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Strategic management practices of small firms in emerging industries: A study of health biotechnology firms

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Abstract

Brouthers, Andriessen, & Nicolaes (1998, p. 130) state that "...little research exists that examines strategic management practices in small firms".

The purpose of this study is to explore the strategic management practices of small firms operating in emerging industries. The study further goes on to compare these practices in the context of the practices documented in the theory.

The research utilized qualitative data collected from a non-probability sample of firms in the health biotechnology industry. The case study methodology, using in-depth interviews was used to collect data from senior executives of two health biotechnology firms.

The study found that the strategic management practices of small firms in emerging industries support and predominantly subscribe to and the planning, rational and entrepreneurial schools of thought.

The recommendation from the findings of this study is that small firms in emerging industries, such as health biotechnology firms studied, need to engage in strategic management processes that are more formal but that also consider the influence of the entrepreneur as the driver of strategy.

Future research could include an in-depth and wider study of the most appropriate strategy practices for small firms in emerging industries.



Declaration

I declare that this research project is my own work. It is submitted in partial fulfillment of the requirements for the degree of Masters in Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorization and consent to carry out this research.

Lerato Mosiah

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1. Chapter 1: Problem definition

1.1. Introduction

Strategic management is the process of formulating, implementing and evaluating cross-functional decisions that enable a firm to meet its objectives (Pearce II & Robinson, 1994). The process entails specifying the firm's objectives, developing policies and procedures to meet these objectives and finally allocating the necessary resources to implement the policies and procedures.

Various perspectives and definitions of the term "strategy" exist (Porter, 1996). Mintzberg (1978) also alludes to the variety of ways that strategy may be defined, citing that the common theme that underlies all definitions is that of a deliberate conscious set of guidelines that determine decisions into the future. According to him, strategy is a pattern in a stream of decisions which in the long run exhibit a form of consistency (Mintzberg, 1978).

Theory development in the field of strategic management has advanced greatly in the past decades. Some researchers have focused their studies on the processes by which actions are decided and implemented (Pettigrew, 1992). Mintzberg (1978) also subscribes to this process school of thought. According to Mintzberg & Waters (1985), strategies may be formulated and implemented according to a set plan (deliberate) and, on the other hand, strategies may simply emerge without any form of planning.

The study of strategic management has since developed in the area that attempts to address the question of how firms make strategies; how they interrelate them and how they ultimately implement them. The literature, with the contribution of work from (Mintzberg & Lampel, 1999) suggests that the strategic management process or practice is characterised by nine schools of thought.

The concern recently however, is that these strategy studies have focused mainly on large firms; neglecting the small firm (Beaver, 2007; McCarthy, 2003). Strategy formulation and implementation is as important to small firms as it is to large ones.

Small firms are critical to the economic vitality of a country (Beaver, 2007). Small firms are powerful mediums for job creation (El-Namaki, 1990) and contribute to business and innovation development (Beaver, 2007). However, despite their contribution and importance, the value of strategic management to these firms has only recently been acknowledged.

Studies in strategic management in small firms merits separate consideration because small firms inherently and almost invariably face major challenges (Cooper, 1981). Amongst the many challenges small firms face is their ability to anticipate and manage rapid change in the business environment brought on by new technologies (McGahan, 2004) for example. Changes relating to the market place (external environment) and the internal firm pose greater challenges for the small business. The inability to address these challenges has resulted in many failing or ceasing to trade within a few years of inception (Beaver, 2007). Beaver (2007) suggests that the underlying problem may be an overall lack of adequate

strategic management skills and abilities. Brouters, Andriessen, & Nicolaes (1998) has stated in his work that the literature on strategic management in small firms is inadequate. Based on these comments it is prudent and critical that more studies on the strategic management practices; targeted to small firms, be conducted for them to survive amidst the challenges.

The purpose of this study, therefore, is to explore the strategic management practices of small firms. Furthermore, due to the recognition that, one of the major challenges facing small firms is coping in changing or emerging industries, the study will focus on small firms in emerging industries. The study aims to gain an understanding of how small firms formulate and implement strategy given an emerging industry, and how their practices compare to practices documented in the literature.

1.2. Research problem

One of the external factors that serve as a threat to small firm performance is the hostility that comes with a changing business environment. This may come in the form of creative destruction of an existing industry (McGahan, 2004). The formation of new industries or the destruction of previously existing industries is commonly as a result of emerging technologies. This phenomenon invariably initiates a new wave and an emergence of small start-up firms that are attracted by the new commercial opportunities associated with the new technology (Hamilton, 1990). These newly created industries are characterized by high levels of risk and uncertainty (Hamilton, Vila, & Dibner, 1990). Small firms are particularly vulnerable

to environmental changes due to their limited resource bases and inability to survive the consequences of poor strategic management practices.

The biotechnology industry, is characteristic of an emergent industry, having emerged from the creative destruction of the traditional pharmaceutical industry (Pisano, 2006). The destruction was caused by new entrants that brought new knowledge, new technologies, skill sets and competencies to the pharmaceutical industry.

The small firms that emerged from the destruction of the pharmaceutical industry face major challenges typical of small firms in emerging industries. Learning to compete effectively in this environment is fundamental for better performance of small biotechnology firms. The biotechnology industry has therefore witnessed a wave of newly formed firms throughout its entire history.

Small firms in the industry have been vulnerable to the challenges posed by the new industry and have therefore have fallen short of expectations from both a global (Pisano, 2006) and a South African (Motari, Quach, Thorsteinsdottir, Martin, Daar & Singer, 2004) perspective.

Firms in the biotechnology industry have continually demonstrated a wave of disappointing economic performance (Pisano, 2006), which is typical of small firms operating in emerging industries.

The emphasis on biotechnology in South Africa is influenced to a large extent by the improvement demonstrated by the US biotechnology industry. South Africa

would like to emulate this achievement with its young biotechnology industry (Akermann & Kermani, 2006).

The challenges facing small firms are well documented (Duhaime, 2001) and referred to in this paper. One of the reasons could be that they lack strategic management skills and abilities (Beaver, 2007). It would therefore be interesting to explore what the strategic management practices of small firms in the emergent industry of biotechnology are like. This research topic was chosen because on searching the literature there was no evidence of research performed on strategic management of biotechnology firms, particularly in South Africa. The study will examine the strategic management practices of these firms and compare them to the various schools of thought related to strategic management.

1.3. Purpose of the research

South Africa's efforts to develop the biotechnology industry could benefit the country and the rest of Africa from an economic standpoint and in terms of health improvements in the region. The biotechnology industry has been ear-marked to address the major challenges facing the developing African continent by way of improved food security through the development of genetically engineered crops and improved healthcare through the development of treatment modalities for threatening infections such as tuberculosis, malaria and HIV/AIDS (Cloete, Nel & Theron, 2006).

Despite the South African government's effort to establish a conducive and competitive environment for the success of new biotechnology firms, these firms

continue to under-perform (Cloete, Nel & Theron, 2006). These firms play a key role in building an economically healthy biotechnology industry that serves to transform health care in South Africa (Motari *et al.*, 2004).

The purpose of this study was to gain an understanding of the strategic management practices in small firms in the emerging industry of biotechnology and the reasons for these emerging practices. The findings will be interpreted in the context of the various strategic management schools of thought (Mintzberg, 1990; Mintzberg & Lampel, 1999).

1.4. Scope of the research

Biotechnology is broadly defined as a set of new transforming and enabling technologies (OECD, 2005) used for the production of a diverse range of goods and services in various industries such as health care, agriculture, food, horticulture, forestry and mining. For purposes of this research report, the definition outlined by Pisano (2006) will be used. Pisano (2006, p.16) defines a biotechnology firm as “any firm founded after 1976 for the purposes of advancing, developing or commercialising new technologies for drug discovery”.

The scope of the research will be limited to the study of strategic management practices of small firms in South Africa.

It should be noted that strategic management practices of small firms may be influenced by other factors within the different industries they operate in. This research will be restricted to looking at firms that operate and apply the new technology to the pharmaceutical sector of the healthcare industry. The report will



not consider applications of biotechnology to agriculture, food, horticulture, forestry and mining.

2. Chapter 2: Literature review

2.1. Introduction

Small firms vary substantially from large firms in ways that have far reaching implications for their strategies and management processes (Duhaime, 2001). They typically differ from their larger competitors in terms of their resource positions, the goals of their founders and their potential (Cooper, 1981), making them particularly vulnerable to changes in the business environment.

According to Duhaime (2001), small firms make a crucial contribution to technology and innovation, to the extent that the world's economy "is dependent" on them (Duhaime, 2001, p. 109). Despite their contribution to economic vitality and their significance to a country's socio-economic well-being, many small firms fail (Beaver, 2007).

These findings have in the past prompted researchers to study the characteristics of small firms and likely causes of perpetual failure. The causes are many and range from inadequate accounting procedures to the inability to manage growth (Beaver, 2007). However, it is the overall lack of strategic management skills and abilities seem to be the overarching reason (Beaver, 2007). Due to the importance of small firms, it is particular interest to study their strategic management practices and to compare these to theory.

Research on strategy management in large organisations has improved greatly in the past decade, however, a current review of the literature indicates an imbalance of theory development with respect to small firms.

Strategic management is a broad field of study in modern management that deals with firms and their relationship with their market environment and operating context. The term “strategy’ is equally broad and has been defined in a variety of ways. Beaver (2007, p. 12) defines it as “the actions a firm takes to pursue its objectives” while Mintzberg (1978), acknowledges the different approaches to defining strategy, referring to it in common terminology as “a plan” (Mintzberg, 1978, p.935).

2.2. Defining strategic management

Pearce II and Robinson (1994) define strategic management as the set of decisions and actions that result in the design and activation of strategies to achieve the objectives of an organisation. Strategic management activities, such as decision-making activities, happen at three different levels of the organisation: corporate, business and functional. Key to strategic management is the value of formality and the alignment of strategy makers in both the strategy formulation and implementation processes.. The development of the field of strategic management has been evolving at a fast rate in the past decades, leading to the emergence of vast views reported in the literature.

2.3. The strategy formulation process

Early developments revolved around Chandler's work that recognised that a long-term coordinated strategy was necessary to give a firm structure, focus and direction. He coined the phrase "structure follows strategy". Philip Selznick in 1957 introduced the idea of matching the firm's internal factors to its external environment which gave emergence to the SWOT analysis advocated by authors such as Andrews and Learned. In SWOT analysis the firm's strengths and weaknesses are assessed taking into consideration the opportunities and threats from the environment within which the firm operates. Ansoff later developed a host of new strategy concepts (the strategy grid) that management could use to systematically prepare for future opportunities and challenges. This was followed by Peter Drucker's view that clear objectives are instrumental to the success of an organisation. Through the theory of management by objectives, the process of setting objectives and monitoring these should permeate top-down throughout the entire firm.

Strategic management is a continuous process that involves the sequential formulation and implementation of strategies that aim to achieve the firm's long term mission and near-term objectives. Various approaches are used by strategic planners in pursuing the process.

The process assesses both the firm and environment in which the firm operates. In order to be successful, the firm's executives must respond to the challenges posed by the firm's immediate and remote external environment (Pearce II & Robinson,

1994). The strategic management model is a tool described by Pearce and Robinson (1994) to outline the various approaches used by strategic planners in the strategic management process (Pearce & Robinson, 1994).

During this process, the firm's competitors are assessed, goals are set and strategies are devised to meet existing and potential competitor's activities. The strategy is usually reviewed on a regular basis to assess implementation and success rates in the face of the changing environment (McGahan, 2004). As such, firms need to engage in the process of formal strategy planning to survive the negative impact of these forces and factors.

