 4.11.

Table 4.11 Responses to Question 10: What methods are in place for measuring intellectual capital? If you don't have any methods what indicators do you use?

Respondent	Comment
C2	I am not aware we have any. We probably have somewhere in Legal a patent file, so we probably have that, but other than that I would say this its quite poor.
C3	None. Not really set up any measurements.
C4	There is no measure per se for intellectual capital. You have this balanced business plan and an innovation component, and those measures collectively as a measure of the increasing intellectual capital.
C6	None that I am aware of. Has been talked about. We do in the strategy process, we measure the value of business per se, based on NPV of future cash flow.
C8	We have a couple of formulas we use to measure brands and health of brand equity. Our scorecard has a number of key indicators around performance, innovation and leadership.
C9	On the brand side we have a lot of measures. Normal process performance management, the balanced scorecard, and that cascades down from the top, business performance at a high level down to individual performance against that criteria.

Question 11 How does the company plan to go about creating new knowledge for the development and growth of intellectual capital?

It was felt by one respondent that creating new knowledge came from moving forward in the industry, bringing in better people, growing financially and investing in people and training.

Another aligned creating new knowledge with the promotion of ideas, and said this approach had been successful to date. Brainstorming sessions were referred to by one respondent as a means of providing great opportunities for generating ideas and these sessions were held on a regular basis. Also, information sharing as part of a joint venture provided a source for creating new knowledge. This approach was working well with both parties to the venture said to be benefiting from the association.

A forum to stimulate cross-pollination of ideas was regarded by one respondent as the means for the creation of new knowledge. This business unit was involved in innovation workshops, and sessions that were bringing in positive results, and were well received by staff. It was also felt that talking with customers and exploring what they were doing that was new and different, was another useful approach. Another respondent mentioned that constantly pursuing customer needs, identifying their problems, and finding a solution, was a way of creating new knowledge. Learning from other organisations that might not necessarily be directly involved with your industry, and looking for opportunities, ideas, and intellectual stimulus to maximise those connections, were also referred to.

Table 4.12 provides a selection of responses to this question.

Table 4.12 Responses to Question 11: How does the company plan to go about creating new knowledge for the development and growth of intellectual capital?

Respondent	Comments
C1	We will create additional intellectual capital through things that are enhancing our existing products and services, or adding new products or services either through partnerships or developing them ourselves.
C2	Just keep embracing win-win philosophies, embracing the external world, keep bringing better and better people into the business. Performing financially better, invest more heavily in people, and widen the ability to train. To specifically expand the i2B programme.
C3	My target was 60 suggestions and ended up having 124 (i2B programme). We have had quite a high success rate in terms of actually getting people into that process – creating new knowledge through promoting new ideas.
C4	Providing a link – understanding what customers needs are, what their problems are, and then finding a solution. Finding the right research provider who has got the technology to provide that solution.

Question 12 The goal of CHH is to become more innovative. Do you think the dividing up of the organisation into smaller companies has created a more innovative environment? If so, how?

The immediate answer by all respondents was "yes," although reservations relating to the creation of an imbalance in wealth sharing and associated issues were expressed. There was a downside in the form of anti-competitive behaviour between businesses, but it was felt this issue could be worked through relatively quickly. It was mentioned that some of the original divisions had been broken down to a point where they were not operating effectively. Plans were underway at the time of the interviews to "rejoin" some of the business units.

Accountability featured strongly in responses. In the smaller, flatter, and more accountable units ideas that would never previously have been acknowledged were being recognised and returning rewards. Empowerment of staff was also pointed to as providing benefit and opportunity. The advantages of both accountability and empowerment, specifically from a financial perspective, were in evidence. There are better behaviours around the use of working capital and the requesting of capital. For example, projects costing around a million dollars were being undertaken for substantially less cost because people were looking more carefully at how to raise the funds rather than seeing capital as something they could just take from the big pool. What was now occurring was a more collective view of what created value and what did not. Another financial perspective was the point that money was being saved through examining innovative ways about how the business unit was run, and finding ways of getting on track by taking ownership.

Reference was made to the fact that being part of a large organisation had meant that ideas put forward were ranked according to the value they would generate, and that a smaller idea could come too far down in the pecking order and get lost. That idea might only generate say $1m in the first year but could have the potential over the succeeding years to bring in substantial income. With the dividing up of the organisation, the company with the smaller idea could now run with it and generate considerable value for the business unit.

Other points raised indicate that people had much more control, and they were now able to get closer to customers and to the market. One respondent said the benefits were considerable with an important one being that the business unit was independent and had the ability to make decisions. As a result of the dividing up of the organisation opportunities to be innovative were stronger and

people were becoming more involved in the initiatives, which in turn led to greater personal development. Further comments pointed to a greater focus on the value created by people, and that managers were looking more closely at whether people were delivering. One view indicated that when people were seeking solutions they were generated more often through the more informal structure. It was also said that poorly performing units, previously hidden within the larger organisation, were being exposed, and as a result were having to address issues not previously given much consideration in order to improve their performance.

Another respondent pointed to the restructuring as creating a real drive for success, and added that innovation comes out of successful companies. Legacy systems, processes, and history were referred to as barriers, but as a result of the restructuring those barriers were breaking up and people were beginning to react differently, and to think outside the box. It was also realised that in its previous position the organisation was somewhat archaic, taking the view that there was only one way of doing things, whereas now there was awareness that there might be several ways that things could be done. One respondent remarked that having worked under the new system, to return to a position under the previous structure it would be as a very different type of manager.

Reference was made by two respondents to the need to be more commercially focused. They felt this would lead toward more entrepreneurial thinking by those involved in the business units. Following through from innovation to commercialisation, would, it was said, bring with it the requirement for further capabilities such as marketing and sales, and the ability to ensure new product and service development. It also emerged that there was greater awareness of the importance of going to the market to find out what was available, and what was needed and wanted, rather than assuming what would be there. Innovation should lead to the generation of greater revenue.

One respondent did ponder over the thought that large organisations tended to curtail people's innovation because of the need to work from the perspective of economies of scale.

Responses to the question are given in Table 4.13.

Table 4.13 Responses to Question 12: The goal of CHH is to become more innovative. Do you think the dividing up of the organisation into smaller companies has created a more innovative environment? If so, how?

Respondent	Comments
C1	I would say yes. It allows people much more control, it allows them to get closer to their customers, and closer to the market, and it unleashes some of that entrepreneurial talent that many of us have but can't necessarily act on inside a larger corporate.
C4	I think so. Some businesses like myself that are smaller, more strategic, have a much higher innovative focus. People have to think more about business in a commercial sense. It does provide a definite entrepreneurial focus.
C5	The aim of atomisation was to create greater ownership. With ownership comes innovation and behaviours more related to how can we do a better job.
C7	Yes, I believe so. Before that we had six large companies, but there was little transparency. The way it has been split up or analysed it creates a real drive for success, and I think innovation comes out of successful companies.
C9	Yes. I think it has created an environment where the decision making is closer to the customer, and provided a framework where there is more autonomy to make decisions at a lower level than to some extent being caught up in a bureaucracy.

Question 13 Have the products/services offered by the company increased/changed as a result of ideas promoted by staff?

The response to the question was a unanimous "yes". Enthusiasm for what was occurring came through very strongly, and there was considerable support for staff and the ideas they were putting forward. Ideas were coming from all levels of the business units and also coming from customers. It was felt that this was only the beginning, and that service and products had improved and increased, with new ideas and initiatives being promoted. One respondent said a number of things had been done that were new and unique for this business. One business unit, identifying itself as being knowledge-based, had successfully sold its position as research providers to Carter Holt Harvey Ltd, and saying that the organisation was prepared to buy from it at market rates in what was a very competitive environment. The business unit felt it was being recognised as an independent unit that could compete successfully with businesses in the outside world, and this was regarded as a great step forward. Another respondent provided a good example of how a considerable improvement in the service it offered was achieved by addressing the problem of lead-time. Ideas promoted by staff resulted in reducing the time to customer from weeks to days even in the busiest season. The same business unit also indicated changes had been made to products, and new patents registered.

A number of innovative ideas put forward were directed towards processes, and they had led to considerable refinement and improvement to the many operational areas bringing considerable benefit. From ideas presented through the i2B programme, several businesses had been, or were being, considered for launching. As a result of the restructuring prospective ideas could be promoted more effectively, and taken to the commercialisation stage more quickly. It was said that where previously shared resources clouded the costs, now they were being more effectively allocated, and when losses were identified steps could be taken to turn around the negative contribution.

Responses to the question are given in Table 4.14

Table 4.14 Responses to Question 13: Have the products/services offered by the company increased/changed as a result of ideas promoted by staff?

Respondent	Comment
C1	Absolutely. It is all about staff ideas, staff changes, as well as customer changes and customer ideas.
C3	Yes. We are actually starting to get the benefits coming through reducing costs. We know where we are against our competitors and have lowered the cost curve through actual employee suggestions.
C4	I have only one level, researchers, and our products come from their ideas. We are a truly knowledge-based organisation. We have sold, on a competing basis, technologies within the organisation.
C8	I am sure there is. A number of things have been done that are new and unique for this business, things done in this business that would not have been done had the group not been split.

Question 14 How is the intellectual property of the company managed?

Intellectual property is an important outcome of innovation, and while generally regarded as being a protective mechanism it can, if managed appropriately, be a provider of wealth in its own right. Responses suggest that in six of the nine business units there was no process for managing intellectual property. Three said they had a system but at a very basic level with one respondent saying that the patent attorneys managed the patent process, and also notified when payments are due. The patent attorneys also provided a filtering service to make them aware of what was in the

market, but as was pointed out by the respondent there was still the issue of extracting value from the intellectual property.

One business unit had made a start into taking greater control of their intellectual property. An opportunity was given to the interviewer to discuss the approach being taken with the person responsible. The staff member kept in almost daily contact with the intellectual property lawyers over patenting issues and renewals. As a result a management system was being put in place to keep track of what was happening, and for checking through existing files to verify currency and use of patents. This approach recognised the importance of keeping good records, and the need for the company to gain greater benefit and value from its intellectual property.

Considerable discussion around the area of intellectual property emerged during the interviews. Recognition of its importance to the business units was acknowledged, but there is some uncertainty about what should be done and how it could be managed. Discussion arose about the value of patenting software, but it was felt that it was preferable to be ahead of the competition by about six months. One respondent expressed concern about possible breach of copyright in situations where anyone who accessed the company Web site could be in a position to download the entire site and its content. Furthermore, identifying who was responsible would be difficult. Patenting is very expensive, particularly in the United States, and many people mistakenly believed one patent covered all countries. It can take up to six years to get a patent through countries such as China and South America where the existence of a patent may not be respected. One respondent mentioned that it was important to keep records of ideas particularly if there was a likelihood of proceeding to patent in the United States where the laws were different from the rest of the world. The business unit had in place a very strict system to ensure accuracy for the recording of ideas, and they also strictly monitored confidentiality requirements, and exclusivity type contracts within their employment contracts. Working alongside an external company and creating intellectual property highlighted the need to have in place sound agreements around its management.

Taking a financial perspective, one respondent said that money was being made from brands, and that the know-how associated with the brands was also beginning to bring in revenue thus providing a dual benefit. Another respondent indicated that if the business unit did not extract revenue of around 30 per cent from new products it would not be able to maintain its position as a viable business unit.

The business units were not recognising the value of their intellectual property and were losing out on the opportunity to maximise value from it. However, the ability to extract value by generating an income stream from intellectual property through licensing to interested companies was mentioned by three respondents.

Responses from five Chief executives are given in Table 4.15.

Table 4.15 Responses to Question 14: How is the intellectual property of the company managed?

Respondent	Comment
C1	There is a pipeline of ideas through a quite specific management process. We are kind of tracking the intellectual property per se by tracking the customers and the users response to us and feedback to it and customer surveys. For patented products we would go after infringers.
C4	We have patent attorneys for the patent process. There is still the issue of extracting value from the IP, and of course licensing.
C5	Yes. We have files of all our registered patents. Someone manages and registers new ideas, has a phone conference between the designers on a regular basis. We want to make sure there is adequate ownership round it. Our experience with doing those sorts of things centrally is not good.
C8	It is done by legals, and they keep us up-to-date.
C9	We add to the value of it and we register on behalf of them [joint partners]. We have a significant role in managing but we don't own anything.

4.1.1 Summary of the Responses by the Chief Executives

There was a preference for the three-component expression for understanding intellectual capital: human capital + internal capital + external capital. Employees were identified as the key initiators of intellectual capital, and the knowledge input of employees was valued.

The chief executives put a strong focus on value, and the need to maintain a competitive advantage through extracting value from intellectual capital. Although there was acknowledgement by the chief executives of opportunities to create value, there were instances of uncertainty about recognising how to maximise value. The people focus was apparent in the recognition of the value of their contributions, and also of the importance of providing opportunities for career advancement. It was recognised that ongoing increases of knowledge was important for enhancing

the development of the business units. Employee knowledge was recognised as providing considerable value from both those working within the organisation and from people external to it. However, a few respondents placed products, brands, and financial considerations ahead of employees for contributing to value. Sound policies and processes were regarded as the foundation on which to build the value generating process.

None of the business units had a strategy in place to manage intellectual capital, although two chief executives mentioned that there might be a strategy implicit within the overall organisational strategy. There were no specific measures in place relating to measuring the value of intellectual capital.

Dividing up the organisation had a positive effect to encourage innovation and advantages of the restructuring appeared to outweigh any disadvantages. It was acknowledged that in the restructuring to smaller business units many staff had undergone a huge learning curve, but it was felt that this had created a positive situation through the opening up of the mind. It was regarded as important to motivate staff to achieve success and to maximise their capabilities.

Asked whether the business units would be more innovative if intellectual capital was managed had brought positive responses. It was recognised there was considerable knowledge and expertise within the business units, and the importance of becoming more innovative was acknowledged. Management concerns pointed to less communication, and concern was expressed by three of the chief executives about the development of a competitive environment amongst some of the business units.

In general, policies and procedures are documented. The need to codify knowledge was identified in the concern expressed over the loss of knowledge when employees left. However, finding ways of extracting knowledge from people in order to codify it poses problems. Document management technology was available for capturing knowledge, but there was not a consistent use of the technology.

There was a focus on employees with the aim of empowering and motivating them, to instil an organisational culture that encourages the raising of skills and capabilities, and to direct behaviour towards innovative practices. It had become apparent that this had resulted in a positive

organisational culture, and behavioural changes by employees were creating a good work environment. However, the offering of incentives for sharing knowledge was not regarded as appropriate.

The importance of intellectual property, and extracting value from it was recognised by all chief executives, and it was acknowledged that there was a need to take greater responsibility for its management.

4.2 Responses by the 18 Employees Interviewed, and 44 Employees who Completed the Questionnaire.

In the various tables given below, the letters "IE" and a number between 1 and 18 provides examples of the responses given by employees who were interviewed. The letters "QE", with a number between 1 and 44 are examples of responses given by employees who completed the questionnaire.

Question 1 What are your views on the dividing up of CHH into numerous companies?

The views of most employees interviewed and surveyed were very positive about the restructuring of Carter Holt Harvey. It was seen as providing autonomy, release from restraints of the corporate structure, and regarded as being the natural thing to do. There were tremendous benefits seen by the employees from what was regarded as a positive and proactive step. One respondent indicated being "an absolute advocate for it". The organisation had been transformed from a stodgy clumsy organisation that was overly hierarchical, but having great people, to one that was more flexible and made greater use of their talents.

Positive views expressed point to the importance of flexibility to perform as individuals, for the business units to have control of their destiny and to be given ownership, as well as being closer to the customer. The business units were able to be more innovative and entrepreneurial, allowing each to manage resources in a way that matched its need to develop. There was also the opportunity to find weak areas and do something about them, and to provide a greater opportunity for many staff to be significant in smaller businesses. It was pointed out that there is a greater opportunity to

look to specialisation, and to provide higher quality of service. Although there might be advantages of scale benefits by also being linked to the corporate organisation, it was felt there has also emerged the innovative spirit of small business.

However, reservations were expressed by some of the staff. Those covered areas such as difficulties in dealing with the new environment and with implementation while still under the corporate umbrella. It was mentioned that decentralisation was the 3 or 4-year cycle that organisations go through before another centralisation process. Some employees were concerned at the potential for increased costs for certain service activities from a centralised position when it was felt that the business units could undertake those functions more cheaply. Some of the responses indicated areas of concern such as duplication of roles and resources, reverting to old ways, declining team spirit, or scepticism about no visible and tangible difference emerging. The varying in size of the business units from very small to quite large was also commented on. It was also mentioned that an environment of innovation requires the right response to failure, and it was felt that not enough people in senior management had the maturity to handle their own and their subordinates' failures.

