CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

The purpose of this chapter is to present an extensive review of the literature concerning the main constructs involved in this study. By revealing the generally-accepted facts and arguments regarding the research issues, the review enables the researcher to explicate the research gap that warrants further discussion. The chapter starts by discussing the concepts involved, and eventually the linkages between constructs are established and translated into hypotheses. Although constructs such as strategic orientation have been extensively discussed in past literature, careful deliberation of the literature is required to establish a valid reasoning for the research issues. Based on the discussion of the constructs concerned, a theoretical model is presented, which provides the basis for empirical analysis and discussion in this research project.

2.1 STRATEGIC ORIENTATION

According to Chandler (1962, p.13), strategy refers to "*the determination of the basic long term goals and objectives of the enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals*". In a simplified version, strategy is defined as a pattern or plan that integrates the organisation's goals, policies, and action sequences in a cohesive manner (Quinn,

1980). From both definitions, strategy can be seen to provide the linkage between where the organisation is at present and where it would aspire to be in the future.

Accordingly, organisations have a multiplicity of strategic options from which to choose in order to adapt and align themselves to the environment. The strategic orientation of firms is conceptualised as relatively enduring in nature and is considered as central to organisational effectiveness (Evered, 1983). As defined by Manu and Sriram (1996, p.79), strategic orientation is "*how an organisation uses strategy to adapt and/or change aspects of its environment for a more favourable alignment*". Strategic orientation will determine competitive strategies pursued by firms to ensure continuous improvement in performance (Gatignon & Xuereb, 1997).

Strategic orientation is comprised of a pattern in a stream of decisions that will act as a guide to the organisation's ongoing alignment with its environment (Hambrick, 1983). Several studies across multiple industries and environmental contexts (e.g. Covin & Slevin, 1989; Hambrick, 1983; Snow & Hambrick, 1980) have reported that strategic orientation remains stable for a long period of time (Schul, Davis & Hartline, 1995), even in times of environmental upheaval (Fox-Wolfgramm, Boal & Hunt, 1998).

This enduring nature of strategic orientation influences the development of internal policies and procedures applied within firms. Previous studies have identified distinctive organisational behaviours in relation to different strategic orientation (e.g. Manu & Sriram, 1996; Pleshko, 2007). In relation to this, several strategic typologies

have been introduced that classify strategy according to its distinctive organisational behaviour (Ansoff, 1965; Chandler, 1962; Miles & Snow, 1978; Miller, 1990; Porter, 1980). Two such prominent frameworks are the Miles and Snow (1978) typology, which is distinguished based on product-market change (Manu & Sriram, 1996), and the Porter's typology (1980), which focuses on customers and competitors (Hambrick 2003; Olsen et al., 2005).

Porter's (1980) generic strategy is based on the assumption that a firm's sources of competitive advantage are derived from cost and differentiation (Porter, 1980). Accordingly, firms can maximise performance either by striving to be low cost producers or by differentiating their lines of products and services. The degree of these strengths classifies the firm into cost leadership, focus, and differentiation. In cost leadership, the focus is to gain market share by offering the lowest price in the market. To achieve this, firms acquire cost advantage through improvements in their production processes, by virtue of accessing large sources of lower cost material, using optimal outsourcing, and also through vertical integration. Differentiation strategy involves product development and unique and distinctive services that shape the customer's perception of a product as being better or different from products offered by competitors. Due to its unique attributes, a product can be offered at a premium price and this will generate above-average profit (Dess & David, 1982). Finally, focus strategy concentrates on a narrow segment and within that segment, an attempt is made to achieve either cost advantage or differentiation. Usually, firms that use focus strategy gain greater customer loyalty.

The Miles and Snow strategic typology (1978) was developed from the perspective that firms are complete and integrated systems in dynamic interaction with their environments (Aragon-Correa, 1998; McDaniel & Kolari 1987; Sanchez & Marin, 2005). The typology is based on the model of adaptive process where firms have to deal with issues and decisions across three main domains: entrepreneurial, which is related to product-market decisions; engineering, which deals with production and delivery; and administrative, which concerns structures, roles and policies (Kabanoff & Brown, 2008).

According to Miles and Snow (1978), firms can be classified into three ideal strategic types: prospector, defender, and analyser, and each of these is capable of leading to the achievement of competitive advantage. Each type has a unique configuration of contextual, structural, and strategic factors. As summarised in Table 2.1, defenders are classified as firms that adopt a conservative view of strategy and focus on improving production efficiency and cost control in order to hold a secure market position in a narrowly defined segment. Prospectors, who are at the other end of the continuum, have wide and varied markets, and devote their strategies to coping with change and innovation (Aragon Correa, 1998; Doty, Glick & Huber, 1993; Hambrick, 1981, 1983). Analysers on the other hand, share the elements of both defender and prospector. Firms in this category can be identified by their effort to maintain a secure position in a core market whilst simultaneously seeking new market positions via product development. Studies by Hambrick (1983) and Smith, Guthrie and Chen (1986) confirmed the typology predictions that prospectors are characterised by an unstable customer base, changing product mix, focus on innovation and aggressive towards growth, while defenders demonstrate a stable

product base, competitive edge in pricing and focus on efficiency. An extension of Miles and Snow typology is reactor, in which firms in this category do not have a coherent strategy since they primarily act in response to competitive or other market pressures (Olson, Slater & Hult, 2005). Their uneven and transient ways in responding to the challenges in the adaptive cycle constitute them to be short term oriented and sometimes considered to be equated with absence of strategy (Andrew & Boyne, 2006). Therefore, reactor is often excluded in the discussion of the ideal strategic types as proposed by Miles and Snow.

Table 2.1
A Summary of the Miles and Snow (1978) Generic Strategy Categories

Strategic Orientation	Main Focus	Traits
Prospector	Entrepreneurial, innovative and new opportunity-oriented	Wide and varied market, focus on external effectiveness, extensive environmental scanning, maximising new opportunities. Concern for product and market innovation. Stress more on marketing and R&D capabilities. Emphasis on creativity and flexibility. Sees the environment as 'uncertain', responds quickly to changing market conditions.
Defender	Defends existing market (often a niche market)	Narrow range of products/services, search for market stability, internal orientation based on efficiency measures and avoids unnecessary risk. Focus on cost control, centralised and formalised structures are common.

Table 2.1, continued

Strategic Orientation	Main Focus	Traits
Analyser	Hybrid of prospector and defender	Operates well in both stable and dynamic markets. Balances efficiency and innovativeness. Preserves core market product domain and yet ventures into new ones. Increased production in stable markets and innovates in dynamic markets.

Both strategic typologies have been applied extensively to study organisational behaviour and strategic management from different perspectives (McDaniel & Kolari, 1987; Olson et al., 2006). However, this study has chosen to adopt the Miles and Snow (1978) typology for a number of reasons. Firstly, from a theoretical perspective, the Miles and Snow (1978) strategic typology has a quality of parsimony in its underlying assumptions that whatever strategy firms adopt, they must deal with all the three domains in the adaptive cycle: entrepreneurial, engineering, and administrative. Whilst parsimonious, the typology is still able to capture variations across organisations (Hambrick, 1983) and the differences in attributes across the strategic types provide richness in explaining strategic behaviour. In other words, the Miles and Snow typology (1978) provides a holistic perspective of strategy conceptualisation (Venkatraman, 1989).

Secondly, from the application perspective, the Miles and Snow typology (1978) is the most commonly-accepted model of strategic types in the management and marketing literature (Conant, Mokwa, & Varadarajan, 1990; McDaniel & Kolari, 1987; Ruekert & Walker, 1987; Song & Xie, 2000; Walker, Boyd, Mullins &

Larreche, 2003). Furthermore, this typology is viewed as having stood the test of time and place (Hambrick, 2003; Song, Nason, Anthony & Di Benedetto, 2008). Since this typology has been empirically validated by numerous studies (Doty et al., 1993; Jusoh, Ibrahim & Zainuddin, 2006; Hambrick, 1983; Shortell & Zajac, 1990; Smith et al., 1986; Song et al., 2008), it is also considered academically acceptable and internally consistent (Dvir, Segev, & Shenar, 1993). Evidently, this typology has remained popular and its application in many different industry settings (DeSarbo, Di Benedetto, Jedidi & Song, 2006; DeSarbo, Di Benedetto, Song & Sinha, 2005; Hambrick, 2003) indicates its robustness in analysing firm competencies and strategies on a generic basis (O'Regan & Ghobadian, 2006).

In relation to this study, the Miles and Snow typology (1978) takes into account the trade-off between external and internal strategic factors (McKee, Varadarajan & Pride, 1989). In fact, in the conceptualisation of this typology, Miles and Snow (1978) stress the importance of internal consistencies in achieving the objective of the strategies adopted. Among these three strategic typologies, none was inherently superior unless properly implemented. This allows for other variables to be included in the analysis of the variation displayed by different strategies. In relation to that, the similarities in the underlying assumption of the role of environment in both the Miles and Snow (1978) strategic typology, and explorative learning, become an important motivation to apply this typology in this study. Discussion on the Miles and Snow (1978) typology in prior studies suggested that the environment plays a role in determining whether a firm will be a prospector, defender or analyser, and similarly, explorative learning is argued to be more crucial in a dynamic and competitive landscape. Due to this, it becomes conceptually logical to adopt the

Miles and Snow (1978) typology to explain the importance of aligning strategy and learning factors to achieve performance. The next section focuses on the Miles and Snow (1978) model and is subsequently followed by a discussion on prospector strategic orientation.

2.2 MILES AND SNOW (1978) STRATEGIC TYPOLOGY

The introduction of this typology to academia has generated interest especially in determining the accuracy of the elements in the adaptive cycle as postulated by the model (Hambrick, 1982, 1983; Lyles, Baird, Orris & Kuratko 1993; McDaniel & Kolari, 1987; Meyer, 1982; Schenk, 1994; Snow & Hrebiniak, 1980). As shown in Table 2.2, most of the studies have focused on the entrepreneurial dimension, probably due to its importance in defining firms according to this typology (Morgan, Strong & McGuinness, 2003; Segev, 1987). Furthermore, this dimension describes the risk-taking behaviour of the leader in the organisation in achieving the firm's vision (Mintzberg, 1978), and this could be directly related to strategic formation and strategic process issues.

Table 2.2
Dimensions of Adaptive Cycle in Previous Studies on Miles and Snow Typology (1978)

Author	Dimensions	Strategic group	Elements
Hrebiniak & Snow (1980)	Administrative	D, A, P, R	Functional importance
Hambrick (1982)	Entrepreneurial	D, P	Scanning
Meyer (1982)	Entrepreneurial	D, A, P	Scope of services
Hambrick (1983)	Entrepreneurial, engineering	D, P	Entrepreneurial orientation based on R & D and marketing expenses
Hawes & Crittenden (1984)	Entrepreneurial	D, P, R	Performance
Barrett & Windham (1984)	Entrepreneurial	D, P	Performance
Slocum, Cron, Hansen & Rawlings (1985)	Administrative	D, A	Employees performance
Davig (1986)	Entrepreneurial	D,A, P, R	Performance

Table 2.2, continued

Author	Dimensions	Strategic group	Elements
Zahra (1987)	Entrepreneurial, engineering	D, A, P, R	Managerial philosophies
Chaganti & Sambharya (1987)	Administrative	D, A, P	Functional importance, TMT composition
Segev (1987)	Entrepreneurial	D, A, P, R	Strategy processes
McDaniel & Kolari (1987)	Entrepreneurial	D, A, P	Functional importance and product innovation
Simons (1987)	Administrative	D, P	Functional importance
Ruekert & Walker (1987)	Administrative	D, P	Interactions between business units
Smith, Guthrie & Chen (1989)	Entrepreneurial, engineering, administrative	D, A, P, R	Product design, specialisation and TMT
Usidken Sozen & Enbiyaoglu (1989)	Entrepreneurial	D, A, P, R	Performance
Shortell & Zajac (1990)	Engineering , administrative	D, A, P	Planning, innovativeness and R&D
Conant et al. (1990)	Entrepreneurial, engineering, administrative	D, A, P, R	Functional and performance
Dvir et al. (1993)	Entrepreneurial, engineering,	D, A, P, R	Technological progress and performance
Parnell & Wright (1993)	Entrepreneurial, engineering, administrative	D, A, P	Performance
Beekun & Ginn (1993)	Administrative	D, P	Board structure
Schenk (1994)	Engineering	D, A, P	Functional importance and new product development
Thomas & Ramaswamy (1996)	Administrative	D,P	Managerial characteristics
Aragon Correa (1998)	Administrative	P	Natural environment approaches
Woodside, Sullivan & Trappey (1999)	Entrepreneurial	D, A, P, R	Functional importance and performance
Gimenenz (2000)	Entrepreneurial	D, A, P, R	Performance
Morgan et al. (2003)	Entrepreneurial	D, A, P	Functional importance
Peng, Tan & Tong (2004)	Administrative	D, A, P	Ownership
Moore (2005)	Entrepreneurial, engineering, administrative	D, A, P, R	Performance
Olson et al. (2005)	Administrative	D, A, P	Structural importance and performance
Parnell & Hershey (2005)	Entrepreneurial	D, A,P, R	Performance
Laugen, Boer & Acur (2006)	Engineering	D, A, P	New product development
Jusoh et al. (2006)	Administrative	D, A, P	Functional importance and performance
Olson et al. (2006)	Entrepreneurial, administrative	D, A, P	Goal clarity, performance
Andrew, Boyne & Walker (2006)	Entrepreneurial, administrative	D, P, R	Performance
Lo & Wang (2007)	Administrative	D, P	Performance effectiveness
Pleshko (2007)	Administrative	D, A, P	Structural importance and performance
Song et al. (2008)	Entrepreneurial	D, A, P, R	Innovative performance
Wang (2008)	Entrepreneurial	D, A, P, R	Learning and performance

Note: D is defender, A is analyser, P is prospector and R is reactor.

Since this typology focuses on the dynamic process of adjusting to environmental change and uncertainty, it effectively takes into consideration the trade-off between external and internal strategic factors (McKee et al., 1989). Most of the discussions on internal factors involve structural and administrative dimensions, based on resource-based and contingency arguments. Mainly, research based on Miles and Snow (1978) focuses on the functional importance of marketing (e.g. McDaniel & Kolari, 1987; Manu & Sriram, 1996; Morgan et al., 2003), and research and development (R&D) (Dvir et al., 1993; Shortell & Zajac, 1990), accepting the premise that firms compete in the product-market domain. Some studies focusing on the administrative dimension have gone further to explain top management attributes in different strategic orientations (Chaganti & Sambharya, 1987; Thomas & Ramaswamy, 1996).

