A STUDY FOR AN EXPANDED CONCEPTUAL SCANNING FRAMEWORK AND THE IMPACT ON CURRENT BUSINESS ENVIRONMENTAL SCANNING

– A SYSTEMS THINKING APPROACH –

by

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DECLARATION

Hereby I, Steyn Heckroodt, declare that this dissertation is my own original work and that all sources have been accurately reported and acknowledged, and that this dissertation has not previously in its entirety or in part been submitted at any university in order to obtain an academic qualification.

S. Heckroodt   October 2012

ABSTRACT

The study addresses the question of whether there is a need for an expanded conceptual scanning framework that could benefit present-day business organisations. It addresses this question through the conceptualisation of such a framework, based on findings from the literature review executed during the secondary research phase of the study. Through the primary research phase, an attempt is made to reach conclusions pertaining to the research question. The extent to which businesses perform scanning and related activities as per the findings of the literature review is investigated by means of a Likert scale questionnaire presented to a sample of respondents.

The study acknowledges that the imperative of environmental scanning for business organisations also holds true for non-business organisations, but focuses on business organisations that specifically drive sustainable competitiveness and increased business success.

The study involves the conceptualisation of an expanded scanning framework through combining aspects and components of the ontological and epistemological dimensions prevalent in scanning and its derived activities. These derived activities include information gathering, scenario planning and strategy selection, and their impact on business performance. Furthermore, the conceptualisation of an expanded framework involves the application of a systems thinking approach in executing business environmental scanning. The inclusion of the ontological and epistemological dimensions are proposed as part of the *a-priori* design of an expanded conceptual scanning framework, offering the opportunity to present-day scanners to deal with matters of environmental dynamism more effectively through increased levels of understanding of the environment.

The study aims to move beyond the empiricist mode of scanning and merely levels of knowledge that scanners have about the environment, to how they should approach, view, understand and manage it.

The study expands on current conceptual scanning frameworks, methodologies and approaches applied by business organisations when scanning the business environment. It proposes an expanded conceptual scanning framework, which could increase the depth and width of current conceptual scanning frameworks. The aim is to provide a tool with which business organisations can increase the compound whole of information gleaned from the environment, and its integrity.

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The expanded framework includes a conceptualisation of the construct content of an emerging newness between two or more systems in the scanned environment. It is based on the analysis of the inter-relatedness, inter-dependence and relation between the co-contributing systems of the emerging newness and the interplay of the co-contributing systems' aspects, characteristics, dimensions and qualities. This conceptualised inclusion of emergent newness is based on the methodological analysis of system complexities through the application of a systems thinking approach to create the expanded conceptual scanning framework.

Strategy, as the juncture between environmental scanning and an organisation's capacity, has an environment-strategy interface and an organisation-strategy interface. The proposed expanded conceptual scanning framework incorporates both the ontological environment-strategy interface and the epistemological organisation-strategy interface, which concerns a particular worldview. This worldview underpins their approach when business organisations scan the environment. The expanded conceptual scanning framework aims to enhance the understanding of environmental complexity in order to enhance the management thereof. In this regard, it deviates from the notion that enhanced management of the environment would depend on a more accurate prediction of future environmental changes. Rather, it highlights the notion of increasing the understanding of the environment, in order to manage the opportunities and threats embedded in the environment and its future dynamism better.

OPSOMMING

Die studie ondersoek die vraag of daar 'n behoefte is aan 'n breër konseptuele skanderingsraamwerk wat hedendaagse besigheidsorganisasies kan bevoordeel. Dit hanteer hierdie vraag deur middel van die konseptualisasie van so 'n raamwerk, gegrond op die bevindings van die literatuuroorsig wat gedurende die sekondêre navorsingsfase van die studie uitgevoer is. Gedurende die primêre navorsingsfase word gepoog om gevolgtrekkings rakende die navorsingsvraag te maak. Die mate waarin besighede skandering en verwante bedrywighede onderneem, volgens die bevindings uit die literatuuroorsig, word ondersoek by wyse van 'n Likert-skaal-vraelys wat aan 'n steekproef van respondente voorgelê is.

Die studie aanvaar dat die imperatief van omgewingskandering by besigheidsorganisasies ook vir nie-besigheidsorganisasies belangrik is, maar is spesifiek toegespits op besigheidsorganisasies wat handhaafbare mededingendheid en verhoogde besigheidsukses as dryfkragte het.

Die studie behels die konseptualisasie van 'n verbreede konseptuele skanderingsraamwerk deur die saamvoeging van aspekte en komponente van die ontologiese en epistemologiese dimensies wat by skandering en die daaruit voortvloeiende bedrywighede belangrik is. Hierdie voortspruitende bedrywighede sluit in inligtingsversameling, scenario-beplanning en strategieseleksie; en die impak daarvan op besigheidsprestasie. Verder behels die konseptualisasie van 'n verbreede konseptuele skanderingsraamwerk dat 'n stelselsdenke-benadering by die skandering van die besigheidsomgewing toegepas word. Die insluiting van die ontologiese en epistemologiese dimensies word voorgestel as deel van 'n *a-priori*-ontwerp van 'n verbreede konseptuele skanderingsraamwerk, wat die geleentheid bied aan hedendaagse skandeerders om meer doeltreffend te werk met aangeleenthede van omgewingsdinamika deur middel van hoër vlakke van insig in die omgewing.

Die studie poog om wyer as slegs die empiriese skanderingsmodus en kennisvlakke, gegrond op wat skandeerders van die omgewing weet, te beweeg, na die wyse waarop hulle dit behoort te benader, te aanskou, te verstaan en te bestuur.

Die studie verbreed huidige konseptuele skanderingsraamwerke – metodologieë en benaderings – soos toegepas deur besigheidsorganisasies in hul skandering van die besigheidsomgewing. 'n Verbreede konseptuele skanderingsraamwerk word voorgestel, wat die diepte en breedte van huidige konseptuele skanderingsraamwerke sou kon

verhoog. Sodoende is hierdie studie gerig op die bydrae tot 'n werktuig waarmee besigheidsorganisasies die saamgestelde geheel van inligting wat uit die omgewing verkry is, en die integriteit daarvan, kan verhoog.

Die verbreede konseptuele skanderingsraamwerk sluit in 'n konseptualisasie van die konstruk-inhoud van 'n ontluikende nuutheid tussen twee of meer stelsels in die geskandeerde omgewing. Dit is gebaseer op 'n ontleding van die interverwantheid, interafhanklikheid en verwantskap tussen die mee-bydraende stelsels van hierdie ontluikende nuutheid en die tussenspel van die stelsels se aspekte, kenmerke, dimensies en eienskappe. Hierdie gekonseptualiseerde invoeging van 'n ontluikende nuutheid is gegrond op die metodologiese ontleding van stelselkompleksiteite deur middel van die gebruik van stelselsdenke by die toepassing van die verbreede konseptuele skanderingsraamwerk.

Strategie, as die kruispunt waar omgewingskandering en 'n organisasie se kapasiteit ontmoet, het 'n omgewing-strategie-koppelvlak en 'n organisasie-strategie-koppelvlak. Die voorgestelde verbreede konseptuele skanderingsraamwerk behels beide die ontologiese omgewing-strategie-koppelvlak en die epistemologiese organisasie-strategie-koppelvlak, soos dit 'n spesifieke wêreldbeskouing mag raak. Dit onderskraag die benadering waarmee besigheidsorganisasies die omgewing skandeer. Die verbreede konseptuele skanderingsraamwerk is gerig op die verstewiging van die begrip van omgewingskompleksiteit met die doel om die bestuur daarvan te verbeter. In hierdie sin verskil dit van die siening dat die verbeterde bestuur van die omgewing afhanklik is van 'n meer akkurate voorspelling van toekomstige omgewingsveranderings. Dit plaas die kollig op die siening dat 'n verhoogde begrip van die omgewing dit makliker maak om die geleenthede en bedreigings wat deel is van die omgewing, en die toekomstige dinamika daarvan, beter te bestuur.

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Out of the clutter, find simplicity.

From discord, find harmony.

In the middle of difficulty, lies opportunity.

Albert Einstein

(Friedman, 2006:441)

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LIST OF ACRONYMS

EPISTLE: **E**conomic, **P**olitical, **I**nstitutional, **S**ocio-cultural, **T**echnological, **L**egislative, and **E**cosystems analysis

PEST: **P**olitical-legal, **E**conomic, **S**ocio-cultural and **T**echnological analysis

PESTLE: **P**olitical, **E**conomic, **S**ocial, **T**echnological, **L**egal, and **E**nvironmental analysis

QUEST: **Q**uick **E**nvironmental **S**canning **T**echnique

STEEP: **S**ocial, **T**echnological, **E**conomic, **E**nvironmental, and **P**olitical analysis

ES: **E**nvironmental **S**canning

SP: **S**cenario **P**lanning

SS: **S**trategy **S**election

CHAPTER 1
NATURE AND SCOPE OF THE STUDY

1.1   INTRODUCTION

In Chapter 1, the researcher contextualises the study by outlining the background factors that motivated the research and provided justification for doing the study. The chapter commences with a clarification of the research question, and defines the terminology used for contextualising it. It expands on the research topic and discusses the delimitations thereof. Furthermore, the researcher elucidates the focal point of this study and provides related objectives within the confines of the scope and limitations of the research. The chapter contains a discussion of the primary and secondary research objectives, as well as the research methodology applied. Finally, a brief description of the contents of the subsequent chapters of the study is given.