The current debate on strategic management focuses on whether small firms should formalise the strategic management process or not.

2.3.1. Approaches to strategy formulation

The debate around strategic management has developed and centred around two broad schools of thought; the deliberate and emergent schools of thought (Mintzberg, 1988; Harrington *et al.*).

The study on strategy formulation attempts to find clarity to how strategies form. Mintzberg and Waters (1985) set out to study and explore the complexity and variety of strategy formulation processes and concluded that strategies may either be deliberate (realised as intended) or emergent (realised in presence or absence of intentions). The emergent schools of thought are formulated utilising a

descriptive approach to theory creation while the deliberate schools of thought utilise the prescriptive (normative) approach.

Researchers have argued extensively around these schools of thought, with some arguing that the two views are not mutually exclusive (Harrington, Lemak, Reed, & Kendall, 2004).

This debate gave rise to the notion that strategy formulation falls along a continuum between the emergent and deliberate schools of thought.

The different types of strategy processes, according to Mintzberg and Waters (1985), are therefore described based on their position along the continuum.

Grant (2003) contributed to the debate, stating that strategy may be seen as a rational design or as an emergent process.

2.3.2. Strategy formulation: schools of thought

the field of strategy research has evolved greatly in the past decades, giving rise to a diversity of paradigms and perspectives that are partially competitive and supplementary in nature.

There has been ongoing debate in the field of strategic management, with arguments centering around whether the various schools of thought have added value to field of strategy or not. Some scholars have argued that the multiformity of these schools of thought has brought about a lack of consistency and coherence (Camerer, 1985). To date, there is no formal agreement regarding neither the

methodological approach nor the theoretical dimensions to be used when defining the process of strategy formation; to the extent that the definition depends largely on which school of thought one prefers to use (Mintzberg, 1990).

According to Mintzberg and Lampel (1999) the literature on strategy suggests that strategy is characterised by nine major schools since its inception in the 1960s. Three are prescriptive (what “ought” to be) and six are descriptive (what “is”). These various perspectives emanated from the crystallised thoughts of various groups of researchers in the strategy field (Brown, 1993), and assist scholars and practitioners understand, appreciate and exploit the differences in strategy approaches.

This research reports on the practices of strategic management (formulation and implementation) of the targeted firms based on the nine schools of thought developed and classified by Mintzberg (1990) and Mintzberg, Lampel, & Ahlstrand (1998). Refer to Appendix 1.

Each school provides insights into implicit assumptions of trends in the strategy field relating to some theoretical dimensions identified by Volberda & Elfring (2001). The five theoretical dimensions are:

- Prescriptive versus descriptive – strategy formulation is either a formal and static process, as supported by the prescriptive schools (the design, planning and positioning schools) or an informal and dynamic process as

supported by the descriptive schools (the entrepreneurial, learning, political, cultural, environmental and cognitive schools).

- The unit of analysis of the schools – the various schools of thought address themselves to different components and levels of the firm, for example, the individual level (addressed by the entrepreneurial and cognitive schools), the group level (addressed by the learning school) and the organisation level (addressed by the design, planning and positioning schools).
- The research area of the schools – the research area can focus on either strategy content (positioning school), strategy process (planning, design, cognitive, learning and political schools) or the context in which the process takes place (environmental and cultural schools).

As mentioned above, a review of the literature on strategic management shows varying views on how strategy is formed (Mintzberg and Lampel, 1999) A brief description of the different perspectives, derived from Mintzberg and Lampel, (1999) , relating to strategic management practices is outlined below.

The prescriptive perspective comprises of the design school, the planning school and the positioning school.

Design school: Strategy formation is a deliberate process of conception that supports strong, visionary leadership. According to this school of thought, strategy formation sets out to achieve a fit between the firm's internal strengths and weaknesses and its external threats and opportunities. This approach is

characterised by senior management who formulate clear, simple and unique strategies that are simple to implement. This view of strategic management practices did not develop further, but rather merged with other schools of thought, such as the planning school, in different contexts. The design school is weak in dealing with fast changing environments.

Planning school (Chandler, 1962; Ansoff, 1965): Considered to be an important branch of the strategy literature currently. Igor Ansoff (1965) is the custodian of this school of thought which sees strategy formation as a formal process where rigorous steps are taken from the analysis of a situation to the execution of the strategy. According to this school of thought, strategy formation is “supported by techniques with regard to the firm’s objectives, budgets, programs and operating plans” (Mintzberg and Lampel, 1999, p. 22). This school of thought is beneficial in that it gives clear direction, enables efficient allocation of the firm’s resources and allows the strategists to pre-screen the facts before they judge the crafted strategies.

Positioning school: Strategy formation is seen as an analytical process, supported by Michael Porter in his work on strategy positioning. The firm is considered within the context of the analysis of its industry. It focuses more on how the firm can derive and improve its strategic positioning within the industry it operates in.

Various assumptions govern these schools of thought including for example that the environment is considered to be relatively constant and stable, the aim of strategy formation is to influence the environment by either responding to it or by

adjusting and configuring the firm to it. The underlying assumption is that the CEO and senior management are obligated to analyse the environment and align the threats and opportunities to the strengths and weaknesses of the firm in order to realize the firm's objectives.

The next groups of schools of thought, the cognitive and learning schools are descriptive in nature and are based on psychology as a discipline. Strategy formation is seen as incremental, unfolding or emergent as opposed to planned and deliberate (Mintzberg & Waters, 1985). According to this school of thought, the assumptions are that the environment is likely to be very demanding and / or difficult to analyse and comprehend.

Learning school (Quinn, 1980): This descriptive school of thought sees strategy formation as an emergent process where everyone in the organisation, through a process of learning, is a strategist. The lessons learnt are incorporated into the overall plan of action. It is the belief of this school of thought that strategies must emerge in small, gradual steps as the firm adapts and learns what works and what doesn't. Its contribution to theory is based on the fact that more people learn than just the leader of the firm, hence reducing the complexity and unpredictability in strategy formation. Strategy formulation and implementation are intertwined as they emerge.

Entrepreneurial school: Strategy formation is a visionary process centered on the charismatic founding Chief Executive Officer. The contribution to the theory is that a sound vision and a visionary CEO are fundamental to strategy formulation where

it may be deliberate with respect to the broad approach and emergent in terms of the details. Strategies are formed on the basis of intuition to a large extent and the leader maintains close control over implementing his formulated vision.

Cognitive school: The process of strategy formation is seen as a mental process where the focus is on how the people in the firm perceive patterns and process information. This approach is based on gaining understanding on what is happening in the mind of the strategist and how the information is processed. The contribution to the field of strategic management of this school of thought is that strategies emerge as maps, concepts and frames of reality, having undergone a cognitive process in the mind of the strategist from a creative point of view.

Cultural school: Strategy formation is seen to be a collective and cooperative process, where the management's approach is to involve various groups and departments within the firm. The strategy formation is seen as a social process that is rooted and reflected in the corporate culture of the firm. It therefore focuses on common interest and integration. The contribution to theory is that social processes, beliefs and values play a crucial role in decision-making and overall strategy formation.

Mintzberg (1990, 1991) and Ansoff (1991) therefore view the firm's strategy process as either deliberate or emergent. Harrington, Lenmark, Reed, Kendall (2004) however, argue that the process should be treated as a continuum in that both approaches may be present in firms at different stages. Prahalad and Hamel

(1990) on the other hand advocate the “dynamic capabilities” approach which considers core competence, strategic intent and stretch of the firm.

A firm’s strategy may be viewed from a content or a process point of view, where the content refers to what the business does and the process relates to the manner in which the firm decides to do what it does. This research focuses on the process of strategic management in small firms.

Various factors have been reported in the literature to have influenced the formulation process. The different formulation processes have typically had an impact on the strategic management practices adopted by the firm.

The strategy formulation process is a critical aspect of the entire strategic management practice and organisations should strive to undertake effective strategic approaches in order to perform well (Beaver, 2007).

Strategy management has been argued to be informal, intuitive and often invisible in small firms.

The notion of formality with respect to strategic management refers to the extent to which the responsibilities, authority, discretion and participants in decision making are specified (Pearce II & Robinson, 1994). Greater formality is positively correlated to successful planning (Pearce II & Robinson, 1994). If formality is positively related to firm performance, then the question is whether small firms should engage in a formal strategic management process or not. Various factors

determine and impact the extent to which formality is deployed in firms (Goold & Campbell, 1988). These are:

- The size of the firm
- The predominant management styles
- The complexity of the environment – environmental turbulence
- The production process
- The problems and challenges the firm faces
- The purpose of the planning process

Formality is associated with the size of the firm and also with the stage of development of the firm (Pearce II & Robinson, 1994).

Gilmore (1971) presents a different approach to formulating strategy in smaller companies. Most studies in this field have been studied with interest by large firms. In his writings, Gilmore (1971) describes six major steps in the strategy formulation process that will contribute significantly to smaller firms. He concludes that senior executives, using the six-step approach (refer to Appendix 2) should approach strategy formulation as a joint effort. Judgment, experience, intuition and well-guided discussions are the key to success, not staff work and mathematical models (Gilmore, 1971).

2.4. The strategy process

2.4.1. Introduction:

A firm's strategy may be viewed from a content or a process (O'Regan and Ghobadian 2002), point of view, where the content relates to the distinct elements of the strategic plan and refers to what the business does. The process relates to the mechanisms for the development of the strategic plan and its subsequent deployment. It places emphasis on the manner in which the firm decides to do what it does.

The literature review for purposes of this report will focus on a review of the strategy process, with particular interest on the strategy process research field and the definition of strategy process.

2.4.2. Strategy-process research field: an overview

Hutzschenreuter & Kleindienst (2006) conducted a comprehensive review of the the strategy-process research field. Their work will be used in this report to provide a reference point for interpretation of results and drawing of conclusions in the last chapter.

According to Pettigrew (1997), strategy processes are shaped by both the environmental and organisational context. These processes may be either prescriptive, descriptive, anchored at individual, group or organisational level (Hutzschenreuter & Kleindienst, 2006). These varying concepts and frameworks governing the strategy-process have brought about much complexity to the field.

However, Hutzschenreuter & Kleindienst (2006) have attempted to demystify the facts relating to the field of strategy-process research.

Hutzschenreuter & Kleindienst (2006) identified the key antecedents, processes and outcomes as well as the relationship that exists between these factors. An integrative framework was developed on the basis of these findings and much emphasis is based on the position of the individuals involved in the strategy process as opposed to previous exclusive focus on strategic planning. The framework illustrates the interrelationship between the five sets of antecedents, strategy process factors and outcomes identical to the antecedent factors.

From the framework emerges two categories of research; the first being of studies that are contained solely within one or the other of the boxes in the framework (known as box-exploring studies) and the second being studies relating to one or more of the linkages in the framework (known as linkage-exploring studies). The linkage-exploring studies enable researchers to account for the what, why and how of the links between the antecedents, the processes and outcomes.

Hutzschenreuter & Kleindienst (2006) refer to these linkages as research streams.

The other three research streams in numerical sequence relate to:

- The relationship between antecedent factors and outcomes
- The interrelationship between strategy-process factors
- The relationship of strategy-process factors and outcomes

Studies in the box-exploring category are concerned with describing phenomena with subsequent development of concepts (Hutzschenreuter & Kleindienst, 2006). The four areas of the box-exploring category are strategy process, strategist's characteristics, personal and cognitive context, strategy formulation and strategy implementation. Nicholaas Van Wyk (2007) in his thesis has reported on each of these processes through a reconstructed table of findings of each one of the four areas. Refer to Table 1 below for the reconstructed findings on research performed on the components of strategy process.