There was a struggle going on in some areas to create an innovative culture, or understanding what it might mean. However, employees appeared to be taking more ownership for the success of "their" business unit. Although there were inevitably some reservations about certain aspects of the restructuring, from the perspective of those involved in the research, the dividing up of Carter Holt Harvey Ltd was regarded as a very good move.

A selection of responses is given in Table 4.16.

Question 2 CHH has indicated they want to encourage an innovative environment. What challenges do you face working in an innovative environment?

The tenor of responses suggests that employees were reasonably accepting of, and comfortable with the innovative direction of the organisation. Business units could do things that previously they would not have had the opportunity to undertake, and regarded it as a very health environment to work in. One respondent identified innovation as being a major part of the work, and that it was only through being innovative that improvement would happen. On the whole it was evident that employees were responding to the programme of innovation, with one respondent saying that it was enjoyable to be working in such an environment, but the worry was about retaining an innovative

outlook. Another referred to constantly looking to working outside the square, that the same old thing was no longer acceptable, and now there was constant looking, searching and questioning. One respondent simply said that innovation was part of the job. Employees said they enjoyed coming up with ideas, learning new skills and meeting the challenge of an environment requiring a person to be reactive, and changing all the time.

Table 4.16 Responses to Question 1: What are your views on the dividing up of CHH into numerous companies?

Respondent	Comment
QE2	Enables these companies to be more innovative and entrepreneurial.
IE3	Good to be a bit more autonomous. A lot more accountable. We were high performing but the rest of the division wasn't so we were seen as not performing as well.
QE9	I believe this is a positive for the organisation.
IE9	I think atomisation gives a financial and innovative freedom for all the work. It is like a motivation. You are accountable for your actions.
QE10	Benefit – will help identify value adding and value destroying areas of our business
IE11	I think in some instances it has been very good and beneficial, but in other instances people do not associate some of the offspring companies with CHH, and I have found it is potentially damaging.
IE12	I think it has some good merits but it has gone too far and is being consolidated as we speak.
IE14	I think the atomisation, and indeed any managerial change will create new dynamics in the business.
IE17	Everybody is accountable for what they are doing.
QE18	It was a good idea to begin with doing away with the concept of moving a juggernaut so that smaller business can react faster and have more control. However, it seems to be creeping back to old form.
QE28	I didn't like it at first but now I can see advantages.
QE34	I believe it is a good idea.
QE38	It is an essential part of our growth strategy.

Some concerns were expressed. For example, it is very easy to be drawn back into the old model of a corporate way of working, and it was important to keep focused on the innovative environment. One respondent said not everybody wanted to be involved, suggesting that there were some employees uncomfortable with what was happening. Another respondent pointed out that it was tough on staff to work in an environment that was constantly challenging practices that had been ingrained for years and years. It was mentioned by a respondent that on the one hand staff were encouraged to be innovative, but on the other there was still a fundamental cost focus.

Reference was made by two of the respondents to the dislike of failure and the stigma attached to failure, and pointed to this as having a stultifying effect on being innovative. Providing an environment for innovation also required the right response to failure. It was mentioned that not enough senior management had the maturity to handle their own and their subordinates' failures, and that there was a need for greater flexibility and encouragement of risk taking.

A number of responses to Question 2 are given in Table 4.17

Table 4.17 Responses to Question 2: CHH has indicated they want to encourage an innovative environment. What challenges do you face working in an innovative environment?

Respondent	Comment
IE1	A very healthy environment to work in. I think having a programme for innovation is great.
QE2	Need to be prepared and comfortable with ongoing changes.
IE3	I find it quite easy to be innovative given the area I am in. Really supportive environment and easy to work in.
QE3	Creating space for constructive innovation sessions.
IE4	Good ideas came through and businesses have been launched. We learned a lot by making mistakes, thinking freely, and being imaginative in the first year.
IE7	I work best coming up with ideas on the best way to handle things. I like looking at the big picture.
IE8	The challenge is from a cultural point of view, business units can be quite territorial in behaviour. Need to get business units to work together and get some focus and resource behind new product development.
IE9	Innovation is a major part of my work and through lots of ideas constant improvement is going to happen. No real challenges. I am quite comfortable, and I think it is good.
IE11	Bringing everyone on board at the same speed has proven to be quite tough. It is a challenging environment and you need to be reactive and changing all the time. It is tough on our staff and our people to work in an environment that is constantly challenging practices that have been ingrained for years and years.
QE11	No challenges other than learning new skills.
QE16	The pressure to be personally innovative while handling day-to-day work pressure is sometimes stressful.
QE18	Coming up with new ideas and concepts every week, then following them through to a result.
QE31	Mostly people's resistance to change.
QE39	To transform the innovative ideas into real businesses is a continuous challenge.

Question 3 How do you increase your own knowledge?

For all respondents, reading emerged as the principal method for increasing knowledge. However, for other ways of increasing knowledge there are divergent views between employees interviewed and those responding to the questionnaire. Second equal for interviewees was the Internet and networking. Asking people was next on their list as a means of increasing knowledge, with virtually no comment being made regarding formal training/on the job training. Questionnaire respondents placed people asking second, on the job training third. Conferences/seminars were a long way behind at fourth, with the Internet fifth. Networking was barely mentioned. A range of approaches to increasing knowledge were given by all respondents and were very similar from both groups, for example, adapting to change, reviewing standards, company information, mentors, observing, and study.

Table 4.18 illustrates responses from employees.

Table 4.18 Responses to Question 3: How do you increase your knowledge?

Respondent	Comment
QE1	Asking, attending courses/seminars, observing
IE4	I am now a firm advocate of networking with talented people. The learning I admire is experiential learning.
IE6	Learn by reading, researching,
QE9	By reading, listening to media, research the Internet, learning from more experienced peers.
IE10	I speak regularly with colleagues and people I know. I get information regularly from Europe and the States about the technology advances in this environment.
IE16	People with a lot of experience, they are the best source of information, they have been there, done that.
QE19	Conferences, reading, hands on workshops, market visits, membership of technical societies, journals, etc, research projects.
QE34	By continually adapting to change and adjusting to new work situations.

Question 4 Sharing knowledge can be a sensitive issue. What difficulties do you think arise through expecting people to share their knowledge?

Eight of the 18 interview respondents and three of the 44 survey respondents said there were people, one way or another, that regarded their knowledge as giving them a sense of power, but the respondents who mentioned this said they themselves did not have any difficulty sharing

knowledge. One comment suggested that some people would point out that they had put in a certain amount of time and effort to gain their knowledge, and thus were reluctant to share it. In four of the interviews, and in ten survey responses, it was said that people were perhaps protective of their knowledge and their ideas because they were concerned about the security of their job.

Other respondents saw no barriers to sharing knowledge, saying colleagues did not mind sharing their knowledge. Expertise in various areas was recognised and acknowledged, and there was no apparent problem with knowledge sharing. One respondent, referring to the importance of open communication, pointed out that sharing was regarded as the norm, and sharing is expected to freely occur. Expanding on this, the respondent said that in a situation where lessons had been learned, and mistakes had been made, knowledge about this had not been passed on to others. However, in another business unit employees realised the impact and value of the knowledge sharing approach and knowledge is made available to all.

It was pointed out that if people were not going to contribute anything directly to the value of the business unit then it raised the question about whether the function the person was undertaking was required. Explicit knowledge did not appear to present a problem for sharing, but tacit knowledge was something more difficult to deal with. There were times, it was explained, that people were not aware of what a person knew until they left, and then it was too late to retrieve that knowledge. Beyond the confines of the business unit knowledge sharing was not an expected, or acceptable behaviour, although it was likely to occur if working in partnership with another company when sharing would bring mutual benefit.

There was widespread recognition of the variety of different skills in a business unit with many of them experts in their fields. While sharing may freely occur, it was pointed out that there were situations when even their own experts are not trusted. One respondent cited an example of a person who had been in the industry for many years, knowing what he was talking about, and yet some colleagues were reluctant to trust his knowledge.

Table 4.19 provides eight examples of responses from employees.

Table 4.19 Responses to Question 4: Sharing knowledge can be a sensitive issue. What difficulties do you think arise through expecting people to share their knowledge?

Respondent	Comment
IE1	Open sharing and communication. We share pretty freely internally.
QE2	Human nature can be to protect your skills and knowledge in the belief that this will protect the individual's own position.
IE2	There are a number of tangible examples where the sharing of knowledge has resulted in a positive outcome both for the business and the individuals.
QE5	People who won't share knowledge are afraid of losing their jobs or positions. If I get sick or leave someone should be able to do my job.
QE13	Knowledge is constantly changing to we need regular sharing rather than one offs.
IE17	If I need to know anything I will ask and usually people I associate with most of them are pretty much forthcoming anyway.
QE17	I believe job security becomes a threat in cases where defence is used. If you share your knowledge, someone else can do it.
QE23	Having a positive, collaborative environment fosters information sharing.

Question 5 How, when and where do you think the most effective exchange of knowledge takes place?

Respondents mentioned a range of places. High on the list of those interviewed was formal situations, followed on an equal basis with informal situations, on the job, and teams. Respondents to the questionnaire placed on-the-job at the top of their list, followed, considerably behind, by formal situations, then informal situations. In 'other', those interviewed listed socialising, chance meetings, seminars and conferences, while the questionnaire respondents placed in 'other', training, lectures, and conferences.

Considerable knowledge is exchanged informally, certainly from the perspective of those interviewed. When people needed to know something they asked. Employee interviewees mentioned that socialising provided a good opportunity for people interaction, and was a useful means for the effective exchange of knowledge. The socialising situations ranged from social activities (dinners), a beer on a Friday afternoon, and business unit/organisation sporting activities.

Comments from the questionnaire suggest that exchanging knowledge was likely to occur through working alongside other people either directly on-the-job, in teams, in meetings, and at social

events. Respondents mentioned the importance of the applied situation where there was more than one person working on solving a problem, such as working in teams with a common goal, working with like-minded people, hands-on experience, making mistakes and learning from them. One respondent pointed out that for the on-the-job approach, it was critical to have the trainers who are at the top level in knowledge and best practice.

For some respondents, their view of formal meetings was that they did not provide a good avenue for exchange of knowledge, and were regarded more in the nature of channels for communicating information. However, a few comments pointed to daily production meetings and open forums as providing an avenue for knowledge exchange especially when ideas could be shared and debated to provide an informed resolution.

Two interviewees commented on the use of technology as a means through which knowledge can be exchanged, one saying it provided a useful medium for searching, categorising and classifying of information, and making it quick to obtain knowledge. However, the second interviewee said transfer of knowledge by emails was not considered particularly effective, and it was remarked that while a lot of information may be flowing, whether it turned into knowledge was a debatable point.

The 'need to learn' situation for exchange of knowledge was mentioned, pointing out the importance of specialist sessions for the imparting of specific knowledge. One interviewee said that while there was nothing wrong with a formal learning situation such as school, where it was essential to get your core skills, but for little bits needed to fit the jigsaw together, the casual approach worked best.

Other ways identified for exchange of knowledge, were through forming good partnerships with suppliers, having telephone conferences, knowledge flow from businesses, and networking at conferences. One interview respondent suggested there was no specific time or place that was better than another for exchanging knowledge. Continuing, it was said that sharing knowledge and sharing ideas was at a different level for different groups of people. It depends on what the knowledge is, and what the issues are at the time, and each one of those had to be taken into account.

Table 4.20 provides examples of responses from employees.

Table 4.20 Responses to Question 5: How, when and where do you think the most effective exchange of knowledge takes place?

Respondent	Comment
QE2	By working in teams with a common goal.
IE5	Focus group oriented meetings and even some social ones.
IE9	Informal settings where the discourse is open and unhindered.
QE9	Meetings, brain storming, telephone conferences.
IE11	I really think when you get a group of people together, and ask people to share their experiences, this is where I get the best information exchange.
IE17	I guess it is a team effort in most cases. It is more semi-formal, rather than formal.
QE19	Hands on experience, making mistakes and learning from them.
QE22	In real life scenarios where people are motivated to give/receive knowledge.
QE43	Outside of the work place in structured learning centres.

Question 6 A suggestion has been put forward by some management theorists that there should be some form of reward for staff sharing their knowledge. What are your views?

Views expressed by two-thirds of employees interviewed were that if someone was doing something exceptional at work then they should be rewarded in an exceptional way; after all sales people, and senior executives were paid for performance, so junior staff should have that opportunity. It was also pointed out that being paid on performance was a necessary requirement for motivation. A comment was that people would be more willing to put forward their ideas, especially where there was considerable value attached to them, if there was some form of benefit from doing so. One-third of employees responding to the questionnaire indicated that a reward should be given.

A few of the employees interviewed felt there should be no reward pointing out that such a scheme would isolate people. It was likely to be difficult to identify whether in fact the person being rewarded was the one who was the originator of the idea (knowledge) being shared. For questionnaire respondents, almost half indicated no reward should be given for sharing knowledge. It was felt that sharing knowledge was part of the job and what you were being paid to do.

Of the employees interviewed, several favoured some form of non-monetary recognition, but very few employees responding to the questionnaire indicated recognition as a form of reward.

Recognition was seen as important particularly when the knowledge assisted the realisation of company goals. A thank you for something well done or an idea that had improved a process was accepted by employees as a legitimate and acceptable form of acknowledging a special contribution, and was appreciated.

Putting in place a fair and equitable system for rewarding the sharing of knowledge was identified as a difficulty by both interview and questionnaire respondents. For this reason there was a tendency to consider that giving rewards for knowledge sharing was impracticable, and unlikely to occur.

Table 4.21 provides examples of responses by employees.

Table 4.21 Responses to Question 6: A suggestion has been put forward by some management theorists that there should be some form of reward for staff sharing their knowledge. What are your views?

Respondent	Comment
IE1	I think it is patronising to be honest. Not a good idea.
QE2	A lot of the reward comes from attaining success in your goals.
IE5	I think people perform as they are measured and as they are rewarded, and if knowledge sharing is important for our organisation, then absolutely.
QE7	People should be comfortable doing what they please. I think a reward-based system has the potential to be biased.
IE7	I like sharing knowledge, I don't care whether I get rewarded or not.
QE9	How do you measure knowledge sharing?
IE10	This is very difficult. Very difficult to get something for sharing your knowledge.
QE12	I disagree. Sharing knowledge needs to become the norm as opposed to incentivising expected normal behaviour.
IE15	I think it would be very hard to manage.
QE17	I agree – recognition in any form makes you feel appreciated and that you count.
IE18	When you join the company you do sign away your intellectual property. Any concepts or ideas that you come up with in the course of your work belong to the company. I don't have any problem with that. The company pays me and part of the amount they pay me is probably based on the fact that I can come up with ideas.
QE23	Don't like it – would prefer to build a culture rather than a reward system.
QE27	A rewards system would certainly encourage people to share more.
QE30	No. Knowledge sharing should be part of the job.

Question 7 How do you go about obtaining knowledge when your require it?

Responses by employees were on the whole similar to those given for question 5. However, at the top of the list for both groups was, asking people, followed by the Internet, and research. Interviewed employees then listed networking while respondents to the questionnaire listed reading. Other ways of obtaining knowledge when required were given as the internal system, the library, suppliers, and university.

A selection of responses is given in Table 4.22.

Table 4.22 Responses to Question 7: How do you go about obtaining knowledge when you require it?

Respondent	Comment
IE2	Research, people are a good place to start, stories.
IE5	If it is person oriented, talk to people. If information oriented, access resource material.
QE5	Ask someone who knows.
QE11	Asking someone to put time aside to explain.
IE11	I tend to utilise the experience of the team – the average employee has long service, so there is a strong platform.
IE13	I would first of all investigate who would be the best person to speak to about gaining this knowledge, and then go and talk to them.
QE20	Stealth, colleagues, literature, trials, modelling.
QE40	Talk to people, and researching websites and books.

Question 8 What is your job title?

Question 9 What is your highest educational qualification?

Questions 8 and 9 were designed to elicit information about the positions held by the respondents and their qualifications. Of the 18 employees interviewed, 7 had the word manager in their job title, and their managerial responsibilities ranged from first level managers to senior level. The positions of the other 11 employees interviewed covered a variety of areas and levels of responsibility. Ten employees interviewed had an undergraduate qualification and 8 have a postgraduate qualification.