As an opening remark to this study it is essential to mention Taleb's (2007:8-9) "triplet of opacity". This includes the "illusion of understanding", where people think they know what is going on in a world that is more complicated (or random) than they realise. Secondly, the triplet of opacity refers to "retrospective distortion", meaning that matters are assessed only after the fact – as if in a rear-view mirror – and history appears clearer and more organised than in empirical reality. Thirdly, the triplet of opacity refers to the "over-valuation of factual information and the handicap of authoritative and learned people". Here more value is placed on facts than is warranted and Taleb (2007:8-9) argues that we are at the mercy of those with authority and learning.

The first of the three "ailments" has a specific bearing on this study. It refers to the phenomenon that people may think they know what is going on in the world when in fact the world has become much more complicated and random than they may realise. It is because of a continuously evolving social complexity that business environmental scanning has become an imperative for business organisations. It is done in an endeavour to keep abreast of environmental changes and responding to these changes by means of appropriate strategy selection and enhanced competitiveness (Katsioloudes, 2002:293-294).

Empirical studies by Homburg, Krohmer and Workman (1999:339-57) and Ward, Bickford and Leong (1996:597-626), advocate a close association between business environment and selected strategy, and suggest that a number of strategies are appropriate for certain environments (Nandakumar, Ghobadian and O'Regan, 2010:910). For decades, businesses have performed external and internal environmental scanning to collect information about their

environments (Costa, 1995:7). The main purpose of gathering information is to develop external future scenarios on the one hand, whilst providing an indication of the business's internal capability on the other (Thompson and Strickland, 1999:256). The opportunities and threats posed in the external environment versus the internal strengths and weaknesses of a business relative to these opportunities and threats, significantly influence the business's strategy selection (Costa, 1995:5).

The study focuses on the external scanning component of environmental scanning. In this regard scanning refers to the continuous monitoring of a business's external environment in order to detect early signs of opportunities and possible threats that may influence its current and/or future plans. Scanning includes the use of conceptual scanning frameworks and applying specific methodologies through certain scanning approaches.

The study acknowledges that the same imperative of environmental scanning for business organisations also holds true for non-business organisations (Bryson, 2004:123). However, the study focuses on business organisations that specifically drive sustainable competitiveness in competing for market share and increased business success.

Researchers and environmental scanners constantly endeavour to enhance scanning methodologies and frameworks in an effort to gather more information from the external environment (Slaughter, 2003:19). Voros (2003:3) elaborates on these enhancements, emphasising that scanning should be less about technique and methodology and more about openness of mind. The outcome of environmental scanning should be based more on design than occurring by chance, mistake, or luck (Voros, 2003:3). Conceptual scanning frameworks should allow for, and assist in an opening up of the mind space of environmental scanners (Voros, 2003:39). The concept of mind space refers to the perceptual filters through which scanners scan the environment.

According to Bodwell and Chermack (2010:193-202), attempts to enhance conceptual scanning frameworks have included combining empiricist qualitative and quantitative scanning techniques with theoretical techniques. These attempts have progressed since the 1980's, when it was argued that the qualitative and quantitative methods of research were incompatible to the tenet that they are. Recent studies refer to numerous notions about enhancing the empiricist mode of environmental scanning with that of the social/interpretivist mode and *vice versa* (Slaughter, 2003:19-20). These studies maintain that current scanning frameworks and methodologies are inadequate. Slaughter (2003:21) expands further on this notion of inadequacy and explains why an empirical approach towards scanning, on its own, is not sufficient. He is of the opinion that an empirical scanning framework fails to identify

phenomena that do not respond to meaningful empirical methods. Slaughter (2003:21) also states that businesses operate in a broader environment that shows signs of experiencing dysfunction, stress and turmoil on an extraordinary scale. The suggestion is therefore that businesses need to have a richer and deeper viewpoint and employ more thoughtful and innovative strategies.

1.2   THE RESEARCH QUESTION

The researcher has investigated the need for a broader and deeper conceptual scanning framework, asking the research question of whether such a framework will assist scanners to understand the rich and complex reality of the environment better. In this context, as a fundamental tenet of the study, the scanning approach is equally important to both the units of analysis and the specific sources of information of the study. The units of analysis include businesses, individual scanners and environmental systems. The sources of information include the Internet, published articles, business managers and employees, external business stakeholders, books, books' chapters, conference papers and working papers, conferences, blogs, journals, and magazines. Chapter 4 provides more information pertaining to the units of analysis and the respective sources of information.

The study addresses the above-mentioned research question through the conceptualisation of an expanded scanning framework, based on findings from the literature review performed during the secondary research phase of the study. Through the primary research phase, these efforts are extended in an attempt to provide conclusive recommendations pertaining to the research question. This is done by determining the extent to which businesses perform scanning and related derivative activities as per the findings of the literature review.

The study's aim is to conceptualise an expanded scanning framework through combining aspects and components of the ontological and epistemological dimensions prevalent in scanning and its derivative activities. These dimensions are proposed as part of the *a-priori* design of the expanded conceptual scanning framework in an effort to offer present-day scanners the opportunity to deal with matters of environmental dynamism more effectively through increased understanding of the environment. The design moves beyond the empiricist mode of scanning and mere knowledge that scanners have about the environment, to how they should approach, view, understand and manage it.

Furthermore, the relation between scanning and information, information and scenario planning, scenario planning and strategy selection, strategy selection and business performance, and systems thinking as a scanning approach is investigated. Through the study,

the researcher considers the viability of including a dimension of emergence (Vogelsang, 2004:4) between environmental systems into the approach and conceptualisation of current scanning frameworks. This raises the question of whether such an inclusion could potentially increase the depth and width of scanning frameworks. The question is investigated by researching the inter-relatedness, inter-dependence and relation between two or more systems in the environment, co-contributing to the emergent space and what Vogelsang (2004:4) terms "newness" between systems.

According to Grant (2005:68), conceptual scanning frameworks refer to those theoretically conceptualised and constructed frameworks used by businesses to depict the environment they scan. These frameworks contain those components that businesses regard as co-contributing to the requisite whole of the specific business environment that requires scanning. The relation between the components is included (Grant, 2005:68) and may differ from one business to the next.

The scanning methodology refers to the set of practices, procedures and rules applied by scanners, whilst the scanning approach refers to the underlying view they have of the environment. Regarding this study, a structured approach would for instance refer to the possible inclusion of the above-mentioned newness when constructing a conceptual scanning framework. A structured approach would further entail a methodological application of such a framework.

According to Burt, Wright, Bradfield, Cairns and Van der Heijden (2006:55), the information compound whole refers to the total amount of information available to a business in the environment, as scanned by such a business. Should it be judged that there is no need for more information, a business may, with reference to its own unique information needs, regard this information compound whole as complete (Montgomery, Wernerfelt and Balakrishnan, 1989:189-97).

In the final instance, scanning is about gathering business environmental information with the aim of improving business performance (McAdam and Bailie, 2002:972), through the selection of a specific business strategy (Whittington and Gailluet, 2008:241-247).

1.3   BACKGROUND AND MOTIVATION FOR THE STUDY

The motivation for this study is provided through reference to strategy selection and the phenomenon of an ever evolving and uncertain business environment (Bodwell and Chermack, 2010:195), resulting in challenges inherent in current scanning methodologies and conceptual frameworks.

1.3.1 Strategy selection

In the 1970s, research indicated a correlation between environmental scanning and business performance (Auster and Choo, 1993:194). Katsioloudes (2006:74) states that from the 1970s onward, this correlation was affirmed as positive and that more businesses then commenced with scanning. Table 1.1 lists some of the more recent authors and researchers who confirm this phenomenon.

Table 1.1: Research confirming the positive correlation between scanning and business performance

Author/Researcher	Title of their work
Gonza´lez-Benito (2010)	Supply strategy and business performance An analysis based on the relative importance assigned to generic competitive objectives
Wang, Lo and Zhang (2006)	How technological capability influences business performance An integrated framework based on the contingency approach
Nandakumar, *et al.* (2010)	Business-level strategy and performance The moderating effects of environment and structure
Mackay, Bititci, Maguire and Ates (2008)	Delivering sustained performance through a structured business process approach to management
Dick (2008)	Exploring performance attribution The case of quality management standards adoption and business performance

Strategy selection requires that information from the external and internal business environments be obtained (Mintzberg, 1973:71). This is supported by Goodwin and Wright (2001:2-17) in their study on the enhancement of strategy evaluation in scenario planning, as a role for decision analysis. It provides a business with an indication of possible threats and opportunities in the external environment, and of internal business strengths and weaknesses. It is apparent that the selection of a strategy is both aspirational in terms of wanting to capitalise on external opportunities, and rational in terms of a specific choice of strategy, which is shaped by the business's capabilities. In this sense, the selection of an appropriate strategy is a balancing act between opportunity and possibility that business managers need to perform.