TABLE 1: PRESENTATION OF RESEARCH FINDINGS ON THE ELEMENTS OF STRATEGY PROCESS. RECONSTRUCTION OF RESULTS IN HUTZSCHENREUTER & KLEINDIENST (2006)

| Strategy Process | |
|---|--|
| Key Focus | Findings |
| Conceptualising the process | <p>a. Evolutionary; iterated process of resource allocation; guided evolution; organic perspective; shaping conversations;</p> <p>b. Reject balkanised/rational/design approach to concept of strategy</p> <p>c. Shift focus from strategic choice to strategic change; change can take place before it is recognised;</p> <p>d. Look for patterns and their systematic implications</p> |
| Strategist's characteristics and strategist's personal and cognitive context | |
| Key Focus | Findings |
| Exploring cognitive concepts | <p>a. Cognition is influenced on multiple levels <i>i.e.</i> personal, group, and issue – this explains managerial behaviour</p> |
| Strategy Formulation | |
| Key Focus | Findings |



| | |
|--------------------------------|--|
| Strategic planning | a. Transmutation of concept; strategy is a result of formal strategic planning and decisions are made outside of plan and later incorporated into the plan b. Combine discipline and imagination for strategy-making. |
| Strategy Implementation | |
| Key Focus | Findings |
| Resource-based perspective | a. Implementation skills could be a source of advantage; b. Organisational members should be treated fairly and be included as participants of implementation |

Strategic management is dominated by linkage-exploring studies (Venkatraman & Grant, 1986), however, some useful findings have been uncovered in the box-exploring studies (see Table 1 above).

Research in the past was dominated by planning-related topics (Huff & Reger, 1987) with very little reference to planning-performance links and the description of planning activities in organisations. The effects of cognition and perception are progressively becoming popular, and dubbed today as one of the cornerstones of strategy-process research (Hutzschenreuter & Kleindienst, 2006).

Six main perspectives of strategy-process research have been identified by Hutzschenreuter & Kleindienst (2006) from a content point of view. These are outlined in table 2 below:

TABLE 2: THE SIX MAIN PERSPECTIVES OF STRATEGY-PROCESS RESEARCH IDENTIFIED BY HUTZSCHENREUTER & KLEINDIENST (2006)

| | |
|--------------------|--|
| Perspective | 1. Rational-mechanistic |
| Brief description | Classical model; deterministic; sequential; rational and analytical; Strategy is alignment between internal strengths and external opportunities; limited consideration of individual organisational members; descriptive research provides more realistic information than prescriptive approach. |
| Perspective | 2. Cognitive |
| Brief description | Recognise bounded rationality of organisational members; decisions are the result of cognitive models and not trational consideration; context-specific nature of decisions is recognised; explains individual and organisational behaviour. |
| Perspective | 3. Upper echelon |
| Brief description | Top executive decisions influence strategic choice, organisational design and performance; decisions are influenced by perception and evaluation – not only rational; integrates cognitive and behaviour research to explain behaviour of organisation. |



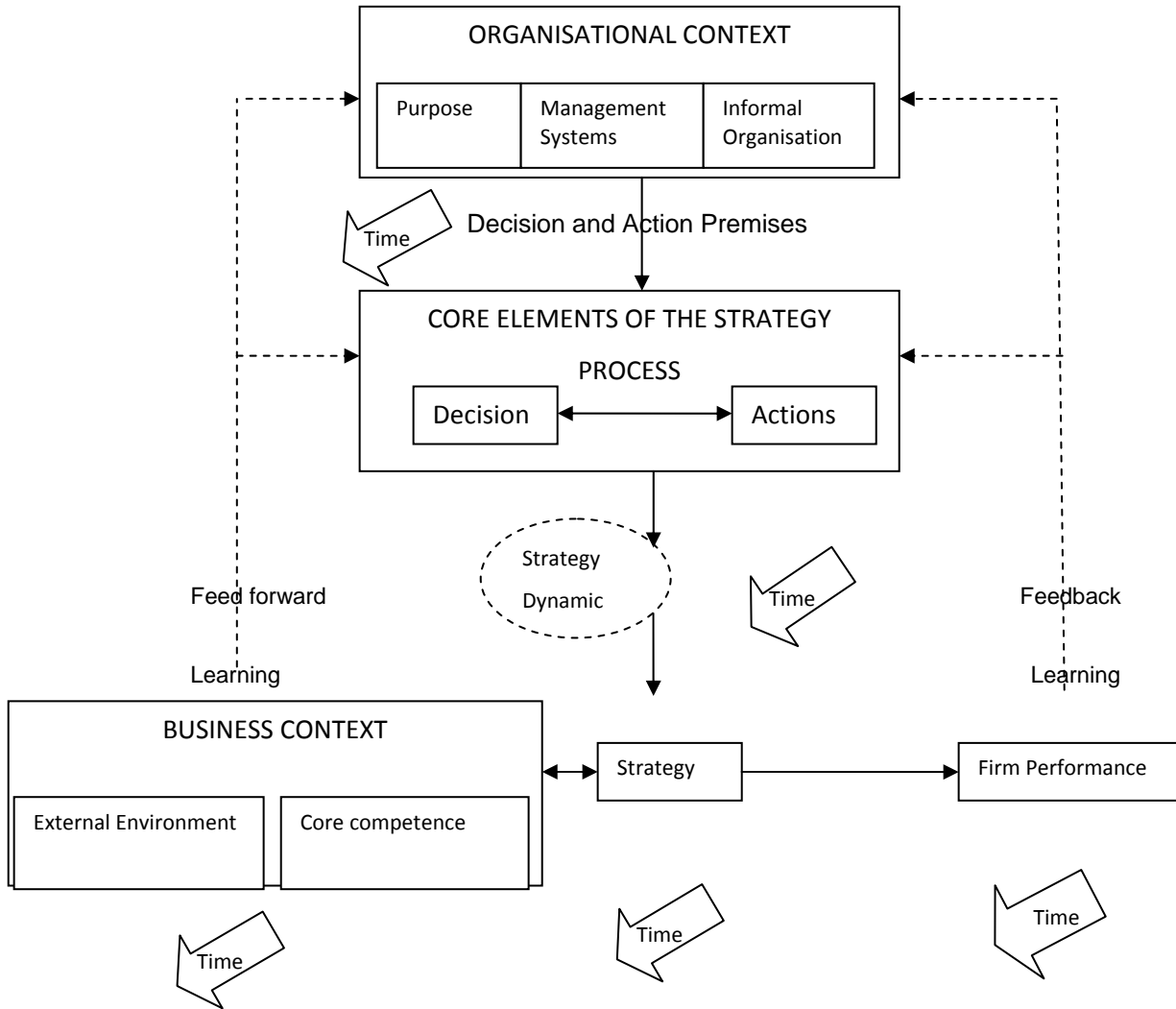
| | |
|--------------------|--|
| Perspective | 4. Middle Management |
| Brief description | Decisions of middle management – not top management – greater influence on outcomes; involved with thinking and doing; middle managers determine content of information communication upward and downward and therefore organisational action. |
| Perspective | 5. Organic |
| Brief description | Dialectic approach – upper echelon provides rationalising and structuring and lower levels provide strategic initiatives; dynamic and eclectic side of strategy process; influence of historical developments; messy side of reality |
| Perspective | 6. Micro |
| Brief description | Value in micro activities of organisational members; strategy as social action; focus on organisational members as strategists (not organisation) – effectiveness of strategists; work of strategists and how strategists learn. |

Each of the perspectives indicated in Table 2. above offers different insights into the strategy-process concept which over time should start merging leading to a cross-fertilisation between them (Hutzschenreuter & Kleindienst, 2006).

Hutzschenreuter & Kleindienst (2006) outline areas for future research which will assist researchers build on existing literature in order to improve the understanding of strategy processes. One of the key areas for further research recommended by Hutzschenreuter & Kleindienst (2006) is “antecedents’ influence on strategy processes”

Chakravarthy and White (2001) recommend a holistic approach for studying the strategy process of a firm. They recognise the difference between strategy process and content and further conclude that strategy process needs to be considered from an integrative point of view where the process is linked to the context of the organisation and the business.

FIGURE 1: CHAKRAVARTHY & WHITE'S HOLISTIC VIEW OF STRATEGY PROCESS



Pettigrew (1997) further argues that the organisational context impacts the strategy process through attributes such as its size, age, structure or technology. Other attributes are the firm's routines, culture or values.

The strategic processes of formulation and implementation consist of three components: the strategists, the issue and the sequence of actions (Hutzschenreuter & Kleindienst, 2006)

LINKING STRATEGIC PLANNING TO FIRM PERFORMANCE

Strategic planning is generally accepted to be positively related to a firm's performance. Based on that, Kraus, Harms & Schwarz (2006) further investigated the precise aspects of strategic planning that relate to performance. Their findings were that strategic planning is commonly characterised by the length of time of the planning process, the formalisation of the planning process and the presence of and frequency of evaluations and controls (Kraus *et al.*, 2006).

If the purpose of strategy planning is to assist the firm to accurately anticipate and forecast imminent environmental changes, then it becomes evident that firms that undertake to engage in a form of strategy planning will tend to show a better performance (Falshaw and Glaister, 2006).

2.5. New firm creation

What is different about small businesses?

According to Duhaime (2001) small firms make a substantial contribution to technology and innovation to an extent that the world economy depends on them. Occasionally, new industries are established through innovation of these small entrepreneurial start-up companies. Small firms also have the ability to transform existing industries.

Definition of small firm according to USA Small Business Administration?

Challenges for small firms:

- Little room for error in the strategy choices they make
- Insufficient resources to implement the strategy
- Vulnerable to discontinuities in the business environment
- Size and scale prevent them from negotiating with other entities, for example with governments; Small firms do not have the power to negotiate.
- Dependence on single or too few products or suppliers or customers.

Small firms differ from their larger competitors in ways that have important and impactful implications for their strategies and general management processes.

New and small firms rely primarily and draw upon the knowledge and skills of the founder (Cooper, 1981). However, the literature also states that for the most part, new firms are closely related to the nature of business of the parent firm.

McCarthy (2003) notes that the founders of a business approach strategy planning differently from the standard textbook model. The characteristics of the founders of small firms will therefore tend to influence the planning activities of the firm. Based on these findings, the influence of senior executive management (Schraeder, 2002) and founders (McCarthy, 2003) on the strategic the planning process should not be ignored. Robinson and Pearce (1984) believe that the systematic incorporation of several participants –including persons outside the firm- should enhance creativity and ultimately the firm's performance.

Strategy management is considered to be a large part of new firms (Beaver, 2007) as they face uncertain futures. This uncertainty may be reduced by prior planning and organising. The new firms therefore have to manage the unpredictable and powerful forces of the market and competition in order to survive. Small new firms should also select the right market, assemble the appropriate resources, define their strategic thrusts and determine their competitive weapons.

Gartner (1985) outlines four major perspectives in the entrepreneurship framework that are pivotal to describing new firm creation. These are: characteristics of the founding individual(s) of the firms (the leadership), the organisation which they create, the environment surrounding the new firms and the process by which the new firms are started.

Cooper (1981) on the other hand points out that small firms vary substantially in their resource positions, the goals of their founders and in their stages of development, being start-up, early–growth stage and later-growth stage.

New firms therefore create an environment for strategic management in which both the opportunities and constraints are different from those in large organizations. Kraus *et al.*, (2006) also emphasizes that strategic planning approaches for small, new firms should be different from approaches targeting larger firms.