The focus of previous research that has adopted the Miles and Snow (1978) strategic typology has been mainly on bridging the idea of different competitive postures and performance (Davig, 1986; Gimenez, 2000; Hambrick, 1983; Miles & Cameron, 1982; Parnell & Wright, 1993; Snow & Hrebiniak, 1980). Most of these work have attempted to test the proposition that proper implementation of stable strategies will lead to positive performance by using various financial (Gimenez, 2000; Hambrick, 1983; Parnell & Wright, 1993;) and non-financial measures (Schenk, 1994; Shortell & Zajac, 1990). Based on contingency arguments, these studies propose that proper implementation of strategies is highly dependent on the mediation of internal constructs and the strategic orientation of the firm. This is in line with the logic that these strategic types are not intended to reflect how well firms perform, but rather, the effectiveness of a particular strategic orientation is contingent upon the alignment

of the strategic orientation and the internal repertoire of firms (Beer, Voelpel, Leibold & Tekie, 2005; Miles & Snow, 1978; Naman & Slevin, 1993). This notion has become the impetus for many subsequent research efforts using the Miles and Snow (1978) strategic typology to explain the relationship between various internal factors to this strategic orientation.

In line with greater interest in the internal dynamics of the firm (underpinned by the resource-based perspective), studies on the Miles and Snow (1978) typology cover structural issues in relation to strategic orientation (Gatignon & Xuereb, 1997; Moingeon, Ramanantsoa, Metais & Orton, 1998). Among the structural considerations that have been highlighted in these studies are formalisation (Olson et al., 2005; Pleshko, 2007), centralisation (Olson et al., 2005), and networking and coordination (Ruekert & Walker, 1987). In terms of external factors, environmental factors are often included as mediating or moderating influences in the relationship between strategic orientation and performance (Moore, 2005; Parnell & Hershey, 2005; Zahra & Pearce, 1990). Among the environmental issues that have been studied are competitiveness, highly-regulated industries (Snow & Hrebiniak, 1983), rapidly changing environment (Zajac & Shortell, 1989), turbulent environment (Beekun & Ginn, 1993; Covin & Slevin, 1989), and technological environment (Schenk, 1994). Basically, these studies try to establish the extent of the dynamic and stable industries that shaped the background to the arguments proposed by Miles and Snow (1978). Although Miles and Snow (1978) posit that environmental conditions influence the selection of strategic orientation (Lo & Wang, 2007), studies using a single industry approach found that all four types existed within a particular industry (e.g. Davig, 1986; Smith et al., 1989).

Whilst the interest in exploring the relationship between strategy and performance became central to strategic management literature, most prior empirical studies have adopted a static perspective (Moingeon et al., 1998). For instance, studies on structural issues concentrate on direct relationships between prospectors, defenders and analysers, to formalisation, centralisation, and complexity, and some went further to evaluate the impact of these relationships on performance (Hambrick, 1983, 2003; Olson et al., 2005; Pleshko, 2007). Studies that incorporate environmental issues (Gimenez, 2000; Hambrick, 1983; Miller, 1990) often consider the environment as a moderating factor that increases or decreases the impact in the strategy-performance relationship.

In relation to environmental issues, one interesting finding by Dvir et al. (1993) concerning the task of environmental scanning, suggested that phases in environmental scanning and learning new ideas, and the adoption and integration of ideas into new products and processes, are performed differently by prospectors, defenders, and analysers. This proposition suggests the existence of variations in information acquisition which is related to learning in the Miles and Snow (1978) strategic typology. Unfortunately, from the review of past literature, less attention is given to learning issues in relation to the Miles and Snow (1978) model. Considering the importance of knowledge in the study of management, this opens the door to the exploration of the role of learning in the strategy-performance relationship.

Although previous studies using the Miles and Snow typology (1978) have attempted to explain the behaviour of at least prospector and defender (and some also include analyser and reactor) simultaneously, this study chooses to focus

completely on, and elucidate the learning behaviour of firms with a prospector strategic orientation. The main reason for this precise concentration is that the nature of competition nowadays that is driven by the heightened pace of change in communication technologies and advances in core technologies, compels firms to be more prospector-oriented (Naman & Slevin, 1993). In other words, the current competitive landscape requires firms to be more entrepreneurial (Dess, Lumpkin & Covin, 1997), risk-takers (Bettis & Hall, 1982) and strategically innovative (Markides, 1998) in order to secure the benefit of being the first mover and market pioneer (Kerin, Varadarajan & Peterson, 1992; Robinson, Kalyanaram & Urban, 1994). After all, both environmental turbulence and environmental complexity are positively related to innovative, risk-taking, and proactive behaviour of firms (Naman & Slevin, 1993; Zahra, 1991). In line with this argument, O'Regan and Ghobadian (2006) found that high performing firms display a higher proportion of prospector attributes. This is supported by previous findings that found a greater prospector orientation tends to provide a higher level of sustainability (Jennings & Zandbergen, 1995) with greater gains in market share, sales growth and new product sales, in comparison with other strategic types (Matsuno & Mentzer, 2000). Therefore, it can be concluded that prospector strategic behaviour is becoming an important requirement in today's competitive landscape (The Economist, 1998).

From another viewpoint, Conant et al. (1990, p.377) suggested that *"a large number of studies examining the relationships between strategic types and performance suggest that organisational performance will be equal in defender, prospector, and analyser; and higher than in reactor organisations*". From the contingency perspective, the effectiveness of a particular strategic orientation is contingent upon

the alignment of the strategic orientation and the internal repertoire of the firms. Therefore, the classification of firms into strategic types is not intended to reflect how well firms perform. This line of argument is supported with the definition of strategy by Hambrick (1983, p. 5) that sees strategy as *"a pattern in a stream of decisions that a) guides the organisation's ongoing alignment with its environment and b) shapes internal policies and procedures".* This definition introduces an important aspect of strategy that requires alignment between strategy and internal aspects of the firm in order to achieve what is aspired to by the implementation of the strategy.

Another justification for this study's focus on prospector strategic orientation is the fact that the classification of strategic orientation in previous studies is based on majority-rule (Song et al., 2008). This implies that there is no absolute prospector or absolute defender (Andrew et al., 2006). In other words, the classification of prospector and defender is based on the degree to which a firm believes itself to be (Snow & Hambrick, 1980) and the classification of firms into these two groups reveals the sharpest contrasts in their behaviour (Hambrick, 1983; McDaniel and Kolari, 1987; Shortell & Zajac, 1990). In line with this, this study decided to focus on one side of the continuum to explain the behaviour of the firm in the strategy-performance relationship; and indirectly it will imply the behaviour of the other side of the continuum as well.

Therefore, it is the objective of this study to establish the mediating role of organisational mechanisms and learning approach in the relationship between strategic orientation and performance that will support the alignment proposition

from the contingency perspective. Based on the arguments presented, it is therefore, sufficient to focus on one strategic orientation, in this case prospector orientation, to explicate the relationship between strategy and learning in performance determination.

2.2.1 Prospector Strategic Orientation

In the Miles and Snow (1978) strategic typology, prospector strategic orientation is described as proactiveness and market-seeking orientation of firms (Aragon-Correa, 1998; Luo & Park, (2001) and this is reflected in firm's vigorous efforts to exploit emerging opportunities, experiment with change and mobilise first-mover actions (Dess et al., 1997; Lynn, Morone & Paulson, 1996). Basically, firms with prospector strategic orientation, also known as "prospectors" are the most aggressive when compared to the analyser and defender. Prospectors typically maintain an aggressive competitive position and tend to be industry pioneers in the creation and development of new technologies. They are also more opportunistic and display interest in developing new products and broader markets. Usually, prospectors are innovators who are vigorously searching for new opportunities by concentrating on the development of new products and technologies and the exploration of new markets (Olson et al., 2005; Pleshko, 2007). In other words, prospectors possess the qualities of innovative organisations; they are likely to be pioneers or leaders in their field. To be the first in the market with new products, prospectors are known to continuously experiment and be quick to respond to

emerging trends and changes in the market place (Miles & Snow, 1978; Laugen et al., 2006; Andrew et al., 2006).

Prospectors tend to adopt a proactive stance to their competitive landscape and endeavour to locate and exploit new product and market opportunities (Olson et al., 2005), and their proactive pursuit is the source of their competitive advantage (Morgan et al., 2001). Prospectors are characterised by extensive environmental scanning (Daft & Weick, 1984) and continuous pursuit of the identification and exploitation of new opportunities through both product and market development (Miles & Snow, 1978). Their strategic behaviour involves exploiting and developing resources more rapidly than competitors (Clarke & Montgomery, 1999) in order to generate high sales growth and profitability (Covin & Slevin, 1991; Lumpkin & Dess, 2001; Zahra, 1993; Zahra & Garvis, 2000). They are also known to be risk-takers (Dickson & Giglierano, 1986) especially in resource allocation situations. All in all, prospectors combine their entrepreneurial skills with constructive risk-taking in order to venture into business opportunities.

As explained in the literature, prospector firms are suggested as being highly innovative and aggressive in their pursuit for competitive advantage. They are usually first movers (Kerin et al., 1992), and are known to focus on product competitiveness through innovation and product development. Being first movers, they need to develop capacity to identify new opportunities and to change structures and procedures quickly (Liu, 2006). A study by Song et al. (2008) found that prospectors tend to develop greater technical and information technology capabilities in order to pursue first-mover initiatives. The findings also suggested that internal

assessment was important to prospectors in order for them to align their capabilities with the competitive environment, and continue in their prospecting.

From the discussion of the nature and attributes of prospectors in strategic literature, it can be concluded that firms with prospector strategic orientation will tend to be aggressive in terms of searching for new opportunities and responding to changes; opportunity seeking in terms of vigorously locating and exploiting new product and market (Olson et al., 2005); proactive and adaptive in terms of continuously experimenting new ideas and mobilising first-mover actions (Lynn, Morone & Paulson, 1996; Olson et al., 2005); and risk takers in terms of allocating resources and venturing into new product and new market (Dickson & Giglierano, 1996). Having these attributes, firms with prospector strategic orientation may likely to become industry pioneers, innovators, first movers and creators.

Therefore, the attributes of prospectors supported the findings by O'Regan and Ghobadian (2006) that found high performing firms to display a higher proportion of prospector attributes. A greater prospector orientation was also found to correlate with higher level of sustainability (Jennings & Zandbergen, 1995) in the form of greater gains in market share, sales growth and new product sales (Matsuno & Mentzer, 2000). Therefore, this study proposes there is a positive relationship between prospector strategic orientation and performance.

Hypothesis

1a. Prospector strategic orientation is positively related to performance

Previous studies on prospectors have concluded that such firms are the most marketing-oriented of the strategy types (Hambrick, 1983; McDaniel & Kolari, 1987; Manu & Sriram, 1996; Olson et al., 2005). This conclusion is drawn from the fact that in a competitive environment, organisations are expected to be more market-oriented (Lusch & Laczniak, 1987) in order to sell new products and to enter into new markets. However, these studies fail to relate the importance of marketing issues to innovativeness that is found to be more prevalent in prospector-oriented firms (Manu & Sriram, 1996). Although many studies attempt to elaborate the structural dimensions that support a prospector orientation (Hambrick, 1983; Olson et al., 2005; Pleshko, 2007), they have failed to explore the link between prospectors' organisational mechanisms that encourage the development of innovative behaviour and culture that is seen to prevail in prospector firms. Further discussion will highlight the importance of learning in developing innovative capabilities and significantly contribute to performance enhancement.

2.2.2 The Importance of Learning in the Strategy-Performance Relationship

The general conclusion from past studies that different approaches to learning may be required in different types of environments (e.g. Burgelman, 2002; Ghemawat & Costa, 1993; Lant & Mezias, 1992; Levinthal, 1997; Levinthal & Warglien, 1999), has some potentially interesting implications in respect of strategy. As suggested by Fiol and Lyles (1985), a firm's strategic posture will partially determine its orientation and capacity of learning. They asserted that strategy influences learning by setting the limits on the decision making process, and creating a context for perception and interpretation of the environment (Nieto & Quevedo, 2005).

Dodgson (1993, p.377) describes learning as "*the ways firms build, supplement and organise knowledge and routines around their activities and within their cultures, and adapt and develop organisational efficiency by improving the use of the broad skills of their workforces*". This definition implies that organisational learning occurs when the knowledge acquired which is retained in the system, and the culture of the organisation, is transferred from individual to individual (Yeung, Ulrich, Nason & Glinow, 1999). Many definitions of organisational learning as illustrated in Table 2.3, suggest the importance of learning in generating organisational capabilities that will improve organisational performance. Weick (1995) describes learning as important for organisational success, and Senge (1990) believes that learning will expand the boundaries of organisational capabilities. Learning is considered as being important to guide behaviour (Levitt & March, 1988), and to utilise experiences as a path to improve actions (Yeung et al., 1999). Basically, learning is seen as having a positive impact on performance (Baker & Sinkula, 1999; Noble et al., 2002) and this is supported by findings in the organisational learning literature that show the ability to learn faster than competitors is a source of competitive advantage (Dickson, 1992).

Table 2.3
Definitions of Organisational Learning

Author	Definitions
Weick, 1995	An organisation that continually improves by readily creating and refining the capabilities needed for success.
Shaw and Perkins, 1992	The capacity of an organisation to gain insight from its own experience, the experience of others, and to modify the way it functions according to such insight.
Senge, 1990	Learning organisation is one that is continually expanding its capacity to create its future.

Table 2.3, continued

Author	Definitions
Levitt and March, 1988	Organisations are seen as learning by encoding inferences from history into routines that guide behaviour.
Fiol and Lyles, 1985	The process of improving actions through better knowledge and understanding.

From table 2.3, organisational learning can be described as a process of applying knowledge to improving or acquiring new capabilities to ensure future sustainability. According to Huber (1991), organisational learning involves four processes that are related to knowledge acquisition, information distribution, information interpretation, and organizational memory that will lead to changes in the potential of the organisation. The concept of organisational learning is translated into learning organisation which is defined as an organisation which create the climate and culture to facilitate learning among its members and continually transforms itself through the learning process (Pedler et al., 1989). In other words, learning organisations is seen as one that purposefully construct structures and strategies so as to maximise organisational learning (Dodgson, 1993).

Increased interest in exploring this issue has generated multiple studies from management perspective that distinguish learning into various types and levels. For example, Fiol and Lyles (1985), explain learning in terms of higher and lower level learning, Senge (1990) classifies learning into generative and adaptive learning, whilst Dodgson (1991) separates strategic from tactical learning. From the lens of organisational theory, Agryis and Schon (1978) develop a three-fold typology of

learning which they describe as single-loop, double-loop and deuter-learning to illustrate organisational learning based on individual learning.

According to the resource-based view, knowledge and organisational competencies are valued as competitive assets (Crook, Ketchen, Combs & Todd, 2008; Keskin, 2005; Moingeon et al., 1998) and accordingly different types of organisational competencies are required to exploit different types of knowledge bases (Beer et al., 2005). A study by Pisano (1994) found that in environments characterised by rich scientific knowledge bases, resources that support research may be critical to competitive advantage. However, in environments where 'technology is more art than science', resources that support learning-by-doing capabilities are likely to be more valuable. This leads to the conclusion that although some aspects of an organisation's knowledge environment may be idiosyncratic, different firms may need to adopt different approaches to learning, even within the same industry or the same technological area (Pisano, 1994).