Of the employees surveyed, 13 indicated they were in managerial positions and 31 were in positions covering a variety of areas and levels of responsibility. Eighteen respondents had an undergraduate qualification, 24 a postgraduate qualification, and five did not state their qualification.

Table 4.23 provides an analysis of the responses.

Table 4.23 Responses to Questions 8 and 9: What is your job title? What is your highest educational qualification?

Interviewed Employees 18				**Surveyed Employees 44**			
Position	**%**	**Qualification**	**%**	**Position**	**%**	**Qualification**	**%**
Managers	39 (7)	Certificate	28 (5)	Managers	30 (13)	Certificate	34 (15)
Various, e.g.	61 (11)	Diploma	28 (5)	Various, e.g.	70 (31)	Diploma	7 (3)
IT systems,		PG Diploma	-	Export,		PG Diploma	2 (1)
Projects,		Degree	39 (7)	Engineer,		Degree	50 (22)
Planner,		PhD	5 (1)	Accounts,		PhD	2 (1)
Export				Planning,		Not stated	5 (2)
Officer				Distribution			
Accountant							
Total	100 (18)		100 (18)		100 (44)		`100 (44)

4.2.1 Summary of Responses by Employees

The tenor of responses to the challenges of working in an innovative environment pointed to some employees finding it stimulating, they are accepting of, and are comfortable with the innovative direction of the organisation. However, others indicated it could be a stressful environment in which to work. Reference was made to the need to recognise the importance of commercialisation of products and services if wealth is to be generated from innovations. Views expressed were that taking risks was an inevitable activity if a business was to grow, and that lessons were learned from failures. Management need to take on board those issues.

Although reasons why sharing might not occur were mentioned, sharing knowledge did not appear to be an issue and indeed was an expectation of employment. Respondents valued knowledge sharing and they pointed to the benefits gained by everyone as a result of doing so. Knowledge sharing occurred in many situations ranging from formal to socialising with many pointing to on-the-job situation as being one that was highly on the list of employees surveyed.

Continuously increasing their knowledge was recognised as important. Reading was regarded as the first preference as a way of increasing knowledge, and interacting with people was also identified as an important way to increase knowledge. The sharing of knowledge did not present a significant problem and was regarded by the majority as an expected part of the work situation. Asking someone was generally the approach to finding knowledge when it was urgently required. A two-thirds majority of employees interviewed felt that there should be a reward for sharing knowledge, while almost one-third of the employees responding to the questionnaire felt the same way.

4.3 Chapter Summary

Three components – human capital, internal capital, and external capital – were the preferred indicators for understanding intellectual capital. It was recognised that the intellectual capital value of the organisation was generated by the knowledge and contribution of employees. No business unit had a strategy for managing intellectual capital, but it was recognised that the capabilities available to a business were a key to its competitive advantage. There were no identifiable measurements directed towards intellectual capital to indicate its value, and measuring intellectual capital was regarded as probably difficult to implement. Codification of knowledge was an area that needed to be addressed. New products and services were emerging, and innovation was recognised as important for the future growth of the business units. Although protection of intellectual property was undertaken, there was little evidence of managing intellectual property with a view to generating wealth.

Increasing knowledge was recognised as important by all participants. Reading was at the top of the list of ways of increasing knowledge by employees but not by the chief executives. Both groups regarded interacting with people as an important way to increase knowledge. On-the-job learning was acknowledged by the chief executives and employees surveyed as a way to increase knowledge, but this method was not mentioned by interviewed employees. Sharing of knowledge was not an issue, and regarded as the norm. Chief executives do not favour rewards. From the employee perspective, the majority of those who were interviewed favoured rewards while almost half of those who completed the questionnaire were against the giving of rewards. However, everyone viewed recognition as an acceptable reward for knowledge sharing.

Chapter Five discusses the findings of the research**.**

Chapter 5: Discussion of Findings

5.0 Introduction

In this Chapter the findings of the research presented in Chapter Four are discussed to determine whether managing of intellectual capital at Carter Holt Harvey Ltd (CHH) aligns with the theoretical Intellectual Capital Management Model.

The Chapter commences with a discussion of the responses by the chief executives to the questions presented to them during the interviews. Alignment of the responses with the Intellectual Capital Management Model developed from the literature is addressed throughout the discussion. As questions 7, 8, and 12 asked of the chief executives are similar to questions 1, 3, and 6 to the employees, those questions are discussed together in Section 5.2. The remaining questions to employees are then discussed. The chapter concludes with a discussion about the alignment of the characteristics of the Intellectual Capital Management Model with the findings of the research.

5.1 Discussion of Responses to Questions put to the Chief Executives

5.1.1 Question 1 - Components Identifying Intellectual Capital

The definition of intellectual capital is frequently couched in terms of the presentation of components, varying in number between two and four, according to the interpretation of various authors (Edvinsson and Malone, 1997; Roos *et al*., 1998; Sullivan, 1999; Harrison and Sullivan, 2000; Sveiby, 1997; Stewart, 1997; Fletcher *et al*., 2003; Brooking, 1996; Joia, 2000; Bontis, 2004). Regardless of the number of components, most authors agree that human capital should be identified as a separate component, and this was also the view of the chief executives. Acknowledging the contribution made by people through their knowledge and skills, the chief executives conceded that employees are not totally owned by the organisation, and when they leave they take their knowledge with them. This is in line with the views of Sveiby (1997) and Stewart (1997).

Knowledge from external sources is not guaranteed, it only becomes available to an organisation by association with suppliers, distributors, customers and other external parties. Access to that knowledge can be somewhat tenuous and severed at any time. On the other hand, knowledge built up and captured over the period of existence of an organisation is owned by it. However, for the growth and development of the knowledge base there is reliance upon the input of employees, and on knowledge obtained from external sources. The chief executives, aware of the tenuous nature of knowledge from external sources, determined that as external capital is not owned by the organisation it should be a separate component. This is also the approach taken by Sveiby (1997).

The chief executives supported internal capital as a component, with intellectual property regarded as being part of it, and not a separate entity. This is consistent with the views of Stewart (1997) and Edvinsson and Malone (1997).

The views expressed by various authors (e.g. Carson *et al*., 2004; Hussie, 2004; Kaufmann and Schneider, 2004), suggest that in order to identify intellectual capital, three components, e.g. human capital + internal capital + external capital = intellectual capital, are adequate. Accordingly, the three-component approach was used in the core of the Intellectual Capital Management Model (the Model), and is supported by the results of the interviews with the chief executives.

5.1.2 Creating Value in the Company

Intellectual capital arises through the accumulation of human, internal and external assets, and when addressing intellectual capital it is essential to determine its level of value and positioning in the hierarchy of priorities within the organisation. The focus of question 2[1] and 3[2] was on the issue of where value resided in the business units.

Several authors (e.g. Prahalad and Hamel, 1990; Drucker, 1994; Lloyd, 1996; Quintas *et al*., 1997; Teece, 1998) point to the importance of employee knowledge and refer to it as an organisation's most precious asset. Value resides not in things, but in knowledge, thus stressing the importance of intellectual assets (Prahalad and Hamel, 1990). As no business can operate without the knowledge of its employees, the intellectual capital contributed by those who work in an organisation is of considerable value. Value contribution also comes from external connections, such as customers

[1] Where would you say the value of the company resides?
[2] What processes have been followed to identify where the value is?

and suppliers, and working along side other organisations. The value of customers is emphasised by a number of authors (Kanter, 1996; OECD, 1996; Teece, 1998).

The chief executives agreed that the real value was in the contribution made by their employees. A few chief executives acknowledged that value also resided in their products, customers, physical assets, brands and processes, thus reinforcing the input made by employees. This signals recognition by them that it is through employees that businesses grow and flourish, and that the contribution they make has considerable value. In general the views of the chief executives reflected those of the authors referred to above. It was clear that the chief executives are aware of the importance of the contribution by employees to the business units. They also acknowledge there is a value contribution through connections with external sources.

Although acknowledging the value contribution of employees and from external sources, this recognition did not really relate to their perception of value in the business sense. This was evident when asked about processes to indicate where value resides, resulting in the identification of connection. Comments relating to the monetary perspective were in many ways linked to the value contribution of employees because it is through their activities that the monetary value is created, and around monetary activities it is usual to have in place a number of systems and processes. Throughout the interviews reference was made to a range of systems and processes that were in place covering many areas of the organisation. However, virtually no processes were identified that could be directly linked to attributing value to intellectual capital.

Viewing value-attributed processes from this perspective, it could be said that systems and processes were present, but it is evident there were none that directly related to determining the sources of the value creation from an intellectual capital perspective. Although there is no direct match with the inclusion of systems and processes in the Model, there was a link can be identified through the approach taken for the development of products and brands and the operational activities of the business units. The Model illustrates the organisational vision as being one of generating wealth. It was acknowledged by the chief executives that the value potential of the business units was principally derived from the input of employees and therefore they were the source of wealth generation.

5.1.3 Management of Intellectual Capital

Question 4[3] inquired about a strategy for managing intellectual capital. The intellectual capital of an organisation is critical to its future success, therefore its management should form an integral part of the corporate plan. Maximum potential is gained through taking a holistic perspective of an organisation's intellectual capital to maximise its full potential (Clarke and Rollo, 2001; Carnerio, 2000; Fletcher *et al*., 2003; Rastogi, 2003). The approach taken by the Dow Chemical Company to instigate the process for management of its intellectual capital was one of linking the business strategy to the organisation's intellectual capital (McConnachie, 1997). Inclusion of intellectual capital in an organisation's strategy is also the view of other authors (e.g. Stewart, 1997; Quintas *et al*., 1997; Joia, 2000; Marti, 2003). The level of recognition of the importance of intellectual capital is a determinant of performance (Riahi-Balkaoui, 2003). Therefore, as an organisation's most valuable asset, it would appear to be logical for intellectual capital to be an integral part of an organisation's strategy.

The chief executives were aware of the need to maintain a competitive position, and acknowledged there was considerable value in the technical knowledge and expertise within their businesses that could be further exploited to provide benefit for all involved. Responses about management of intellectual capital tended to be vague at times. There was no explicit evidence linking the knowledge of employees with knowledge held by the organisation, or with knowledge from external sources. Nor was there real evidence of recognition given to intellectual capital being integral to the effective operation of the business and its source of wealth. This indicates that CHH was not taking a holistic view of the intellectual capital available to it.

Managing the intellectual capabilities of the organisation to maximise its full potential is of considerable benefit (Clarke and Rollo, 2001). The research revealed no specific evidence of a deliberate strategy for the management of intellectual capital, either at the corporate level, or in the business units. As a result there is no direct alignment with corporate strategy in the Model. The principal reason for managing intellectual capital is to support the corporate strategy by ensuring that all knowledge available to an organisation is directed to the fulfilment of its vision. Although the knowledge contribution of people is recognised by Carter Holt Harvey taking a holistic perspective of the value of its intellectual capital has yet to be fully acknowledged.

[3] How does the company manage intellectual capital, i.e., is there a strategy in place to manage intellectual capital?

5.1.4 Innovations and Management of Intellectual Capital

The literature supports the view that as a result of managing intellectual capital there will emerge new innovations leading to growth, and to increasing organisational wealth (Edvinsson and Malone, 1997; Sveiby, 1997; Romer, 1998; Joia, 2000; Petty and Guthrie, 2000). Recognising intellectual capital as an asset of value, and for the need to develop management practices to generate value is critically important.

For an organisation to survive in a highly competitive world market, and to be able to sustain its position, it must be continuously innovating. However, vital to success, and to sustaining its position in the market place, an organisation needs to develop an innovative culture, and allied to this is managing the innovation process. This ideally involves having an innovation champion to provide the drive and leadership for developing an environment to influence and motivate employees to participate.

The chief executives responded in the affirmative to question 5[4] that asked if through managing intellectual capital an organisation would become more innovative. In answering the question, they acknowledged the importance of intellectual capital, and recognised its close link to innovation. One of three aims designed to direct the future of CHH through the business units, was to focus on innovation. It was recognised that the future viability of a business unit lay in its ability to continuously introduce new products, services, and processes. Although it was conceded that innovation was important for the future of the business units, no evidence emerged of a process being in place in the business units to actively manage innovation.

It is necessary for managers to understand that the innovation process does need to be managed, and to recognise that innovations emerge from knowledge sharing and knowledge creation. It is important to stress the link between knowledge sharing and innovation, and managing intellectual capital if an organisation is to become more innovative (Darroch and McNaughton, 2002). Although the business units were newly formed, a plethora of knowledge had accumulated in CHH over the years. An avenue CHH should have been exploring is the reviewing of accumulated knowledge, and reconfiguring it, as this can lead to new innovations (Grant, 1996).

[4] Do you think that through the management of intellectual capital an organisation can become more innovative?

Evidence suggests that the innovations that have emerged, or were emerging from the business units appeared to have done so without any specifically directed management processes being in place. This suggests that a management process might not be necessary, yet the literature points to the importance of having a process for managing innovations. Although there was no evidence pointing to the business units managing intellectual capital to become more innovative, the chief executives recognised that if they did so the business units could be more innovative.

The Model has placed the innovation component under human capital. Although not managing the process, the chief executives acknowledged that it was from the contribution of employees that innovations emerged. From this perspective, the results support the inclusion of innovations as a component of human capital in the Model.

5.1.5 Intellectual Capital from External Sources

Working closely with customers and suppliers generates a valuable source of knowledge and opens avenues for adding value to products and services (Kluge, *et al*., 2001; Fletcher *et al*., 2003). The value of customers is emphasised by a number of authors (e.g. Kanter, 1996; OECD, 1996; Amidon, 1997; Teece, 1998), with Stewart (1997) saying organisations do not spend enough time attending to the needs of customers. Those authors also point to the significance of having a greater understanding of what is important for the success of their customers' businesses.

Entering into a coalition with other organisations having complementary skills has the potential to bring considerable benefits and opportunities to increase value and generate growth (Byrne, 1993; Evans and Wurster, 1997). Developing good connections across the industry, the business world generally, and with government, is essential as such connections have value for the business units. However, where this involved outsourcing it is critical that management is aware of the danger of hollowing out. Hollowing out occurs when too much knowledge has been given away during the process of working collaboratively with other organisations, and it is essential to have a system for determining ownership of knowledge.

The chief executives frequently made references to the importance of customers and suppliers, and how essential it was to build good relationships with them. It was evident from the comments of the

chief executives when responding to question 6[5], that they recognised the considerable knowledge contribution of their customers and suppliers. For two chief executives the dividing up of the organisation had made them realise how important it is to be closer to customers, and to work alongside them. However, during one interview it was a revelation for the chief executive that customers could be considered as intellectual capital. This provided a new and interesting perspective for that chief executive on how customers should be viewed, and it was said this would have a positive impact on the approach taken in future relationships. Overall, participants recognised the importance of giving due attention to the needs of customers and suppliers, and acknowledged the value contributed to their businesses through the accumulation of knowledge resulting from working in partnership with other organisations. The chief executives were also aware of their responsibility for associations with other stakeholders, such as the Government and the community, and maintaining networks with them was important.

It was acknowledged that partnerships and alliances promoted the sharing of knowledge and complementary skills providing the opportunity to add considerable value. Only one chief executive operating in a joint venture specifically referred to having a process in place for protecting the knowledge of the business unit. The majority of chief executives acknowledged that alliances with external parties had the potential to add considerable worth to their business units, and particularly so when working collaboratively on research. The views of the chief executives aligned with those promoted by Quintas *et al*. (1997), and Inkpen and Dinur (1998) who expound the benefits to be gained from such alliances.

With one exception (e.g. the chief executive who did not recognise customers as intellectual capital), the chief executives acknowledged the need for external capital to be recognised and supported. Although aware of the importance of engaging with external parties there was no evidence of managing the intellectual capital gained through the development of such relationships. However, the lack of management of intellectual capital did not detract unduly from the considerable interaction occurring between the business units and external parties. Those relationships are identified in the Model under external capital, and the activities in the business units can be identified as aligning with the Model.

[5] What internal and external networks are used to acquire knowledge that will benefit and add value to the company?

5.1.6 Codifying Knowledge

Knowledge accumulated by an organisation provides a valuable source of intellectual capital. From the time a business begins operating it accrues knowledge, yet organisations do not appear to fully appreciate this is occurring, and are frequently unaware of the real worth of their in-house knowledge. Documentation of processes, policies and procedures, in most instances, is the usual practice because they set the direction for operational activity.