The choices that small firms make about strategy and scope have far reaching implications for implementing the firm’s strategies (Duhaime, 2001).

2.6. New industry creation

The strategic management practices of firms are reliant on the conditions of the industry within which they operate. Emerging industries may be defined as newly formed or re-formed industries that are typically created by either changes in technology, emergence of new customer needs, or any other economic, social or legal changes (Pearce II & Robinson, 1994). The essential nature of emerging industries is the general lack of the so-called “rules of the game” which presents both risks and opportunities for start-up firms in these industries. Strategic management practices must be undertaken to accommodate the following characteristics of markets in emerging industries:

- Technological uncertainty about how product standardization will unfold

- Inadequate competitor and buyer information – uncertainty due to lack of clear timing of demand – difficulty in planning
- High initial set up costs with decline in costs at later stage as the experience curve improves
- Few entry barriers leading to high inflow of new firms
- Customers' uncertainty by availability of non-standard and conventional products
- The need for high-risk capital based on industry uncertainty (venture capitalists are risk averse to new emerging industries)

Firms must do following or have the ability to do the following:

- Ability to shape industry structure

Most established firms have successfully developed the capabilities to compete in established industries, where strategies and trajectories are well known. However, managing in emerging industries, poses a challenge for both established and new firms. The challenges faced by new firms are more pronounced due to the presence of internal constraints that hamper their ability to formulate and execute strategies quickly and continually (Szulanski and Amin, 2000) in order to be competitive.

Contrasting and various views have also been published regarding the influence of the nature of the industry on firm performance. For instance, the degree of formal

strategy processes may have a positive impact on stable industries (Falshaw, Glaister, & Tatoglu, 2006).

New industries are created as a result of changes that occur in the industry due to threats to the industry's core activities and assets. The first type is a threat to the industry's core activities that have traditionally generated profits for the industry (McGahan, 2004). Entry into the industry of new alternatives makes the core activities obsolete and hence less relevant to suppliers and customers (McGahan, 2004). The second type is a threat to the industry's core assets, for example, its resources, brand capital and knowledge that in the past gave the organisation its uniqueness (McGahan, 2004).

In a study carried out in the United States, Fildes (1990) found that managers of these new biotechnology firms faced internal and external challenges. The challenges faced by biotechnology firms could obliterate their success. It is on this premise that managers of these firms have to adopt different approaches.

3. Chapter 3: Research questions

This section outlines the research questions that have been formulated to get an understanding of the strategic management practices of small firms in emerging industries and the reasons for these practices. The questions have been carefully formulated to assist in the collection of data and information to generate answers to the research questions:

A lot of research and many concepts of formulating and implementing corporate strategy have been and are being studied with interest by large firms. These unfortunately hold little promise for the smaller firms (Gilmore, 1971). Larger firms through their corporate planning departments, continually explore ways in which management science can be applied to the strategy formulation and implementation problem. For smaller firms that lack planning departments, operations research groups or even large-scale computing capacity, this approach does not hold much value (Gilmore, 1971). Hence, smaller firms by their nature, face difficult trading conditions, internally and externally, that make the quest for competitive advantage a difficult exercise leading to failure (Beaver, 2007). Emerging industries increase the level of uncertainty and complexity of the trading environment for smaller firms (McGahan, 2004).

One of the many reasons (Beaver, 2007) for small firm failure appears to be the lack of effective strategic management processes. Studies suggest that the strategic management processes in these firms relies primarily on the characteristics of the founder who act on instinct, intuition and impulse (McCarthy,

2003). Many small firms operate informally (McCarthy, 2003) using loosely defined strategies with founders managing the process in a way that is different from the standard strategic management models documented in the theory.

In order to understand why small firms do not seem to employ effective strategic management practices tailor made for their circumstances, it is this best to understand their strategic management practices first, and to compare these practices to the theory.

Based on the lack of understanding of the strategic management practices small firms in emerging industries employ; and based on the literature review in Chapter 2 and the aims of the study, broad research questions have been formulated.

The first research question is:

1. What are the strategic management practices or processes of small firms operating in emerging industries and what are the reasons for these practices?.

The second research question is:

2. How do the findings compare to the theory in the context of the various strategic management schools of thought?

4. Chapter 4: Research methodology

4.1. Introduction

The aim of this research is to find out what strategic management practices small firms in emerging industries, such as the health biotechnology industry, employ and the reasons for these practices. Current knowledge and perspectives on this topic are inadequate; therefore the qualitative research methodology was the most appropriate to employ in this study (Eisenhardt, 1989).

Eisenhardt, 1989 also wrote that the case study approach is the most appropriate method for data collection when seeking to understand the dynamics present within a single setting. Cases are the basis from which theory may be developed inductively. In this way, the theory is emergent because "...it is situated in and developed by recognizing constructs within and across cases *and* their underlying logical arguments (Eisenhardt & Graebner, 2007, p. 25).

The research was undertaken to gain in-depth understanding of the strategic management practices of small firms in the health biotechnology industry; to understand the reasons for these observed practices and to compare these to practices prescribed in the theory.

4.2. Research design

The research design will therefore be qualitative and exploratory in nature, providing qualitative data that will be used to gain insight into the phenomenon of interest (Zikmund, 2003). The case study methodology is most ideal when a holistic, in-depth understanding of the phenomena of interest (Eisenhardt & Graebner, 2007). Data was collected through in-depth interviews of senior executives and through careful analysis of firm's records. Qualitative studies are field-based in nature and hence most of the interviews were held at the firm premises and lasted 60 to 90 minutes each. Qualitative research is commonly inductive, theory-generating and subjective. In order to circumvent this unfavourable outcome, multiple respondents were interviewed in each firm to generate different perspectives and to ensure that the findings are objective. The objectives of the research were explored through the use of open-ended questions with all the respondents.

Case study research is the intensive investigation and study of one or a few entities that are similar to the researcher's problem area (Zikmund, 2003). Therefore, data collected from these interviews was captured and presented in a form of case studies. The case study method according to Eisenhardt (1989) is a research strategy that allows for good understanding of the dynamics present within single settings.

The case study method is highly focused as it allows for a closer analysis of the order of events occurring in the specific cases.

4.3. The unit of analysis

The unit of analysis in a case study is typically a system views and perceptions as opposed to individuals or firms (Eisenhardt & Graebner, 2007). In this case study, the unit of analysis was the process of strategy formulation and execution within the firm.

A select number of issues fundamental to understanding the process being examined were considered, which made the case selective in nature.

The selection of data analysis methods must correspond to the chosen data collection method (Polit and Beck, 2004). Therefore in this research study, in depth interviews were analysed thematically (Boyatzis, 1998). An inductive-deductive process of reasoning was used in analyzing the data to finally draw up conclusions in the last chapter.

The study was limited to two small health biotechnology firms. The chosen firms had less than 30 employees each and the turnover per firm per annum did not exceed R200 million. The CEOs of the firms requested that their firm's identity be protected. Interviews were limited to at least three key managers in each company; mainly the chief executive officer, the chief operations officer and managers responsible for marketing or business development.

4.4. Population, sampling method and size

Zikmund (2003, p. 369) describes the population as “a complete group of entities sharing a common set of characteristics”. The finite group of firms in this report was typically all biotechnology firms operating in the healthcare arena in South Africa. A sampling frame was used to choose the sample for this study. A sample of two small health biotechnology firms was taken from a list of health biotechnology companies found in South Africa that were represented at the Bio2Biz South Africa 2007 conference held in Gauteng. The list was available from the website: www.bio2biz.org. The sample was small health biotechnology firms nationally that were founded to capitalize on the commercial opportunities of the new technology.

The non-probability, convenience and judgmental sampling technique (Zikmund, 2003) was used because the sample selection relied heavily on the researcher’s personal judgment. The desired and required characteristics of the members of the sample were known to the researcher based on prior experience and knowledge on the industry being studied. The sampling technique was therefore appropriate in obtaining a satisfactory and high response in the number of interviews required.

The sampling frame used gave rise to a sampling frame error based on the fact that the entire population was not represented (Zikmund, 2003). Not all biotechnology companies operating in the healthcare arena were present at the conference. Zikmund (2003), cautions against generalizing from a few case studies. Therefore, the results obtained from the two firms studied in this report will

not be generalized to the entire population of biotechnology firms within South Africa.

4.5. Procedure and data collection

4.5.1. Introduction

This exploratory research was aimed at small health biotechnology firms in South Africa. The health biotechnology firms selected were founded within the past two decades for the purposes of advancing, developing or commercialising new technologies for drug discovery. Respondents were senior executives of the selected firms and they were contacted telephonically to request meeting dates for face to face interviews. Issues relating to strategy and strategic decisions require top management involvement. It is top management that possesses the perspective required to understand the broad implications and impact of their decisions on the firm's performance in the long-term (Pearce II & Robinson, 1994). For these reasons, the interviews were targeted to the senior executives of these firms.

Data was collected over a period of two months using the qualitative research technique. During this period, the senior executives from the selected health biotechnology firms were contacted and interview dates reserved. The data was collected through face to face in-depth interviews (Rosenberg and Yates, 2007) that lasted approximately an hour each. The interviews were conducted using an interview guide, a primary data collection tool, which was designed to accurately

capture the various aspects of the research. The proceedings of the interview were recorded to ensure accuracy of data capture during the case write up and analysis of the cases. The advantage of using the interview method together with the interview guide as a tool is to ensure a targeted approach, allowing the researcher to focus on the study topic (Tellis, 1997).

According to Eisenhardt & Graebner (2007) “Interviews are a highly efficient way to gather rich, empirical data” (2007, p. 28) and have become the primary source of data. Yin (1994) has also identified interviews as amongst one of the best ways of data collection. One of the challenges facing interview data is that interviews may be biased in the manner that they are carried out (Eisenhardt & Graebner, 2007). There is a high probability of the interviewee expressing what the interviewer wants to hear. The challenge is best mitigated by data collection approaches such as triangulation that limit bias (Eisenhardt & Graebner, 2007).

4.5.2. Interview Guide design

The interview guide (see Appendix 3) was designed to include questions that were geared to answer the research questions in Chapter 3. As the research was exploratory, all the questions in the interview guide were open-ended allowing further probing, substantiation and deeper clarification of issues considered to be critical to the interpretation of the data (Zikmund, 2003). The interview guide was created to address the three key strategic areas facing small health biotechnology firms:

- What are the strategic management practices of small health biotechnology firms.
- What are the reasons small biotechnology firms engage in these strategic management practices.

Hence the first part of the interview guide focused on understanding the firm's view of the anatomy of the health biotechnology industry. This section was created to gain an understanding of management's perception of the external factors that have a potential impact on the performance of the firm.

The next section was created to explore the firm's view and perceptions of the internal strategy management practices and how these compare to theory.

The third section aimed to get an understanding of the role of the owner or the chief executive officer in determining the strategic management practices.

The fourth section dealt with the strategy formulation process that gave rise to the strategic practices.

4.5.3. Data analysis

Qualitative content analysis is the analysis of choice in qualitative studies (Sandelowski, 2000). Through this method, verbal and visual data is carefully analysed and the informational contents are summarised. Content analysis is an empirically grounded method having as its foundation the absence of direct

observational evidence. It is exploratory in process, and predictive or inferential in intent.

The interview data recordings were transcribed and using the qualitative content analysis method the main findings were captured and reported on.

Analysis entailed counting responses and the number of participants in each response category. This technique culminates in an interpretation of, and description of the patterns or regularities in, the data (Sandelowski, 2000).

4.5.4. Assumptions and limitations of the research

An assumption was made during the research process that all firms were equally exposed to the impact of the biotechnology industry.