Mintzberg (1973:71-72) states that "because of the unique access to external information and an all-embracing access to internal information", business managers find themselves at a juncture. This requires them to act as information processors. They receive information, direct its flow and take action based on the assimilated information.

1.3.2   The business environment

At the time when an increasing amount of businesses started adopting the practice of environmental scanning, their motivation was based on the challenges brought about by turbulent and volatile external environmental forces (Mintzberg, 1973:71). This awareness of an ever-changing environment persisted and remained the reason to continue their scanning (Auster and Choo, 1993:194). Currently the changing environment, and associated opportunities and threats, require innovative approaches to react and respond to the environment's changing nature (Cufaude, 2009:32). Clearly, environmental scanning is important for its outcomes of providing information on the changing nature of the environment. It is vital to keep abreast of these changes in order to identify particular environmental threats and opportunities facing a business (Favaro, Karlsson and Neilson, 2010:10). These threats and opportunities are categorised and weighed against the chosen competitive strategy of the business enterprise. Furthermore, they are weighed against the crafted vision and mission, as directive tools through which the successful implementation of the chosen strategy may be driven (Thompson and Strickland, 1999:134-137).

Voros (2003:45) and Wilber (1995:107-108) describe the changing nature of the environment as developing through means of evolution. This evolutionary development is applicable to four dimensions, emanating from the intentional and behavioural dimension of people and their related cultural and social systems dimensions (Wilber, 1995:107-108). Section 1.5.2 provides more detail of this evolutionary developmental status. Along with the evolving nature of environmental change, higher levels of future environmental uncertainty contribute to the importance of environmental scanning (Auster and Choo, 1993:195). This leads to businesses placing a higher value on immediately available, easily accessible and high quality information (Auster and Choo, 1993:195).

1.3.3   Challenges in current scanning methodologies and frameworks

The following sections focus on challenges pertaining to current scanning practices, and contain a discussion of scanning approaches, methodologies, processes and frameworks.

1.3.3.1   *A structured scanning approach*

Structure refers to activities that are performed in an organised manner, to the extent that it may lead to a particular pattern in which these activities are performed, based on the relation between them (Longman, 2004:744). *Approach* refers to a specific method in which to do something (Longman, 2004:33). Combining the concepts, a structured approach refers to an organised manner in which to do something, guided by a particular arrangement of the relation

between the various activities that comprise the organised manner of the action (Patton, 2005:1083-1092).

According to Boddy (2002:76), there is a distinction between the external and internal environmental spheres, comprising the totality of forces directly taken into consideration when selecting a business strategy. A structured approach to scanning also refers to the manner of gathering information on the environment, from both internal and external information sources (Auster and Choo, 1993:197). It is based on the assumption that the totality of forces in the environment can be determined in a quantitative and/or qualitative manner. According to Slaughter (2003:20), scanners endeavour to present the results from such an approach in an empiricist quantitative format.

One of the potential challenges that scanners face is to move beyond such an empiricist manner and include the epistemological interpretivist dimension of the scanner(s) performing the scanning. Slaughter (2003:21) is of the opinion that this enables a more comprehensive scanning framework. The empiricist manner refers to the belief that knowledge exists, based only on experience and what is immediately given (Nodoushani, 1999:44). It is based on the belief that the scientific worldview is marked by the application of logical analysis (Neurath, 1973:309). The epistemological interpretivist manner, however, refers to what counts as valid knowledge (Heracleous and Jacobs, 2008:312), but based on the non-exact science of subjective perception and interpretation (Smircich, 1983:355). This leads to the recommendation that scanning be performed in a combined empiricist and social interpretivist manner, through observation of the requisite whole that constitutes the totality of a business's specific environment. The commonality between these methods remains the purpose they serve, which is to gather information about the environment, since this forms the basis for scenario planning and strategy selection (Thompson and Strickland, 1999:44).

The literature reviewed for this study contains references to the terms scenario sketching, planning, analysis, crafting, thinking and building. Because of this variety in the terminology used, Godet and Roubelat (1996:164-171) are of the opinion that the term scenario is being abused. Bishop, Hines and Collins (2007:5-25) reason that scenario planning is more wide-ranging and has to do with a total foresight study. This includes speculating about the uncertainty encompassing the future. Martelli (2001:57-70) expands on this speculation by referring to the envisaging of a few different future outcomes that are probable, relative to the status of a business. For ease of reference and standardisation, this study uses the term scenario *planning*.

Challenges relating to scanning approaches have to do with how scanning is impacted on by scanners' views of the environment and possible future changes within that environment (Fink, Marr, Siebe and Kuhle, 2005:376). There are fundamental differences between the various approaches to future possibilities that scanners employ. These range from viewing the future as deterministic (Burt, *et al*., 2006:55), to something that can be forecasted (Bodwell and Chermack, 2010:193-202) and something that can be planned for through foresight (Wright, 2005:89). According to Aaltonen and Sanders (2006:28), the future can be treated as intended, selected and planned, whilst Varum and Melo (2009:355-369) are of the opinion that it can be treated as continuously emerging and amplifying with unpredictable and unknown emergent processes.

The approach towards the future outlined by Varum and Melo (2010:355-369), has a bearing on this study in that it is a systems thinking approach to scanning that considers the emergent newness between environmental systems scanned. This relates to the characteristics of emergence (Burt, *et al*., 2006:63), unpredictability (Varum and Melo, 2009:356), and a new and unknown complex inter-relatedness between environmental components (Vogelsang, 2004:4), and how to conceptualise and think about these characteristics (Clemens, 2009:263). Currently, scanners approach this emergent newness as both unpredictable and unknown (Borjeson, Hojer, Dreborg, Ekvall and Finnvedena, 2006:727).

1.3.3.2   *A scanning methodology*

Methodology refers to the set of practices, procedures and rules applied by the scanners of the environment, and includes the what, how and where of scanning.

According to Costa (1995:5), current scanning methodologies range from elementary forms of scanning such as the updating of relevant secondary information, to highly advanced methods. Such advanced methods may include the addition of primary information and specialist investigating units for particular aspects of the environment (Kotler and Armstrong, 1996:223). Factors taken into account in establishing such scanning units relate to cost, availability of skills, market potential, risk profile and quality of a business's infrastructure.

1.3.3.3   *A scanning process*

Process refers to a particular course of action, executed with the intention of achieving a specific outcome (Longman, 2004:284).

In this study, the course of action relates to the various steps taken in the scanning process – from the gathering information, to processing it into meaningful forces that influence the strategy selection of a business. The processing of information refers to the level of deduction

that is required when progressing from the point of gathering information, to a form of future planning (Tevis, 2010:339), to the selection of a strategy. In this regard, Hyde (2000:93) is of the opinion that scanners bear the potential perplexity in mind as they progress from information gathering to strategy selection by means of deduction.

The challenge of strategy selection lies in logical deduction (McKiernan, 2006:17). It pertains to the complexity involved in factoring in the impact of scanned realities from useful information (Voros, 2003:43). This conundrum relates to the limitation presented by the fact that information gathering is dependent on past and current trend-breaking and/or trend-setting developments (Tevis, 2010:338), while strategy selection requires some level of future prediction (Schermerhorn, 2005:278).

1.3.3.4 *Conceptual scanning frameworks*

Conceptual scanning frameworks refer to perceived views of the environment that assists scanners in gathering and managing information about the environment (Grant, 2005:68). Such frameworks contain the perceived systems that make up the environment of a business, their relation to one another; and to the business (Johnston, Gilmore and Carson, 2008:1174). Figure 1.1 is an example of such a framework. The figure consists of four environmental spheres, being the external environment, the general environment, the competitive environment and the internal environment.

These spheres are conceptualised based on the components that constitute a particular sphere. In this regard, Boddy (2002:77) positions environmental components such as political-legal factors, buyers and suppliers in specific spheres. In doing so, the conception of hierarchical distance between the environmental systems and the business performing the scanning on them, is created. Furthermore, Figure 1.1 illustrates possible stakeholder relations among environmental systems that could be positioned in any one of the respective spheres.