Studies on the Miles and Snow (1978) typology reveal that there are apparent tendencies for the strategic types to develop different distinctive competencies which are capabilities that their competitors do not have (Conant et al., 1990; Sanchez & Marin, 2005). In other words, firms may have a comprehensive and extensively tested set of response mechanisms unique to the firm for dealing with environmental shifts (Hambrick, 1983). According to Gimenez (2000), if there is an alignment between the chosen strategy and the internal repertoire of the firm, any of these strategies may enhance the firm's competitive ability in a particular industry. As suggested by Beer et al. (2005), in order to operate efficiently, organisations need to

attain fitness by building the capacity to learn which is essential in maintaining alignment between the environment, strategies, and capabilities. To put it differently, non-alignment between strategy, internal resources, and external environment will result in the firm being an ineffective competitor, and thus, experiencing low performance (Brunk, 2003). It is the learning factor that determines alignment and develops consistencies among all variables with any change in strategy.

According to Beer et al. (2005), in an ever-changing environment, the moulding of organisations to their strategies involves continuous learning. When organisations engage in learning, they not only exploit opportunities, but also become capable of creating opportunities (Paladino, 2007). As suggested by Yeung et al. 1999), organisations learn by trying many new ideas and being receptive to experimentation with new products and processes. Therefore, as the rate of environmental change accelerates, exploration increases in importance because firms must be able to cope with increasing complexity and be ready for drastic change (Brown & Eisenhardt, 1998). Hence, learning which is manifested in knowledge, experience, and information acquisition will support firms' pursuit of capabilities to adapt to the changing environment. According to Ghemawat and Costa (1993), a dynamic environment requires firms to attain dynamic efficiency, which can be achieved through the development of capabilities that help them to explore and seize emerging opportunities. Evidently, a changing and competitive landscape requires extensive learning through exploration to identify opportunities in the competitive climate and to be flexible and creative in the pursuit and application of knowledge.

The following section will explain March's (1991) notion of explorative and exploitative learning, and this will be followed by the discussion of trade-off from the resource-based perspective.

2.3 EXPLORATIVE AND EXPLOITATIVE LEARNING

The process view of learning asserts that effective management of learning constructs provides firms with the capacity required for learning and for employing different learning styles according to circumstances (Bell, Whitwell & Lukas, 2002; Yeung et al. 1999). According to Huber (1991), learning is often conceptualised as information processing behaviours that involve information acquisition, dissemination, interpretation, and memory.

March (1991) uses the process approach in delineating two types of organisational learning: exploration for new knowledge and exploitation of existing knowledge. Exploration involves the use of new knowledge, skills, and processes to increase variation and flexibility that are essential to effective adaptation (McGrath, 2001). Since exploration involves experimentation and discovery, the outcomes are less certain and the return is more remote in time. On the other hand, exploitation involves the use of existing knowledge, skills, and processes to refine the existing system to improve efficiency (March, 1991). The objective is to create stability and consistency by minimising variation. This may include efforts to map and improve the existing processes and once improvement is achieved, it would be documented for the purpose of diffusion to others.

As opposed to exploitation, explorative learning is geared towards variance maximisation in the pursuit of improvement in mean performance (March, 1991). Variation is known to be important for effective adaptation in complex and highly volatile environments (McGrath, 2001). Firms that experience successful adaptation are found to be those that engage in exploration while improving existing routines (Levinthal & March, 1993). This implies that exploration is associated with adaptation due to its variance-increasing effects, and the degree of variation depends on the extent of new knowledge that is acquired through the process of exploration (McGrath, 2001).

The objective of exploration is to find new knowledge, skills, and processes that can be used to reconfigure resources to achieve competitive advantage. In other words, exploration involves searching for new dynamic capabilities (Benner & Tushman, 2002). The effort requires experimentation, and high risk is involved because there are possibilities that money and time spent on exploration may not generate positive returns (March, 1991; Van Duesen & Mueller, 1999). However, the joint qualities of novelty and the difficulty of imitating newly-found knowledge, give firms the advantage of being able to grow and expand in the future (Kogut & Zander, 1993).

The need to explore in order to reach a new platform of competitiveness arises when existing routines become obsolete or unsuitable due to changes in the environment (Eisenhardt & Martin, 2000; McGrath, 2001). Kogut and Zander (1992) assert that volatility of the market not only depends on the competitiveness of other firms and demand for the product, but is also influenced by the ability of competitors to innovate and imitate the advantage created through exploration. Therefore, firms

need to compete on the grounds of information and know-how, and the abilities to develop new knowledge through experiential learning are an added advantage.

Exploration is more likely to flourish in a system that encourages improvisation and experimentation, where information flows are frequent and dense, and roles and jobs are undefined (McGrath, 2001). Findings from research on the exploratory projects of large companies show that high levels of goal and supervision autonomy are associated with higher variance (McGrath, 2001). This implies that flexibility in terms of goal-setting, and the delegation of supervision authority, are desirable in order to stimulate exploration. When greater autonomy is given, employees have the freedom to be creative and to respond quickly to market opportunities (Birkinshaw, Nobel & Ridderstrale, 2002). The circumstances which allow greater individual discretion will also increase motivation and commitment.

On the other hand, the objective of exploitation is to create stability and consistency in order to improve efficiency. Since competition is frequently a question of speed, small differences in efficiencies can generate significant improvements in profitability and survival chances (Kogut & Zander, 1992). It is also believed that building on current capabilities creates an effective deterrent to imitative efforts (Zander & Kogut, 1995).

Exploitation activities rely more on replication or absorption of new approaches into the existing sets of routines for the execution of a particular task (Zollo & Winter, 2002). Since exploitation involves the refinement of exiting routines embedded in the organisational knowledge base, it is more easily learned and diffused across

firms. Exploitative learning is focused on making tasks explicit and task cycles short and routine (Clegg, 1999). Knowledge is made explicit through codification and standardisation to accelerate learning and transfer (McGrath, 2001). Codification not only facilitates the diffusion of existing knowledge; it also allows better coordination and the implementation of complex activities (Zander & Kogut, 1995; Zollo & Winter, 2002). The emphasis on quality through continuous improvement leads to rapid learning (Clegg, 1999). The establishment of knowledge into routines and processes deepens the memory of firms and increases the predictability of the process (Eisenhardt & Martin, 2000) and this will eventually make knowledge highly embedded in human behaviour (Zollo & Winter, 2002).

However, as knowledge becomes more codified and easily taught, it becomes susceptible to imitation (Kogut & Zander, 1993). This presents firms with the dilemma of whether to invest in codification efforts that will yield learning advantages such as rapid learning, or to maintain their tacitness as a means of protecting novelty and preventing imitation. Besides this conflict, exploitation also limits variation and concentrates on improving mean performance through incremental change. Therefore, exploitation alone is not sufficient to maintain competitive advantage in the long run because the environment is not constant (March, 1991; Van Duesen & Mueller, 1999). In conclusion, a concentration on exploitation is only appropriate when firms compete in a stable environment (Eisenhardt & Martin, 2000), and this depends on the market position of firms. Greater control of market share will strengthen the competitive position of firms and increase their influence, thereby giving them greater control over changes in the market.

Codification of knowledge increases the speed and cost of transferring knowledge. Unfortunately, however, not all tacit knowledge can be codified. Therefore, knowledge with certain characteristics such as codifiability and teachability enhances the process of exploitation (Zander & Kogut, 1995). This is supported by findings from Benner and Tushman (2002) that show that process management practices that concentrate on codification to standardise routines, promote incremental improvements while reducing the possibility of radical or architectural innovations. The differences in the characteristics of exploration and exploitation are summarised in Table 2.4.

Table 2.4

Key Characteristics of Exploration and Exploitation

Exploration	Exploitation
Competence	
Radical innovations	Incremental innovation
Technology-oriented	Product and process-oriented
Experimentation with novel combinations	Experimentation in organisation
Tacit knowledge	Codified knowledge
Governance	
Spin-offs, new entrants	Entrance by incumbents
Loose alliances	Formal alliances, acquisitions
Limited use of contracts	Contracts
Relation-based trust	Institution-based trust
Networks	
Dense, open networks	Non-dense, more exclusive networks
Informal, flexible ties	Formalisation
Limited size, high entry and exit	Stabilisation
Locally embedded	Delocalised

Table 2.4, continued

Exploration	Exploitation
Transitional process	
Divergence of knowledge and organisation	Convergence in knowledge and organisation
Variety through break-up of existing networks	Selection by the institutional environment
New relations to outsiders	
Strength of ties	
High frequency of interactions	Low frequency of interactions
Short duration	Long duration
High(er) openness	Limited openness

Source: Gilsing and Nooteboom (2006)

2.3.1 Explorative-Exploitative Learning: A Balance or a Trade-off

Based on resource and inertia arguments, long-term survival involves a complex trade-off between current profitability and investing in future capability (Kogut & Zander, 1992). In other words, firms have to make explicit choices based on calculated decisions about alternative investments and competitive strategies, and implicit choices inherit in the inertia of many features of organisational forms and processes (Hannan & Freeman, 1984). In terms of learning, firms have to choose between acquiring new information about opportunities to improve future returns, and using existing knowledge to improve present returns (March, 1991). It is a trade-off because different decisions involve different allocations and investment of organisational resources. The first choice involves allocating part of the investment to the search among uncertain alternatives, while the second suggests concentrating investment on the best existing alternative.

This is also supported by population ecology theorists who postulate the immobility of investment as one of the constraints that limits the flexibility and ability of organisational adaptation to changes in the environment (Santos, 2003). According to Hannan and Freeman (1984), the process of reallocating resources (as a result of a managerial decision to initiate core changes) involves re-structuring work groups, revising routines, and re-shaping lines of communication. This involves an exhaustive process of re-organisation with highly disruptive impact if unsuccessful (Barnett & Carroll, 1995).

However, findings from previous studies on the exploration-exploitation trade-off show that if firms engage in exploitation in exclusion of exploration, they are likely to continually operate at sub-optimal level (Gupta, Smith & Shelly, 2006; March, 1991; Simsek, 2009). Excessive exploitation leads to improvement along a single technological trajectory and rigidity (Agryris & Schon, 1978; Katila & Ahuja, 2002), and the absence of exploration discourages innovation which renders firms vulnerable to competition (Liu, 2006). Hence, a balance between exploration and exploitation is evidently important to achieve above-average performance and to maintain competitiveness in the industry (Auh & Menguc, 2005; Liu, 2006; March, 1991; Wang, 2008). Accordingly, the exploitation of existing capabilities and exploration for new ones, are both essential to achieve competitive advantage (Teece et al., 1997).

Previous findings also indicate that firms that are able to adapt to a changing environment are those that have the ability to engage in exploration, while improving existing routines (Levinthal & March, 1993; March, 1991). This is

supported by the findings from a study on acquisition process that show the best performers to be high in both exploration and exploitation (Van Deusen & Mueller, 1999). Therefore, achieving a balance between exploration and exploitation is the idealistic condition that will ensure the achievement of competitive advantage for long-term survival.

The importance of both learning approaches is also supported by a study by Zollo and Winter (2002) that found a recursive and co-evolutionary relationship between the two. The study posits that exploration and exploitation are involved in a cyclical evolution of organisational knowledge. The process of exploration for new knowledge is followed by the process of exploitation once the new knowledge is selected as best practice. Knowledge is replicated and diffused through knowledge sharing, and retention is achieved through codification and routinisation (Gilsing & Nooteboom, 2006; Zollo & Winter, 2002). This suggests that firms have to build up their capabilities to support both approaches in learning through time.

Discussion on explorative and exploitative learning generates two different logics that create tensions. They compete for firms' scarce resources, resulting in the need for firms to manage the trade-offs between the two. However, theoretically, a balance between the two is required to achieve success. This is evident from past studies on exploration and exploitation which are built on the premise of trade-off, and yet generate conclusion that a balance is inevitably essential (e.g. Lavie & Rosenkopf, 2006; Liu, 2006; McGrath, 2001). The tension may also cause firms to be trapped into the dynamics of accelerating exploration or exploitation (Levinthal & March, 1993; Liu, 2006; March, 1991). On one hand, the self-reinforcing nature of

organisational learning makes it attractive for firms to maintain their current focus and to augment their current capabilities even if the environment has changed, thus causing core capabilities to be turned into core rigidities (Leonard-Barton, 1995). To counter such an excessive focus on exploitation that results in organisational myopia (Radner, 1975) and competency traps (Levitt & March, 1988), the need to go beyond a local search has been very much emphasised in the literature. D'Aveni (1994) strongly advocates that no firm is able to build competitive advantage that is sustainable because today's strength becomes tomorrow's weakness so rapidly. As such, Peter (1990) suggests that firms nowadays require a radical self-generating innovation strategy that becomes obsolete from the inside in order to continuously follow the innovative trajectory. Radical actions such as licensing a firm's most advanced technology and selling-off old winners limits dependence on existing technology and forces commitment to search for new ones.

Due to recent developments in the discussion of organisational strategy, more research on learning has focused on explorative learning (e.g. Linnarson & Werr, 2004; Sidhu, Volberda & Commandeur, 2004; Siggelkow & Levinthal, 2003; Siggelkow & Rivkin, 2006). Studies on exploration have found explorative learning to have significant influence on innovation, which in turn is required to maintain competitiveness in the industry (Geiger & Makri, 2006; Laforet, 2008; March, 1991). Accordingly, firms that are able to adapt to a changing environment are those that have the ability to engage in exploration, while improving existing routines (Levinthal & March, 1993; March, 1991). According to McGrath (2001), exploration promises sustainability against intense competition, and firms need to capitalise on their discoveries through optimal variance-seeking efforts. It is also suggested by

Rosenkopf and Nerkar (2001) that firms that focus inward on their core competencies run the risk of developing peripheral innovations. Based on these arguments, this study proposes that there is a positive relationship between explorative learning and performance.

Hypothesis

1b. Explorative learning is positively related to performance

Based on prior discussion on the importance of both approaches in learning, this study decided to concentrate on the importance of explorative learning due to the following reasons:

1. The decision is based on the premise that to be competitive, explorative learning is essential and this will be supported by exploitative learning once the knowledge is established (Garcia et al., 2003). In other words, firms can choose not to explore and just concentrate on exploitation although this will lead to the competency trap (Liu, 2006). However, firms that choose to explore, inevitably have to exploit the knowledge that has been acquired.

2. As discussed earlier, the dynamic landscape of business today requires firms to be innovative to ensure sustainability. As suggested by Noble et al. (2002), exploration plays a more important role than exploitation since it involves programmatic discovery of new resources and technologies that will be translated into better firm performance. The importance of developing competitive advantage increases the importance of focusing on internal

dynamics that are required to encourage explorative learning that then leads to resource optimisation and generates greater returns (Gima, 2005).