The limitations of the research were identified as follows:

- The population of relevance was limited to biotechnology firms operating in the healthcare arena. Hence, the findings from interviews conducted were representative of the firms, the divisions and the individuals and not of the firm as a whole.
- The results from the case study which is a form of exploratory research may not be generalized and interpreted to apply to the entire South African biotechnology industry population (Zikmund, 2003).
- Multiple-case studies provide a stronger base for theory building (Yin, 1994). Multiple-case studies provide theory that is better grounded and more

accurate. They enable better testing of emerging theory through triangulation (Eisenhardt, 1989) and broader exploration of research questions and theory elaboration. This research studied two case studies and by inference, the above benefits of multiple-case studies are limited in these results.

- Due to the small size of the firms studied, only three senior executives were interviewed in each firm.
- Two of the firms selected were located in Gauteng and the other two in the Western Cape. Interviews with the senior executives of the firms based in the Western Cape were conducted at a convenient time during the 2008 Annual Bio2Biz conference held in Gauteng. Telephonic interviews were conducted where an individual from one of the firms located in the Western Cape could not honour appointments when in Gauteng. According to Zikmund (2003), telephonic interviews are acceptable methods of collecting data and “may be comparable to that collected in personal interviews” (Zikmund, 2003; p. 207). Telephonic interviews tend to elicit exhaustive and dependable responses compared to personal interviews (Zikmund, 2003).
- In the interests of the time constraints towards completion of the research report the interviews were limited to the Chief Executive Officer and one or two members of the senior executive team.
- To maintain confidentiality, the names of the firms have been changed.



The report will be used as a reference point for new, small firms that want to consider the use of effective strategic management practices in order to be successful.

5. Chapter 5: Results

5.1. Introduction

This section outlines a report of two cases studied during the research process. It describes in detail the strategic management practices of two South African biotechnology firms and compares these to the strategic practices described in the theory. Both firms were founded more than two decades ago with the purpose of employing new technologies in the development of drugs. The first case provides and describes the findings at Biofirm (a fictitious name) from interviews with the senior managers. The second case outlines the findings from interviews with senior managers of Biotech (a fictitious name). In both instances, the managers were asked questions pertaining to the firm's strategic management practices.

A brief background of the biotechnology industry is provided below for a clearer appreciation of its complexity.

5.2. The health biotechnology industry in general

Introduction

The information contained in this section of the report is based largely on the US Health biotechnology sector as the founding place for biotechnology (Pisano, 2006).

Health biotechnology industry is a relatively new industry that is predominantly produced by new start-ups and small firms. It is based mainly on specialised

scientific knowledge (Audretsch, 2001) and characterised by experimentation and innovation in the organisation of research and development (R&D).

Health biotechnology R&D is traditionally organised through a collaboration of the large pharmaceutical firms and entrepreneurial entrants. These firms focus on basic science and employ chemistry for drug discovery with the hope of eventually transforming the existing pharmaceutical industry.

An outstanding attribute of the biotechnology industry that sets it apart from other industries is its fusion of science and business. The science of biotechnology is the creation of new products and services. The industry experienced a convergence of two previously distinct areas of knowledge (science and business) to a point where the “science is the business” (Pisano, 2006, p.1).

Location

The industry, which is entrepreneurial in culture, evolved in Silicon Valley as a result of the presence of venture capital, the boom in high-technology industries such the semi-conductors and computers, and the presence of academic institutions and government research laboratories. The industry therefore has geographical clusters; characterised by high prevalence of linkages, cooperation and strategic partners or alliances between the firms, scientists, academics, government, pharmaceutical firms and venture capitalists of those regions. A prerequisite to successful regional clustering is the presence of qualified and experienced scientists with business acumen in order to commercialise the scientific knowledge through a biotechnology firm (Audretsch, 2001). This has

been a challenge for many regions globally as resources of this nature are rare (Pisano, 2006).

The founders

The industry is very entrepreneurial in nature but has few if no commercial successes (Beaver, 2007). Audretsch (2001) reports on the characteristics and origins of founders in the US of 60 firms that made an initial public offering (IPO) during the period March 1990 and November 1992. His findings were that fifty percent (50%) followed an academic trajectory. Half of them had careers in the pharmaceutical and related industries and the other half came from other more established biotechnology firms.

Nature of operations

The inherent “bureaucratic processes which inhibit both innovative activity and speed with which new inventions move through the corporate system towards the market” have contributed largely to the relatively small scale of firms in this industry (Link & Rees, 1990).

Due to the nature of the business, the industry firms face a myriad of challenges that are critical to their survival. Some of these challenges include the lack of adequate resources (financial, human, infrastructure) to pursue R&D effectively, the need for complex strategic alliances and collaborations within the industry, and the challenging product regulatory environment that hampers smooth registration of patents (Pisano, 2006).

Globally, most small firms focused on developing products to be marketed by their larger strategic partners or alliances. This strategy dominated with small biotechnology firms because the firms concentrated on their core mission – to move from basic research to taking product to market through technological innovation (Audretsch, 2001). The other advantage is that small firms are able to offset the major liabilities (financial and operational) associated with acquiring manufacturing capabilities, marketing and sales (Audretsch, 2001).

A complementary relationship ensued, when the larger pharmaceutical firms preferred small biotechnology firms manage the legal (patenting laws) liabilities associated with biotechnology research (Audretsch, 2001).

Traditionally, small biotechnology firms develop products and larger firms, under a marketing license agreement; convert them into large-scale marketed products (Audretsch, 2001).

Innovation is fundamental to long term sustainability of health biotechnology firms. The innovation process from R&D to commercialisation is long and costly with no guarantee of commercial success. One of the biggest challenges for these firms is that they historically have no commercial product to draw revenues from for long periods of time. As a result of this uncertainty and due to the complex nature of the industry, investors are reluctant to invest in these firms as evaluation is extremely complicated. Investors tend to rather focus on the input constructs of the business and this involves the management and scientific team (Audretsch, 2001).

Since a decade and a half ago, the strategy of most biotechnology firms has tended to shift from exclusive development of products to include the commercialisation aspect too. However, this remains the challenge for small biotechnology firms, as according to Head of R&D at Hoffman LaRoche noted in 1993, “a conservative estimate would expect 30-40 of the recombinant proteins now under development to become successfully marketed products over the next 5 – 6 years” (quoted in Audretsch, 2001, p.6).

The major barriers to innovation amongst US firms (Hall & Bagchi-Sen, 2001) are regulations, the US patent process, skills shortage, lack of management expertise and firm size (with respect to funding). Small firms in the US cited a lack of venture capital as the greatest barrier to innovation. As a result they do not operate in every phase of the innovation process, and prefer to position themselves as product developers as opposed to playing in the R&D or commercialisation arenas.

In the early stages, small firms rely on government grants and venture capitalists to support their R&D activities. However, albeit possessing adequate funds, they still lack the required resources to transcend through the innovation process (from innovation to market). A study by Hamilton, Vila, & Dibner (1990) found that small firms were systematically progressing from high commitment to scientific activities to commercial activities.

Through the development of new cutting edge basic scientific research, universities create opportunities for new firm creation.

The health biotechnology industry may be well described as following the Schumpeterian process of “creative destruction”. In this process, new entrants bring new knowledge, technologies, skill sets and competencies into the industry (McGahan, 2004). The high rate of entry and new firm formation typical of the health biotechnology industry has brought about the expectation that the industry would displace the traditional pharmaceutical firms as the dominant players. This has not been the case largely because health biotechnology firms have lacked the critical downstream complementary capabilities and financial resources to enter on their own

5.3. The South African biotechnology industry

The South African government has the potential to develop and grow a globally competitive biotechnology industry. The country has made significant progress in developing agricultural biotechnology, with little initiative into the health biotechnology. South Africa aims to be one of the leading sub-Saharan African countries in the development of research and development (R&D) capacity and capability. An example is the lead role taken by the country in HIV-AIDS vaccine development (Motari, Quach, Thorsteindottir, Martin, Daar, & Singer, 2004).

In 201, South Africa began focusing on the biotechnology industry in 2001 through the adoption of the National Biotechnology Strategy to create incentives for the

industry. The main contribution of government is to support research initiatives by creating vehicles which provide seed funding for start-up biotechnology firms. The National Biotechnology Strategy was therefore adopted to address critical factors of success of the industry such as human resource development, funding, and regulatory and legal issues. To assist grow the industry; government encourages the development of international partnerships, private public partnerships (PPPs) and biotechnology innovation regional centres (BRICS). The universities and research institutions provide high quality of research. These institutions have been instrumental in the creation of biotechnology start-up firms.

The overall strategy of government to its people with regards health biotechnology is many-fold (Motari, Quach, Thorsteindottir, Martin, Daar, & Singer, 2004). It primarily includes increasing access and affordability of healthcare and encouraging the development of new products and services.

The small size of the South African biotechnology industry and the shortage of skills have led the industry to invest in building collaborations and strategic partnerships with the aim of obtaining mutually beneficial license agreements. Universities, laboratories, various government bodies, and the research institutions all contribute to the development of the South African biotechnology industry through either funding R&D, building research capacity and technology transfer and training. It is thus not feasible for one biotechnology company to play in the entire value chain from conducting research and developing product to being a sales and marketing company (Ernst & Young, 2006).

The development of the biotechnology private sector is still embryonic with few firms sporting novel bioproducts for health technology. The portfolios of these firms consist of biogenerics, licensed products from foreign international companies or products that are still in the pipeline awaiting commercialisation. A lot of research is being carried out in the laboratories but with little commercialisation. The South African industry boasts a sound regulatory environment, high quality tertiary institutions and laboratories that have made the clinical trial and diagnostic testing services very attractive to foreign companies (Akermann and Kermani, 2006; Motari *et al*, 2004). The multinational companies present in South Africa are seen as taking advantage of the strong clinical trial base.

Academic institutions frequently license out their inventions to health biotechnology firms. About two thirds of these licenses are given to small and medium-sized firms, which in turn either commercialise the technology on their own or sub-license it to other larger commercially-able firms.

Despite the challenges inherent in the industry, the global health biotechnology industry in 2007 achieved record levels in financing as investors started to show increased confidence in the industry. Refer to Appendix 4 for a key industry financial indicators for 2007.

5.4. Case Study 1: BIOFIRM

5.4.1. Background

Biofirm is a South African health biotechnology firm established to create a private sector health biotechnology industry. Biofirm is devoted to the development and manufacture of biotechnology products for human pharmaceutical use.

The products produced by Biofirm are aimed at areas of infectious diseases, cancers and auto-immune diseases.

Operations

Biofirm has two manufacturing operations. The plants produce concentrated product which is further developed, packaged and sold via a tender system. Large capital outlays are required to maintain the assets at the production plants and to retain the necessary talent required in specialised operations such as those carried out by Biofirm.

The Head Office is supported by finance, regulatory and marketing departments. Biofirm's revenues in the past have relied heavily on government business via an annual tender process. Asked how the firm copes with the overheads with a small turnover, the Marketing Manager responded by explaining that the overheads are borne by the major shareholder and other investors in the group.

The over-reliance of the firm profitability on public sector contracts raised many concerns amongst the management. The firm's strategy had to be reviewed in light of these challenges. During the last quarter of 2006, the firm embarked on a strategy review which would see it focus its efforts in penetrating the high valued and attractive private market.

One of the fundamental problems was the lack of consistent funding due to a high turnover rate of shareholders. Finance has therefore been irregular. Marketing was also a challenge for Biofirm. The firm was founded to become a biotechnology company with both an R&D and marketing focus as would occur with a traditional pharmaceutical company.