That organisations do own knowledge is a view supported by authors such as Levitt and March (1988) and Spender (1996), and gives credence to the internal asset component identifying intellectual capital. Senge (1990) makes the point that it is through individual learning that knowledge increases, enabling organisational learning to take place, and this in turn will lead to an increase in organisational knowledge. To benefit from knowledge, organisations need to identify where the knowledge is, evaluate it to determine the business goals it will serve, and make it available in a way that is accessible by those who require it (Davenport and Prusak, 1998). However, codifying knowledge is not an easy task and regardless of their willingness to do so, it is just not possible for people to write down all that they know. Tacit knowledge cannot be turned into explicit knowledge therefore it is not possible for people to convey all they know (Polanyi, 1958; Polanyi, 1967; Joia, 2000; Firestone and McElroy, 2003).

Responses from the chief executives to question 9[6] suggested that managing the codification of knowledge was a concern. In most instances policies and procedures were documented, but there were gaps, for example in the documenting of some processes, and attempts were being made to address this. It was accepted that it was not possible to record all knowledge, but it was necessary at least to capture the essential elements of a task so that when people left, the business units were not bereft of vital knowledge. It was important to codify knowledge whenever possible, and the chief executives recognised there was a need to do so.

Only three chief executives mentioned the existence of technology systems – a document management system, a customer relationship management system, and a system to document projects undertaken by various business units. This latter system appears to be separate from the organisation's intranet. As a source of knowledge the intranet was barely mentioned by the chief

[6] To what extent is knowledge codified in the organisation, and what systems are in place to allow for the flow of knowledge?

executives. The impression received was that not a lot of use was being made of the technology systems, with the inference that they were not generally accepted as a means through which knowledge was captured or shared. On the other hand it may be that in the minds of the employees the systems were not sufficiently user friendly for accessing knowledge.

Codifying knowledge is an essential part of the process of the management of intellectual capital and is a component in the internal capital section of the Model. CHH was established over 100 years ago and has accumulated a vast amount of knowledge of importance for the organisation, and the wider forestry industry. This points to the likelihood of codification having occurred over time. However, while recognising the importance of knowledge codification, the chief executives admitted that this issue was not being addressed properly. Nevertheless, such action as had been taken at CHH did fit with the inclusion of codifying knowledge as a component of the internal capital of the Model.

5.1.7 Metrics

Integral to the functions of management is the need to assess progress towards achieving goals and objectives. When tangibles are involved, measurement raises few difficulties, but attempts to measure intangibles such as intellectual capital have proven to be difficult. Many authors (e.g. Stewart, 1997; Sveiby, 1997; Guthrie *et al*., 2004) support the importance of measuring, but they concede there are difficulties in developing appropriate measures. Several models have evolved, for example, the Intangible Asset Monitor (Sveiby, 1997), the Skandia Business Navigator (Edvinsson and Malone, 1997), and the Balanced Scorecard (Kaplan and Norton, 1992). In the Intellectual Capital Management Model, metrics is part of managing internal capital.

Responses by the chief executives to question 10[7] tended to be negative. A few referred to measurements for identifying customer numbers, or measures for intellectual property related to brands. Only three chief executives made reference to the Balanced Scorecard (Kaplan and Norton, 1992), yet Balanced Scorecard objectives for performance, innovation and leadership were explicitly identified in the 2001 Annual Report. The other chief executives did not see any connection between the Balanced Scorecard and measurements that might fit those for intellectual capital.

[7] What methods are in place for measuring intellectual capital?

The chief executives generally felt that measuring intellectual capital would be very complex. Those views are in line with the dilemma faced by theorists who point to difficulties associated with measuring intellectual capital. Considerable research has been undertaken on the issue of metrics (e.g. Stewart, 1997; Kennedy, 1998; Carrol and Tansey, 2000; Joia, 2000; Guthrie, 2001; Edvinsson *et al*. 2004), and agreement on appropriate measures is likely to be an ongoing debate for some time. When measures are developed it is important that they have relevance for management, and are sufficiently flexible to meet the changing needs of individual organisations.

As there was no explicit evidence of management of intellectual capital taking place, inevitably measuring intellectual capital was not an activity with which the chief executives were concerned. Although the Model points to metrics being a facet of managing intellectual capital, this is not supported by management practices in the business units.

5.1.8 Creating Knowledge

In their responses to question 11[8] relating to managing knowledge creation, the chief executives did not directly address the issue. Although there is awareness that people are the generators of ideas, there was considerable uncertainty about how to respond to the question. The question appeared to touch on an area that had not previously been explored in the business units so the dilemma was what to say. Suggestions included enhancing existing products to add value to them, and bringing in new people to create new knowledge. A structure for developing an innovative environment was referred to by one chief executive, but there appeared to be no system to indicate that respondents were familiar with managing a process to stimulate the creation of knowledge for the generation of ideas. The responses of the chief executives were surprising when CHH was engaged in promoting the importance of innovation as evidenced by the setting up of the i2B project in 2000.

The chief executives indicated that knowledge creation was not an established practice, thus indicating there was little match between their practice and the inclusion of knowledge creation in the Model. Having said that, there is evidence that innovations occurred thus indicating knowledge creation was taking place. Whether the chief executives were aware of it, and whether it was linked explicitly or otherwise to the management of intellectual capital does not alter the situation.

[8] How does the company plan to create knowledge for the development and growth of intellectual capital?

Knowledge creation as a component of the human capital section in the Model is confirmed on the basis that innovations driven by new knowledge were emerging from the various business units.

5.1.9 Innovations

An anticipated outcome of an innovative environment is the advent of new products/services that are commercially viable, and also of new processes designed to improve the methods of production and marketing of existing products/services. The embodiment of knowledge in an organisation's products and services is the "primary source of wealth creation" (Clarke and Rollo, 2001, p.178). In an innovative environment there is also a need for organisations to be more entrepreneurial in their thinking, and to develop good commercialisation techniques for launching new products and services on to the market. Although organisations may vary in size, taking an entrepreneurial approach is associated with activity rather than relationship to the size of an organisation (Drucker, 1998; Thompson, 1999).

Responding to question 13[9], the chief executives' unanimous 'yes' to whether new ideas for products and/or services had emerged, is illustrative of the impact, and the benefits, that are derived through the development of an innovative environment. The i2B project no doubt had a part to play in encouraging ideas to be put forward by employees, and the way in which they were received and acknowledged, suggests that the i2B project had a positive impact on employees. This was especially so when ideas were developed and implemented.

The chief executives indicated the sense of achievement resulting from the successes in innovations was having an impact on the business units and their employees. It was recognised that continuous improvement and development of ideas was essential for the future of the business units. Employees were encouraged to be innovative in their approach, and were responding to the challenges. There had been a change in the culture, and behaviour had created a positive work environment. It became evident that ideas directed toward the improvement of existing processes had met with considerable success, particularly so in the longer established business units. The number of process improvements coming from the established companies should not be surprising as it confirms the views of Kanter (1996) who identified that new products are more likely to come

[9] Have new products/services increased as a result of ideas promoted by staff?

from new organisations, with ideas for process improvement generally coming from established ones.

Respondents working in the business units commented that there were greater opportunities to be entrepreneurial in their thinking, and in the activities in which they engaged. This signals there was a need, and a desire to move towards taking a more entrepreneurial approach to business. However, wealth is not generated from innovations until the innovations have been accepted into the marketplace.

Although acknowledging the economic necessity of commercialisation, comments made during the interviews suggested there was insufficient expertise available to provide the assistance required to successfully launch many good ideas. There is a high cost associated with launching products on to the market that can place restrictions on an organisation (Duke, 1995). However, if commercialisation expertise is not readily available, launching new products on to the market will not return anticipated rewards.

In the Model, innovation is identified as a component of human capital. The innovation focus and commitment identified from the discussions indicates that there was recognition of the importance of innovation, and that it was an essential tool to sustaining a future position in the marketplace. It was recognised that innovations came from knowledge sharing and knowledge creation. It is clear that the innovative approach being undertaken in the business units fitted well with the inclusion of innovations in the Model.

5.1.10 Managing Intellectual Property

Several authors (e.g. Brooking, 1996; Teece, 1998; Narayanan, 2000) have mentioned the potential problem of focusing on protection, rather than on managing intellectual property. Entering into licensing agreements discourages illegal use of the protected idea, and reduces the likelihood of expensive litigation. If organisations do not pursue the infringement of patents there will be uncollected royalties, and devaluation of the intellectual property asset (Brooking, 1996). Knowledge embedded in intellectual property is extremely valuable, and intellectual property should be managed to exploit its full potential. This means that there is a need for organisations to be more visionary in their thinking to reap the considerable value that can be gained from their

intellectual property. In its own right, and beyond a purely protection mechanism, intellectual property has the potential to generate a cash flow.

As a long established organisation with involvement in research and development, CHH had accumulated considerable intellectual property. Responses to how intellectual property was managed, question 14[10], pointed to responsibility for intellectual property being associated with securing protection for the product. The corporate lawyers had taken responsibility for the protection of intellectual property, but their responsibility did not appear to extend to the management of intellectual property beyond the protection level.

From the interviews, there was evidence that the business units were continuing the tradition of being innovative in the development of new products and processes. One business unit with a number of patents was looking to manage them more effectively, but at the time of the interview the project was in its infancy. Two chief executives referred to the wealth to be gained through licensing to other organisations. Another also mentioned licensing, but in doing so related it to a joint venture with an overseas organisation with which the business unit was associated. The comments indicate that a few of the chief executives were aware that beyond protection there was wealth to be generated from intellectual property. However, there was a general lack of awareness of the opportunities for licensing to other organisations thus giving them the legal right to make a product or use specific components of a product, was in evidence. A proactive approach is necessary for managing intellectual property to take it to the point where it is recognised as a valuable asset that generates income, but responses from the chief executives indicated a lack of attention being given to this.

From the perspective of the Model, the activities within the business units pointed to recognition of the importance of intellectual property, thus there is a fit with the Model. However, the majority of the business units did not actively engage in the process of taking patents from the purely protection mode to that of reaching their highest level of potential to enable them to generate wealth.

[10] How is the intellectual property of the company managed?

5.1.11 Summary of Sections 5.1.1 to 5.1.10

The findings pointed to the chief executives favouring a three-component equation for defining intellectual capital, and which they regarded as adequately illustrating the sources of knowledge available to an organisation.

In a few instances a monetary perspective was initially taken when identifying where the value in the company resided, but all chief executives concluded that employees contributed considerable value. Associations with external sources were also identified as a further source of value.

No apparent strategy for managing intellectual capital was in evidence in the business units. It was agreed that if the management of intellectual capital was addressed there was a strong likelihood of the business units being more innovative. The lack of management had not negated the strong focus on innovation in the business units. However, it was acknowledged that managing intellectual capital would further improve, and encourage the potential for increasing innovations. It was recognised that there was considerable knowledge and expertise within the business units, and the importance of becoming more innovative was acknowledged. The need to be continuously creating knowledge was recognised as necessary, but no specific management process appeared to be in place within the business units to encourage knowledge creation.

As no direct management of intellectual capital was taking place, it followed that there was no need for any measurement activity in this regard. A few of the chief executives referred to Kaplan and Norton's (1992) Balanced Scorecard as having some affinity with the measuring of intellectual capital, but indicated their use of it was not linked to managing of intellectual capital.

It was evident that the chief executives worked closely with their customers and suppliers, and where appropriate were in favour of entering into alliances with other organisations. It was acknowledged there is considerable value to be gained for the business units through networking both internally and externally as is working collaboratively with other organisations. It was also recognised that it is important to maintain good relationships with the Government and the wider community.

Although considerable knowledge had evolved over the lifetime of the organisation it was signalled by the chief executives that insufficient attention had been given to codifying knowledge, and this

was being addressed. A substantial investment in technology had been implemented by the organisation but respondents scarcely gave recognition to it as a means through which knowledge could be accessed and shared.

There was an enthusiasm for the increase in products and services that had emerged as a result of the i2B programme and this had extended into the results being achieved in the business units. It was felt there was a need to be more entrepreneurial, and it was emphasised that commercialisation skills needed to be increased to gain maximum exposure for new products and services. The protection of intellectual property was regarded as critical, but there was little evidence of it being managed with a view to the generating of additional wealth.

5.2 Questions Put to Both Chief Executives and Employees

5.2.1 Approaches to Increasing Knowledge

Question 7[11] asked chief executives for their views about how employees increase their knowledge and question 3[12] asked employees how they increase their own knowledge.

When taking up a new position, there is no quicker way of increasing knowledge than having to get a job done, with or without assistance. Increasing knowledge through on-the-job learning is a recognised method that has its roots in apprenticeship training, but is one that is equally valid in other situations. 'Learning by doing' is a recognised method for increasing knowledge (Machlup, 1962; Penrose, 1963; Spender, 1999). Taking this approach, a person is gaining experience, and through experience knowledge is increased, and as pointed out by Penrose (1963), changes in knowledge acquired also changes the ability to use that knowledge. Learning is generally regarded as being distinct from working, but knowledge transfer should not be seen as being isolated from practice because organisations are places where people are working and learning together, and in doing so increase their knowledge (Brown and Duguid, 1991). There is considerable value to be gained from on-the-job learning. However, training on the job does require close monitoring to ensure appropriate standards, are maintained to avoid dilution of the training.

[11] How do employees increase their knowledge?
[12] How do you increase your own knowledge?

Employees are the principal generators of knowledge. When recruited, employees take into organisations their skills and competencies, knowledge, and expertise to carry out delegated tasks. As employees become established within a business their knowledge about it increases, and they add value to its operational activity. However, if an organisation is to sustain a competitive advantage within the marketplace it must constantly strive to raise the level of its knowledge (Stewart, 1997). From a management perspective, the greater the knowledge of the workforce, the greater is the benefit to the organisation. Knowing how employees increase knowledge means that employee development programmes can be directed in a way that more effectively matches the learning approach of the individual.

The findings of the research point to employees at CHH having being keen to increase their knowledge, and this was likely to be a positive signal for the business units. Table 5.1 shows the responses to this question.

Table 5.1 Approaches to Increasing Knowledge

How Knowledge Increased	Chief Executives 9		Employees Interviewed 18		Employees Surveyed 44		Total No
	No.	%	No.	%	No.	%	
Reading	2	9	12	38	19	26	33
Interacting with people	5	23	10	31	17	23	32
On the job	4	18	0	0	18	24	22
Internet, media	3	14	5	16	10	13	18
Courses, seminars, and conferences	7	32	4	12	5	7	16
Research	1	4	1	3	5	7	7
Total	**22**	**100**	**32**	**100**	**74**	**100**	**149**

Reading emerged as an important way to increase knowledge especially among employees. Most reading was business related but general reading was also mentioned. Reading should not be regarded as a surprising choice because New Zealanders are renowned for their prolific reading habits (Cardiff, 2005). Talking to film producers, Beaton (2003) states, "New Zealanders are the most avid book readers in the world. I think any nation that has hungry readers devouring books and newspapers is bound to have a good pool of creative, innovative thinkers" (p. 1).

Chief executives looked to increase employee knowledge through training, and their assumption was that employees would also identify training related to the workplace as the principal way to increase knowledge. Attendance at courses, seminars, and conferences was fairly low on the employee list of ways to increase knowledge, yet was perceived more highly by the chief executives as a means of increasing knowledge. No specific indicators were evident as to why employees did not appear to regard courses, seminars and conferences very highly, yet it is not unusual for employees to be pleased to be chosen to attend such activities. This stated lack of interest on the part of employees was likely to be of concern for management. It is not uncommon for organisations to invest considerable amounts of money in sending employees on courses, seminars and conferences to increase knowledge and skills, and to increase awareness of what is happening in their specific industry. However, whichever approach is taken, increasing the skill level and knowledge of employees is critically important to generate wealth in a competitive market (Kluge *et al*., 2001; Coulson-Thomas, 2004).

All respondents agreed that interacting with other people as a way to increase knowledge was important. There was a close link between those responses, and the ones identifying gaining knowledge on the job. Both approaches involved interacting with people. However, on-the-job learning was mentioned by employees surveyed and the chief executives, yet not by the employees interviewed. A possible reason for this may be that the employees interviewed regarded interacting with others as including increasing knowledge while on the job. On-the-job learning is an important way to increase knowledge because training is carried out in the context in which the knowledge gained will be applied.