This study builds on conceptual scanning frameworks such as the one in Figure 1.1. The framework illustrated in Figure 1.1, and other similar conceptualising attempts, mostly represent the ontological social dimensions of the environment. In this study, however, the researcher endeavours to show the need for such frameworks to include more of the epistemological dimension (cf. 1.3.3.1) of the scanners executing the scanning. This translates into conceptual scanning frameworks having to include both the objective world out there (McKiernan, 2006:17), and the subjective filter (Burt, *et al.*, 2006:56) through which the scanning takes place.
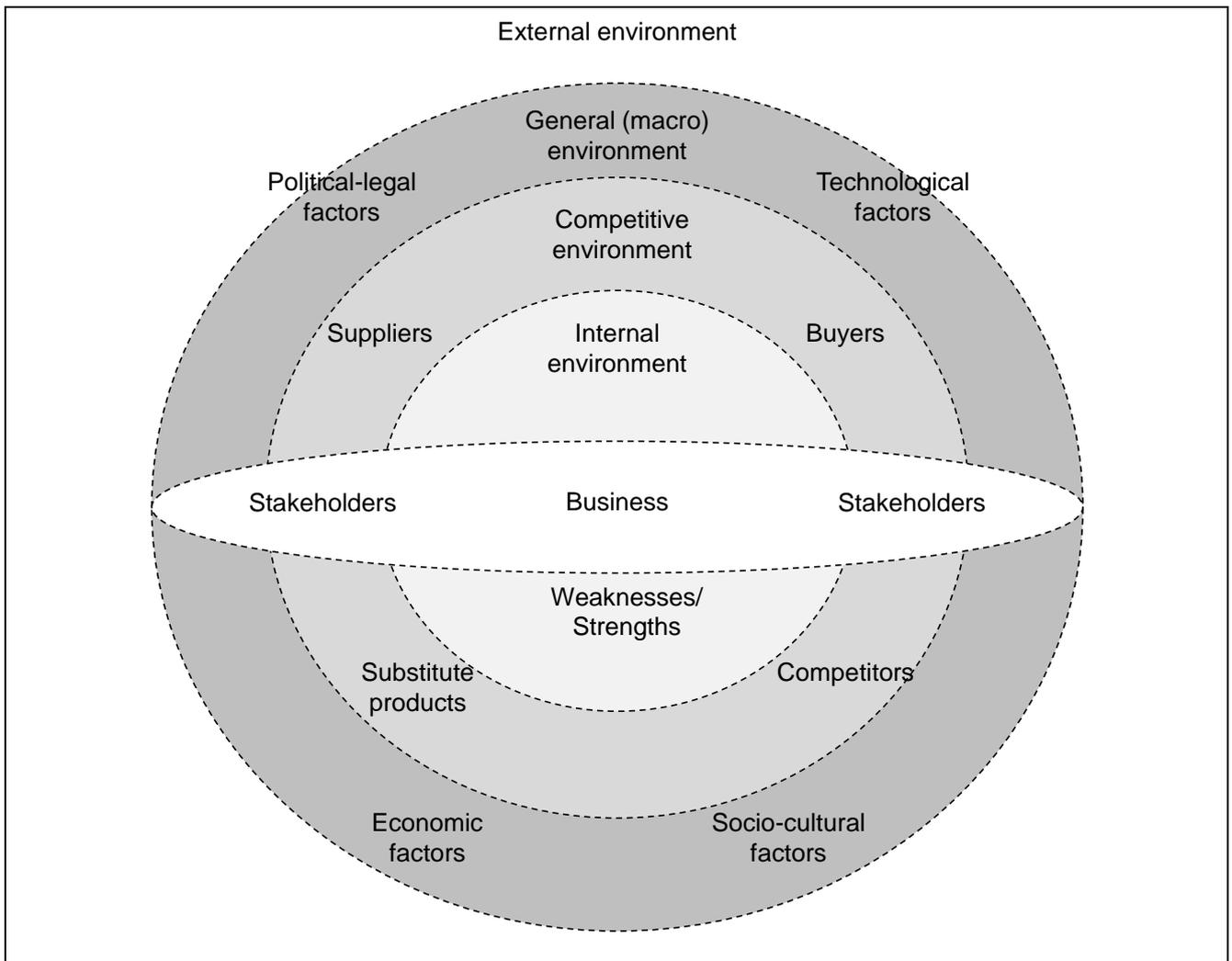
Figure 1.1: A conceptual scanning framework

Source: Boddy, 2002:77 (Amended)

According to Wand and Weber (1993:220), ontology is a field of philosophy concerned with expressing the nature and structure of the world. It is concerned with what is said to exist in the world and assumes it to be real. According to Hirschheim, Klein and Lytinen (1995:20), epistemology is concerned with the nature of human knowledge and understanding, and how it is acquired through different methods of inquiry and investigation. Guba and Lincoln (1994:108) categorise alternative inquiry paradigms through the ontological, epistemological and methodological questions. The ontological question refers to what the form and nature of reality is, and asks the question what there is that can be known about it. On the other hand, the epistemological question investigates the nature of the relationship between the knower or would-be knower, and inquires as to what can be known. The methodological question asks how the inquirer can go about finding out whatever he or she believes can be known.

The ontological and epistemological questions express a concern regarding a person's worldview, encapsulating a comprehensive conception of the world from within a specific viewpoint.

Aiming to include an ontological and epistemological dimension to the conceptualisation of an expanded scanning framework, a further challenge of this study is not to reduce such an inclusion to yet another form of reductionism. In this regard, Wilber (1995:38) states that businesses, in their attempts to enhance the management of environmental uncertainty and complexity, tend to break the environment down into manageable bits. He argues that environments emerge through systems and systemic inter-relatedness (Smircich and Stubbart, 1985:724-738), and that this relatedness, within environmental boundaries (Haines, 2006:1), is better understood through a systems thinking approach, as opposed to reductionism or a fragmentation of the environment (Kofman and Senge, 1993:4-23).

1.3.4 A summary of the motivation for the study

The motivation for the study is grounded in the notion, as expressed by Francis (2010:25), that scanning needs to be done in a manner that significantly influences strategy selection. The literature review presented in Chapter 2 of the study highlights the constant need to improve current scanning techniques. The reason is the positive correlation between scanning and business performance (Auster and Choo, 1993:194). From this, it is evident that since strategy selection is significantly impacted on by the information gleaned through scanning, continuous enhancement of scanning techniques is a prerequisite for appropriate strategy selection. In this regard, Beal (2000:29) refers to the dynamism of the business environment, in that it is unstable, uncertain and in constant flux. Bishop, Hines and Collins (2007:5-25) support this notion of a continuous need for businesses to develop more comprehensive scanning methods, because of the dynamism pointed out by Beal (2000:29). It correlates directly with the need for businesses to reduce their risk exposure related to a selected strategy, based on the information gleaned from scanning the environment (Schermerhorn, 2005:278).

The motivation for this study stems from the notion that current scanning frameworks may perhaps limit the ability of businesses to gather sufficient and relevant information, where information is required for appropriate strategy selection in order to increase performance and sustainability. The assumption is therefore that a need exists to increase the level of confidence with which businesses are able to make probabilistic judgments on many of the most important business challenges that they face.

1.4 THE EMERGING SYSTEMS COMPLEXUS AND SYSTEMS THINKING

As part of the introduction to this study, the matter of the emerging systems complexus and systems thinking, as an approach to scanning, is discussed in the following paragraphs.

1.4.1 Emerging systems complexus

In this study, *emergence* is defined as a newly established relational phenomenon between two or more systems. The Freedictionary (2010) describes emergence as something that comes into prominence. *Emerging systems complexus* refers to the complexity between two or more systems, which can be analysed through means of observing the co-contributing systems' inter-relatedness, their inter-dependence, and the relation between them. Inter-relatedness refers to the notion that the systems are related and contain patterns that are inextricably part of a greater flux of conditions (Burt, *et al.*, 2006:63). Inter-dependence refers to the notion that they are mutually dependent on one another (Burt, *et al.*, 2006:52) and the relation between them refers to the significant association between the systems that co-contribute to an emerging complexus (Johnston, *et al.*, 2008:1171).

Figure 1.2 illustrates a conceptual scanning framework, similar to the one in Figure 1.1. Figure 1.2 indicates the relation between the respective systems in the environment through the overlapping grey sections. These overlaps can be viewed as conceptualisations of an emerging systems complexus. The dotted lines indicate a dynamism between the environmental spheres, and what Othman (2007:261) terms "the movement of environmental components" between these spheres. An expanded scanning framework is proposed in Chapter 3 of this study, where the researcher among other things attempts to conceptualise the dynamism between environmental spheres. This is done in an attempt to provide a comprehensive concept of systems thinking as an approach in which the expanded conceptual scanning framework can be applied.

A system implies a whole, which is an organised and purposeful structure, consisting of inter-related and inter-dependent elements. According to Haines (2000:33), system elements continually influence one another, directly or indirectly, to maintain their activity and the existence of the system, in order to achieve the common purpose of the system.