In conclusion, the above discussions on strategic orientation and organisational learning explain the focus of this study and the reasons for selecting prospector strategic orientation and explorative learning as constructs. The following discussion will further explain the relationship between these two constructs.

2.3.2 The Relationship between Prospector Strategic Orientation and Explorative Learning

Firms that purposefully construct structures and strategies so as to enhance and maximise organisational learning have been designated as 'learning organisations'. Learning organisations focus explicitly on the acquisition of knowledge that is considered potentially useful to firms in order to refine existing knowledge and to develop new ways of thinking (Harrison & Leitch, 2005). Learning is seen as a purposive quest to retain and improve competitiveness, productivity, and innovativeness in uncertain technological and market circumstances. Dodgson (1993) postulates that the greater the uncertainties, the greater the need for firms to learn. In other words, learning is more pertinent in uncertain or dynamic conditions.

The Miles and Snow (1978) prospector organisation is postulated to operate in a dynamic environment, the volatility of which is influenced by the number of competitors in the industry. As the number of firms in the industry increases, the rate of imitation becomes more intense because of the robust activities of companies

to outdo each other (Kogut & Zander, 1995). Levinthal (1997) argues that in a dynamic situation (rugged landscape), 'long jump' learning is needed which involves random exploration of more distant portions of the landscape (Levinthal & Warglien, 1999). Similarly, Burgelman (1991, 2002) proposes that in a dynamic environment, firms require variation-increasing autonomous processes which involve exploiting initiatives that emerge through exploration outside of the scope of the current strategy, in order to enter into new product-market environments. By engaging in variation-seeking initiatives, firms need to develop and retain new learning that will offer adaptability towards a wide range of environmental variation and over a longer time horizon. In relation to environmental dynamism, Ghemawat and Costa (1993) introduce the notion of dynamic efficiency which involves learning effort that is directed towards developing new strategic initiatives in order to survive in the changing context.

If firms in a dynamic environment rely on similar technologies, the speed of imitation is accelerated, hence making it essential for prospectors to develop new knowledge to capitalise on innovation and deter imitation. Benner and Tushman (2003) found in their study on process management, that in turbulent environments, exploration was required to achieve radical, architectural, and modular innovation. And in a marketing study by McDaniel and Kolari (1987), empirical evidence emerged that prospectors focused more on marketing research activities and placed greater emphasis on new product development which again requires exploration. Moreover, Nerkar (2003) in a study of temporal exploration, suggested that in tightly competitive situations, it is exploration that leads to dramatic improvements in performance. Accordingly, higher environmental dynamism which is associated

with a prospector strategic orientation, requires stronger exploration orientation (Sidhu, Commandeur & Volberda, 2007).

It is also suggested that in a dynamic environment, entrepreneurial firms need to engage in proactive and extensive environmental scanning (Daft & Weick, 1984; Miles & Snow, 1978). This acts as a starting point for learning, serving as the impetus for information acquisition and dissemination. Being the most entrepreneurial type among the Miles and Snow (1978) strategies, prospector firms were found to engage in significantly greater environmental scanning than the other strategy types (Hambrick, 1982; Huber, 1991; Sinkula, 1994). According to Wang (2008, p.636), in order to pursue entrepreneurial efforts, *"firms must be committed to learning, receptive to new information and new ways of doing things, and most importantly, engage in shared interpretation of information to achieve consensus on the meaning of the information".*

Being entrepreneurial firms, prospectors need to explore and experiment in order to be innovative and risk-tolerant. In the study of environmental jolts, prospectors who compete in volatile niches require extensive experimentation and learning in the adaptation phase (Meyer, 1982). This implies that prospectors need a high degree of generative learning because the nature of the environment in which they are competing requires radical variation from the existing products and processes (Wang, 2008).

The exploration for new technologies and the exploitation of existing knowledge comprise the central theme in the innovation process (Garcia et al., 2003). An

innovation refers to a new way of accomplishing some task, or the implementation of an idea. In other words, innovation occurs when a new idea is put into use. According to Damanpour (1992), innovation is defined as the adoption of an idea or behaviour, whether a system, policy, programme, device, process, product, or service, that is new to the adopting organisation. Based on this definition, innovation encompasses all aspects involved in the operation of a business. The objective of adopting innovation is to increase the performance or effectiveness of the firm and basically innovations are taken on board as responses to changes in the internal and external environments, or as a pre-emptive action designed to influence the environment.

According to Cohen and Levinthal (1990), the ability to exploit external knowledge is a critical part of innovative capabilities. Firms need to continuously renew themselves through innovation if they are to survive and prosper in a dynamic environment (Liao, 2007). Accordingly, firms in the pursuit of becoming innovative tend to encourage new ways of thinking by rewarding ideas and tolerating mistakes (Miller & Friesen, 1983). Innovation is even more pronounced in the current business environment characterised by fast changes in customers, technologies, and competition. Therefore, explorative learning becomes more pertinent in developing innovative capabilities. A prospector firm which competes in a volatile and dynamic environment must develop innovative capabilities to ensure survival. This is evident from the findings of Sidhu, Volberda and Commandeur, (2003) that indicate that a higher level of new product development success is associated with prospector firms, as opposed to firms with lower exploration.

A few studies have ventured to explain the relationship between prospector strategic orientation and explorative learning and found a significant positive relationship between the two (e.g. Auh & Menguc, 2005; Sidhu et al., 2004). Based on the reasoning of environmental dynamism and innovation, this study posits that exploration is more closely related to prospectors. Firms with prospector strategic orientation should engage more in explorative learning in order to align themselves to the dynamic environment they are competing in. By expanding more explorative learning efforts, firms will be able to develop innovative capabilities and this will contribute to their ability to compete in the industry. With greater innovativeness, prospectors can not only maintain their competitiveness, but also improve performance. Therefore, this study postulates that there is a positive relationship between prospector strategic orientation and explorative learning.

Hypothesis

2a. Prospector strategic orientation is positively related to explorative learning.

2.4 COMBINATIVE CAPABILITIES

The resource-based perspective asserts that a set of unique resources that create value in the marketplace is the key to sustainable competitive advantage (Chen, 1996; Nanda, 1996). Prahalad and Hamel (1990) propose that superior core capabilities, which they refer to as ‘core competencies’ are important in building competitive advantage. In regimes of rapid change, core competencies are seen as dynamic capabilities to address the issue of adaptation to changes in the environment

(Teece et al., 1997). Dynamic capabilities which reside in routines that are intrinsically intangible (Kogut & Zander, 1992) are aimed at deploying and coordinating different resources (e.g. Grant, 1996; Teece et al., 1997).

From the resource-based perspective, knowledge that forms functional and integrative capabilities is an important driver of performance (Verona, 1999). Since capabilities are composed of knowledge, the focus of the discussion of capabilities is shifted to learning that takes place within the organisation (Iansiti & Clark, 1994; Leonard-Barton, 1995). It is suggested that the development of dynamic capabilities requires the acquisition of knowledge and then synthesising those knowledge resources (Kogut & Zander, 1992). This indicates the importance of knowledge in developing dynamic capabilities, and this idea leads to the introduction of the concept of combinative capabilities.

Combinative capabilities are seen as the ability to recombine knowledge to generate new applications from existing knowledge and the unexplored potential of technology (Kogut & Zander, 1992). According to Kogut and Zander (1992), combinative capabilities increase the ability to synthesise and apply current and acquired knowledge. Such capabilities are path dependent and exhibit common features that involve organisational mechanisms (Eisenhardt & Martin, 2000). Van den Bosch, Volberda and Boer (1999) have classified combinative capabilities into three categories of organisational mechanism, these being: system capabilities, coordination capabilities, and socialisation capabilities. System capabilities refer to direction, policies, procedures, and manuals that are used to integrate explicit knowledge. They reflect the degree of formal systems prevailing in the firm. The

benefit of having greater system capabilities is that they require less communication and coordination among sub-units, and allow routinisation of work processes. In other words, system capabilities provide a more formalised environment.

Coordination capabilities are essential in complex interaction processes that are required to enhance control and achieve performance. Coordination capabilities can be achieved through training and job rotation, participation, and communication (Jansen, Van den Bosch & Volberda, 2006). Training and job rotation complement system capabilities (Van den Bosch et al., 1999) because they indirectly establish rules and procedures. On the other hand, participation and communication enhance mutual adjustments and knowledge integration that are required in encouraging cross-functional interfaces (Cohen & Levinthal, 1990). As such, lateral forms of communication and joint decision-making processes that cut across functions and lines of authority can be achieved. Although coordination capabilities can be explicitly designed, they can also be accomplished through the process of interaction that prevails in the firm (De Leeuw & Volberda, 1996).

Finally, socialisation capabilities refer to the ability to develop shared ideology that fosters shared identity as well as collective interpretation of reality (Van den Bosch et al., 1999). These capabilities stem from a firm's culture in infusing beliefs and values over time, and that eventually produces a distinct identity to the employees. Socialisation capabilities encourage social integration beyond what can be achieved through system and coordination capabilities. In relation to tacit knowledge, Nonaka (1991) suggested that socialisation can expedite the process of acquiring this through observation and emulation of external technical experts.

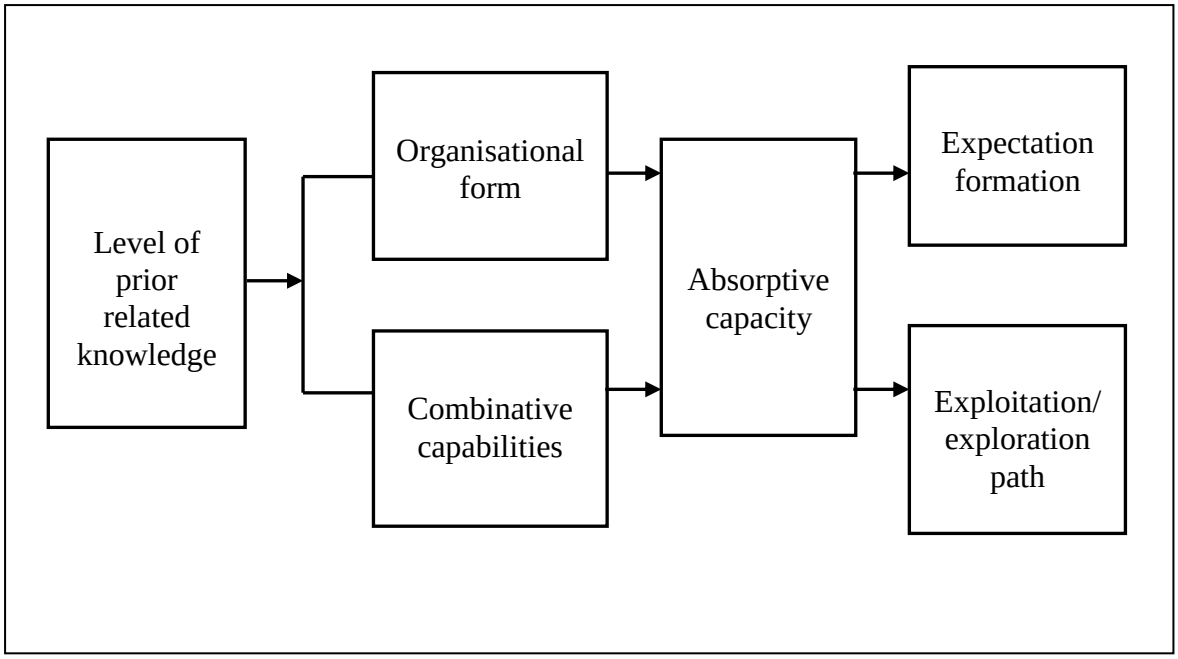
In the knowledge management literature, organisational mechanisms that stimulate knowledge creation, protect knowledge, and facilitate the sharing of knowledge in organisations, are called knowledge management enablers. Knowledge management enablers provide the infrastructure necessary for the organisation to increase the efficiency of knowledge processes (Sarvary, 1999). They consist of knowledge management methods, structure, and culture (Lee & Choi, 2003). For instance, Moingeon et al. (1998) suggested that organisational structures are important to support learning. Therefore, following the description of knowledge management enablers provided by Lee and Choi (2003), combinative capabilities can be considered as such facilitators.

Prior studies on the relationship between combinative capabilities and learning concentrate on the importance of combinative capabilities in developing absorptive capacity. According to Cohen and Levinthal (1990), absorptive capacity is a function of the firm's level of prior-related knowledge, as is also the ability to evaluate and utilise outside knowledge. Zahra and George (2002) suggested that absorptive capacity consists of potential and realised capacities. Potential capacity refers to knowledge acquisition and assimilation capabilities which provide firms with the strategic flexibility to adapt and survive in high velocity environments. Realised capacity comprises knowledge transformation and exploitation.

Both potential and realised capacity requires combinative capabilities. Variations in the mix and level of combinative capabilities that are essential to acquire and transform new knowledge determine the responsiveness of a firm to a changing environment. In other words, the ability to capture and extract value from external

knowledge depends highly on the firm's absorptive capacity and the development of absorptive capacity requires combinative capabilities.

In relation to explorative learning, Van den Bosch et al. (1999) suggested that in a turbulent environment, firms are likely to pursue more efforts exclusively to increase their absorptive capacity. This is further supported by findings that suggest a positive and significant relationship between absorptive capacity and innovative effort (Nieto & Quevedo, 2005). The findings show that firms with a higher level of absorptive capacity have greater ability to use the newly-found knowledge, which then generates greater profits. Furthermore, it is believed that firms experience rapid productivity improvements as a consequence of their growing stock of knowledge (Dutton & Thomas, 1984; Schilling, Vidal, Ployhart & Marongani, 2003). The application of their expanding repertoire of knowledge increases the effectiveness and efficiency of production technologies (Amit, 1986; Hall & Howell, 1985). This is further supported by Simons (1995) who suggested that the possession of a diverse knowledge base will elicit greater learning or problem-solving skills.



Source: Van den Bosch, Volberda and Boer (1999)

Figure 2.1
Determinants of Absorptive Capacity and Expected Formation

As illustrated in Figure 2.1, organisational form and combinative capabilities are important organisational determinants of absorptive capacity. According to Van den Bosch et al. (1999), different organisational forms and different combinative capabilities enable or restrict absorptive capacity. It is suggested in the framework that absorptive capacity is not only determined by the level of prior related knowledge, but is also influenced by organisational forms and combinative capabilities. What is more interesting in this model is that absorptive capacity affects learning in terms of the ensuing exploitation or exploration path. This framework implies that firms with greater absorptive capacity tend to be more proactive in terms of exploring opportunities and experimenting with technologies in order to be competitive. This notion is supported by findings from Volberda et al. (2001) that

show firms with greater absorptive capacity to achieve a greater exploration to exploitation ratio, and demonstrate more proactive strategic behaviour.