5.4.2. The competitive environment

The main competitors were large multinational pharmaceutical firms that had been operating in the health biotechnology industry as well. The business environment for Biofirm was unfavourable based on high barriers to entry created by the aggressive competitors. Barriers to entry included the introduction of a new technological innovation in the manufacture of a delivery device and the development of a unique pricing strategy which was linked to a packaged product offering. These firms engaged in collaborations with partners in allied sectors of the healthcare sectors such as the medical aids and suppliers. Underpinning their dominance of the market, these firms had hefty marketing budgets that influenced important decision makers through sponsorships and incentives.

Biofirm was in a challenging situation reflecting the difficulties associated with the industry. During that period, management began a series of major initiatives to reinvigorate the firm.

Faced with this challenge the CEO adopted a strategic focus in preparing to respond to the challenges facing the firm. He described the firm's challenges as follows

“Biofirm has in the past focused on a drug developmental strategy with very little focus on business development and market orientation. The firm, needs to be more market oriented, focusing on the commercial aspect of the business”.

The CEO embarked on a five year turnaround strategy.

5.4.3. Strategy formulation process

To manage the programme, the CEO selected a few key people to champion the sales, marketing and finance functions. The turnaround programme was generated from within the business with the CEO heading up the strategy office. The programme succeeded through extensive involvement of the senior and middle management who were encouraged to apply their own experience within their areas of expertise in the business. The CEO emphasized that it was important that everyone in management got involved in the strategy making process in order for them to internalize it and to own the process. “We use a bottom up approach and I like to involve everybody...so I've obviously got a good executive team and we almost on a daily basis talk strategy on an informal level” said the CEO. Energising

the internal climate by facilitating and encouraging contributions from all employees is one of the most important strategic management practices according to the CEO.

The CEO added that there would come a time when the strategies would have to be formalised. He has now set up an advisory committee which consists of senior people and they would meet on a regular basis to discuss the strategy. On completion of the consultative forum at the advisory level, all the employees would be informed on the intended strategy and encouraged to give feedback on their views. Meetings were conducted every six months, off-site away from head-office. At these two day meetings, senior and middle managers were asked how they see a successful firm going forward. They engaged in a SWOT analysis of the firm, taking into consideration the critical external and internal forces affecting their views.

The CEO is a firm believer of assessing the external environment in order to identify a range of opportunities for investment. "...as a firm, you are trying to look at how you can diversify yourself from your competitors" said the CEO. Managers use the two day meetings to discuss key value chain activities and capabilities, core competencies of the firm and most importantly funding strategies. A major focus is placed on the firm's critical success factors which were isolated according to strategic themes to be pursued. For example, funding was one of the major constraints identified. Two to three managers with expertise in the area under scrutiny would be assigned the task of elaborating further on particular strategic

themes. A session is then set aside for feedback. Based on feedback and deliberation of the issues surrounding the strategic analysis made, strategic choices are made that would ensure a sustainable competitive advantage.

The CEO together with his senior management team through a defined strategic management process focused on business development by identifying external opportunities to significantly increase sales and earnings. Other areas of focus were streamlining business processes by improving efficiency of all operations.

Key business processes are documented and available to all staff members for easy reference. All business policies and procedures are documented and relevant policies are discussed at cross-functional monthly management meetings to ensure common understanding. During these cross-functional meetings, which are often chaired by a senior executive member, business process problems are discussed and unsolved problems get escalated to the correct level of management. Recurring and often complex, unsolved issues are fed into a basket for discussion with the CEO. New ideas are encouraged through an open door policy to the executive management team. This is done through the participation of all employees in formalized strategy sessions. Strategies are in place to ensure that the management progressively learns more skills and techniques to ensure that they are more effective in terms of continuous improvement. Talent and succession management processes are in the process of being developed and will be implemented in the next year according to the Human Resources Manager. A retention and performance management process has only recently been put in

place. A recruitment strategy is to be implemented due to the high demand and scarcity of the relevant talent.

Biofirm has recently implemented a comprehensive recognition and reward philosophy that is currently being communicated throughout the entire organisation by the CEO and the senior management team.

Senior management responded to these challenges by engaging in a formal strategic planning process. The aim was to restore and grow sales.

Findings at Biofirm are listed below:

- The CEO is changing the focus of the firm by focusing on marketing orientation strategies – expansion to global markets
- Firm has a social responsibility programme in place
- The current strategy is recorded and forms the basis for future decisions and actions.
- Senior management has a good understanding of the mission and vision of the business they operate
- In response to the emerging environment the firm operates in, strategies are reviewed every six months to establish its appropriateness and validity
- The external trends and developments are studied to make assumptions about the future economic landscape, the developments in the new technology and competitor activity – personnel in various departments undergo training which is scheduled annually.

- The internal operating situation is examined and carefully analysed to meet the external requirements. This involves analysis of financial and operating trends, and identification of resource requirements to deliver on the desired strategy.
- Alternatives to existing strategy are not considered frequently due to lack of adequate resources.

5.5. Case study 2: BIOTECH

5.5.1. Background

Biotech was founded in 1995 with a primary aim of developing, producing, marketing and selling health biotechnology products to South Africa and sub-Saharan Africa. The biotechnology company, which was founded by the current Chief Executive Officer (CEO) currently turns over approximately R180 million per annum. In 2003, Biotech concluded an agreement with government, to form a Public Private Partnership (PPP). Specifically, the partnership comprised the Department of Health, a Strategic Equity partner and a Biotech consortium. Its primary aim is to develop and restructure the State Vaccine Assets to ensure adequate uninterrupted supply to the local and regional markets of cost effective vaccines.

The vision of the CEO when he started the company in 1995, was to contribute significantly to the development of the private sector of the biotechnology industry of South Africa. The opportunity to partner up with government in 2003 was a

strategy that the CEO embraced it as it formed part of the broader objective of ensuring that the health of South Africans is enhanced through access to quality and cost-effective vaccines. Biotech's expansion strategy into other markets has been successful mainly through ensuring a strong export component while retaining a strong local R&D capability.

The CEO has a team of senior executives who oversee the efficient operation of the various functions within the firm. The Deputy Chairman of the group is an Attorney with great interest and extensive knowledge of health biotechnology as a business. The Deputy Chief Executive, MM, is a qualified medical doctor with special interest in bioscience. The Financial Director, who is directly related to the CEO, ensures that the firm maintains sustainable growth in profits.

5.5.2. Operations

Biotech has agreed set objectives with the South African government. These include amongst others; to develop and retain local skills and talent in vaccine development and production; to be a competitive global player in the provision of vaccines; to promote Black Economic Empowerment and to establish strong local R&D capability in South Africa.

To meet the above objectives, Biotech set out to create the necessary infrastructure in the major provinces, Gauteng and Cape Town. The production facility is located in Cape Town, South Africa and it uses state of the art technology operated by technically competent and highly skilled personnel. All operations at

Biotech meet the local regulatory requirements for manufacturing, packaging and warehousing, and distribution.

Biotech, through its partnership with government, is contracted by the Department of Health to spend approximately 21% of its pre-tax profits on research and development.

The firm has a staff complement of 70 employees who drive the operations to achieve their stated objectives. The Human Resources department at Biotech recognises that the sustainability of the firm rests on their people and have therefore put in place best practices in order to make Biotech the employee of choice in the industry.

Besides supplying the local market, Biotech also manufactures generic products for other markets. The local market is serviced by five sales representatives nationally and an export manager oversees the export operations from the Gauteng branch. The marketing division is concerned with product availability and distribution logistics.

5.5.3. The challenges

Biotech faces challenges typical of the health biotechnology industry. "...we are operating under stringent standards....said the Deputy Chairman, MS.

Amidst these challenges though, the firm continues to show gradual growth from the sole proprietorship and entity it was once before. As the firm grows it also faces new challenges. One of the major challenges impacting mainly on the senior

managers, says MS, is that “...there is still a lot of operational involvement on the part of those who are supposed to be driving strategy”. The leadership has acknowledged this finding and sought to remedy the problem by appointing strategy consultants who will lead them in the correct direction.

The other challenge is previous over-reliance on government contracts. The Deputy CEO stated that the sentiment in the industry is that Biotech is comfortable because they have an existing PPP. “However”, he says, “we are panicking because we see that we need to be sustainable...”.

According to the Deputy Chairman, skills shortage and access to funding in the health biotechnology industry are the biggest challenges facing Biotech.

The firm is currently embarking on a strategy renewal programme which is aimed at refocusing the business in a desirable direction that will ensure sustainable growth. As part of the strategy renewal programme, Biotech has appointed a retired scientist who previously operated an international vaccine producing plant. Albeit he resides in England the senior management find it compelling through video-conferencing facilities, to utilize his expertise and knowledge “...from time to time when we have our strategy and board meetings” says MS.

5.5.4. The competitive environment

Biotech is in a new space in terms of the manufacture of vaccines. As a result, “...the firm found itself in a situation where the environment dictated the strategy” says the Deputy Chief Executive, MM. He further went on to describe how the

vaccine market is very limited and rigid in terms of the target market. The demand of preventative products such as vaccines is prescriptive as application is based often based on a pre-determined schedule.

5.5.5. The strategy formulation process

The CEO, who founded Biotech, through his executive team of four is the main driver of the strategy. On describing his character, one of the senior managers said, “.....when he believes in something, he will pursue it and it has to fly...he wants his ideas to go his way, and strives to be the originator of ideas and opportunities for he business...”. The CEO has a strong domineering character and strategy is driven “top-down”.

The partnership arrangement of Biotech and the government has strengthened relationships between Biotech and the government. This has impacted in the manner in which strategy is formulated at Biotech. Most decisions, even though pioneered by the CEO are governed by the contract terms with government.

The strategy process at Biotech is driven mainly by the CEO and the executive team. At an annual review meeting with the government, Bioetch takes note of government’s objectives regarding vaccine supply. The annual strategic planning meetings and budget process, which are slightly informal, are usually held before the financial year end in preparation for the following trading year. In these meetings, comprising of the executive team, the CEO would present the objectives

for Biotech and the desired profits for the following year. The team would have to devise plans to achieve these stated objectives and targets.

The firm had no cohesive culture that encouraged senior level collaboration as the Deputy CEO puts it, “it was more of an entrepreneurial environment...”.

Due to the top down nature of the business, there is general disagreement amongst the senior executives in terms of how the strategy should be formed and implemented.

All meeting proceedings were recorded in minutes which are kept on record for ease of reference by the shareholders on request. Albeit driven largely on the government’s mandate, the CEO has established good practice in capturing business plans and other essential documents pertaining to strategic planning within the group.

The firm has a well defined mission that expresses how the company intends to contribute to the societies it serves. The purpose of the firm, its objectives and value system are clearly outlined and communicated.

The mission statement, however, was developed two years ago because they felt it was still relevant to what the firm stands for and again, “...reviewing the firm’s mission and vision is a time-consuming exercise that requires buy in from everyone in the business including our shareholders...” said the Deputy Chairman.

The senior executives spend most of their time on operational issues. As a result, the business plan is not adequately reviewed to ensure adherence to the intended mission. As the Deputy Chairman says, “...we are still at a stage of getting to understand the industry....to know the market and our competitors...”.

With government being the major customer currently, there is no serious need for a full business review and structured strategy planning session. As the Deputy CEO puts it “...we would have agreed the strategy upfront with government, so whatever we do in our operations and all that, we are working towards fulfilling those strategies”.