None of the responses appeared to regard the Internet and/or media particularly highly as a way of increasing knowledge. However, it is possible that employees made use of those forms of enquiry as pointers to sources to be explored to obtain the knowledge required rather than as sources of knowledge in their own right. Research did not emerge as a particularly significant means of increasing knowledge, and those who did suggested it may well be employees whose work had an element of research focus. When people want to know about something they undertake research, and the starting point for the research may be asking someone.

In the Model, skills and competencies are identified under the human capital section, and the organisational capabilities component is in the internal capital section. Organisations should be constantly seeking to increase the knowledge of their employees to enhance organisational

capability. Employee knowledge and the level of skills and competencies available are determinants of where an organisation can position itself in the marketplace. As competition increases, it is necessary to increase organisational knowledge to increase the impact on the capabilities that an organisation can offer to the market. Capabilities and competencies are unique to each organisation. During the interviews with the chief executives it was clear they were very much aware of the importance of skills and competencies, and the need to be continuously increasing employee knowledge. Their comments matched the views of various authors regarding the significance of capabilities and competencies built up within organisations (Prahalad and Hamel, 1990; Rastogi, 2003). Dynamic capabilities are essential to support a sustainable and competitive position (Teece, 2000).

The responses clearly indicate a fit with the Model. There was a strong connection between skills and competencies and organisational capability, and so placing of skills and competencies under human capital and capabilities under internal capital is appropriate.

5.2.2 Incentives for Sharing Knowledge

As sharing knowledge is an important activity within a business, question 8[13] to chief executives and question 6[14] to employees asked whether incentives should be offered for sharing knowledge. The question originated from suggestions by several authors (e.g. Davenport and Prusak, 1998; Wenger and Snyder, 2000; Kankanhalli *et al.*, 2002; Michailova and Husted, 2003) that the offer of incentives can be a motivator in situations where resistance to sharing knowledge may present a problem for some organisations.

Monetary rewards usually come to mind when considering incentives, but recognition as an incentive is regarded as a legitimate and acceptable method of reward (McDermott and O'Dell, 2001). Recognition was the approach taken by Xerox and discussed by Brown and Duguid (2000). Recognising staff for their contribution and receiving an accolade in front of peers encourages others to share their knowledge, and may be an approach giving greater satisfaction than a monetary reward. However, if non-sharing of knowledge is having a detrimental effect on the operation of the business, steps may need to be taken to negate such occurrences through the offering of incentives (Davenport and Prusak, 1998; Kankanhalli *et al*., 2002; Laupase, 2003).

[13] What are your views on offering incentives to share knowledge?
[14] Should incentives be offered to encourage the sharing of knowledge?

Assessing the level of knowledge sharing, and attempting to place a monetary value on it, is problematical and inevitably raises questions about how and when the cut-in point is identified. Such schemes could be fraught with difficulties, particularly where teams are involved, and problems are likely to arise if an organisation attempts to instigate an incentive scheme for sharing knowledge (Gamble and Blackwell, 2001). Where the problem of non-sharing exists, the situation first requires investigation to identify why sharing is not occurring. What may be revealed is that there is a need to develop a culture to encourage sharing. Although the process for changing a culture takes time, the rewards may be greater than following the route of offering incentives.

CHH employees interviewed were unanimous in their view that sharing knowledge was not a problem. The researcher pondered the genuineness of the responses on the basis there might be an element of bias towards what the researcher wants to hear. However, when comparing the interviewed responses with those of employees completing the questionnaire, it appeared that the sharing of knowledge was the norm. There is not only a seeming readiness to share, but also there was an expectation that sharing would occur. Employees recognised that sharing knowledge benefited not only the organisation by increasing its knowledge base, but also at a personal level there was benefit as a result of increasing their own knowledge.

Views on whether incentives should be given for the sharing of knowledge are identified in Table 5.2.

Table 5.2 Rewards for Sharing Knowledge – Views of Chief Executives and Employees

View	Chief Executives 9		Interviewed Employees 18		Surveyed Employees 44	
	No.	**%**	**No.**	**%**	**No.**	**%**
Yes reward	2	23	12	66	14	32
No reward	6	66	3	17	21	48
Uncertain	1	11	3	17	9	20
Total	**9**	**100**	**18**	**100**	**44**	**100**

Six of the chief executives were against the offering of incentives, two felt that incentives should be offered, but tempered their comments around applying certain conditions, and one was uncertain. Views from the employees about the giving of incentives for sharing knowledge were varied. Two-

thirds of employees interviewed favoured the offering of incentives compared to just under one-third of employees surveyed. When a comparison was made there did not appear to be a logical reason for the difference between the two employee groups.

Rewards in the form of recognition were an acceptable incentive according to employee responses, and from the perspective of McDermott and O'Dell (2001) recognition is a way of making the importance of knowledge sharing visible. Respondents agreeing to the giving of rewards did not always infer a monetary reward, with a number indicating that recognition was an appropriate form of reward. This was the method taken by one chief executive and it appears to have had a successful outcome.

The chief executives and employees indicated there could be difficulties in determining an equitable approach to the giving of incentives, particularly when teams are involved. Responses to the question about whether or not to give rewards suggested that it was one around which there would be ongoing debate.

The discussion revealed that monetary rewards were not necessarily the approach to take when considering rewards. In general, employees were happy to receive acknowledgement of their contribution. Knowledge sharing was identified as an important activity in the management of intellectual capital, and was included as a component of human capital in the Model. The sharing of knowledge fits with the positioning of it in the human capital section, and the offering, or not, of incentives does not impact on this in the Model.

5.2.3 Organisational Restructuring

Question 12[15] to the chief executives, and question 1[16] to employees, asked about the restructuring of CHH from six divisions into thirty-two business units registered as independent companies.

The structure of an organisation impacts on its functional ability (Klein, 1998; McManus and Loughridge, 2002), and restructuring a large organisation into smaller groups is conducive to greater viability of teamwork, and development of an innovative workplace (Minkes and Foxall,

[15] The goal of CHH is to become more innovative. Do you think the dividing up of the organisation into smaller companies has created a more innovative environment?
[16] What are your views on the dividing up of CHH into numerous companies?

2000). There is also the view that the size of the organisation does not affect the level of innovation (Quinn, 1985; Kanter, 1996; Ireland *et al*, 2001), and it is the environment within the organisation that creates the appropriate interaction and stimulus to innovate (Kanter, 1996).

Organisations that make clear statements about the future influence the creation of "a strong culture capable of appropriately guiding behaviours and actions" (Ahmed, 1998, p. 38). It is therefore important to energise people to be innovative. This can be achieved through empowering people, defining their boundaries of action, identifying the extent of their responsibility and accountability, and the level of autonomy granted to them. Implementing such an approach enables an innovative culture to thrive.

The views of the research participants regarding the restructuring of CHH are given in Table 5.3.

Table 5.3 Restructuring Carter Holt Harvey Ltd

View	Chief Executives 9		Interviewed Employees 18		Surveyed Employees 44	
	No	**%**	**No**	**%**	**No**	**%**
Positive	7	78	10	56	20	45
Positive – with reservations	2	22	8	44	15	34
Neutral	0	0	0		2	5
Negative	0	0	0		7	16
Total	**9**	**100**	**18**	**100**	**44**	**100**

It is apparent that the restructuring of the organisation into smaller units was regarded as a positive move. Responses suggested that working in a large organisation stifled innovation. The smaller business units gave the perception of being released from a bureaucratic structure that had prevented individuals from demonstrating their innovative thinking and abilities. Employees are listened to, their ideas are given consideration, and ideas with potential are acted upon. This was regarded as encouraging, and rewarding. An insightful comment by one employee pointed out that greater responsibility was then being taken when costing projects. Ideas that previously would not bring huge returns to the organisation, but could in fact produce a return of considerable value to a business unit, were given the opportunity to develop to fruition and were bringing rewards.

The interviews and questionnaires revealed an insight into an environment that had evolved as a result of the restructuring. There appeared to be commitment, acceptance and enthusiasm for the environment the restructuring set out to establish. Perceptible throughout the interviews with the chief executives and employees, and in the employee questionnaires, were the number of comments referring to noticeable changes in the behavioural activity. There was enthusiasm for the business units to be successful, and this was reflected in the comments about people being more accountable. The frequent use of words such as empowerment, autonomy, taking responsibility, ownership, and motivation, indicate the positive behaviour and attitude that has emerged from the restructuring. Employees were responding to the responsibility granted to the business units to become successful. They welcomed the opportunity to put forward ideas knowing they received consideration, therefore, recognised they are valued for the contribution they make. Kluge *et al*. (2001) refers to people-oriented cultures generating commitment, enthusiasm, taking responsibility, and supporting an entrepreneurial style of behaviour that can bring considerable benefit to organisations. Reaction to the changes illustrated it is possible to build a culture that leads to positive and desirable behaviours.

Whether the changes in this particular instance were linked to the setting up of smaller business units where employees perceived they are receiving more notice was difficult to determine. However, an organisation's structure, and its culture, can influence the behaviour of employees (Allee, 1997; Klein, 1998; Davenport, *et al.* 1998; McDermott and O'Dell, 2001; McManus and Loughridge, 2002). The restructuring had apparently led to a change in behaviour. Employees in the various business units favoured interacting with people, and this propensity towards pro-social behaviour appeared to be having a positive impact on the business units. The views confirmed the very important part that behaviour and attitude played in the operational activities of an organisation.

Comments arising during the interviews pointed to concerns by a few respondents. For example, that the restructuring had been taken to such a level that some of the business units did not work effectively, and that there was now a need for some regrouping to be undertaken. It was felt there was a decline in co-operation amongst some of the business units, and an element of competition with each other instead of presenting a united force to the external marketplace. Other comments related to the number of services being operated centrally, which was not regarded as necessarily being a good thing, and that having been restructured into small companies insufficient freedom was being given to act like small companies. The points raised indicate issues for consideration

when restructuring. None of the problems appeared to be insurmountable, and it was likely those issues would be resolved.

Overall there was a consensus that in smaller business units, people mattered. There was clearly a positive response to the idea of autonomy and flexibility in the operation of the business units with the result that employees were more responsible and accountable. The behavioural changes that were occurring were conducive to creating an innovative environment. Comments made by the respondents relating to behavioural changes concur with the view of Ahmed (1998) who says that when an organisation clearly identifies its future direction, it also creates the environment and influences behaviour.

The internal capital section of the Model includes structure as a factor to be considered when managing intellectual capital. Respondents emphasised the part played by an organisation's structure in relation to the effectiveness of its operations, and this points to a fit with the position of structure as a component in the Model.

Positive behavioural changes are occurring in the business units. Behavioural activity has the ability to impact considerably on an organisation's operations (Ahmed, 1998; Kanter, 1996). People can react positively or negatively to the environment in which they are working and respondents in this study made frequent reference to their environment. Comments from the chief executives and employees indicated that encouraging ideas along with opportunities given to develop and implement the ideas was generating a positive work environment. Employees felt they were valued for their contribution and as a result were taking greater responsibility, acknowledging ownership of tasks and were more accountable. When employees are challenged they become more interested in their work and more engaged and this leads to a greater desire to be successful. (Kanter, 1996).

Including behavioural change as a component in the Model would signal its importance not only directly in the operational activities of an organisation, but also to the success of innovations with the potential to generate wealth. Although CHH had been recognised as an innovative organisation prior to the restructuring, what had positively emerged within the business units is the enthusiasm of employees to the opportunities afforded them, and their desire to make the business units successful. A positive organisational environment will have a beneficial impact on the success of an organisation (Kanter, 1996).

Within their responses participants indicated the importance of socialisation. Participants referred to their network of contacts when seeking knowledge and that there were no apparent difficulties to sharing of knowledge and the discussing of ideas. There is preference for gaining knowledge in the informal situation indicating good relationships among staff. When training is required, on-the-job training was high on the list of preferred ways to gain knowledge suggesting that people respond positively when they have the opportunity to learn when interacting with other people. Learning and sharing knowledge can also occur when involved in work organised social activities, such as sport. Socialisation within the workplace not only brings people together to get things done, but also encourages interaction that leads to new knowledge and discussion of ideas that can ultimately lead to innovations (McElroy, 2002). Networks and communities of practice have an important part to play as they provide opportunities for people with common interests to share their experiences (Kanter, 1996; McElroy, 2002). It is natural for people to socialise and there are benefits to be gained as a result of this occurring in the workplace (Weick and Roberts, 1993). The value of socialisation is underestimated as an organisational activity and the importance of the contribution that can be made as a result of socialising suggests that socialisation be introduced as a component within the Model.

5.2.4 Summary of Sections 5.2.1 to 5.2.3

From the questions raised about increasing knowledge, employees identified reading as the most important way to increase their knowledge. This was contrary to the belief of the chief executives who gave reading a lower listing. A consistent pattern across all respondents was the identification of interaction with people as an important source for increasing knowledge. On-the-job training was high on the chief executives' list of ways to increase knowledge, as it was for employees surveyed, but was not referred to by the employees who were interviewed.

Discussion around the giving of incentives for sharing knowledge revealed that the chief executives and a majority of the employees surveyed were against the giving of rewards, but two-thirds of employees interviewed were in favour of them. Determining a process for equity in the giving of incentives was identified as being an extremely difficult task. Non-monetary recognition for sharing knowledge was important.

There was a favourable response to the restructuring of CHH from six large divisions into 32 business units. The greater autonomy afforded the business units was welcomed. Employees were listened to, their ideas acknowledged and discussed, and, where suitable, were implemented. This was regarded as encouraging and generated an outcome that saw employees becoming more responsible and accountable. A noticeable impact resulting from the restructuring was the positive behavioural changes that had taken place.

Responses point positively to the positioning of structure in the Model. It is evident that the structure of an organisation does impact on its operational activity. The interaction among people, recognising the need to be constantly increasing knowledge through learning, sharing knowledge, and creating knowledge, provide opportunities for organisations to become innovative. Their positioning in the Model has considerable relevance in the management of intellectual capital.

Perhaps the most significant outcomes from these results is the recognition of the behavioural changes and the importance of socialisation within the workplace as new components to the Model.

5.3 Questions to Employees

5.3.1 Challenges of an Innovative Environment

Responses about the challenges they faced when working in an innovative environment, question 2[17], pointed to the business units being able to do things that previously they would not have had the opportunity to do. Although the tenor of responses suggested employees were reasonably accepting of, and comfortable with the innovative direction being taken, some concerns were expressed. One concern was the possibility of reverting back to previous ways and not being prepared to move forward. Certainly if the momentum generated by an innovative approach was not maintained there was a danger of this occurring. A second concern pointed out that it was tough on employees to work in an environment that was constantly challenging practices that have been ingrained for years. The third concern centred on the dislike of failure, and the stigma attached to failure. It was mentioned that there are some people in senior management who did not have the maturity to handle failure, or the failures of their subordinates.

[17] What challenges do you face working in an innovative environment?

Expressing views on the approach by senior management to handling failure provided an insight into employee views and attitudes. A small number of employees referred to the need for a more amenable approach to risk taking indicating they were aware of potential avenues of opportunity for their business units. A reason for risk aversion can arise from focusing too much on the 'probably' rather than the 'certainty' effect (Teece, 2000). Several employees pointed out that failure should be openly acknowledged with the reasons for the failure identified and analysed. The maturity in their thinking was apparent when they did not regard failure as a negative state, but one through which considerable learning, and the gaining of knowledge could take place. It is all too easy for organisations to push aside failure and ignore the importance of examining why it has occurred. If the reasons for the failure are not identified, and acknowledged, then there will be no learning from the failure to ensure a similar situation does not occur in the future.

A further point raised by employees was the issue of intellectual property. They mentioned a lack of awareness in some instances of the importance of intellectual property protection, saying that there was no proper development of intellectual property, nor was there recognition of the value in processes. The comment relating to processes was astute because the focus of protection tends to be on the product rather than on the skills and competencies embedded in the process. Reference was made to the need for a strategy for managing intellectual property to direct the ability to earn high revenue from it. Such comments from employees indicated their recognition of considerable intellectual property residing in the business units, the need to protect it, and to gain a return on investment.

Commercialisation, an integral part of the innovation process, did not feature in the questions put to employees, but several referred to it being an issue. They recognised the significance of developing a commercial orientation, and said that the ideas must be assessed for their commercial viability. Comments pointed to a lack of skills in the commercialisation process, and this was regarded as a critical issue. Those employees coming from a scientific background said the change of direction towards a commercial orientation, while necessary, was not easy to accept. Some employees also pointed to the opportunity to be more entrepreneurial in their thinking, and that this was having a motivational effect. The comments highlighted the understanding by employees of the importance of the commercial potential of ideas generated by them.