Based on the above framework, explorative learning is well related to potential absorptive capacity which requires explicit linkage between the focal firm and knowledge sources outside the firm (Eisenhardt & Martin, 2000). This is supported by various studies that have suggested that firms can reconstitute knowledge from external sources through joint ventures (Kogut & Zander, 1992; Vermeulen & Barkema, 2001), acquisitions (Chauduri & Tabrizi, 1999), strategic networks (Linnarsson & Werr, 2004; Vanhaverbeke, Beerkens & Duysters, 2004), and recruitment of new workers with the requisite skills (March, 1991; Van Duesen & Mueller, 1999).

Potential absorptive capacity makes firms receptive towards acquiring and assimilating new knowledge from external as well as internal sources (Lane & Lubatkin, 1998). According to March and Simon (1993), a firm's exposure to knowledge within its environment will influence decision-making and the development of future capabilities. The breadth and depth of knowledge exposure positively influences a firm's tendency to explore new and related knowledge (Van Wijk, Van den Bosch & Volberda, 2001). Potential absorptive capacity also plays an important role in renewing a firm's knowledge base and the skills necessary to compete in changing markets. Firms with well-developed capabilities of acquisition and assimilation (potential absorptive capacity) are likely to be more adept at continually revamping their knowledge stocks by spotting trends in their external environment and internalising this knowledge (Zahra & George, 2002). Being

responsive to the external environment, firms can reconfigure their resource base in time to capture emerging strategic opportunities.

Since potential absorptive capacity involves capabilities to acquire and absorb new knowledge, learning would be more exploratory. Explorative learning requires a well-developed acquisition capability to identify new emergent opportunities as well as assimilation qualities to understand and diffuse the newly-found knowledge. Although the concepts of potential and realised absorptive capacity are considered complementary (Zahra & George, 2002), exploration requires more acquisition and assimilation qualities than transformation and exploitation.

In conclusion, the importance of combinative capabilities lies on their ability to develop absorptive capacity that will determine the potential of firms to capture and extract value from external knowledge. In other words, combinative capabilities are important to build up absorptive capacity and this in turn will enhance the firm's ability to acquire and transform new knowledge through explorative learning. By having the right mix of combinative capabilities, firms will be able to respond effectively to the changing market conditions. This is in line with the findings of Boer, Van den Bosch & Volberda (1999) that highlighted the importance of aligning a firm's organisational forms to combinative capabilities in order to integrate component knowledge that will generate new product-market combinations. Thus, it is evidently important to examine the impact of the components of combinative capabilities on explorative learning.

The following discussion firstly establishes the relationship between prospector strategic orientation and combinative capabilities. Based on the findings and conclusion of prior literature, the discussion presents arguments that relate prospector strategic orientation to the three components of combinative capabilities, namely system, coordination and socialisation capabilities. This is followed by the discussion on the relationship between combinative capabilities and explorative learning.

2.5 PROSPECTOR STRATEGIC ORIENTATION AND COMBINATIVE CAPABILITIES

Knowledge-based theory sees a firm as a body of knowledge residing in its structures of coordination, which in turn, defines the social context for cooperation, communication, and learning (Lam, 2000). In other words, the knowledge of the firm is socially embedded. It is rooted in firms' coordination mechanisms and organisational routines, which in turn are heavily influenced by organisational strategy. The theory asserts that the primary role of firms and the essence of organisational capabilities are the integration and creation of knowledge (Grant, 1996; Spender, 1996; Tsoukas, 1996). Accordingly, the greater the environmental uncertainty, firms which have superior abilities to manage exploration will be better able to adapt to changing conditions (McGrath, 2001). Therefore, differences in the organising principles of firms reflect their differing knowledge base and learning capabilities. The following discussion elaborates the nature of the relationship between different combinative capabilities and prospector strategic orientation.

2.5.1 The Relationship between Prospector Strategic Orientation and System Capabilities

Miles and Snow (1978) perceive strategy as a constraint for the firm in its attempt to respond to its environment. In the case of prospectors, since they are continuously developing new products and exploring into new markets, they tend to have difficulties achieving operational efficiency (Auh & Menguc, 2005). Their efforts in utilising multiple technologies in developing new products require them to have an efficient integration and coordination mechanism (Miles & Snow, 2003). In line with this, many studies attempt to explain the relationship between strategic orientation in general, and prospectors in particular, with structural dimensions (e.g. Olson et al., 2005; Pleshko, 2007).

In organisation theory research, scholars have deliberately distinguished between structures designed for efficiency and those designed for innovation; for example mechanistic versus organic structures (Burns & Stalker, 1961). According to Covin and Slevin (1989), organic structures permit rapid organisational response to changing external forces in unpredictable environments, while mechanistic structures are better suited to predictable environments where rapid organisational responses are not typically required (Burns & Stalker, 1961; Lawrence & Lorsch, 1967). According to Ortenblad (2002), learning organisations prefer organic structures where information flows freely among people and across boundaries. Flexibility is very important in learning organisations and can be achieved by having a decentralised structure that confers greater empowerment upon workers (Marquardt & Reynolds, 1994; Senge, 1990). This strengthens the proposition that an organic structure which is more effective for firms operating in dynamic environments, will

be positively linked to exploration, whereas a mechanistic structure which is relatively more effective for firms in benign environments, will be suitable to exploitation. As found by Khandwalla (1977), high performing firms in the industries characterised by intense, diverse and shifting competitive pressures, adopt organic structures while high performing firms in industries with minimal competitive pressure adopt more mechanistic structures.

According to Burns and Stalker (1961), organic structure which is characterised by loose structures and few rules, is the most appropriate system in changing conditions. Due to this reason, prospectors favour an organic structure because they require a relatively flexible structure to facilitate rapid responses to environmental change (Conant et al., 1990; Slater & Narver 1993). This not only applies to large firms; studies on small and medium sized companies have revealed a positive relationship between prospectors and flexible management practices (Laforet, 2008; Sanchez & Marin, 2005).

In relation to combinative capabilities, organic structure is characterised by low system capabilities. Organic structure encourages both horizontal and vertical communication and appreciates flexible roles (Olson et al., 2005). Therefore, the high volume of development activities in prospector-oriented firms is suited to organic structure which is characterised by a low level of formalisation (Shortell & Zajac, 1990). Since tasks change frequently, it is not economically feasible to codify job descriptions and operating procedures closely. Prospectors' aggressive and bold nature requires mechanisms that allow for the processing of quick and correct information to support their strategy (Pleshko, 2007). Formalisation is suggested to

drive out creativity (Lenz & Lyles, 1983) and has inherent ability to discourage the pursuit of opportunities (Frederickson, 1986).

This is also highlighted in the study of marketing organisations by Olson et al. (2005) which shows that prospector firms which are found to place greater emphasis on innovation, are characterised by a higher number of specialists who operate in decentralised and informal organisations. As proposed by Walker and Ruekert (1987, p.27), prospectors' performance will be enhanced when

> *"(1) decision-making authority is extended down to or at least shared with lower-level managers within the department, (2) rigid rules and policies are supplanted by discretion and informal coordination mechanisms, and (3) more specialists with more detailed knowledge about particular techniques, products, or customers are incorporated within the department."*

Therefore, it can be concluded that prospectors require autonomy and less formalisation, supported by diversity in knowledge and expertise.

Prospectors' activities in technological development involve high uncertainty. Consequently, structures that constrain decision-making in a tight manner such as mechanistic structure would be definitely inappropriate. On the other hand, organic structure that is characterised by low formalisation, greater autonomy and dense communication will be more suitable for prospector strategic orientation. Therefore, as organic structure reveals low system capabilities, this study predicts that firms with greater prospector strategic orientation will have lower system capabilities.

Hypothesis

2b. Prospector strategic orientation is negatively related to system capabilities.

2.5.2 The Relationship between Prospector Strategic Orientation and Coordination Capabilities

Since prospectors are continuously developing new products, they need to develop and integrate multiple technologies and this requires flexible structures to coordinate the various functions involved (Laugen et al., 2006). Coordinated integration of a firm's resources is considered important in creating superior value and the synergistic effects of such coordination are obviously related to the orientations of the firm (Gatignon & Xuereb, 1997; Kohli & Jaworski, 1990; Narver & Slater, 1990). This is in line with the Miles and Snow (1978) proposal that prospectors tend to have complex coordination and communication mechanisms because their strengths rely on participative and decentralised decision-making. Therefore, because of a higher level of conflict is predicted to prevail in prospector strategic orientation, greater coordination capabilities are required to resolve and integrate processes (Ruekert & Walker, 1987).

Inter-functional coordination refers to the specific aspects of organisational structure that facilitate communication and implementation of tasks among different functions in the firm (Jaworski & Kohli, 1993; Narver & Slater, 1990). This construct measures the degree to which functional units interact, communicate, and coordinate with one another to collect and use information (Gima, 2005). In fact, organisational behaviourists suggest that coordination and control mechanisms are essential in linking different units together as part of the formal organisational arrangements

(Nadler & Tushman, 1980). Inter-functional coordination enables firms to synthesise, integrate and apply current and newly-acquired external knowledge (Henderson & Cockburn, 1994; Kogut & Zander, 1992). It is believed that this mechanism is necessary to enable different strategic orientations to work jointly in achieving successful product development initiatives (Gatignon & Xuereb, 1997). However, despite the importance of this mechanism in the development of innovative capabilities, it still receives scant attention in strategic management research (Olson et al., 2005).

Walker and Ruekert (1987) propose that the performance of prospectors depends upon the use of decentralised decision-making procedures that are supplanted by discretion and the existence of informal coordination. Findings from Olsen et al. (2005) show that top-performing prospectors are characterised by highly informal and decentralised structures. According to the information processing literature, a decentralised structure which usually involves inter-department task interdependence, not only increases the need for departmental information processing power, but also requires coordinative power (Siggelkow & Rivkin, 2006). Having the capabilities to coordinate teams, functions, and departments, it is therefore essential to ensure efficiency in working towards a common goal. As suggested by Beer et al. (2005), maintaining alignment involves collaborative processes and this requires coordination between various departments in the event of change. Thus, it is justified to conclude that firms with greater prospector strategic orientation require coordination capabilities to support their strategic objectives.

Hypothesis

2c. Prospector strategic orientation is positively related to coordination capabilities.

2.5.3 The Relationship between Prospector Strategic Orientation and Socialisation Capabilities

Socialisation capabilities are found in firms with a strong identity. Greater socialisation capabilities are manifested in a coherent set of beliefs, a high degree of shared values, a common language, and a strongly agreed-upon kind of appropriate behaviour. Socialisation capabilities give rise to social integration and this supports and strengthens system and coordination capabilities.

Although socialisation capabilities eventually develop trust and this is translated into commitment towards organisational goals, such capabilities may inhibit the activities of prospectors. According to Nahapiet and Ghoshal (1998), a dense network may increase the redundancy of information and to some extent, diminish access to divergent perspectives. As a result, socialisation capabilities which lead to convergence in beliefs, restrict change that is crucial in a dynamic environment. An increase in the socialisation rate will inevitably reduce experimentation which is essential in innovative orientation (Rodan, 2005).

There is also broad agreement in the literature that densely-shared understanding and beliefs may induce firms to be more risk-averse (Lester & Canella, 2006). According to Cho and Pacik (2005), risk aversion is likely to limit a firm's ability to grow and

to innovate. Shared understanding and beliefs also influence a firm's susceptibility to environmental change. Firms with 'strongly held values' try to maintain stability and avoid jolts (Lyles & Schwenk, 1992). In other words, these firms search for the conditions that match the structure, knowledge or business methods that have normally been used.

In terms of the external environment, findings from Vanhaverbeke et al. (2004) concluded that explorative learning is less successful when a firm's partners are well connected to each other. Nahapiet and Ghoshal (1998) suggested that a dense network may constrain employees to engage in broad searches of information and selective perception of information and alternatives (Janis, 1982). Firms will be collectively blinded by conforming to the norms of doing things (Jansen, Van den Bosch & Volberda, 2005). As suggested by the innovation literature, innovativeness depends on the ability of firms to integrate knowledge, and this process of integration is most effective when it involves diverse sources of knowledge (Carayannis, Alexander & Ioannidis, 2000). The sharing and exchange of knowledge across organisational boundaries is a new key asset in the struggle for competitiveness; and the ability to facilitate the flow of ideas, information, and innovation between firms requires new, unique management skills, and organisational design. Although some studies have demonstrated that shared vision and values increases commitment in organisational learning (Sinkula, Baker & Noordewier, 1997), it may, in a different context, actually hinder the process of explorative learning. Therefore, it can be concluded that socialisation capabilities inhibit the acquisition and assimilation of new external knowledge (Cohen & Levinthal, 1990).

Hypothesis

2d. Prospector strategic orientation is negatively related to socialisation capabilities.

2.6 COMBINATIVE CAPABILITIES AND EXPLORATIVE LEARNING

March's model (1991) suggested that learning happens at two levels: learning within organisations and learning by organisations. In organisations, memories of individuals are augmented through knowledge as it establishes organisational culture, processes, organisational structures, physical structures and archives (Walsh & Ungson, 1991). It is acknowledged by the literature that learning at both the individual and the organisational level is an interdependent phenomenon (Easterby-Smith, Crossan & Nicolini, 2000; Popper & Lipshitz, 2000).

Although March (1991) recognises mutual learning between these two levels, his model did not discuss the role of interpersonal learning that accelerates the exploration for new knowledge. This is because March (1991) modelled learning as independent of location, whereas the location of individuals and their resulting networks are an important consideration in accessing learning effectiveness (Miller, Zhao & Calantone, 2006). Accordingly, individuals tend to rely on established network ties to facilitate learning (Erickson, 1988) and encourage knowledge transfer (Orlikowski, 2002).

Since learning is conceptualised as a socially-constructed phenomenon, it is therefore determined by the infrastructure of social relations within firms. The interactions between individuals, groups, and processes facilitate the performance of learning processes. Brown and Duguid (1991) argued that the interaction between, and adaptive capabilities of, individuals and groups affect learning. This is in line with the notion that a system's collective properties, in this case learning, emerges from inter-related social practices of organisational members (Weick & Roberts, 1993). As learning is seen from a social construction perspective, the uniqueness of inter-functional and social relationships contributes to competitive advantage. Thus, further research is greatly needed to comprehend the internal repertoire of the firm that allows acceleration of the learning curve.

Taking into consideration the social aspects of learning, it is incumbent to explore the relationship between combinative capabilities and explorative learning because the importance of social knowledge is manifested in combinative capabilities. Combinative capabilities which are measured through organisational mechanisms such as cross-functional teams and participative decision-making, involve spatially proximate individuals and social networks (Jansen et al., 2005). Such capabilities also include control systems and dominant values that influence the ability to access new external knowledge and to integrate knowledge (Henderson & Cockburn, 1994). As suggested by Teece (2000), the combination of information-seeking and co-aligned organisational processes can significantly enhance learning and competitive advantage.