The current situation at Biotech is that the intentions or plans of action are clear and well articulated by way of formal processes and procedures. The senior managers, led by the CEO convene on a monthly basis to formally review progress of the stated objectives and to prioritise forward planning. This formal control process ensures implementation of agreed actions. The strategy is captured in a business plan which clearly outlines the mission, objectives, risks and challenges facing the firm, financial targets, budgets and milestone schedules. These documents and processes are available to all managers within the firm to ensure precise communication of the plan and translation of the plan into actionable activities. In this way all employees have a clear sense of direction and what is required of them. The CEO’s understanding and experience in the field of biotechnology has encouraged managers to be more vigilant of the external environment.

In summary, the key findings at Biotech are that:

- The strategic management process at Biotech is highly influenced by the PPP arrangement it has forged with government.
- The current strategy is recorded and forms the basis for future decisions and actions guided by government mandate.
- Senior management has a good understanding of the mission and vision of the business they operate – these have not been updated in two years
- Despite the dynamic, new and emerging environment the firm operates in, strategies were historically not reviewed to check for alignment between the external and internal environments
- The external trends and developments are seldom studied to make assumptions about the future economic landscape, the developments in the new technology and competitor activity.

The internal operating situation is examined and carefully analysed to meet the external requirements. This involves analysis of financial and operating trends, and identification of resource requirements to deliver on the desired strategy. The strategic outlook at Biotech seems to be taking a new direction as the CEO attempts to exploit other opportunities within the industry. The mission was cascaded down to the entire firm. There is a plan to go on a strategy planning session later in the year involving the senior managers. These meetings will be held on an annual basis now in order to have a collaborative review the strategy.

6. Chapter 6: Discussion of results

6.1. Introduction

The purpose of the research was to gain an understanding of the strategic management processes in small firms in emerging industries and the reasons for these practices. The report further interprets the findings in the context of the various schools of thought in the field of strategic management (Mintzberg, 1990) described in Chapter 2.

Chapter 5 provided a detailed narrative of the two cases studied. The two companies, while operating in the same industry, display different strategic management practices in terms of how they cope with the emerging industry.

The section that follows provides an interpretation of the strategic management patterns identified in each firm with reference to the schools of thought referred to in Chapter 2 and the research questions set out in Chapter 3. Each case is analysed individually (with-in case analysis) and thereafter the cases are compared against one another (cross-case analysis) prior to final interpretation of the findings in the context of the schools of thought of strategic management.

Overview of literature review

Various perspectives on the definition of strategy (Porter, 1996).and strategic management (Mintzberg, 1990) exist in the literature Pearce II & Robinson (1994), define strategic management as the set of decisions and activities that result in the formulation and implementation of plans designed to achieve the firm's objectives. Mintzberg and Waters (1985) propose that strategies are formulated and implemented based on a continuum ranging from "pure deliberate" to "pure emergent". Other perspectives of strategy formulation and implementation exist. The resource-based view, for example, holds a different perspective that looks at strategic management in the context of the "...firm's distinctive competencies and heterogeneous capabilities" (Manhoney & Pandian, 1992).

The study of strategy in large firms has taken great strides in the past decades with little emphasis on theory building with respect to small firms (McCarthy, 2003).

Little research exists that examines strategic management practices in small firms in emerging industries in South Africa. This is the purpose of this study.

6.2. Overview of data received

The research questions in Chapter 3 were developed to explore the strategic management practices of small firms operating in emerging industries. To do this, the questions helped determine how small firms in emerging industries formulate and implement strategy. The responses to these questions were compared to existing practices documented in the theory and the differences and similarities recorded. The content of the responses captured in the cases was analysed and multiple indicators were collapsed into single constructs (Eisenhardt, 1989). The emerging pattern was continually compared to the theory using the framework developed by Mintzberg (1990) and Mintzberg & Lampel (1999).

Research question 1:

What are the strategic management processes of small firms operating in emerging industries and what are the reasons for these practices?.

Research question 2:

How do the findings compare to the theory in the context of the various strategic management schools of thought?

6.2.1. With-in case analysis

BIOFIRM: Planning and Learning schools

The concepts and constructs that can be used to describe the strategic formulation practices at Biofirm are, participative, intentional, clear, formal, adaptive, directional, systems based, factual and concise.

The strategy formulation process is driven firstly by the responses of the firm to the challenges that are associated with the new, emergent environment it operates in and secondly by the experience of past crises within the firm. The crises or difficulties experienced by the firm were mainly attributed to the general complexity of the industry (biotechnology industry) and the embryonic stage at which it is at in South Africa.

Biofirm, in its urgency to face the challenges of a highly competitive industry placed great emphasis on adopting a deliberate, rational and formal approach to strategy formulation. Through the learning process, the difficulties experienced by the executive changed the overall behavior patterns in strategy formulation and implementation. Quinn (1980) states that strategic actions emerge due to factors such as learning.

Plans were written down and reviewed frequently to ensure that implementation has occurred. The external market was constantly analysed for trends and scanned for potential threats and opportunities. Every effort was taken to retain skills within the firm by putting in place best Human Resource practices.

The CEO, in collaboration with his executive team, drove the strategy, giving clear and concise direction. The CEO's decision-making and strategy implementation was perceptive probably based on his business background and experience in biotechnology.

The above attributes to strategy formulation and implementation are characteristic of what (Mintzberg, 1990) describe as dominant in the planning and learning schools of thought. The strategy formulation process was characterised by a rapid migration from an emergent approach to a more planned (Robinson & Pearce, 1984), deliberate and rational approach (Mintzberg and Waters, 1985).

Strategy formulation at Biofirm falls along a continuum between being purely deliberate to being purely emergent. According to Harrington *et al.*, (2004) the emergent and deliberate strategies are not mutually exclusive. The two are seen by Mintzberg and Waters (1985) as forming the poles of a continuum along which different mixes of strategies exist depending on the impact of internal or external factors such as for example, the leader and the environment (McGahan, 2004).

Reasons for the strategic management practices adopted by Biofirm are outlined below:

The strategy processes observed at Biofirm are typical of a firm that is finally committed to plans after years of deliberation and difficulty (Beaver, 2007) due to the complexity of the industry. The company has the rights to supply products within a high value market sector of the industry

However, due to the constraints inherent in the biotechnology industry the value remained locked provided the firm devises and adopts alternative, innovative and profitable approaches to make it successful.

The challenges posed by the industry are a threat to Biofirm and by adopting a more deliberate and rational approach, supported by the planning and learning schools of thought, it is hoped that the firm would be able to meet the challenges and deliver more value to the shareholders.

The CEO acknowledges the complexity of the biotechnology industry and the challenges small biotech firms face. The strategic management practices seen at Biofirm were directed at overcoming these challenges.

BIOTECH: The Entrepreneurial and planning school

The concepts and constructs that can be used to describe the strategic formulation practices at Biotech are, visionary, charismatic founder and CEO, intuition, judgment, hierarchical approach, government involvement, consultative (use consultants) and slightly structured in approach.

The strategy formulation process is driven firstly by the responses of the firm to the external environment, more especially the impact of the relationship with government and secondly by the influence of the founding CEO. The complex emerging biotechnology industry poses challenges to its small firms and typically these firms either have to adapt or die. Biotech, through the influence of its founding CEO has opted to take advantage of the opportunities of this emerging

industry. The strategy to enter into the vaccine market and partner up with government in a PPP is evidence of an entrepreneur who is visionary. He was able to predict market trends and to devise ways in which to exploit good relationships with the major player in the vaccine business.

Mintzberg & Waters (1985), states that the environment in the context of the entrepreneurial school of thought, is largely co-operative enabling the visionary leader to find a safe niche in the environment. The practices at Biotech, outlined above, are supportive of the entrepreneurial school of thought.

It is however also interesting to note that even though the entrepreneurial school of thought dominated; some of the attributes displayed at Biotech support the planned school of thought. For example, the executive team constantly engaged with consultants in the field of biotechnology. Clear concise plans were drawn up on the basis of these discussions and the CEO undertook to ensure implementation of these plans.

Reasons for the strategic management practices adopted by Biotech are outlined below:

The entrepreneurial school of thought dominated at Biotech mainly because the environment was co-operative (government tender) and dynamic enough to be exploited by a visionary individual.

6.2.2. Cross-case analysis

A cross-case analysis was done to identify the similarities and differences between the strategic management practices of the firms and the practices documented in the theory. Appendix 5 compares the emergent practices of the two biotechnology firms in the context of the various schools of thought.

Berry (1998), states that the model of strategy in the small business literature is predominantly the planning model. This notion supports the works of Ansoff (1965) and Chandler (1962) work that define planning as a formal process. A comparison of the two firms indicates that both firms display attributes that support the planning school of thought.

The strategic management practices adopted by Biofirm differ significantly from those identified at Biotech. The two major points of difference are apparent in the learning and entrepreneurial schools of thought.

Biofirm: This firm predominantly follows the learning school of thought albeit the planning school is dominant compared to Biotech. In this case, the dominant planning, formal and rational approach is aligned to the work of Berry (1998).

Biotech: The firm follows predominantly an entrepreneurial approach to strategy formulation and implementation. However, as mentioned in the individual analysis, the senior executive tends to follow a planned approach when dealing with the detail (use of consultants for specific projects) of strategy formulation and implementation. Some degree of planning helps the entrepreneur anticipate

change and control their environment (McCarthy, 2003). However, with the entrepreneurial approach, planning is an informal process that resides mainly in the head of the entrepreneur – the CEO is the architect of the strategy (Mintzberg, Lampel, & Ahlstrand, 1998).

This finding at Biotech supports the work of Mintzberg (1998) which states that strategic management practices are deliberate in broad lines and flexible or emergent in the details.

In summary, both firms showed a tendency to follow strategic management practices supported by the planning school of thought. The differences between the two firms may be attributed to the different contexts (organisational and business) that the process of strategy formulation should be looked at as recommended by Chakravarthy & White (2001).

7. Chapter 7: Conclusion

The chapter highlights the main findings of the research. The results are collated together and on the basis of these, recommendations are made to practitioners and scholars in the field of strategic management and health biotechnology.

The study of strategy in large organisations is well developed and has made great progress in the past decades (McCarthy, 2003).

According to Brouthers *et al.* (1998), very little research exists that examines strategic management practices in small firms. The literature reviewed, even though minimalistic, shows differences in researchers' views regarding the most appropriate strategic management practices for small firms. Kraus, Harms, & Schwarz (2006) point out that small firms tend to engage in formal approaches to strategic management. This is in contradiction to the findings of Beaver (2007) who states that small firms are for the most part managed far less formally than larger organisations.

Duhaime, 2001 for example recommends that strategic planning be forced onto the small firm's agenda on a regular basis to be successful. This view would support the planning school of thought (Mintzberg, Lampel, & Ahlstrand, 1998) which takes on a formal, rational and deliberate (Mintzberg & Waters, 1985) approach to strategy formulation. On the other hand, small firms may be severely affected by the environments they operate in, that "...even the very best planning techniques are of no use..." (Mintzberg, 1978, p. 943).

Despite their economic contribution and importance to a country's competitive advantage, small firms face major challenges (Cooper, 1981) and many fail within a few years of trading (Beaver, 2007).

Beaver (2007), stressed the fact small firms tend to fail largely due to an overall lack of strategic management skills and abilities.

On the basis of this, the purpose of this study was to gain an understanding of the strategic management practices or processes in small firms in an emerging industry and the reasons for these emerging practices. The findings were interpreted in the context of the various strategic management schools of thought (Mintzberg, 1990; Mintzberg & Lampel, 1999).

7.1. Main findings

The study found that the strategic management practices of small firms in merging industries follow predominantly the planning school of thought. This finding supports the view of McCarthy (2003) that the planning school is more dominant in small firms.