From the comments it is evident that on the whole employees were responding to the programme of innovation. Employees indicated they enjoyed coming up with ideas, learning new skills, and

meeting the challenge of an environment requiring a person to be reactive and constantly changing. This certainly suggests that when the right environment is created employees will respond positively thus providing benefit to them, and to the organisation. The responses augur well for developing an innovative environment.

5.3.2 Issues Associated with Sharing Knowledge

If value is to be derived from the knowledge of employees, it is essential that sharing knowledge is the norm. As discussed in the literature (e.g. Allee, 1997; Carnerio, 2000) the nature of knowledge is such that the act of sharing generates increasing knowledge, and the greater the knowledge in an organisation the greater are its opportunities to operate in an increasingly competitive environment (Wright and Taylor, 2003).

The views of several authors point to a number of reasons why people may not share their knowledge. Reasons given are job security (Darling, 1997; Davenport and Prusak, 1998), the 'knowledge is power' syndrome (Kluge, *et al*., 2001; Kankanhalli, *et al*.; 2002), and trust (Nonaka and Takeuchi, 1995; Michailova and Husted, 2003). Being prepared to share is associated with cultural, social, economic, and organisational contexts (King and Anderson, 2002; Michailova and Husted, 2003; Robbins *et al*., 2004). The environment of a business is a determinant of the willingness, or otherwise, of people to share their knowledge.

A few respondents made reference to barriers such as 'knowledge is power', and to job security as reasons why staff might not be inclined to share knowledge. However, in making those comments, the respondents emphasised they personally had no difficulty in sharing, and were merely suggesting that some people might have such a problem. The overwhelmingly positive reaction by the respondents to the question points to the fact that people might be more amenable to sharing knowledge than was previously thought. Employee responses indicated that the environment in which they worked was such that they were comfortable in sharing their knowledge.

The views of the employees further confirm the importance of sharing knowledge as a component in the Model. It is evident that sharing was an expectation of the work environment at CHH, and that the respondents had no difficulty meeting that expectation.

5.3.3 Exchange of Knowledge

Question 5[18] asked about the exchange of knowledge. When working alongside other people, it is inevitable that interaction occurs either in a formal or informal manner. People spend a considerable part of their day in the workplace, and camaraderie has an essential part to play in the well being of employees. Providing the means for interaction to occur is important. Whether it is necessary to delineate between the formal and more informal situation may well depend on the prevailing culture of an organisation. It is clear that situations allied to the more informal setting suggest the socialising process is a valid and significant way of increasing knowledge. In organisations where there is a positive approach to social interaction amongst staff there are considerable benefits generated through the sharing of knowledge (Connelly and Kelloway, 2003).

Although formal situations were initially identified as locations for the exchange of knowledge, a broader perspective emerged in the responses when it was evident that a considerable amount of knowledge was being exchanged in informal situations. These situations ranged from teams, focus groups, working with people with similar views, on-the-job exchange of knowledge, interaction with external parties, and social/sports activities linked to the organisation. In effect, a considerable number of situations emerged that provided opportunities for the exchange of knowledge, indicating a trend towards the informal socialisation aspect of exchange as being an effective approach. This pointed to the informal approach as providing the recipients of knowledge with the opportunity to question the knowledge in a less threatening environment. The findings strengthen the view of the value of socialisation as a means through which knowledge can be shared (Nonaka, 1991; Spender, 1999; Brown and Duguid, 2000).

Exchanging knowledge fits with the inclusion of knowledge sharing in the Model, with the views of respondents indicating that the environment will determine how favourably this might work. From an intellectual capital management perspective, awareness of the impact of the environment in which people work, and particularly the social environment, will have a bearing on how effective the exchange of knowledge will be.

[18] Where does the most effective exchange of knowledge take place?

5.3.4 Finding Knowledge

The issue of finding knowledge when it is required was addressed in question 7[19]. When requiring knowledge people have to put together their own intelligence networks (Baker, 1996).

When urgently seeking knowledge, the overwhelming response of the employees was, "people asking". This provides a connection with 'interacting with people' discussed above. The response provided a further link to the practice of increasing knowledge through interacting with others, and suggested that employees developed a system of networks for seeking knowledge when they needed it. Although networks appeared to operate within the business units, some employees indicated they also used outside connections. External and internal networking was regarded as important because it was through the networking process that valuable contacts could be made for potential future benefit. However, it was noted that those who most valued networking were the people whose jobs took them to customers and suppliers to discuss business matters. At events such as conferences, the social side presented a good opportunity for sharing knowledge because it was through the more relaxed environment that knowledge was often gained that might not be available in the normal course of events. This response concurred with the view of Baker (1996) about the setting up of intelligence networks.

The responses reinforced the view that knowledge can be increased through interacting with others, and that sharing knowledge is regarded as a normal part of the work situation. This again confirms the positioning of knowledge sharing in the Model, and the value of a sharing environment.

5.3.5 Summary of Sections 5.3.1 to 5.3.4

The view of employees to the challenges they may face as a result of working in an innovative environment is that they could do things that previously they were unable to attempt. In responding to the new environment, they were learning new skills, having their ideas considered, and in some cases their ideas were becoming a reality. They regarded the cultural and behavioural changes that had occurred as positive and encouraging. Concerns expressed were that there could be a reverting back to old ways, and the new environment challenged established practices, and this may be difficult for some employees to accept.

[19] How do you go about obtaining knowledge when you require it?

The question of failure was raised by some employees who felt that management needed to develop a greater maturity in approach to be able to cope effectively with failure, and also to be more flexible in their view of risk taking. Commercialisation of innovations was raised indicating there is a need to take a greater commercial orientation to promoting the innovations developed through the business units. Giving greater attention to the management of intellectual property was also raised by a number of employees.

In response to the question about sharing knowledge, it was revealed that sharing was not an issue, and indeed it was an expected part of the job. However, it was mentioned that some people might well have issues with sharing knowledge, and identified these as relating to the power syndrome and job security. In the social environment that developed as a result of working alongside people, the exchange of knowledge readily occurred, and there were benefits associated with sharing. When looking for knowledge when it was urgently required the favoured approach was to ask someone by making use of work-linked networks, or external networks. This approach illustrates the advantages from the employees' perspective of the informality around the socialisation aspect of the work situation.

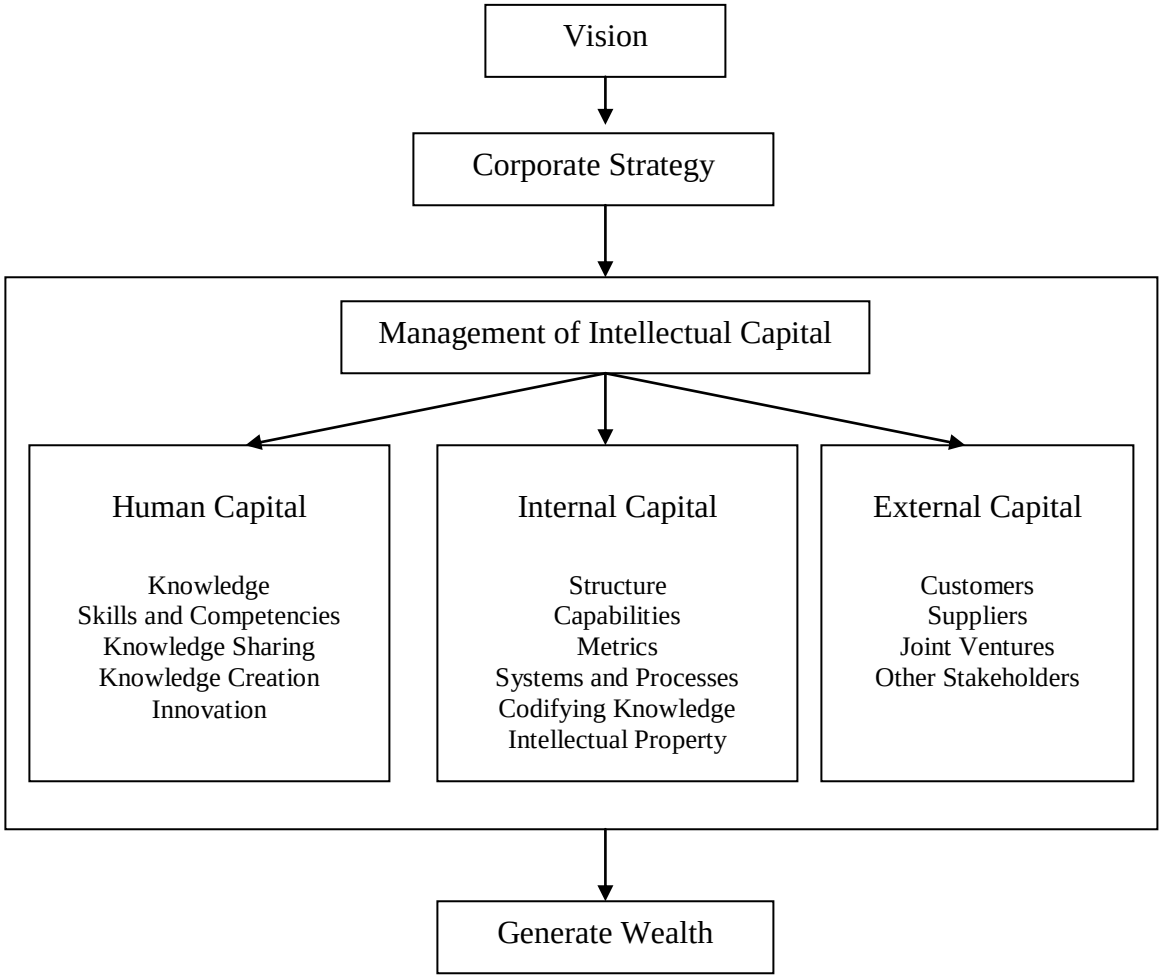
The final question to be considered in this Chapter is how the findings of the research align with the Intellectual Capital Management Model, which is reproduced for convenience in Figure 5.1.

5.4 Aligning the Intellectual Capital Management Model with the Findings of the Research

The Intellectual Capital Management Model was designed to illustrate the characteristics to be addressed when an organisation is looking to develop a strategy for management of its intellectual capital. The Model was derived from an extensive review of the literature.

Although the findings of the research suggest there was no apparent evidence of specific management of intellectual capital occurring in the case examined, at either the corporate or business unit level, many of the components of the model were present. If the corporate strategy took cognisance of the importance of managing intellectual capital there would be a requirement by the business units to include this in their individual strategies to ensure compatibility with the corporate strategy.

Figure 5.1 Intellectual Capital Management Model



The context in which an organisation operates is liable to change because of economic conditions pertaining at the time. It is critical to address this situation when planning future development, and to take an audit of the organisation's intellectual capital to assess its position to meet changing conditions. The restructuring of CHH was designed to meet the challenges of the anticipated future business environment. Furthermore, the context in which the business units were operating at the time of the research was similar to that of business start-ups. The business units were in the process of determining their positions and status in the marketplace, developing customer relationships, and exploring opportunities.

Vision is a component in the Model. The Annual Reports of CHH for 2000 and 2001 did not outline the organisation's vision, but the stated aims identified its future direction. Those aims were

based on the philosophy of the founders (emerging over 100 years ago). They identified innovation, leadership and performance as being the building blocks of the organisation. They also recognised the importance of adopting new technologies and processes, and the exploitation of new opportunities was recognised. The aims stated that the organisation wanted to be recognised as one that performed to very high standards to provide it with a strong competitive advantage. With no obvious stating of the organisation's vision, the aims can perhaps be identified as expressing the vision, and in this context can be identified as aligning with the inclusion of vision in the Model. It is critical to an organisation's future that its intellectual capital is aligned to its vision (Harrison and Sullivan, 2000; Sullivan, 1999).

A corporate strategy is important if the aims and objectives of an organisation are to be achieved. From discussions it is evident that CHH had a corporate strategy in place, and it is appropriate to illustrate this in the Model.

5.4.1 Human Capital

Knowledge is critical to the operational activities of an organisation. Knowledge dominates the human capital section of the Model. It is evident that the chief executives were fully aware of the knowledge contribution made by employees. Acknowledgement of the vital role of employees fits with the positioning of knowledge in the Model.

The Model identifies skills and competencies as a component of human capital. Discussions revealed that there was considerable reliance on the skills and competencies of employees that linked to the successful operation of the business units. Activities in the business units indicate that the skills and competencies of employees aligned with this component in the Model.

Managing the process of facilitating knowledge sharing is important for both performance improvement and for encouraging knowledge creation. The research revealed that knowledge sharing freely occurred, and was regarded as an activity that was part of the normal work situation. Knowledge creation emerges from the sharing of knowledge, and in turn can lead to ideas and innovations. That innovations do emerge indicates that knowledge sharing and knowledge creation take place. Those activities match with the inclusion of knowledge sharing and knowledge creation as components in the Model.

As one of the aims of CHH was innovation, the chief executives gave attention to the need to focus on producing innovations, even though there was no evidence of a plan for the management of it. It is not unusual for organisations to have no specific plan or person responsible for innovation (Cottam *et al*. 2001). However, one of the business units at CHH did have the remit for encouraging innovation across all the business units, and for assisting the development of ideas showing potential. Although having no one specifically responsible for innovation, the chief executives acknowledged that there would be increased innovation if intellectual capital were managed. Certainly as a result of the restructuring into smaller units, comments from the employees indicated they were responding to an environment that encouraged innovation.

5.4.2 Internal Capital

Intellectual capital determines the capabilities of the organisation and it is crucial for managers making decisions to have access to all available knowledge, and to take a holistic view of the organisation's intellectual capital (Rastogi, 2003, Hussi, 2004). Carrying out a knowledge audit identifies what knowledge is available and an assessment of its value contribution can be made. This enables managers to rectify gaps in knowledge that may impact on future development plans. The business units were aware of the importance and value of capabilities as a means of advancing their success and, as a result, the inclusion of capabilities in the Model aligns with the approach of the organisation.

Evidence emerging from the research identified from the perspective of the chief executives and employees, satisfaction with the outcome of the restructuring. It had led to the promoting of ideas that previously were not given the opportunity to be tested, and had engendered a feeling of optimism among employees. This illustrates the importance of organisations examining the current structure of their businesses to determine whether a change is necessary, and indicates that organisational structure should be considered when managing intellectual capital. The restructuring by CHH aligns with the inclusion of structure as a component in the Model.

Metrics is a characteristic in the derived model. Although measurements do occur at CHH there was no evidence of measurement activity occurring that could be linked to intellectual capital. As a result there is no match with the metrics component identified in the Model.

Although no systems and processes were directly associated with the management of intellectual capital, it was evident that the organisation did have in place a wide range of systems and processes for its various activities. Having a procedure for setting up systems and processes for the organisation's activities enables a link to be established with the systems and processes component in the Model.

It is important that knowledge available to the organisation is codified so that it is accessible as required by employees when carrying out their work activities. The research indicated that although systems and processes were written down, there was a gap in the codifying of knowledge of relevance to the organisation that at that time was being held in the heads of employees. Although the codifying of this type of knowledge was not fully addressed, attempts were being made by some of the chief executives to codify, and others were aware of the need to increase their efforts to ensure codification took place. These efforts point to a fit with the codifying knowledge component in the Model.

CHH held a large amount of intellectual property, and several of the business units had developed new products and services or were in the process of doing so. There was little evidence of management action to promote the maximising of value from intellectual property, the absence of which would be likely to have a restraining effect on the opportunity for generating wealth. Wealth is not created until revenue is generated from innovations. A few of the chief executives made reference to the importance of the commercialising of new products and services but did not elaborate on this. Although there was little in the way of the management of intellectual property, the activities at CHH pointed to the inclusion of intellectual property as a component in the Model.

5.4.3 External Capital

The research revealed a focus on developing good relationships with customers and suppliers. The chief executives valued their customers and wherever possible work closely with them. They were also aware of the importance of working alongside their suppliers, recognising there are advantages to be gained by both parties. Several of the business units had developed partnerships, and joint ventures with other organisations, and they appeared to be operating satisfactorily. As a large New Zealand organisation prior to restructuring, CHH worked closely with government, and the business units were continuing this association. CHH was also well recognised for its involvement in the community, and of being conscious of the importance of building good relationships with all

stakeholders. From an external capital perspective, the activities in the business units aligned with the components identified in that section of the Model.