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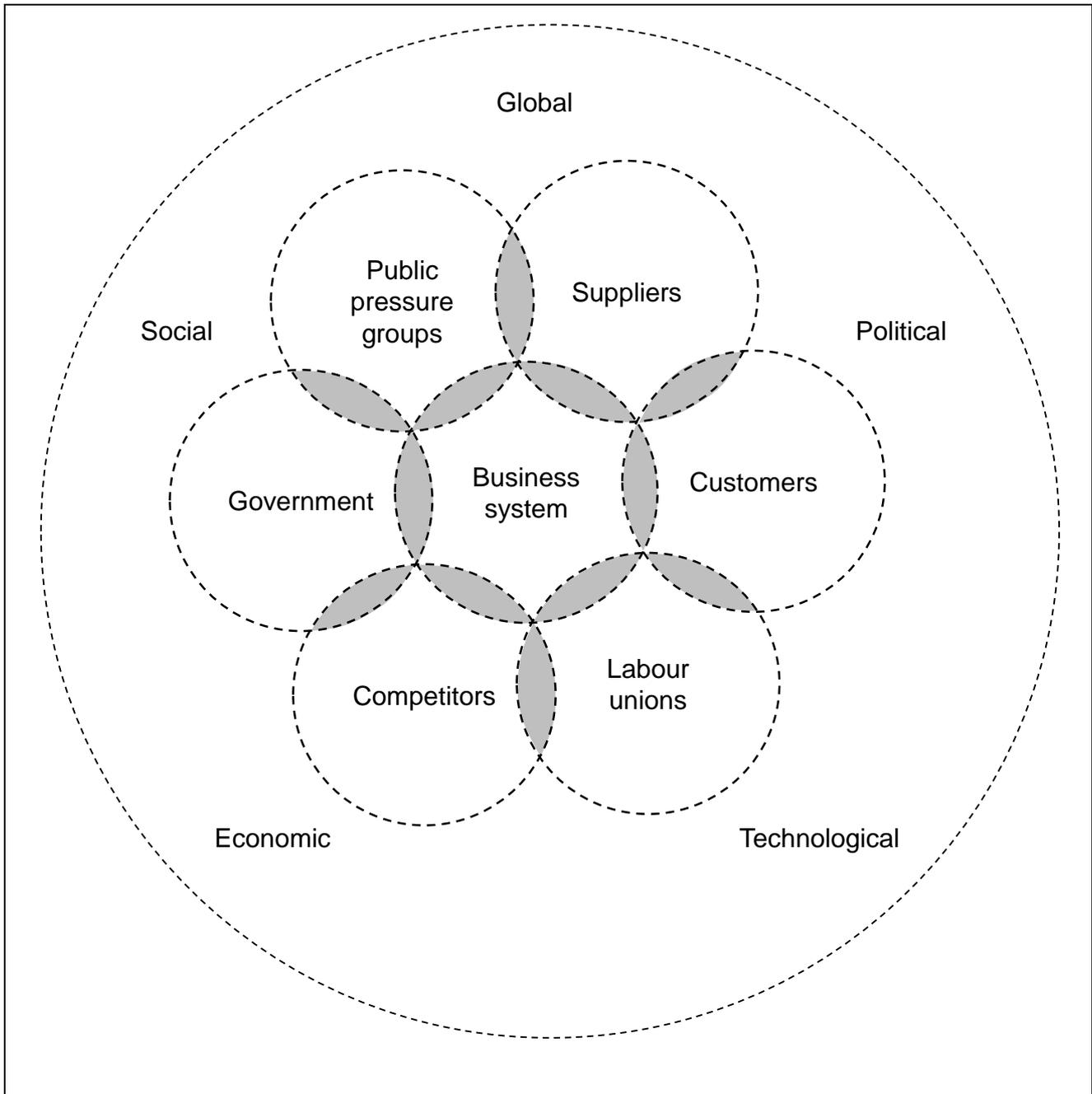
Figure 1.2: Emerging systems complexus

Source: Robbins and DeCenzo, 2005:42 (amended)

1.4.2   A systems thinking approach

Systems thinking is a process of understanding how things relate to one another and influence one another within a whole, and requires a holistic worldview for purposes of comprehension. Boardman and Sauser (2008:2) define systems thinking as a deliberate attempt to think. It prevents thinking from being derailed by emotion, perplexity, and disagreement, being besieged by arguing, opinion, doctrine, and information (Boardman and Sauser, 2008:2). This

results in perspectives not being suppressed, but rather characterised by sensible multiplicity and diversity.

Systems thinking is a methodology to take a situation and attempt to work towards a common and ideal future for all the stakeholders involved, through a holistic and systemic approach (Boardman and Sauser, 2008:2). The concept of an ideal future is borrowed from future mapping (Phillips, 1996:10-18) and is similar to scenario planning, except that it is performed in a reflective manner (Othman, 2007:263). Whereas scenario planning concludes with the planning of possible scenarios, future mapping consists of three steps, beginning with the defining of a convincing ideal future (Phillips, 1996:10-18). This means that a date of completion, in other words for reaching the scenario outcome, is agreed on and is set as a target to work towards. It is almost knowing what is going to happen, before it has happened in real time. Chapter 2 deals more extensively with the concepts mentioned in this paragraph.

Haines (2005:12) describes systems thinking as a way of seeing the whole as primary and the parts as secondary. It requires a higher-level worldview with which to filter and mentally frame what is seen in the world. It is a tool for finding patterns and relationships amongst sub-systems, and is a shift from seeing elements, functions, and events to seeing processes, structures, relationships and outcomes.

In applying a systems thinking approach to scanning, scanners have the opportunity to view the external environment as a whole, with the various social system components in it. These include social trend changes, political dynamics and economic and technological systems, as parts of the whole, being the more indirect interactive forces in the external environment (Plunkett, Attner and Allen, 2005:127). Similarly, customers, shareholders, suppliers and stakeholders, competitors and labour unions are also systems making up the whole, but, according to Plunkett, *et al.* (2005:127), are the more direct interactive forces of a business.

Wilber (1995:37) argues that the whole is not a complete and finite whole in itself, but a part-whole of a whole, and that one can never arrive at a complete whole. A whole is an unending series of part-wholes. This view of the environment, its systems, and the relation between them, points to the notion that the environmental components, according to Wilber (1995:33), "cannot be understood as things or processes, neither as wholes nor parts, but only as simultaneous part-wholes". As an example, the social system components in the environment are the parts of other wholes, also being systems in themselves, referred to as sub-systems (Franco-Santos, Kennerley, Micheli, Martinez, Mason, Marrand Gray, 2007:786) of a larger system.

Figure 1.3 illustrates how a business systemically scans the external environment, viewing the components in the environment and the emerging complexities between them. The small circles, overlapping into the larger circle of the economic system, represent co-contributing sub-systems of the economic system.

According to Wilber's (1995:33) explanation of the concept of a part-whole, the directly interactive systems of a business of government and labour, as per the example illustrated in Figure 1.3, form parts of the whole of the economic system, which in itself is a part-whole. The economic system is a co-contributing system to the larger external environment, and in this sense, may be viewed as a part-whole of that larger system, or whole. The overlaps between co-contributing systems, as sub-systems of a larger system, contain the emergent space, referred to as the emerging systems complexus.
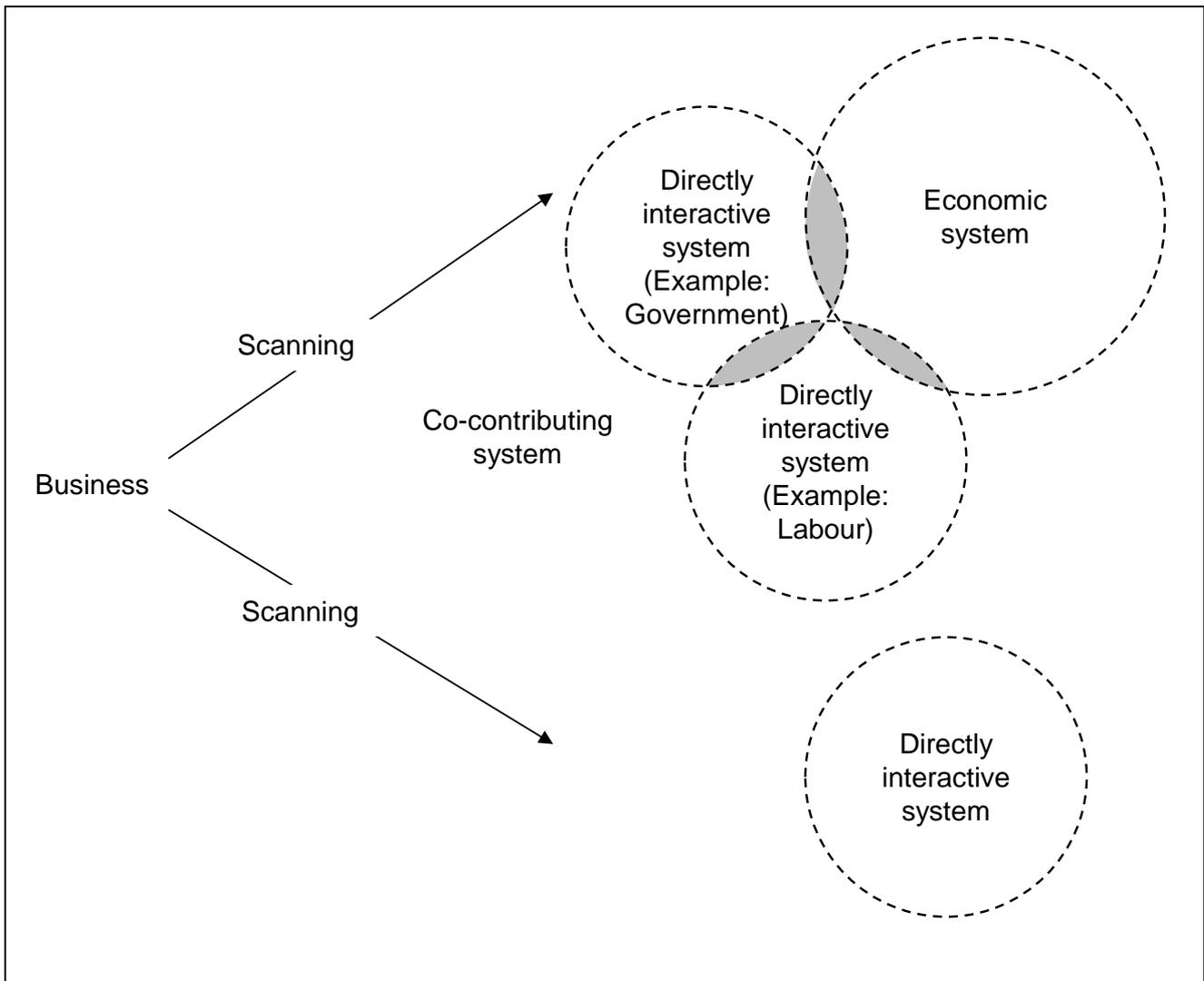
Figure 1.3: Co-contributing systems to a larger whole

Source: Plunkett, *et al.* 2005:127 (amended)

According to Senge (1990:127-128), the effectiveness of a systemic approach is that it allows one to look at multiple cause-and-effect relationships, over time, between environmental systems, such as those illustrated in Figures 1.1, 1.2 and 1.3.