The study suggests that the planning school tends to dominate when there is great uncertainty in the industry and when the rules of the game are dictated by one strong player. In the cases studied the government is a dominant player with respect to developing and keeping the biotechnology industry alive. Firms have to formalise their processes to qualify for incentives such as grants for further research and development, skills training and production.

The second finding therefore was that the strategic management practices identified in the two firms were different to each other. It may be deduced from the literature reviewed that the differences could have been caused by amongst other things, the challenges associated with a newly emergent industry impacting on internal operations, the influence of the founding CEO and past experiences. The literature has shown that these factors can influence how firms formulate and implement strategy.

In the case of Biotech for example, the founding CEO had entrepreneurial traits that determined the process of strategy formulation and implementation. This firm's strategic management practices may be defined in the context of the entrepreneurial school of thought.

The strategic management practices at Biofirm were best described in the context of the learning school of thought. Past experiences influenced the senior manager's decision-making and actions.

7.2. Recommendations for the practitioner

The recommendations for the practitioner include the following:

- The entrepreneur by using the entrepreneurial approach drives strategy in small firms much more than when attempting to use formal, rational and detailed analysis approach. The entrepreneur will be more responsive to the challenges that exist. Trainers and consultants will stress the importance of

formal financial planning and other support functions to help support the firm as it grows.

- The external environment needs to be studied extensively in order to advise the firms on the most strategic approaches. The biotechnology industry for example, is complex and new. It poses endless problems for the small firms who are being advised by practitioners that use the methodology applied to large firms in relatively predictable industries.

7.3. Recommendations for the scholar

Future research:

The methodology used in his study has limitations and the findings are not definitive nor are they exhaustive; requiring further scrutiny. The study found attempted to identify and describe the strategic management practices of small firms in the context of the schools of thought only. Many other constructs may be used to study these practices, for example the resource based view (RBV). Further, the CEO is influential in small start-up firms. It would be critical to understand how much power the CEO has amidst the challenging and demanding environment his firm operates in. These influence of these factors needs to be studied in the context of small firms and their environments.

Furthermore, it would be interesting to have a full fledged study that focuses on the antecedents of each company impacting on their strategic management practices. What are the critical success factors for these firms?.

This study has made inferences that the emerging industry gave rise to the dominant planned, deliberate and rational approach. It would be worthwhile to explore in depth the extent to which the emerging industry impacts on the strategy formulation and implementation processes.

The literature suggests that small firms need to strongly formalise their practices. It is critical to establish if this will hold true based on the fact that management processes in small firms are unique. Most of the contemporary management theory is still founded on the empirical analysis of management in large firms.

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9. Appendices

9.1. Appendix 1:

Nine Schools of Thought in Strategic Management

| PRESCRIPTIVE | | | | DESCRPTIVE | | | | | |
|-----------------|------------------------------|---|--|--------------------------------------|--|--------------------------------|-------------------------------|---------------------------|--------------------------------------|
| Dimensions | Design | Planning | Positioning | Entrepreneurial | Cognitive | Learning | Political | Cultural | Environmental |
| Key author(s) | Andrews, 1965 | Ansoff, 1965 | Porter, 1980 | Schumpeter, 1934 | Simon, 1976 | Lindblom, 1959; Quinn, 1980 | Alison, 1971; Perrow, 1970 | Normann, 1977 | Hannan and Feeman, 1977 |
| Base discipline | None | Systems Theory | Economics | None | Psychology | Psychology | Poilitical Science | Anthropology | Biology |
| Vocabulary | SWOT model, fit | Formalising, programming, budgeting | Analysing, generic strategy | Vision, leadership, innovation | Bounded rationality, map, mental model, reframe | Incremental, 'emerging' | Power, coalition dominant | Ideology, values | Reaction, selection, retention |
| Central actor | President / director | Planners | Analysts | Leader | Brain | Everbody who learns | Everybody with power | Collectivity | Stakeholders |
| Environment | Opportunities and threats | Stable and controlled | Analysable in economic variables | Manoeuverable | Overwhelming for cognition | Demanding | Intractable, malleable | Incidental | Dominant, deterministic |
| Strategy | Explicit perspective | Explicit plan | Explicit generic positions | Implicit perspective | Mental perspective | Implicit patterns | Positions, plays | Collective perspective | Specific position |

Source: Mintzberg, 1990

9.2. Appendix 2:

Gilmore (1971) describes six major steps in the strategy formulation process



9.3. Appendix 3

Interview guide

The aim of this research is gain a better understanding of the strategic management practices in your firm. In order to meet this objective, I will be asking you a few questions relating to how the process is carried out in your firm. The interview, which will last approximately an hour and a half, will be recorded in order to accurately capture the responses during the analysis phase of the research.

Are you comfortable and in agreement that we may proceed with the interview?.

Background on company and respondent.

The following information is sourced from each respondent at the beginning of the interview.

1. Give a brief description of your firm, stating the size, number of employees, name of firm, year of inception, financial performance since inception, and market share in the industry.
2. Briefly describe your role in the firm. How long have you been with the company?.

The strategic management process

1. Describe the strategy formulation process in your firm. Is it formal and deliberate or is it emergent and evolving in nature?
2. Describe the various components/activities that contribute to the strategic management process. List the components or activities.
3. Describe the process with which the firm evaluates the process of strategy formulation. When and how often is this analysis done?
4. Does management constantly monitor changes to the various components that are listed above?. What is management's response to changes in the components?
5. Who participates in the strategy formulation process? What s their role in the process?.
6. What is the role of the Chief Executive Manager or the founder of the firm in the process?.
7. How often is the strategy formulation process reviewed and strategies updated?. What factors trigger the review and updating of the strategy?.
8. What are the common challenges or constraints the firm faces in the decision-making process?
9. What is the current strategy?

10. Is the strategy of the firm documented and communicated to the employees of the firm?
11. List the tools and documents the firm employs in the strategic management process
12. Describe the industry the firm operates in. What is the impact of the environment on the firm's strategic management processes?
13. Does the strategic management process improve after every session? Explain.

Strategy implementation Process.

14. Does the firm engage in any feedback activities to evaluate the impact of the existing strategies?
15. The strategic management process is a dynamic process. What activities does the firm engage in to prevent implementation of an obsolete strategy?.
16. Describe the implementation process.
17. Who makes the strategic decisions of which objectives and strategies are best suited for implementation?.
18. What role does the founder or CEO of the firm play in the strategy implementation process?



LIST OF FIRMS INTERVIEWED and INTERVIEWEES

1. BIOFIRM – NOT THE REAL NAME OF THE FIRM

- Chief Executive Office
- Marketing Director
- Business Development Manager

2. BIOTECH – NOT HE REAL NAME OF THE FIRM

- Chief Executive Office
- Deputy Chairman
- Deputy Chief Executive Officer

9.4. Appendix 4:

Key Industry Findings described in the Ernst & Young's 2008 Global Biotechnology Report

| |
|--|
| <p>The global biotechnology industry had a very strong year on the financing front.</p> <p>Companies in the Americas and Europe raised more than US\$29.9 billion – a new high excluding the outlier genomics bubble year of 2000.</p> |
| <p>Venture financing reached an all-time high in 2007 with investment totaling about US\$7.5 billion, fueled by a record total of US\$5.5 billion in the US and 72% growth in Canada.</p> |
| <p>Global public biotechnology company revenue rose by 8% in 2007, crossing the US\$80 billion threshold for the first time.</p> <p>Absent the acquisition of several leading biotech revenue producers by big pharma, revenue would have increased by about 17% - in line with the industry's historical compound annual growth rate</p> |
| <p>The global industry's net loss decreased from US\$7.4 billion in 2006 to US\$2.7 billion in 2007. In the US, the industry came closer to aggregate profitability than in any previous year.</p> |
| <p>Deal making reached new heights in 2007.</p> <p>In the US the total potential value of deals announced during the year – including mergers, acquisitions and strategic alliances – was close to US\$60 billion, out-distancing all other years by a wide margin.</p> <p>In Europe, the total potential value of such deals skyrocketed to about US\$34 billion.</p> |

Source: Ernst & Young's 2008 Global Biotechnology Report



9.5. Appendix 5

Results of Chapter 5 – With-in case analysis and cross-case analysis

| WITH-IN CASE ANALYSIS RESULTS: BIOFIRM | |
|---|----------------------|
| Research question 2: How do the findings compare to the theory in the context of the various strategic management schools of thought? | |
| THEORY: Schools of thought | FINDINGS |
| Learning school: Emergent process, educational (what works and does not work), demanding environment, organisation adapts, everybody learns, | |
| Design school: Prescriptive, process of conception, deliberate, formal, rational, | √√ |
| Planning school: Developing, formalising and implementing an explicit plan, clear decision and control, allows firm resource allocation | Less pronounced √ |
| Entrepreneurial School: Visionary leader determines environment, based on intuition, judgment, wisdom, insight, innate mental states, | Predominant, √√√√ |
| Environmental school: Reactive process, organisation tries to cope, environment is central role in strategy formation, | √√√ |



| WITH-IN CASE ANALYSIS RESULTS: BIOTECH | |
|---|-----------------------|
| Research question 2: How do the findings compare to the theory in the context of the various strategic management schools of thought? | |
| THEORY: Schools of thought | FINDINGS |
| | Not evident |
| Learning school: Emergent process, educational (what works and does not work), demanding environment, organisation adapts, everybody learns, | √ |
| Design school: Prescriptive, process of conception, deliberate, formal, rational, | √√ |
| Planning school: Developing, formalising and implementing an explicit plan, clear decision and control, allows firm resource allocation | Less pronounced √√ |
| Entrepreneurial School: Visionary leader determines environment, based on intuition, judgment, wisdom, insight, innate mental states, | Predominant, √√√√ |
| Environmental school: Reactive process, organisation tries to cope, environment is central role in strategy formation, | Not evident √ |



CROSS-CASE ANALYSIS

| SCHOOL OF THOUGHT | ATTRIBUTES OF SCHOOL | BIOFIRM | BIOTECH |
|--------------------------|---|----------------|----------------|
| DESIGN | Clear unique strategies | √√ | |
| | Internal organisation matches external environment | √√ | √ |
| | Visionary leadership | √√ | |
| | Strategy formation is process of conception | | √ |
| PLANNING | Clear direction | √√ | √ |
| | Urban planning, system theory, cybernetics | √√ | |
| | Rigorous sequential steps from analysis to execution of strategy | √ | |
| | Strategy formation is formal process | √√√ | |
| POSITIONING | Firm is placed within the context of its industry – improve strategic position in relation to industry | √√ | √ |



| | | | |
|------------------------------|---|---|-----|
| | Industrial organisation (economics) and military strategy | √ | |
| | “nothing but the facts” | √ | |
| | Analysing | √ | |
| | | √ | √ |
| ENTREPRE- NEURIAL | Emergent and flexible | √ | √√√ |
| | Innate mental states and processes – intuition, judgment, wisdom, experience and insight | √ | √√ |
| | Strategy is in mind of the charismatic founder or leader of firm | √ | √√√ |
| | Strategy formation is a visionary process | | √√√ |
| COGNITIVE | Stresses creative side of strategy process | | √√ |
| | What is happening in mind of strategist?, psychology | √ | |
| | Analyses perception of patterns and information processing | √ | |
| | Strategy is a mental process | | √ |
| CULTURAL | | | √ |
| | | √ | √ |



| | | | |
|-----------------|--|--|--|
| LEARNING | Organisation adapts and learns | | |
| | Strategies not developed all at once, but emerge in small steps | | |
| | Pay attention to what worked before and what not | | |
| | Strategy formation is an emergent process | | |