5.4.4 Effect of Alignment on the Intellectual Capital Management Model

The focus of the research question was to determine whether the components of a model derived from the literature on which to develop the management of intellectual capital, aligned with the findings of the research undertaken in a New Zealand organisation. The results are show in Figure 5.2, a revised version of the Intellectual Capital Management Model, which takes account of the results of this study. The changes are highlighted in this section. It was found that the activities in the business units had a close affinity with most components in the Model as the majority of the components identified in the model were in evidence. These are unchanged in Figure 5.2.

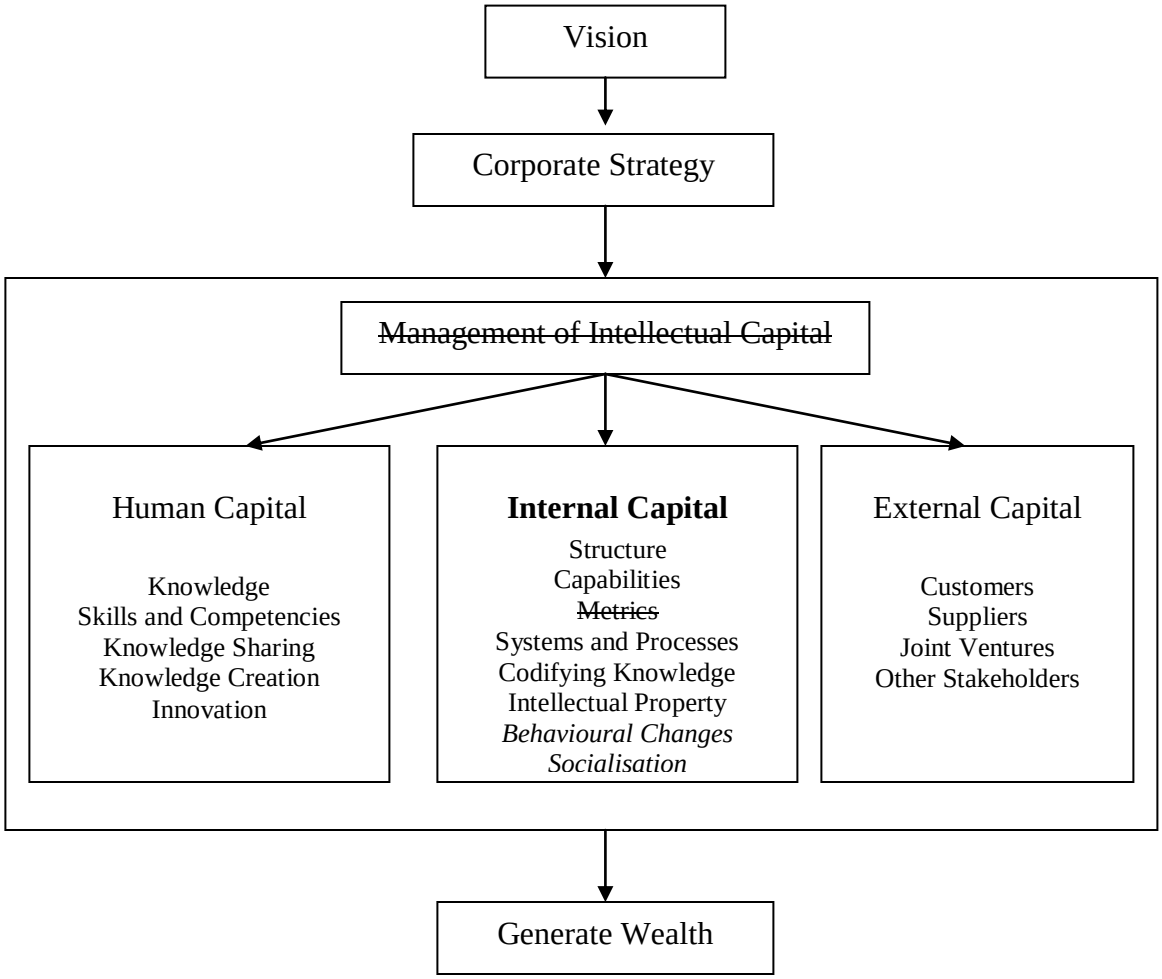
In comparing the Model (theory) with the findings from the research (practice), there was scant evidence of the explicit management of intellectual capital taking place at CHH. The literature emphasises the importance of having an intellectual capital management strategy (McConnachie, 1997; Sullivan, 1999; Klaila and Hall, 2000; Nilsson and Ford, 2004). At CHH the strategy was implicit, at best.

Managing involves the measuring of operational activities to determine whether standards of performance are being met. From the lack of apparent management of intellectual capital, there was no direct measurement of results and so no metrics. The lack of explicit management of intellectual capital, and of associated metrics activity, prevents full alignment of the activity in the Carter Holt Harvey Ltd organisation with the derived Model. Accordingly, both management of intellectual capital and metrics are struck out in Figure 5.2.

An unexpected finding was the very positive behavioural changes that were a feature of the business units. Employees are responsible and accountable, knowledge sharing was practised, the opportunity to promote ideas was welcomed, and employees were keen to make the business units successful. These changes came about primarily as a result of the restructuring. Structure is a component of the Model, but behaviour and attitude play a separate and important part in organisational activity, and are factors that should be taken into consideration when implementing a plan for the management of intellectual capital. Behavioural change is included as a factor in the Model, highlighted in italics in Figure 5.2.

Socialisation is identified by Nonaka (1994) when referring to knowledge conversion as an aspect of the increase in knowledge and knowledge sharing. Weick and Roberts (1993) illustrated the importance of social interaction when a discussion between two aircraft crew resolved a potentially dangerous landing situation. It was clearly evident from the research that socialisation within the business units was contributing positively to their operational activities. The chief executives and employees said increasing knowledge and sharing knowledge occurred during on-the-job training, at meetings, formal and informal, when networking, and as a result of sports/social activities associated with work. Contrary to being seen as time wasting, socialising has a valuable contribution to make to an organisation's operation. Socialisation as a component within internal capital is added to the Model, as shown in italics in Figure 5.2.

Figure 5.2 A Revised Intellectual Capital Management Model



5.5 Chapter Summary

Intellectual capital is acknowledged as a valuable asset, and the knowledge foundation of intellectual capital is generated by input from the human capital, capital internal to the organisation, and from knowledge external to it. Although initially respondents identified the value of the organisation as residing in the monetary area, it was later acknowledged that it was through the intellectual capital of the business units that value was generated, and that the sustainability and success of the business units would be achieved.

There was no evidence of an explicit strategy for managing intellectual capital as part of the corporate strategy. As a result little management of intellectual capital occurred in the business units. It was agreed that if the management of intellectual capital was addressed there was a strong likelihood of the business units being more innovative. With minimum management of intellectual capital taking place the measurement of intellectual capital was also not occurring.

It is through the knowledge of employees that intellectual capital is developed. Employees at CHH were valued for their knowledge input, as was the knowledge of those external to it, and with whom the business units had developed mutually beneficial working relationships. Sharing knowledge did not appear to be an issue for employees, and the view taken by management was that sharing knowledge was an expected outcome of employment. Knowledge creation emerged from sharing knowledge, and in turn encouraged the development of ideas leading to innovations that generated wealth for the business units. The offering of incentives for sharing knowledge was rejected by the majority of the chief executives, along with a large proportion of the employees surveyed. However, many of the employees interviewed favoured the giving of incentives. From a non-monetary perspective, all respondents indicated that recognition and acknowledgement for sharing knowledge was appropriate. A substantial investment had been made in technology, apparently tending to view it as a means of storage rather than for accessing and sharing knowledge.

The capabilities of the organisation, and the skills and competencies of employees were highly regarded by management. Attention was given to the importance of ongoing training to further develop and grow employee skills. However, to maintain a competitive positioning it was seen as necessary to be continuously increasing knowledge. Reading emerged top of the employee list as their way of increasing knowledge, but the chief executives were not inclined to give such high recognition to reading. Courses, conferences and seminars were higher on the chief executives' list.

All respondents pointed to the importance of interacting with others as a valid and important way to increase knowledge. This suggests that the process of socialisation was an acceptable and effective method of increasing knowledge.

Although considerable knowledge had accumulated over the lifetime of the organisation it was signalled by the chief executives that insufficient attention had been given to codifying knowledge, and this was an area that needed to be addressed.

The protection of intellectual property was regarded as critical at CHH, but beyond protection there was no evidence of it being managed with a view to enhancing any potential financial return. Respondents identified a need to be more entrepreneurial, and also for commercialisation of innovations in order to gain maximum exposure for new products and services.

Developing good working relationships with customers and suppliers was recognised as critical for the future of the businesses. Several of the business units worked collaboratively with other organisations. It was acknowledged that developing good relationships with the government, and the community was important.

The chief executives and the employees expressed positive views about the restructuring of CHH. In the smaller business units employees were recognised for their contribution and this was impacting positively on their attitude to work. Employees were more accountable, and taking ownership and responsibility for their actions. Some concerns were raised about an element of competition occurring among a few of the units when they should be focusing on competing with external organisations. It was also felt that some regrouping of business units was necessary, because the small size of some of the units had been broken down to a point where they were not operating viably.

The findings align well with the components in the Model derived from the literature. However, although the majority of components were present there is no evidence that the management of intellectual capital was taking place either at the corporate level or in the business units.

The following table provides a summary of responses to questions put to the participants, with links to the literature.

Table 5.4 Summary of Questions to Research Participants, Link to Literature, and Responses

Questions to Senior Management	Link to Literature	Responses
1 Which of the following equations do you think identifies intellectual capital? (Examples given in handout)	Chapter 1, Brooking (1996), Stewart (1997), Sveiby (1997).	Human capital + internal capital + external capital = intellectual capital.
2 Where would you say the value of the company resides?	Chapter 1, Penrose (1963), Sullivan (1999), Carroll and Tansey (2000), Clarke and Rollo (2001), Lev (1997).	Value lies in the skills and competencies of employees.
3 What processes have been followed to identify where the value is?	Chapter 1, Penrose (1963), Sullivan (1999), Carroll and Tansey (2000), Clarke and Rollo (2001), Guthrie (2001).	None are in place relating specifically to intellectual capital.
4 How does the company manage intellectual capital, i.e., is there a strategy in place to manage intellectual capital?	Chapter 2, Collis and Montgomery (1995), Sullivan (1999), Klaila and Hall (2000), Bollinger and Smith (2001), Riahi-Belkaoui (2003).	There was only implicit management of intellectual capital, and no indication of a strategy for managing intellectual capital in the corporate strategy.
5 Do you think that through the management of intellectual capital an organisation can become more innovative?	Chapter 2, Quinn (1985), Brand (1998), Rastogi (2003).	A unanimous yes. The advantages of managing intellectual capital were recognised.
6 What internal and external networks are used to acquire knowledge that will benefit and add value to the company?	Chapter 2, Brown and Duguid (1991), OECD (1996), Lester (2001).	The business units work closely with various external parties, and network with other business units.
7 How do employees increase their knowledge?	Chapter 2, Senge, 1990, Brown and Duguid (1991), Drucker (1994), Bender and Fish (2000).	Courses, conferences, and seminars.
8 What are your views on offering incentives to share knowledge?	Chapter 2, Davenport and Prusak (1998), Wenger and Snyder (2000), Kankanhalli *et al*. (2002).	Sharing knowledge is an expectation of employment.
9 To what extent is knowledge codified in the organisation, and what systems are in place to allow for the flow of knowledge?	Chapter 2, Wiig (1999), Snowden (2003).	Greater attention to codification is required. Technology systems are in place – but few comments made regarding technology.
10 What methods are in place for measuring intellectual capital?	Chapter 2, Kaplan and Norton (1992), Sveiby (1997), Marr (2003, Bontis (2004), Martin (2004).	No evidence of measurements of intellectual capital were being undertaken.
11 How does the company plan	Drucker (1994), Inkpen and	Training. Sharing knowledge

to create knowledge for the development and growth of intellectual capital?	Dinur (1998), Bender and Fish (2000), Clarke and Rollo (2001).	gained to generate ideas.
12 The goal of CHH is to become more innovative. Do you think the dividing up of the organisation into smaller companies has created a more innovative environment?	Chapter 2, Quinn (1985), Kanter (1996), Ireland *et al*. (2001).	A unanimous yes. Responses about the restructuring of CHH were very positive.
13 Have new products/processes increased as a result of ideas promoted by staff?	Chapter 2, Carnerio (2000), Kluge *et al*. (2001).	Yes. A number of new products had been launched, and others were coming on line.
14 How is the intellectual property of the company managed?	Chapter 2, Teece (1998), Rivette and Kline (2000), Davis and Harrison (2001).	Lawyers take care of protecting intellectual property, but there is little management beyond that.
Questions to Employees		
1 What are your views on the dividing up of CHH into numerous companies?	Chapter 2, Kanter (1996), Ireland *et al*. (2001), Tidd *et al*. (2001).	The responses were on the whole very positive.
2 What challenges do you face working in an innovative environment?	Chapter 2, Kanter (1996).	Most found the environment stimulating.
3 How do you increase your own knowledge?	Chapter 2, Senge (1990), Drucker (1994), Spender (1999), Brown and Duguid (2000).	Reading was top of the list.
4 What difficulties do you think arise through expecting people to share their knowledge?	Chapter 2, Nonaka (1991), Clarke and Rollo (2001).	There may be some resistance by those who felt threatened through sharing, but responses indicated sharing was part of the job.
5 Where does the most effective exchange of knowledge take place?	Chapter 2, Brown and Duguid (1991), Allee (1997).	When interacting with people in an informal setting.
6 Should incentives be offered to encourage the sharing of knowledge?	Chapter 2, Wenger and Snyder (2000), Gamble and Blackwell (2001).	Many interviewed were in favour, while those who responded to the survey were generally against incentives.
7 How do you go about obtaining knowledge when you require it?	Chapter 2, Brown and Duguid (1991), OECD (1996), Lester (2001).	Asking people.
8 What is your job title?		
9 What is your highest educational qualification?		

Conclusions from the research are given in Chapter Six.

Chapter 6: Conclusions and Contribution

6.0 Introduction

The question being investigated in this thesis is, "How does the approach taken by an organisation in New Zealand to manage intellectual capital align with the characteristics of the Intellectual Capital Management Model?" . This Chapter provides conclusions from the research and their applicability in general to the business environment. It discusses the alignment of the findings with the components of the Intellectual Capital Management Model derived from the literature in Chapter Two (Figure 2.9) and provides a conclusion on the adequacy of the Model. The Chapter considers the contribution made to research into managing intellectual capital and identifies areas for future research.

6.1 Understanding Intellectual Capital

When asked about their understanding of intellectual capital, the chief executives agreed that the combination of components – human capital + internal capital + external capital = intellectual capital – satisfactorily identified intellectual capital. In doing so they strongly emphasised the knowledge contribution of employees. However, it was clear that they needed to give higher priority to the management of intellectual capital by taking a holistic view of all sources of knowledge that had the potential to add value and for the future positioning of the business units as recommended in the literature (e.g. Rastogi, 2003; Hussi, 2004). The conclusion reached is that the chief executives, at the time of the research, had not been sufficiently exposed to the concept of intellectual capital to fully appreciate the considerable benefits to be derived from knowledge, nor that an aggregation of all knowledge available to each business unit generates its intellectual capital. Penrose (1963) emphasises the importance of knowledge as a key contributor to intellectual capital to transform tangible resources into productive services. Therefore, understanding the importance of managing intellectual capital is fundamental for the sustainability of an organisation's competitive advantage, and its ability to generate wealth. Increasingly the future success of organisations will be dependent upon their intellectual capital.

The Annual Reports did not identify the vision of CHH but did point to the aims to be achieved, including innovation in order to sustain the future of the organisation. Then, as now, there was a clear relationship between the innovation process and the effective exploitation of intellectual capital for the achievement of organisational aims.

The crux of the Intellectual Capital Management Model (Figure 2.9) points to the importance of managing an organisation's intellectual capital. Although most of the components of the Model were evident in the business units at CHH, there was little evidence for the explicit management of intellectual capital. Currently there are no indicators to point to intellectual assets being viewed comprehensively to suggest there is an asset of considerable value that requires management. Given the absence of evidence for intellectual capital management it is hardly surprising that there was a similar lack of corporate strategy in this regard. The literature clearly points to the importance of including intellectual capital in an organisation's strategy (McConnachie, 1997; Stewart, 1997; Joia, 2000; and Marti, 2003).