1.5   THE DELIMITATION OF THE STUDY

To delimit the research for this study, a distinction has been made between the internal and external business environment, scanning frameworks, scanning processes, methodologies and techniques.

1.5.1   The internal and external business environment

According to Bryson (2004:38), businesses scan both their external and internal environment. Figure 1.4 is an illustration of environmental spheres as levels of influence that a business has over the systems constituting a particular sphere.
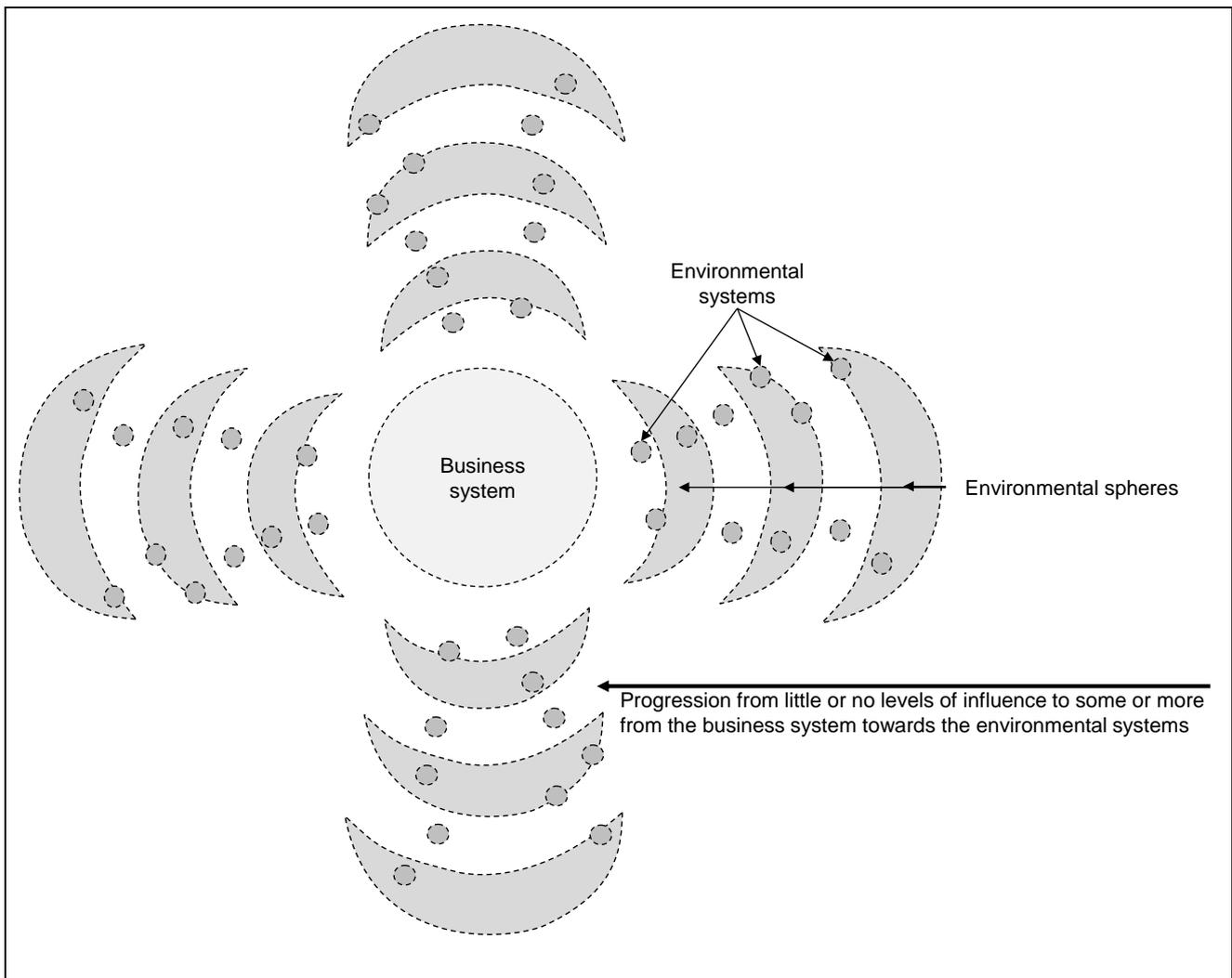
Figure 1.4: Environmental spheres around a business

Source: Grant, 2005:68 (amended)

The delimitation of this study is contextualised within environmental spheres. The focus is on the external environmental sphere, be that the transactional sphere or the contextual sphere, or both. The environmental systems, over which a business has higher levels of influence, constitute the transactional environmental sphere. Those, over which it has lower levels of influence, constitute the contextual environmental sphere (Dostal, Cloete and György, 2005:54). The reason for selecting the external environmental sphere is based on, amongst other things, the apparent lack of attention given in current strategic management literature to a conceptualisation of this environmental sphere, thus constituting a need for such research. According to Mir and Watson (2000:941-953), this lack of attention is primarily due to the dominance of the realist paradigm in strategic management literature.

Table 1.2 presents supportive research in this regard, based on research done by Burt, *et al.* (2006:56) in this regard. Burrell and Morgan (1979) argue that the realist ontological paradigm suggests that the social world peripheral to individual cognition is a *bona fide* world. The paradigm rests on the assumption that the social world consists of hard, concrete and relatively absolute structures, existing separately of an individual's approval of it. This implies that the individual is born into a social world, and exists within this social world, which has an independent reality.

Table 1.2: Textbook coverage of environmental analysis

Authors and textbook	Number of pages per book devoted to environmental analysis	As percentages
Ansoff, Corporate Strategy, Penguin Books (1965,rev. 1987)	7 of 273 pages	2.56%
Pearce and Robinson, Strategic Management: Formulation, Implementation and Control, 5th ed., Irwin (1994)	15 of 413 pages (excluding case studies)	3.63%
Wheelen and Hunger, Strategic Management and Business Policy, 5th ed., Addison Wesley (1995)	9 of 395 pages (excluding case studies)	2.28%
Wit and Meyer, Strategy, Process, Content, Context, An International Perspective, International Thomson Business Press (1998)	19 of 885 pages (excluding case studies)	2.15%
Mintzberg and Quinn, The Strategy Process: Concepts, Contexts, Cases, 2nd ed., Prentice Hall(1991)	2 of 814 pages (excluding case studies)	0.25%
Thompson and Strickland, Strategic Management, Concepts and Cases, 12th ed., McGraw-Hill(1990)	1 of 408 pages (excluding case studies)	0.25%
Johnson and Scholes, Exploring Corporate Strategy,6th ed., Prentice Hall (1999)	15 of 591 pages (excluding case studies)	2.54%
Miller and Dess, Strategic Management, International edition, 2nd ed., McGraw-Hill (1996)	19 of 529 pages (excluding case studies)	3.59%
Rowe, Mason, Dickel, Mason, and Mockler, Strategic Management: A Methodological Approach, 4th ed., Addison Wesley (1994)	13 of 583 pages (excluding case studies)	2.23%
Mintzberg, Quinn, and Ghoshal, The Strategy Process: Concepts, Contexts, Cases, Rev. European ed., Prentice Hall (1995)	3 of 980 pages	0.31%
Grant, Contemporary Strategy Analysis, 3rd ed., Blackwell (1998)	4.5 of 443 pages	1.02%
Collis and Montgomery, Corporate Strategy, Resources and the Scope of the Firm, Irwin (1997)	1 of 197 pages (excluding case studies)	0.51%

Source: Burt, *et al.* 2006:56

1.5.2   Scanning frameworks, processes, methodologies and techniques

Further to the discussion of the delimitation of this study, the distinction and relationships between scanning frameworks, processes, methodologies and techniques, are provided. The primary focus is on the theoretical construction of conceptual scanning frameworks, whilst the secondary focus is on the applied processes of scanning, through various methods and techniques.