Furthermore, the concept of combinative capabilities can also be considered as a systematic build-up or co-evolution of scientific and technological knowledge (Liyanage & Barnard, 2003). This is supported by Hargadon (2003) who believes that it is social knowledge that can spark technological revolutions by effectively combining existing objects, ideas, and people. He termed it as technology brokering, where technology brokers identify, recombine, and transfer latent knowledge to create new knowledge. Based on a few case studies, Hargadon (2002, 2005) highlighted the importance of flexible structures and inter-group communication in order to connect a wide range of relatively disconnected knowledge domains, to create new combinations of ideas that exist in these different domains (Hargadon & Fanelli, 2002).

As mentioned earlier, combinative capabilities are manifested in organisational mechanisms. Therefore, it is important for firms to evaluate organisational mechanisms in the form of structures over time in order to establish structures that economise on the costs of combining knowledge and at the same time optimise the outcomes (Buckley & Carter, 2002). After all, the need to maintain consistency between structure and knowledge is evidently important in order to facilitate individual as well as organisational learning (Hong, 1999; Ichijo, Krogh & Nonaka, 1998). This is supported by Hernes (1999) who suggests that organisational structures should be geared towards firms' natural learning modes, in order to have an impact on organisational actions.

Studies on organisational learning have explored the relationship between organisational learning and organisational mechanisms (that are manifested in

organisational structures) in different types of learning; double loop vs. single loop learning (Agris & Schon, 1978); local search vs. long jump (Levinthal, 1997); variation-reducing vs. variation-increasing (Burgelman, 1991, 2002) and static vs. dynamic efficiency (Ghemawat & Costa, 1993). As summarised in Table 2.5, a local search requires lower autonomy, less interdependence, and moderate communication. On the other hand, a rugged landscape requires long-jump learning that is supported by delegation, less control, greater interdependence, and extensive communication (Levinthal & Warglien, 1999). Variation-reducing induced processes are associated with top-down decision-making and greater control especially in resource allocation, whilst variation-increasing autonomous processes are supported by cross-functional collaboration that involves higher communication and interaction (Burgelman, 1991).

As suggested by Ghemawat and Costa (1993), static efficiency concentrates on existing processes and competencies and, therefore, it is control-driven. The structural orientation for this condition to prevail must be more centralised with a vertical chain of authority and communication. As for dynamic efficiency, this is more knowledge-driven and therefore the structure requires greater flexibility, which includes decentralisation, a network of power and communication, and reward for risk-taking and creative ideas. Although the findings prescribe different structural processes for each type of learning, it is acknowledged that firms need both to survive (Ghemawat & Costa, 1993).

Table 2.5
Major Studies that Associate Organisational Learning with Organisational Mechanisms

Author	Organisational Learning Types	Organisational mechanism
Argyis and Schon (1978)	Single-looped	• Greater control • Concentration of power at the top
	Double-looped	• Extensive information search • Power sharing • Open and constructive confrontations
Lant and Mezias (1992)	First-order	• Routinised activities
	Second-order	• Flexibility
Ghemawat and Costa (1993)	Static efficiency	• More centralised • Vertical chain of authority and communication
	Dynamic efficiency	• Decentralisation • Network of power and communication • Reward risk-taking and creative ideas.
Levinthal (1997)	Local search	• Lower autonomy • Less interdependence • Moderate communication.
	'Long jump'	• Delegation • Less control • Greater interdependence • Extensive communication
Burgelman (1991, 2002)	Variation-reducing induced processes	• Top-down decision-making • Greater control in resource allocation.
	Variation-increasing autonomous processes	• Cross-functional collaboration • Higher communication • Fluid processes with minimal control • Experimentation • Greater involvement in decision-making

Conclusively, different combinations of organisational mechanisms are required to facilitate and stimulate different types of learning (Moigeon et al., 1998). Despite the diverse terminologies, commonalities can be readily observed and two distinct concepts of learning can be apparently identified. This distinction suggests that double loop, long jump, variation-increasing and dynamic efficiency-related learning are closely aligned with exploration (Auh & Menguc, 2005). On the other hand, single loop, local search, variation-reducing and static efficiency are related to exploitation.

As March (1991) asserts that organisational forms and customs are unique to different approaches of learning, many attempts have been made to identify organisational conditions that increase the importance and the effectiveness of explorative and exploitative learning. Specifically, research on exploration-exploitation also suggest that explorative learning require substantially different structural mechanisms, processes, strategies, and capabilities, and may have different impacts on firm adaptation and performance (He & Wong, 2004). As presented in Table 2.6, a study by McGrath (2001) has found that goal and supervision autonomy are important to stimulate exploration. On the other hand, Siggelkow and Levinthal (2003) found in their study on centralisation and performance using a simulation method, that exploration with decentralised structure yield better performance especially in 'disrupted' environments.

Table 2.6
Previous Research on Explorative and Exploitative Learning

Studies	Learning approach	Organisational factors
March (1991)	Exploration, exploitation	Tenure and personal abilities
Van Duesen & Mueller (1999)	Exploration, exploitation	Service tenure
Clegg (1999)	Exploration, exploitation	Total quality management
McNamara & Fuller (1999)	Exploration, exploitation	Control
Swan, Newell, Scarbrough & Hislop (1999)	Exploration, exploitation	Communities of practice
McGrath (2001)	Exploration	Autonomy
Rosenkopf & Nerkar (2001)	Exploration, exploitation	Information acquisition
Douglas & Judge (2001)	Exploration	Control
Katila & Ahuja (2002)	Exploitation	Search depth and scope
Benner & Tushman (2002)	Exploration, exploitation	Process management
Sidhu et al. (2003)	Exploration	Information acquisition
Lee, Lee & Lee (2003)	Exploration, exploitation	Network externalities
Nerkar (2003)	Exploration	Temporal factor
Lunnan & Barth (2003)	Exploration, exploitation	Teamwork
Garcia et al. (2003)	Exploration, exploitation	Resource allocation and flexibility
Siggelkow & Levinthal (2003)	Exploration	Centralisation
Kyriakopoulos & Moorman (2004)	Exploration, exploitation	Market learning
Bogenrieder & Nooteboom (2004)	Exploration	Communities of practice
Vanhaverbeke et al. (2004)	Exploration, exploitation	Alliance network
Sidhu et al. (2004)	Exploration, exploitation	Organisation mission, slack resources
He & Wong (2004)	Exploration, exploitation	Ambidexterity structure
Holmqvist (2004)	Exploration, exploitation	Participation
Linnarson & Werr (2004)	Exploration	Alliance network
Rodan (2005)	Exploration, exploitation	HR functions
Gima (2005)	Exploration, exploitation	Inter-functional co-ordination and control
Jansen, Van den Bosch & Volberda (2006)	Exploration, exploitation	Formal hierarchical, informal social relations
Liu (2006)	Exploration, exploitation	Competency trap
Geiger & Makri (2006)	Exploration, exploitation	Organisational slack
Lavie & Rosenkopf (2006)	Exploration, exploitation	Strategic alliances
Perretti & Negro (2006)	Exploration	Hierarchical layers in team
Gilsing & Nooteboom (2006)	Exploration, exploitation	Network
Wadhwa & Kotha (2006)	Exploration	CVC investment
Sidhu et al. (2007)	Exploration, exploitation	Information acquisition
Lee, Rho, Kim & Jun (2007)	Exploration, exploitation	Communication
Kale & Wield (2008)	Exploration, exploitation	Ambidexterity capabilities

As an extension of March's (1991) study on learning, Van Duesen and Mueller (1999) explored the acquisition process, concluding that the establishment of routines contributes to exploitative learning, and having new members in the acquisition board members (multi-expertise) helps explorative learning. Studies on

networks also suggest that different approaches to learning require different types of structural network. An explorative network is suggested to require flexibility and open communication (Linnarsson & Werr, 2004).

The relationship between combinative capabilities and exploration cannot be separated from the premise of market dynamism (Eisenhardt & Martin, 2000). In a high velocity situation where market boundaries and industry structures are unclear, change becomes non-linear and less predictable. In this situation, exploration provides firms with new knowledge and the freedom to adapt and evolve (Land & Lubatkin, 1998). By building combinative capabilities, experimentation and knowledge acquisition is encouraged and this makes firms receptive to the idea of acquiring external knowledge.

Furthermore, in high velocity markets, building dynamic capabilities involves the creation of new, situation-specific knowledge that requires rapid and iterative experiential learning. As suggested by Rosenkopf and Nerkar (2001), different skills and routines are required to recombine knowledge from different technological areas. Dynamic capabilities also rely more on real-time information, cross-functional relationships, and intensive communication between the firm and external market (Eisenhardt & Martin, 2000). Research on information technology-based companies that compete in volatile and uncertain markets, reveals that routines that are simple and flexible lead to successful alliancing (Eisenhardt & Sull, 2000) and resource allocation processes (Burgelman, 1996). This suggests that combinative capabilities are essential to encourage explorative learning, and thus develop dynamic capabilities that are based on new and situation-specific knowledge.

The above discussion on prior research enables us to infer the relationship between explorative learning and combinative capabilities. Since combinative capabilities are embedded in organisational mechanisms and are defined operationally according to system, coordination and socialisation capabilities, previous studies can be used to delineate appropriate organisational mechanisms to support explorative learning.

2.6.1 The Relationship between Explorative Learning and System Capabilities

As defined earlier, system capabilities refer to the direction, policies, procedures, and manuals that are used to integrate explicit knowledge. This means that system capabilities rely on standardisation of work which includes very formalised procedures in operating core, the proliferation of rules and regulations, and formalised communication (Minzberg, 1979). Procedures that have been proven to be successful are formalised into routines which constitute stable patterns of behaviour and relevant organisational reactions to variegated, internal or external stimuli (Zollo & Winter, 2002). The establishment of processes into routines deepens the memory of firms and enhances the predictability of the outcome (Eisenhardt & Martin, 2000). According to Zander and Kogut (1995), firms rely upon routinised behaviour because given what they already know how to do (i.e. following routines), this is the most efficient way of doing things.

In terms of knowledge, system capabilities can be in the form of storing knowledge through procedures, norms, rules, and forms (March, 1991). In line with the belief of Kogut and Zander (1993) that a firm is a repository of knowledge, knowledge is coded and its application is coordinated to ensure consistency and reliability.

Resources are allocated to efforts to codify existing tacit knowledge into detailed routines that precisely specify steps and sub-divide activities among different individuals. In other words, the ultimate purpose of codifying and simplifying such knowledge is to reduce its tacitness in order for it to be more accessible to the wider organisation (Kogut & Zander, 1992).

System capabilities allow knowledge to be increasingly embedded in human behaviour. As knowledge effectiveness increases through replication and retention phases, knowledge abstraction declines as it is applied to a wider variation of local situations (Zollo & Winter, 2002). The use of routines keeps managers focused on broadly important issues, without limiting them to specific behaviours or applying past experience that may be inappropriate given the actions to a particular situation (Eisenhardt & Martin, 2000). As suggested by McGrath (2001), when the desired results are reliability, replicable performance, and safety; conscious and heedful specification of activities is desirable. Moreover, specified well-codified tasks can be more readily maintained and are easier to enhance, transfer and thus replicate.

It is a virtue of system capabilities that they can accelerate internal transfer and absorb knowledge. This is achieved by reducing the tacitness of knowledge through encoding its use, and replicating it in rules and documentation (Kogut & Zander, 1993**)**. In other words, formalised structure will facilitate the diffusion of existing knowledge through knowledge codification which is an important element in capability building (Zollo & Winter, 2002). According to John and Martin (1984), formalisation also enables firms to accumulate a vast organisational memory of best practices which makes knowledge-use more efficient. In the case of strategic

planning, formalised procedures systemise information collection and dissemination, thus facilitating the identification and storage of strategic issues (Segars, Grover & Teng, 1998). For instance, in order to assess their performance, firms require standardised and routinised intelligence activities in order to maintain consistency and reliability (Germain, Droge & Daugherty, 1994).

Despite the fact that system capabilities aid knowledge absorption and transfer, there are two opposing views regarding the relationship between system capabilities and knowledge utilisation in firms. Whilst one group believes that formalisation increases knowledge use, another is of the opinion that formalised structures can be less flexible and therefore rigid, making it difficult to acquire and utilise knowledge (Zaltman, 1979). Organisational theorists believe that knowledge codification involves direct costs; the time, the resources, and the managerial attention invested in the development and updating of task-specific tools, and indirect costs in the form of a possible increase in inappropriate application of the routine if the codification is poorly performed (Cohen & Bacdayan, 1994). Hence, it is argued that codification can lead to a general increase in organisational inertia consequent to the formalisation and structuring of the task execution (Zollo & Winter, 2001).

Some theorists also believe that increases in stored knowledge more often reduces the variability of performance rather than increasing it (Kang, Morris & Snell, 2007; Leonard-Barton, 1995;). As work is standardised and techniques are learned, variability in the time required to accomplish tasks and the quality of task performance is reduced. However, Frederickson (1986) argued that when systems are so formalised, they drive out creative and proactive behaviour. This suggests that

greater system capabilities in the form of formalisation have the inherent ability to discourage the pursuit of opportunities.

Moreover, formal job and role definitions, consistency of approach and documented and standardised behaviour, are also suggested to interfere with the exercise of individual discretion. Conversely, open and intense interactions will lead to higher creativity and the contribution of new ideas (Amabile, Conti, Coon, Lazenby & Heron, 1996). Therefore, variance enhancement is more likely to flourish in circumstances in which improvisation and experimentation are encouraged, information flows are frequent and dense, and roles and jobs are undefined (McGrath, 2001). In other words, system capabilities reduce variance enhancement because they discourages creativity, improvisation and experimentation.

Accordingly, in a high velocity market, routines should be purposefully simple, although not completely unstructured. Simple principles mean that limited routines will enable firms to self-organise and respond to rapid change (Rindova & Kotha, 2001). As found by Brown and Eisenhardt (1997), successful new product development in a high velocity environment is based on limited routines. In the context where technological, regulatory, and competitive conditions are subjected to rapid change, persistence in the same operating routines may become hazardous (Zollo & Winter, 2002). This is evident by a study conducted by Brown and Eisenhardt (1997) that discovers that firms with highly structured processes may produce new products quickly; however these products were often not well adapted to market conditions.

Exploration is also likely to be encouraged through unhindered communications and interactions. Formality stifles the communication and interaction necessary to create knowledge. In other words, a less formal structure enables organisational members to communicate and interact with one another, thereby stimulating the creation of knowledge. Since, low formalisation permits openness and variation, new ideas and behaviours are encouraged (Damanpour, 1991). This is evident in a study by Lee and Choi (2003) that found formalisation to inhibit tacit-related activities such as socialisation, although it encourages explicit-related activities such as internalisation.

Since exploration requires flexibility and less emphasis on work rules, the range of new ideas seems to be restricted when strict formal rules dominate firms. Flexibility can accommodate better ways of doing things. Therefore, the increase in flexibility can result in increased knowledge creation (Lee & Choi, 2003). Furthermore, exploration also requires variation (March, 1991) in order to be more adaptable when unforeseen problems arise.