Despite the absence either of formal management or strategies for intellectual capital there were encouraging indications of knowledge-based change. The chief executives recognised the importance of knowledge to their business units. They acknowledged the need for a more proactive approach to codifying knowledge. In general, this entailed the codification of knowledge in systems and processes, but less attention was being given to the capture of the knowledge of individual employees. Accordingly it was admitted that there were knowledge gaps, and that greater attention needs to be given to eliminating those gaps.

Knowledge from external sources was recognised as having considerable relevance and value to the business units. The chief executives were actively networking with contacts in other organisations. They acknowledged the advantages of working collaboratively, and indicated there were partnership associations with various companies. Employees, particularly those who worked directly with customers and suppliers, also valued the networks they had developed, and found them particularly useful when seeking knowledge. There was also a good deal of networking by both chief executives and employees with other business units within CHH.

Furthermore, employees repeatedly expressed an interest in increasing their knowledge, while the chief executives frequently remarked on the skills and competencies of employees and their positive approach to the job. In view of the widely acknowledged connection between the competence of staff and the capability of an organisation, it was encouraging to find the chief executives acknowledging that there was a high level of capability within the business units, one to which the skills and competencies of employees was making a major contribution.

This latter was reflected in knowledge sharing practices, which in turn are vital to the creation of new knowledge, ideas and innovations. At CHH these innovations took the form of new products, services, and processes. On the downside, unfortunately there was little indication of effective processes in place to actively manage the innovation process. This was evident, for example, with regard to organisational patents. Management acknowledged that taking innovations through the patenting process not only gave protection to innovation but also opened up opportunities for licensing innovations to other organisations for the payment of royalties.

In a more positive vein, it is clear that the restructuring of CHH into a number of smaller strategic business units had positive human capital implications. Employees welcomed the opportunity of working within a smaller company environment offering the prospect of having a greater input to the operation of the companies and where they are encouraged to be more innovative. As already indicated, the creation of smaller business units had a positive effect on innovation with the development of new products and improved processes. This can be seen as reinforcing the view of Kanter (1996) that smaller units have a greater propensity to be innovative than larger ones is endorsed by this research. It can be concluded from what has taken place that the setting up of discreet companies within an organisation has considerable merit. One aim of the restructuring was to develop an innovative environment, and both the chief executives and employees had responded positively to the challenges of working in such an environment.

Given that it is virtually axiomatic in management circles that in order to manage it is necessary to measure, it was disappointing to find that there were neither structures nor processes in place to measure intellectual capital. This was not exactly a surprise in the absence of a strategy for the management of intellectual capital, but it was a striking omission in view of the systems and processes in place covering other functions and operational activities. These included the use of

Kaplan and Norton's Balanced Scorecard which elsewhere is frequently associated with the measurement of intellectual capital.

Finally, in reiterating that despite its acknowledged importance, intellectual capital was not being managed at Carter Holt Harvey Ltd., it seems likely that the company was not alone in this failing at the time. In fact, any reading of the literature would reveal examples of other companies elsewhere that while exhibiting a number of components of the Intellectual Capital Management Model were nevertheless failing when it came to the effective overall management of intellectual capital.

6.2 Adequacy of the Model

Aspects of the research reveal the need to address the adequacy of the Model (Figure 2.9). Considerable comment was forthcoming about behavioural changes that had resulted from the restructuring of the organisation into smaller business units, changes that were having a positive impact on the operational activity within the business units. Positive behavioural changes were noted by the chief executives, and also by a number of employees, leading to the conclusion that a smaller working environment had the propensity to offer greater opportunities for employees to participate more directly in the operational activities of the business. Employees also commented favourably on the acknowledgement of their contribution to the business units, and in some cases the actual uptake and development of ideas they had put forward. Although CHH had been recognised as an innovative organisation prior to the restructuring, additional positives emerged from the restructuring in the shape of the enthusiasm of employees to pursue the opportunities afforded them, and their desire to help make the business units successful. The inclusion of behavioural change in the Model, as a component of internal capital, signals its importance to the management of intellectual capital.

It was evident from the research that socialisation within the business units was a positive contributor to operational activities, and to ways in which knowledge was increased and knowledge sharing took place. Sharing knowledge was an expectation of the work environment, and this occurred during on-the-job training, at meetings, formal and informal, when networking, and when involved in work-related sports/social activities. Contrary to being seen as time wasting, socialising

has a valuable contribution to make to an organisation's operation. Socialisation as a component within internal capital has been added to the Model.

6.3 Research Contribution

This research both confirmed and extended our understanding of issues in the intellectual capital literature. It also provided further evidence of the need to spread the message of intellectual capital management much wider, and in particular to extend it from the academic and research environment to that of the everyday contexts of management and employees in industry. It was a test of theory and practice.

Consequently it is recommended that academics and practitioners work more closely together so that theoretical development and research is more readily transferred into the practitioner world. The importance of intellectual capital to an organisation mandates more formal functional recognition in order that the outcomes can contribute meaningfully to the corporate strategy.

6.4 Future Research

This research provides a number of leads for future researchers into the management of intellectual capital not just in New Zealand, but elsewhere. In addition to general research into the state-of- the-intellectual-capital-management-art, further research is needed into the relevance of existing management skill sets to determine their fit with the skills required for the management of intellectual capital.

There is also a need to investigate approaches being taken, or that can be taken by organisations, to encourage the codification of knowledge and to the extent that it is possible, the knowledge of employees. This can be conducted either as a separate exercise or in conjunction with further research into the respective implications of smaller and larger business structures. Finally, further research is required on issues such as staff training and development, analysis of capabilities and competencies, socialisation, and the measurement of intellectual capital.

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APPENDIX I

Questions for Chief Executives

1 Intellectual Capital

Which of the following equations do you think identifies intellectual capital?

Human assets + Structural assets = Intellectual Capital

Human assets refer to the collective expertise, creative and problem solving capability, leadership, managerial skills etc of employees.

Structural assets refer to the internal and external foci, e.g. philosophy, culture, systems and processes, information technology systems, customers, intellectual property, e.g. all factors that constitute the company.

Human assets + Internal assets + External assets = Intellectual Capital

As above but showing internal and external factors in separate categories, e.g. separating out customers, distribution channels, brands etc from culture, systems and processes etc.

Should intellectual property be shown as a separate factor?

2 Where would you say the value of the company resides?

3 What processes have been followed to identify where the value is?

4 How does the company manage intellectual capital, e.g. is there a strategy in place to manage intellectual capital?

5 Do you think that through the management of the intellectual assets an organisation can become more innovative? If so, can you explain how this can happen.

6 What internal and external networks are used to acquire knowledge that will benefit and add value to the company?

7 How do employees increase their knowledge?

8 It has been suggested there should be some form of reward for staff sharing their knowledge. What are your views?

9 To what extent is knowledge codified, and what systems are in place to allow for the flow of knowledge across the company, and at an inter-company level?

10 What methods are in place for measuring intellectual capital? If no specific methods for measuring are in place, what indicators are used.

11 How does the company plan to go about creating new knowledge for the development and growth of intellectual capital?

12 The goal of CHH is to become more innovative. Do you think the dividing up of the organisation into smaller companies has created a more innovative environment? If so how?

13 Have the products/services offered by the company increased/changed as a result of ideas promoted by staff? If so, who were the promoters of the ideas, i.e. at which level of the company did the ideas emerge?

14 How is the intellectual property of the company managed? What measurements are in place to identify the value of the intellectual property?

APPENDIX II

QUESTIONS FOR STAFF INTERVIEWS

1 What are your views on the dividing up of CHH into numerous companies?

2 CHH have indicated they want to encourage an innovative environment. What challenges do you face working in an innovative environment?

3 How do you increase your own knowledge?

4 Sharing knowledge can be a sensitive issue. What difficulties do you think arise through expecting people to share their knowledge?

5 How, when and where do you think the most effective exchange of knowledge takes place?

6 A suggestion has been put forward by some management theorists that there should be some form of reward for staff sharing their knowledge. What are your views?

7 How do you go about obtaining knowledge when you require it?

8 What is your job title?

9 What is your highest educational qualification?

INTELLECTUAL CAPITAL MANAGEMENT – RESEARCH SURVEY

Research being undertaken by Helen Mitchell for doctoral study.

QUESTIONNAIRE

Please put the completed questionnaire in the attached envelope, and return to your company reception desk for collection by researcher.

1 What are your views on the dividing up of CHH into numerous companies?

_____

_____

_____

2 CHH has indicated they want to encourage an innovative environment. What challenges do you face working in an innovative environment?

_____

_____

_____

3 How do you increase your knowledge?

_____

_____

_____

4 Sharing knowledge can be a sensitive issue. What difficulties do you think arise through expecting people to share their knowledge?

_____

_____

5 How, when and where do you think the most effective exchange of knowledge takes place?

_____

_____

_____

6 A suggestion has been put forward by some management theorists that there should be some form of reward for staff sharing their knowledge. What are your views?

_____

_____

_____

7 How do you go about obtaining knowledge when you require it?

_____

_____

_____

8 What is your job title?

_____

9 What is your highest educational qualification?

_____

I would like to receive a summary of the findings of the research Yes No

Circle as relevant

Please put the completed questionnaire in the attached envelope and return to Helen Mitchell in the stamped addressed envelope.

APPENDIX III

Department of Management
And International Business
Albany Campus
Private Bag 102 904,
North Shore Mail Centre,
Auckland, New Zealand
Telephone: 64 9 441 8115
Facsimile: 64 9 441 8109

INFORMATION SHEET

RESEARCH BEING UNDERTAKEN BY HELEN J MITCHELL, DOCTORAL

STUDENT OF MASSEY UNIVERSITY, ALBANY, AUCKLAND

To the Chief Executive Officer

Helen Mitchell is undertaking doctoral research in intellectual capital management. Current thinking in management theory is giving greater attention to the intellectual capital of the organisation as the means through which the business can grow. The aim of the research is to identify whether organisations are managing intellectual capital with a view to becoming more innovative and thus increasing entrepreneurial activity to develop and grow their business. The methodology being used for the research involves interviews, a survey, a document and archival search.

The research supervisors for this thesis are –

Associate Professor John Monin, Head of Management and International Business, Massey University, Albany, Auckland. Telephone 441 8106, email D.Monin@massey.ac.nz
Professor Bill Martin, Research Coordinator School of Business Information Technology, Royal Melbourne Institute of Technology, Melbourne. Telephone 61 3 9660 5818, email billm@rmit.edu.au

Helen Mitchell is Associate Head of the School of Management and Entrepreneurship, Unitec Institute of Technology, Private Bag 92025, Auckland. Telephone 64 9 815 4321 Ext 7011, email hmitchell@unitec.ac.nz

Participation in the research will involve the CEO of the business in an interview for approximately one hour. Questions in the interviews will relate to intellectual capital – the IC equation, strategy, measuring IC, knowledge, innovation, and managing of intellectual property.

Potential participants in the research have the right

- to decline to take part
- to withdraw at any time until 28 February 2003
- to refuse to answer any question asked during the research
- to ask any questions about the study at any time during participation
- to provide information on the understanding that your name will not be used unless you give permission to the researcher
- to a summary of the findings of the research

This information sheet only provides information relating to the research being undertaken. A consent form is provided for those invited to participate in the interviews.

Codes will be used to identify the companies, and participants in the interviews. The final report on the research carried out will be read by the researcher's supervisors and the examiners, and a copy will be given to the library of Massey University. Where any aspects of this research form part of publications arising from the research confidentiality of participants will be maintained.

A tape recorder will be used during the interviews, only if participants agree to a recording being taken. The audio-tapes will be transcribed by the researcher. Participants have the option of having the tapes returned to them after transcription, or asking for them to be destroyed. If the options are not taken up the audio-tapes will be stored (5 years) in a locked archive facility at Massey University, Albany. The data collected will be stored during the analysis of the data and writing of the findings in the home of the researcher - the home has an alarm system – and when not actively being analysed, held in a locked cupboard at the home of the researcher. If requested by the participants the data can be destroyed after completion of the final report, or will be stored (5 years) in a locked research archive at Massey University, Albany.

This project has been reviewed and approved by the Massey University Regional Human Ethics Committee, Albany Campus, Protocol MUAHEC 02/001. If you have any concerns about the conduct of this research, please contact Associate-Professor Kerry Chamberlain, Chair, Massey University Regional Human Ethics Committee: Albany, telephone 09 443 9799, email K.Chamberlain@massey.ac.nz.

APPENDIX IV

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INFORMATION SHEET

RESEARCH BEING UNDERTAKEN BY HELEN J MITCHELL, DOCTORAL

STUDENT OF MASSEY UNIVERSITY, ALBANY, AUCKLAND

To staff members

Helen Mitchell is undertaking doctoral research in intellectual capital management. Current thinking in management theory is giving greater attention to the intellectual capital of the organisation as the means through which the business can grow. The aim of the research is to identify whether organisations are managing intellectual capital with a view to becoming more innovative and thus increasing entrepreneurial activity to develop and grow their business. The methodology being used for the research involves interviews, a survey, a document and archival search.

The research supervisors for this thesis are –

Associate Professor John Monin, Head of Management and International Business, Massey University, Albany, Auckland. Telephone 441 8106, email D.Monin@massey.ac.nz
Professor Bill Martin, Research Coordinator School of Business Information Technology, Royal Melbourne Institute of Technology, Melbourne. Telephone 61 3 9660 5818, email billm@rmit.edu.au

Helen Mitchell is Associate Head of the School of Management and Entrepreneurship, Unitec Institute of Technology, Private Bag 92025, Auckland. Telephone 64 9 815 4321 Ext 7011, email hmitchell@unitec.ac.nz

Participation in the research will involve two staff members, randomly selected, in interviews lasting approximately half an hour each. A survey of the remaining staff will involve the completion of a questionnaire containing about nine questions taking approximately ten minutes to complete.

Questions in the interviews and survey will relate to knowledge – obtaining knowledge, sharing knowledge, creating new knowledge, and innovation.

Potential participants in the research have the right

- to decline to take part
- to withdraw at any time until 28 February 2003
- to refuse to answer any question asked during the research
- to ask any questions about the study at any time during participation
- to provide information on the understanding that your name will not be used unless you give permission to the researcher
- to a summary of the findings of the research

This information sheet only provides information relating to the research being undertaken. A consent form is provided for those invited to participate in the interviews. The questionnaire will contain a statement "It is assumed that filling in the questionnaire implies consent. You have the right to decline to answer any questions".

Codes will be used to identify the companies, and participants in the interviews. The survey will be anonymous. The final report on the research carried out will be read by the researcher's supervisors and the examiners, and a copy will be given to the library of Massey University. Where any aspects of this research form part of publications arising from the research confidentiality of participants will be maintained.

A tape recorder will be used during the interviews, only if participants agree to a recording being taken. The audio-tapes will be transcribed by the researcher. Participants have the option of having the tapes returned to them after transcription, or asking for them to be destroyed. If the options are not taken up the audio-tapes will be stored (5 years) in a locked archive facility at Massey University, Albany. The data collected will be stored during the analysis of the data and writing of the findings in the home of the researcher - the home has an alarm system – and when not actively being analysed, held in a locked cupboard at the home of the researcher. If requested by the participants the data can be destroyed after completion of the final report, or will be stored (5 years) in a locked research archive at Massey University, Albany.

This project has been reviewed and approved by the Massey University Regional Human Ethics Committee, Albany Campus, Protocol MUAHEC 02/001. If you have any concerns about the conduct of this research, please contact Associate-Professor Kerry Chamberlain, Chair, Massey University Regional Human Ethics Committee: Albany, telephone 09 443 9799, email K.Chamberlain@massey.ac.nz.

APPENDIX V

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CONSENT FORM

RESEARCH BEING UNDERTAKEN BY HELEN J MITCHELL, DOCTORAL STUDENT OF MASSEY UNIVERSITY, ALBANY, AUCKLAND ON THE MANAGEMENT OF INTELLECTUAL CAPITAL

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I understand I have the right to withdraw from the study at any time and to decline to answer any particular questions. The right to withdraw lasts until 28 February 2003.

I agree to provide information to the researcher on the understanding that my name will not be used without my permission.

I agree/do not agree to the interview being audio taped.

I also understand that I have the right to ask for the audio-tape to be turned off at any time during the interview.

I agree to participate in this study under the conditions set out in the Information Sheet.

Signed:

Name:

Date**:**

I would like to receive a copy of my interview transcript Yes No

Circle as revelant

I would like to receive a summary of the findings of the research Yes No

Circle as relevant