Figure 1.5 is a conceptualisation that provides for the inclusion of the epistemological and ontological perspectives of scanning, as developed by Wilber (1995:121-126). It distinguishes between individual and social dimensions (cf. 1.5.1). The individual dimension, positioned above the horizontal axis, contains an intentional and behavioural component, separated by the vertical axis. In its turn, the social communal dimension, containing a cultural and social component also separated by the vertical axis, is conceptualised below the horizontal axis. The epistemological world of the individual scanner and the ontological scanned world are conceptualised and illustrated by the resultant four quadrants in Figure 1.5.
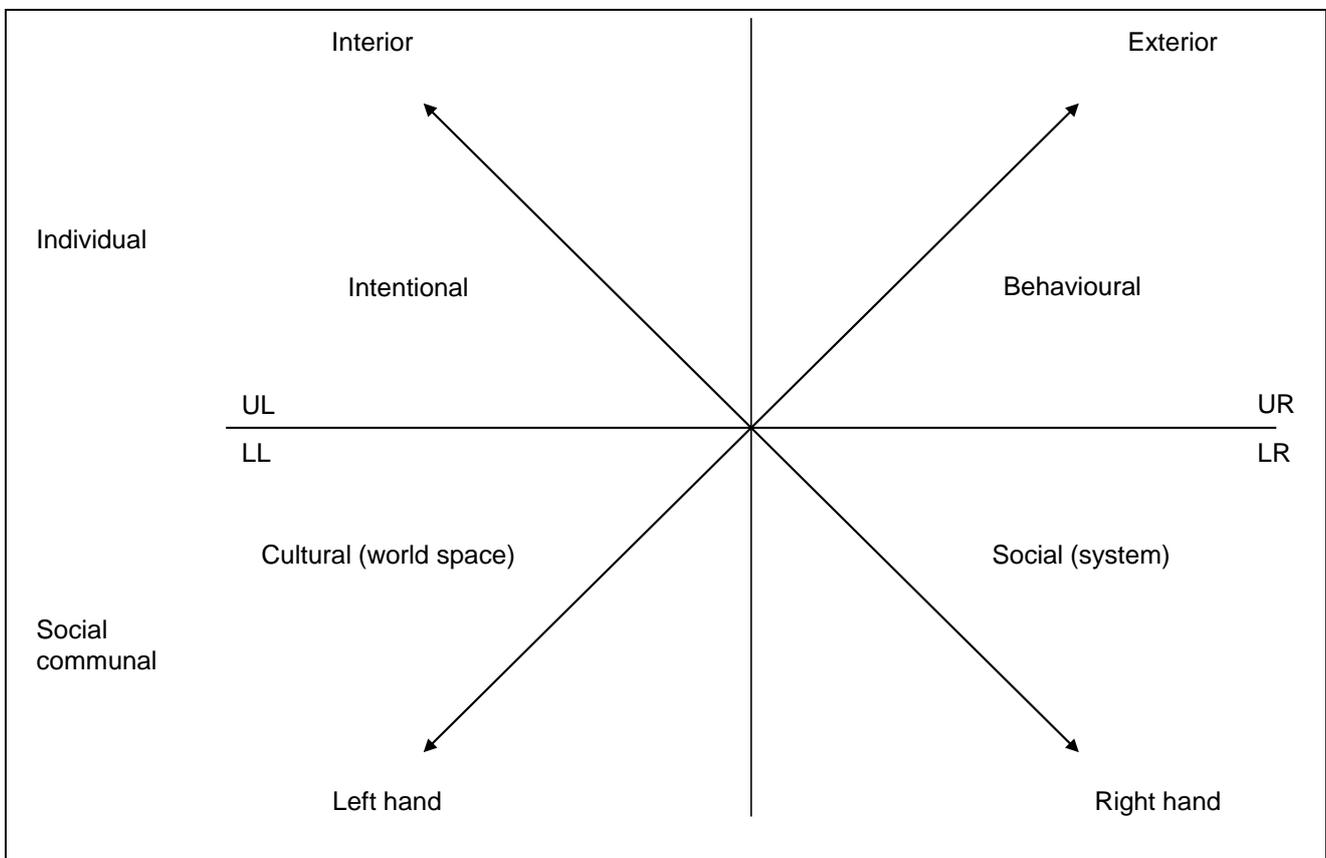
Figure 1.5: The four-quadrant meta-scanning conceptual framework

Source: Wilber, 1995:122

In Figure 1.5 UL indicates the **U**pper **L**eft quadrant. Similarly, UR indicates the **U**pper **R**ight quadrant, LL indicates the **L**ower **L**eft quadrant and LR indicates the **L**ower **R**ight quadrant.

More detail pertaining to the respective quadrants, specifically in terms of the evolutionary levels of development in each quadrant, is provided in Chapter 2 of this study.

Conceptualised as part of the delimited field, based on the notion of part-wholes (Wilber, 1995:37), are part systems or sub-systems co-contributing to larger social systems. Figure 1.6 illustrates this phenomenon of part-wholes through means of the co-contributing systems of government and labour, as examples. There is no significance in the selection of these two systems, but the significance lies in the overlap itself, suggesting the formation of an emerging complexus between these two systems. The arrows in the figure represent what Voros (2003:37-62) calls the evolving nature of systems in the external environment, pointing towards a continuous evolutionary development of these systems.
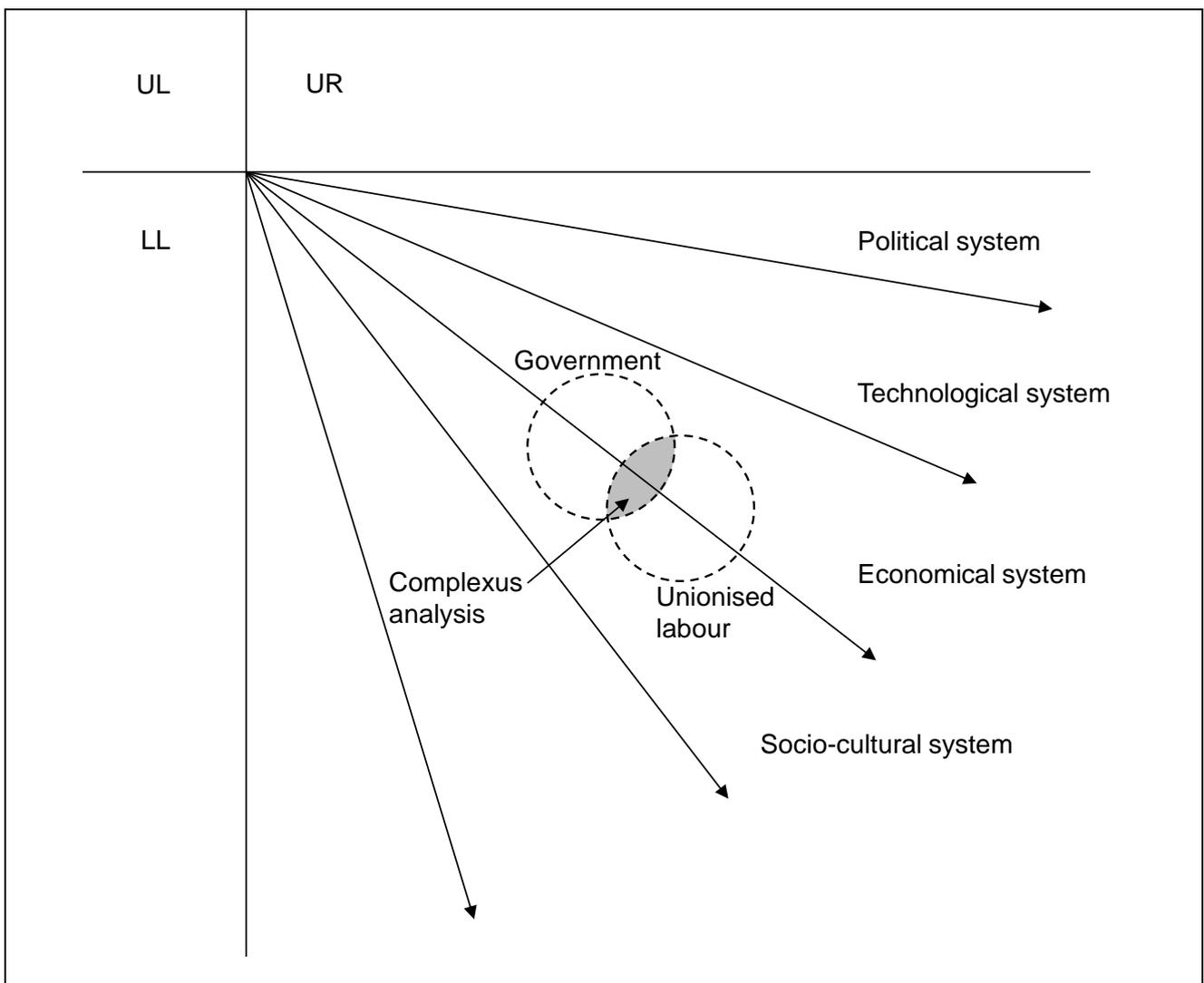
Figure 1.6: The lower right ontological social systems quadrant of the four-quadrant meta-scanning conceptual framework

Source: Voros, 2003:59 (amended)

Figure 1.6 is a conceptualisation of the delimited ontological field of this study, to which the epistemological dimension is added, leading to an expanded conceptualised scanning framework. This expanded conceptualisation is an attempt to include the multi-dimensionality (Dostal, *et al.*, 2005:195) of the systems scanned, as illustrated in Figure 1.6, and inclusive of the dimension of an emerging systems complexus. Furthermore, it considers how a scanner's worldview shapes the scanned reality, and is an effort to combine the ontological and epistemological dimensions of scanning in a coherent expanded conceptual scanning framework.