Exploration involves searching for opportunities in unfamiliar landscapes where variance is desirable. It involves taking advantage of the newly-acquired knowledge, which is usually in tacit and subjective form. This type of knowledge is not easily codified and transferred in blueprints (Kogut & Zander, 1993). Lam (2000) suggests that firms that deal with tacit knowledge require decentralised structures and informal coordination mechanisms, the reason being that tacit knowledge is subjective and dispersed, and cannot, therefore, be standardised, disembodied or pre-determined. As suggested by Nonaka (1994), in order to avoid tacit knowledge from

remaining latent, its mobilisation needs to be accompanied with autonomy and flexibility.

This is supported by findings in a study on process management by Benner and Tushman (2003), who suggest that when exploration is required to achieve radical, architectural and modular innovation, efforts of formalisation through process management will inhibit variability and increase resistance to change. Since uncertainty is high in exploration, formal control should be low and compensated by trust. To increase trust, the frequency of interactions must be sufficient, especially to accommodate an effective transfer of tacit knowledge (Gilsing & Nooteboom, 2006).

Even in procedural knowledge which is easier to capture and understood, a higher level of cognitive effort is still required to codify understandings of the performance implications of internal routines in written tools, such as manuals, blueprints, spreadsheets, decision support systems, and project management software (Zollo & Winter, 2001). Therefore, system capabilities are difficult to materialise since codification and simplification of tacit knowledge in explorative learning involves greater cost. The possibility of the inappropriate application of routine as the result of poor codification is high (Cohen & Bacdayan, 1994) and, therefore, concentration on the building of system capabilities can result in organisational inertia (Zollo & Winter, 2001).

In terms of technology, research findings indicate that older technologies (widely diffused) are better codified and, therefore, less costly to transfer. Cumulative past

experiences with a technology is a critical factor determining the learning capability of the recipient to understand new and related technologies (Zander & Kogut, 1995). Findings from research undertaken by Slevin and Covin (1990) showed that firms in low-technology industry have more mechanistic, structured and standardised processes, and firms in high-technology industry tend to have proactive, aggressive, innovative, focused, and future-oriented strategic posture. This implies that slow technological progress (in low technology environments) allows formalisation to take place and therefore the technology used can be standardised and routinised to allow diffusion and wide application. However, in a rapidly-changing technology situation, firms have to be more organic in order to be sufficiently flexible to adapt to changes in technology.

Although the establishment of routines and processes allows firms to reduce cycle time, the exploitation of existing procedures is not effective within a difficult environment (Van Deusen & Mueller, 1999). Studies have demonstrated that although routinisation improves performance under similar conditions, at the same time, it may constrain performance if similar routines are applied even when the rules of the game have changed (Cohen & Bacdayan, 1994). These arguments lead to the conclusion that explorative learning that is associated with a dynamic environment and rapid changes in technology, require less system capabilities.

Hypothesis

3a. System capabilities are negatively related to explorative learning

2.6.2 The Relationship between Explorative Learning and Coordination Capabilities

According to Teece (1997), dynamic capabilities which are defined as firms' ability to achieve new forms of competitive advantage, need decentralised structures and local autonomy (Rindova & Kotha, 2001) because these make it possible to harness idiosyncratic knowledge in different parts of the firms (Ghemawat & Costa, 1993). Furthermore, in the pursuit of dynamic efficiency, a knowledge-driven environment is required because its bottom-up approach leads to new opportunities. In line with the above arguments, Grant (1986) asserts that the way in which knowledge is coordinated and integrated among functional units is the source of competitive advantage.

Evidently, coordination capabilities become more critical as dynamic capabilities require decentralisation, and knowledge must be integrated in order to achieve competitive advantage (Siggelkow & Rivkin, 2006). It is suggested that decentralisation is necessary to encourage exploration and experimentation with creative ideas among employees (Douglas & Judge, 2001). As noted by scholars, firms, especially in uncertain environments, require greater interdependence between divisions (Duncan & Weiss, 1979), and this warrants greater coordination capabilities. With high coordination capabilities, firms are expected to better coordinate and integrate the dispersed resources for the benefit of the firms. Apparently in explorative firms, more coordination capabilities are required to focus on coordination and the integration of knowledge within and across firms. Furthermore, many researchers believe that the conversion of knowledge in value-creating processes depends on the firm's knowledge integration mechanism (Grant,

1996; Zahra & Nielson, 2002). As illustrated by Beer et al. (2005), coordination capabilities are evidently more crucial in the process of strategy implementation.

According to Daft and Huber (1987), learning is a function of information load facing the organisation. Firms that emphasise experimentation have to deal with a high and abstract information load. Therefore, the structure should be disaggregated so that it can involve many boundary-spanning people and departments, and an aggressive data acquisition approach can be undertaken. However, for firms that deal with a low information load, a centralised structure would be more appropriate since learning is focused on institutionalised experience.

Highly complex interactions in terms of knowledge make learning more difficult and reduce the speed of knowledge diffusion and transfer. In explorative learning, firms require knowledge diversity because this is an important factor in the creation of technological knowledge (Lapre & Wassenhove, 2001). A coalition of specialists in differentiated sub-units provides firms with an added advantage in the depth of their knowledge bases, which in turn increases the development of new ideas (Aiken & Hage, 1971; Olson et al., 2005). Furthermore, a greater variety of specialists provides a more diversified knowledge base and increases the cross-fertilisation of ideas, both of which result in more innovation (Aiken & Hage, 1971; Kimberly & Evanisko, 1981). Not only does diversity in functional expertise contribute to explorative learning (Ortenbald, 2002), but diversity in the backgrounds of team members can also promote a positive impact on exploration (Amabile et al., 1996). However, knowledge diversity and multiple expertise obviously leads to complexity, and to untangle this, coordination capabilities are definitely required.

In explorative learning, higher participation of cross-functional teams that bring together different sources of expertise also leads to effective product development ideas (Kenochi, Nonaka & Takeuchi, 1985; McNamara & Fuller, 1999). The availability of an enhanced range of information will ease the coordination of manufacturing, marketing, and design tasks during the course of process development (Eisenhardt & Martin, 2000). Additionally, the way in which knowledge information and communication flows are distributed in the system can also give rise to different patterns of learning (Marengo, 1992; Ortenbald, 2002). A study by Marengo (1992) shows that even when all the members of a firm are characterised by a given and constant learning process, the way in which knowledge, information and communication flows are distributed in the system can give rise to very different patterns of organisational learning. Explorative firms need a flow of collaborative ideas across the organisations to encourage creative ideas (Amabile et al., 1996). If the flow of information between sub-groups is restricted, the relative lack of ties will create disparities in the knowledge held by the different sub-groups and the firm will, therefore, be unable to take advantage of the diverse knowledge held by the sub-groups (Hargadon & Sutton, 1997).

Many current discussions on dynamic capabilities acknowledge the importance of managing tacit knowledge as a source of competitive advantage (Boer et al., 1999; Grant, 1996; Hargadon, 2003; Kang et al., 2007; Lang, 2004). Tacit knowledge or social knowledge represents knowledge that resides in function-specific social relationships in which individuals are embedded (Lang, 2004). It confers information and control advantages by brokering relations between people who may otherwise be disconnected in a social structure (Burt, 1997). Since it is widely

dispersed and resides within complex social interactions between individuals within a shared area of competence (Weick & Roberts, 1993), the process of learning and integrating tacit knowledge requires unique structural requirements.

With greater diversity and need for integration, a mechanism that promotes intense interactions is required since the knowledge to be transferred is often tacit. Explorative learning that involves learning about new markets and technologies requires a combination of knowledge gained from several sources. A higher degree of participation results in a richer knowledge architecture because of contributions from participants at various levels. Intellectual diversity is known to be a requirement for change and for exploration of knowledge to create new capabilities (Carley, 1992; McNamara & Fuller, 1999; Simon, 1991). Participants in task variation can also increase individual learning curve rates. Exploration will be maximised when learners engage in multiple activities that may appear unrelated (Schilling et al., 2003). Furthermore, a study by McGrath (2001) demonstrates that greater autonomy is required to support exploratory learning than to support the use of existing knowledge.

The practice of informality together with greater autonomy, provides inducement for individuals to exercise greater personal discretion, and increases motivation and commitment (McGrath, 2001). When greater autonomy is given, individuals are given the necessary degrees of freedom to be creative and to respond to technological and market opportunities as they arise (Amabile et al., 1996; Birkinshaw et al., 2002). Studies on creativity have shown that more creative work results when individuals perceive themselves to have choice in how to go about

accomplishing the tasks that they are given (Amabile & Gitomer, 1984). This widens the possibility that individuals will be self-motivated to create new knowledge (Nonaka, 1994). According to McGrath (2001), when exploration is supported with higher autonomy, learning effectiveness increases. In a study on formal learning, it was concluded that production teams that were given full authority to decide were extremely successful at proactively creating the 'right' knowledge to accelerate the organisation's learning curve (Lapre & Wassenhove, 2001).

Based on past literature, it can be deduced that the relationship between coordination capabilities and explorative learning can be explained by reference to two factors. Firstly, explorative learning requires a great amount of information processing to reduce the uncertainty that emanates from the dynamic environment. When a decision involves a lot of uncertainty, top management may not have sufficient information to make sound judgments. An increase in the number of individuals in the decision-making process via decentralisation, allows for the generation of more information, which in turn helps to reduce the uncertainty associated with the decision.

Secondly, since explorative learning taps into the tacit and novel knowledge base, coordinative capabilities are essential in order to manage these complex interactions, and especially when lateral communication to deepen knowledge flows across functional boundaries is involved. By enhancing efficient knowledge exchange, firms can generate new ideas and broaden insights through constant re-interpretation of each functional perspective (Grant, 1996). Furthermore, inter-functional

coordination helps to build trust among functional units (Gilsing & Nooteboom, 2006). This will create suitable conditions for harnessing diverse functional perspectives to make sound decisions.

All in all, coordination capabilities reduce cross-functional conflict and promote commitment. The efficient combination of different functional insights transforms organisational competencies into superior performance (Gima, 2005), and thus the relationship between explorative learning and coordination capabilities should be positive.

Hypothesis

3b. Coordination capabilities are positively related to explorative learning

2.6.3 The Relationship between Explorative Learning and Socialisation Capabilities

The process of acquiring, transferring, and integrating valuable knowledge distributed within and across organisational boundaries often takes place in the context of social interactions (Kale, Singh & Perlmutter, 2000; Nahapiet & Ghoshal, 1998). According to Kogut and Zander (1992), social relations are considered more efficient mechanisms for sharing both tacit and explicit knowledge and, therefore, firms need to develop specific capabilities to control and coordinate the complex social interaction between human, objects, and ideas. As suggested by Vanhaverbeke et al. (2004), explorative learning taps into the tacit and novel knowledge base.

Combinative capabilities are defined as the ability to recombine knowledge to generate new applications from existing knowledge and the unexplored potential of technology (Kogut & Zander, 1992). The focus of combinative capabilities is to minimise the secondary uncertainty that arises when managers are unable to combine their knowledge in ways that are beneficial to the firm because of ineffective communication or lack of access to knowledge resources (Buckley & Carter, 2002). Hence, combinative capabilities are needed to manage and coordinate social interactions in the pursuit of integrating, developing, and reconfiguring knowledge resources.

Although strong and dense social connections are advantageous in terms of increasing opportunities to acquire in-depth knowledge, they may have negative effects on explorative learning. As Gargiulo and Benassi (2000) have pointed out, strong and dense inter-connections may actually limit employees' opportunities to explore varied knowledge domains by locking them into narrow social circles. A case study of a Scandinavian software company (Holmqvist, 2004) illuminated this particular issue, when it found that inter-organisational exploration between the company and outsiders generated successful product development, whereas collaboration with internal partners did not bring positive results. A study by Rosenkopf and Nerkar (2001) suggests that when a search is based on external boundary spanning, firms are likely to engage in well-regarded technology. However, if an organisation relies on its internal expertise, it is consigned to its own level of expertise.

Accordingly, socialisation capabilities are said to create 'mental prisons' (De Leeuw & Volberda, 1996) that inhibit people from identifying what is important as important. As socialisation capabilities tend to develop strong cultures, they increase resistance to change, especially in absorbing outside sources of knowledge that contradict the existing shared beliefs. This is supported by the observation by Cohen and Levinthal (1990) that even a single shared language can pose a barrier to tap diverse external sources of knowledge. Therefore, it is concluded that socialisation capabilities lead to greater efficiency potential but lack scope and flexibility of knowledge absorption (Cohen & Levinthal, 1990). Based on above arguments, this study posits that socialisation capabilities limit the ability of firms to engage in explorative learning.

Hypothesis

3c. Socialisation capabilities are negatively related to explorative learning.

2.7 CONCEPTUAL AND OPERATIONAL DEFINITIONS

Based on the review of past literature, the conceptual and operational definitions of the constructs involved in this study are presented in Table 2.7.

Table 2.7
Conceptual and Operational Definitions of Constructs

Construct	Conceptual definitions	Author	Operational definitions	Author
Prospector Strategic Orientation	Is defined as proactiveness and market-seeking orientation of firms and this is reflected in prospectors' vigorous efforts to exploit emerging opportunities, experiment with change and mobilise first-mover actions.	Aragon-Correa (1998) Luo & Park, (2001) Lynn, Morone & Paulson (1996) Dess et al. (1997)	Is defined as innovative, aggressive, first mover and competitive based on entrepreneurial, engineering and administrative dimensions.	Conant et al. (1990) Covin & Slevin (1989)
Explorative learning	Is defined as learning approach that is geared towards variance maximisation in the pursuit of improvement in mean performance.	March (1991)	Measured by information acquisition and experimentation.	Yeung et al. (1999) Sidhu et al. (2004)
Combinative capabilities	Are defined as the abilities to recombine knowledge to generate new applications from existing knowledge and the unexplored potential of technology.	Kogut & Zander (1992)	Are classified into three categories: system capabilities, coordination capabilities, and socialisation capabilities.	Van den Bosch et al. (1999)
System capabilities	Are defined as the direction, policies, procedures, and manuals that are used to integrate explicit knowledge.	Jansen, Van den Bosch & Volberda (2006)	Reflected in the degree of formal systems prevailing in the firm, the operationalisation of this construct was based on the organisational mechanism associated with formalisation.	Covin & Slevin (1989) Lee & Choi (2003)

Table 2.7, continued

Construct	Conceptual definitions	Author	Operational definitions	Author
Coordination capabilities	Are defined as the capabilities essential in complex interaction processes that are often involved in enhancing control and achieving performance. These capabilities can be achieved through training and job rotation, participation, and communication.	Jansen, Van den Bosch & Volberda (2006)	Are based on items that measure training, skills and inter-functional coordination	Nieto & Quevedo, 2005 Narver & Slater, 1990
Socialisation capabilities	Are defined as the abilities to develop shared ideology that foster shared identity as well as collective interpretation of reality.	Van den Bosch et al. (1999)	Are represented by connectedness and inter-departmental communication which measured the extent to which individuals in organisational units were networked to various levels of the hierarchy.	Jaworski & Kohli, 1993
Performance	Is defined as the ability of firm to produce results in relation to the set target, such as return on investment (ROI), customer retention, sales growth and profitability.	Tippins & Sohi (2003)	Are categorised into three groups: financial, process innovation, and product innovation.	Lee & Choi (2003) He & Wong (2004)

2.8 DEVELOPMENT OF THEORETICAL FRAMEWORK

Researchers have studied the relationship between strategy and performance for a long time, and their studies suggest that the successful implementation of strategies is determined by alignment or fit between strategy and internal mechanisms of the organisations (Chandler, 1962; Miles & Snow, 1978; Noble et al., 2002). The basic premise of Miles and Snow (1978) typology is that whatever type of strategy firms adopt, they are required to build a unique mutually-aligned solution to deal with entrepreneur, engineering, and administrative issues. One important conclusion generated by previous findings, was that the Miles and Snow (1978) strategic typology is a powerful predictor of business efficiency (Doty et al., 1993). It was generally accepted that prospectors, defenders, and analysers have equal chances of being successful and perform better than reactors (Conant et al., 1990; Miles & Snow, 1978).

Although some research efforts have provided contradictory conclusions that were beyond the contention of the theory (e.g. Snow & Hrebeniak, 1980; Zahra & Pearce, 1990), the majority of studies have shown that among the three, prospectors generally achieve better performance due to their characteristics and capacity to adapt to environmental trends (Sanchez & Marin, 2005; Veliyath & Shortell, 1993). This belief is supported by studies (e.g. Gima, 2005; Hurley & Hult, 1998; Yeung, Lai & Yee, 2007) that have demonstrated higher degrees of innovativeness to be positively correlated with the establishment of competitive advantage and consequently, with the achievement of a higher level of performance. Accordingly, a competitive environment forces firms to be actively involved in product innovations

in order to increase or at least maintain their market share. Based on the above arguments, this study suggests that prospector strategic orientation is positively related to performance.

Although this study proposes the existence of a direct positive relationship between strategy and performance, the majority of contingency-based research efforts suggest that alignment between strategy and a class of organisational factors will exclusively contribute to the level of performance (Beekun & Ginn, 1993; Olson et al., 2005; Pleshko, 2007). Based on contingency framing, this study also acknowledges the importance of understanding the role of internal factors in the strategy-performance relationship. This is in line with the conclusion of previous research on strategy, that internal and external factors must be considered as contingent factors (Van de Ven, 1986; Su et al., 2008). The simple examination of direct relationships between strategic orientation and performance will only provide an incomplete picture of the dynamics of organisational behaviour from a strategic management perspective (Wiklund & Shephard, 2005). This is in line with the argument of Frederickson (1986) who asserted that a balanced view of strategy must acknowledge that the strategic decision process and its outcomes can be facilitated, constrained, or simply shaped by organisational mechanisms such as organisational structure, and in fact, these organisational mechanisms may have important deterministic effects of their own. Accordingly, firms may devise the best strategy, but without appropriate internal mechanisms in place, strategic implementation may fail and this will jeopardise the achievement of organisation's goals.

Among many internal factors that have been analysed to understand this relationship, variation in learning approach has not been extensively examined, although knowledge has been suggested to be the missing link in the discussion of strategy and performance (Asoh, 2004; Sun & Chen, 2008). Whilst some studies did attempt to relate organisational learning issues to the strategy-performance discussion (e.g. Jiang & Li, 2008; Noble et al., 2002), these were confined to investigating the direct effects between strategy and learning, and performance, which provides only a partial picture of the dynamic nature of the strategy-performance relationship (Wang, 2008).

Using March's (1991) classification of explorative learning, this study suggests that the more prospective the firms aspire to be, the more explorative should be the learning approach. This is based on the arguments that prospector strategic orientation requires extensive scanning, experimentation, variation maximisation and knowledge diversity. Being a player in a competitive and dynamic landscape requires a firm to be more of a risk-taker, product pioneer, and market leader. All these attributes are achievable if firms dare to be more explorative in their actions to seize market opportunities.

As suggested by Beer et al. (2005), in order for firms to align themselves with the environment, they also need to attain fitness in terms of capacity to learn and change to fit to the new circumstances. In other words, to adapt to changing market conditions, a systematic organisational learning process is required since this will help to rejuvenate firms by re-shaping their design, culture, structure, and processes. A few studies have explored the mediating role of knowledge-related factors such as

explorative learning (e.g. Gima, 2005; Noble et al., 2002) and found support for the mediating role of organisational learning in performance achievement (Yeung et al., 2007). Taking into consideration the direct relationship between prospector strategic orientation and performance, this study suggests that explorative learning partially mediates the relationship between prospector strategic orientation and performance. Accordingly, this study proposes that the synergy of learning and strategy are crucial to organisational success.

However, in order to become more exploration oriented, firms need to develop capabilities that are consistent with the needs to pursue exploration. The concept of combinative capabilities has been introduced and suggested as being important and playing a mediating role in the strategy-learning relationship (Bhatnagar, 2006; Gima, 2005). The mediating role of combinative capabilities in the prospector strategic orientation and explorative learning relationship can be explained by the importance of absorptive capacity in learning. In the model of absorptive capacity, Jansen et al. (2005) propose that the extent of absorptive capacity is determined by combinative capabilities, and this will in turn determine the extent of exploration and exploitation.

Previous studies suggest that organisational mechanisms facilitate learning and the conditions that can support firms to be more explorative, in line with their strategic orientation. In order for learning to happen, appropriate conditions and managerial processes are required (Ulrich, Jick & Von Glinow, 1993). For instance, a study by Moingeon et al. (1998) concludes that specific structures (where project directorates emphasise coordination and integration) need to be developed to stimulate individual

creativity which is important in involving individuals in exploration. Furthermore, as noted by Bhatnagar (2006), experimentation and creativity can be developed through organisational development interventions which allow for the building of appropriate organisational structures, mechanisms, and processes.

Therefore, this study postulates that combinative capabilities positively influence explorative learning by stimulating firms to 'unlearn' old ways of doing things, or by enabling flexibility and facilitating the coordination of the diverse requirements of skills and expertise. Moreover, integration mechanisms such as coordination and participation are suggested to play a role in affecting explorative learning (Keil, Zahra & Maula, 2004; Noble et al., 2002;). This is also supported by Gatignon and Xuereb (1997) who suggest that the strategic orientation and level of inter-functional coordination of a firm can influence the ability of the firm to make a new product successful.

The importance of combinative capabilities is in line with findings in organisational learning research that conceded knowledge as a critical resource for firms wishing to build competitive advantage (Drucker, 1993; Quinn, 1992; Reich, 1991). Therefore, the research framework postulates that combinative capabilities that are represented by system, coordination and socialisation capabilities, partially mediate the relationship between prospector strategic orientation and explorative learning.

Putting all this together, this study presents the notion that both combinative capabilities and explorative learning mediate the strategy-performance relationship. Although empirical work has been conducted on market orientation and

entrepreneurial orientation, comparatively less research has been conducted on the evaluation of organisational learning and combinative capabilities and their combined effects on firm performance.

Past literature has demonstrated that organisational mechanisms constitute a contingent factor that determines performance. However, there has been no conclusive direct relationship identified between organisational mechanisms and performance. On the other hand, prior discussion of the literature has highlighted arguments that establish the relationship between strategic orientation and combinative capabilities, and combinative capabilities and explorative learning. Due to the lack of conclusive agreement that organisational mechanisms such as structure and socialisation factors have a direct relationship with performance, this study postulates that explorative learning fully mediates the relationship between combinative capabilities and performance.

Based on the above arguments, this study presents a research framework that encompasses all factors and the hypothesised relationship to be empirically tested in this study. As illustrated in Figure 2.2, the research framework formulated for this study posits that the relationship between strategy and performance can be extrapolated with the integration of organisational learning and organisational mechanisms (Moingeon et al., 1998) as mediator variables. The existence of direct relationships between prospector strategic orientation and explorative learning and combinative capabilities, between explorative learning and performance, and between explorative learning and combinative capabilities, indicate the mediating roles of both variables in the relationship between strategy and performance. This is

supported by findings in organisational learning (e.g Auh & Menguc, 2005; Sidhu et al., 2004) and structural studies (e.g. Olson et al., 2005; Pleshko, 2007). Using contingency framing, this study explains the strategy-performance relationship by integrating aspects of learning in the internal dynamics of organisational behaviour.

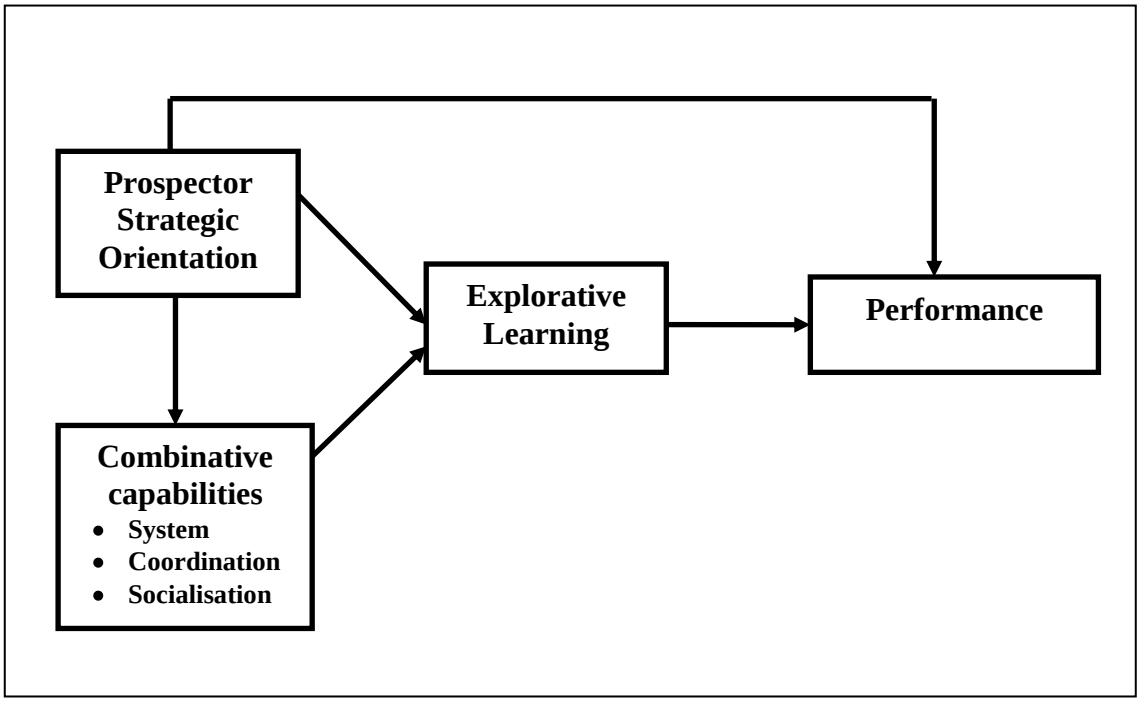


Figure 2.2
Research Framework for The Study

The ultimate aim of this study is to test empirically the relationship between prospector strategic orientation and performance, and to confirm the mediating role of combinative capabilities and explorative learning in the strategy-performance relationship. This aim can be translated into several research questions and tested in a series of hypotheses. Based on the arguments from the literature review, the research questions are as follows:

1. Do prospector strategic orientation and explorative learning determine firm performance?
2. Does prospector strategic orientation determine the extent of combinative capabilities and explorative learning required?
3. Do combinative capabilities determine the extent of a firm's explorative learning?
4. Do combinative capabilities and explorative learning act as the contingent factors in the strategy-performance relationship?
5. Do combinative capabilities and explorative learning mediate the relationship between prospector strategic orientation and firm performance?

These research questions are translated into a series of testable hypotheses as presented in Table 2.8.

Table 2.8
Research Questions and Hypotheses

Research question	Hypotheses
Research Question 1 Do prospector strategic orientation and explorative learning determine firm performance?	1a. Prospector strategic orientation is positively related to performance. 1b. Explorative learning is positively related to performance
Research Question 2 Does prospector strategic orientation determine the extent of combinative capabilities and explorative learning required?	2a. Prospector strategic orientation is positively related to explorative learning 2b. Prospector strategic orientation is negatively related to system capabilities 2c. Prospector strategic orientation is positively related to coordination capabilities 2d. Prospector strategic orientation is negatively related to socialisation capabilities

Table 2.8, continued

Research Question 3 Do combinative capabilities determine the extent of a firm's explorative learning?	3a. System capabilities are negatively related to explorative learning 3b. Coordination capabilities are positively related to explorative learning 3c. Socialisation capabilities are negatively related to explorative learning
Research Question 4 Do combinative capabilities and explorative learning act as the contingent factors in the strategy-performance relationship?	4a. Explorative learning partially mediates the relationship between prospector strategic orientation and performance 4b. System capabilities partially mediate the relationship between prospector strategic orientation and explorative learning 4c. Coordination capabilities partially mediate the relationship between prospector strategic orientation and explorative learning 4d. Socialisation capabilities partially mediate the relationship between prospector strategic orientation and explorative learning 4e. Explorative learning fully mediates the relationship between system capabilities and performance 4f. Explorative learning fully mediates the relationship between coordination capabilities and performance 4g. Explorative learning fully mediates the relationship between socialisation capabilities and performance
Research Question 5 Do combinative capabilities and explorative learning mediate the relationship between prospector strategic orientation and firm performance?	5a. Both combinative capabilities and explorative learning mediate the relationship between prospector strategic orientation and firm performance

2.9 CONCLUSION

This chapter has presented a comprehensive literature review that encompasses literature on strategic management, organisational learning, organisational capabilities and structure, as well as literature on innovation and performance. The discussion from various angles and perspectives provides a comprehensive picture that leads to the development of the research questions of this study. The literature review began by explaining the idea of strategic orientation and how firms adopt various strategic stances to compete in the industry. It then moved to focus on prospector strategic orientation by highlighting the importance of this orientation in the present dynamic and volatile business landscape. The discussion went further to synergise the concept of organisational learning that has been gaining popularity in strategic management literature to explicate the antecedents of superior organisational performance. It also revealed the importance of explorative learning in a dynamic competitive environment and finally proposed the mediating role of explorative learning in the strategy-performance relationship.

The discussion continued to explain the role of combinative capabilities in developing absorptive capacity that is important to explorative learning. Arguments were presented from strategic management and organisational learning perspectives to justify the importance of combinative capabilities and how they influence the strategy-performance relationship. All the discussions were based on contingency framing which asserts that appropriate alignment with other organisational factors is important to ensure achievement of superior performance.

The second part of the chapter focused on developing the theoretical framework of this study based on the arguments of prior literature. Finally, the proposition of the research problems was translated into multiple research hypotheses in this study's attempt to answer the research questions presented in this study. Overall, this chapter has presented the foundation for the theoretical framework of this study which provides the basis for further analysis in the following chapters.