1.6   THE RESEARCH OBJECTIVES

The primary objective of this study is to investigate whether there is a need for an expanded conceptual scanning framework, which could benefit businesses by enabling a deeper and broader scanning and concomitant information yield. Part of the investigation concerns a proposal for such an expanded conceptual scanning framework, as conceptualised by the researcher and presented in Chapter 3 of this study. The framework considers the phenomenon of emerging newness between environmental systems, and applying the framework through a systems thinking approach. In proposing such an expanded scanning framework, the researcher does not negate the possible existence of other supplementary approaches that could enhance current scanning frameworks. The application of a systems thinking approach has led the researcher to include elements, characteristics, dimensions and qualities of systems thinking into the expanded conceptual scanning framework. Amongst other things, these include the dynamism of movement between environmental spheres in environmental systems, the evolutionary levels of development of these systems, hierarchical levels of influence between environmental systems, and the respective worldview(s) of these systems. Chapter 3 of this study provides more detail regarding the inclusive components of the expanded scanning framework.

A secondary objective of the study is based on some of the preliminary findings from the literature review. These findings relate specifically to the steps that a business takes in progressing from scanning to strategy selection. The review elucidates the relation between the respective steps, and sets up the context in which the researcher proposes an expanded scanning framework. The steps, identified through the literature review, are those of scanning, scenario planning and strategy selection. Together, these steps serve to enhance the performance of a business within a specific environment. A re-confirmation of the relation between these steps, or activities, constitutes the secondary objective of this study. In this regard, the relation between scanning and information gathering, information gathering and

scenario planning, scenario planning and strategy selection, and strategy selection and business performance, is researched.

1.7 THE SCOPE AND LIMITATIONS OF THE STUDY

1.7.1 The scope

The scope of the study is limited to the realm of business and management and as such, according to Watkins (2010:7), belongs in the research paradigm of the social world, not in the physical and natural world.

The nature of the study has led to the selection of a qualitative model for the primary research component, which entails an exploration of the opinions of managers and executives on environmental scanning. The researcher employs an interpretive paradigm, which reflects the ontological belief that there is not only one objective social reality, but multiple realities. This paradigm allows for an inclusive approach to the different points of view that businesses and their managers have of environmental scanning, the different techniques and methodologies used, and opinions regarding the value of this process in relation to scenario planning, strategy selection and business performance.

The scope of the study encompasses an investigation of the interpretive dimensions of scanners. This is based on the conceptual models of interpretation through perceptual filters, and considers the ontological truism that all scanning is done through perceptual filters (Voros, 2003:37). In this regard, the study builds on research into the reframing of business environmental conceptual scanning frameworks, which is provided in Chapter 2 of the study. Part of the qualitative analysis of the study includes exploring the reasons why specific strategies are selected, based on the provision of certain dimensions of information. In this regard, according to Katsioloudes (2002:81), a correlation between what is scanned as an object, and what is deduced as decisions, does not imply that a scanned object may lead to prediction. The correlation might be evident, but prediction is not always possible (Katsioloudes, 2002:81). The scope of the study includes addressing this predicament through the proposing of an expanded scanning framework.

Strategy, as the juncture between environmental scanning and an organisation's capacity, has an environment-strategy interface and an organisation-strategy interface. According to Grant (2005:132), the components of the strategy juncture are business capability and environmental opportunities and threats. Figure 1.7 illustrates this juncture and interface components.
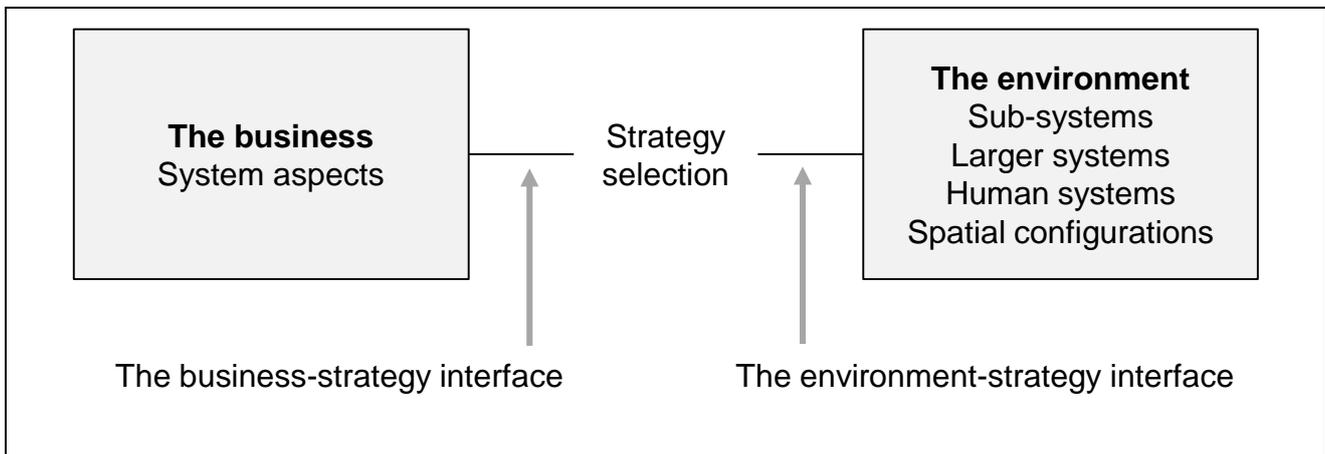
Figure 1.7: The business-strategy and environment-strategy interface

Source: Grant, 2005:132 (amended)

The information that is gathered by scanning the environment, influences the strategy selection juncture directly and in this regard, scanning forms the focal point of the scope of the study.

1.7.2   The limitations

The limitations of the study pertain to the field of study, as well as to the research method. The research resides in a conceptual paradigm, being that of a conceptual scanning framework. According to Grant (2005:68), existing conceptual scanning frameworks are designed and created on the grounds of what a business believes the environment consists of, as a fundamental assumption. Such conceptual scanning frameworks supposedly contain the totality of the units of analysis in a given environmental sphere to be scanned. However, the total environment is still a part-whole, conceptually (Wilber, 2005:37). In this regard, the limitation of the study field results from the factual component of the research in terms of facts, basic elements and information stemming from reality, but limited by what Wright (2005:94) terms the temporary status of the gathering thereof.

Regarding the limitation of the research method, Slaughter (2003:19) refers to the prepared human mind as that which discerns information, knowledge and insight from the information gathered through environmental scanning. A limitation of this study is that the literature review yielded no single definition of such a prepared human mind. The question is; who, internally or externally in a business, qualifies as skilled where scanning is concerned? What constitutes the so-called prepared human mind? Chapter 4 of this study expands on this limitation.

1.8   THE RESEARCH METHODOLOGY

This section explains the specific research methodology employed; the framework which guides the analysis of the study, the research strategy, and design.

The research methodology involves the conceptualisation of an expanded conceptual scanning framework, based on findings from the literature review, executed during the secondary research phase of the study. Through the primary research phase, the methodology enables the extension of efforts to provide conclusive recommendations pertaining to the research question (cf. 1.2). The research methodology involved determining the extent to which businesses perform scanning and related derivative activities as per the findings of the literature review. This was effected through the construction and application of a Likert scale questionnaire, which was presented to a sample of respondents.

The research methodology furthermore entailed that participating research stakeholder groups were involved. Their involvement pertained to the conceptualisation process of the expanded conceptual scanning framework, in that the stakeholder groups assisted in determining which statements should be included for the conceptualisation of the expanded conceptual scanning framework, and which not. It also entailed involving the stakeholder groups when the Likert scale questionnaires were designed to be utilised as the data collection method during the primary research phase of the study. Regarding the involvement of research stakeholder groups, the researcher applied an amended version of the Diamond Research Model (Van de Ven, 2007), depicted in Figure 1.8., allowing for engaged scholarship. The research method included the application of the four stages of the Diamond Research Model in soliciting stakeholder group participation. The four stages are problem formulation, conceptualisation through induction or deduction, conversations held with knowledge experts from practice fields and functions where challenges were addressed, and problem solving.

Chapters 3 and 4 of the study provide the detail regarding the application of the Diamond Research Model in guiding the research methodology.

The research approach of the study is a theoretical one. The topic is studied by perusing the contributions of other researchers, reflecting on their writings, and applying the researcher's intellectual capabilities in constructing an expanded conceptual scanning framework.

An analytical research purpose has been selected, since the research aims to comprehend the phenomenon of scanning in more depth and width. This is done through investigating relationships between scanning and business performance, and the activities that derive from

that. The derivative activities are information gathering, scenario planning, and strategy selection. The study follows a qualitative research process and applies an inductive logic.
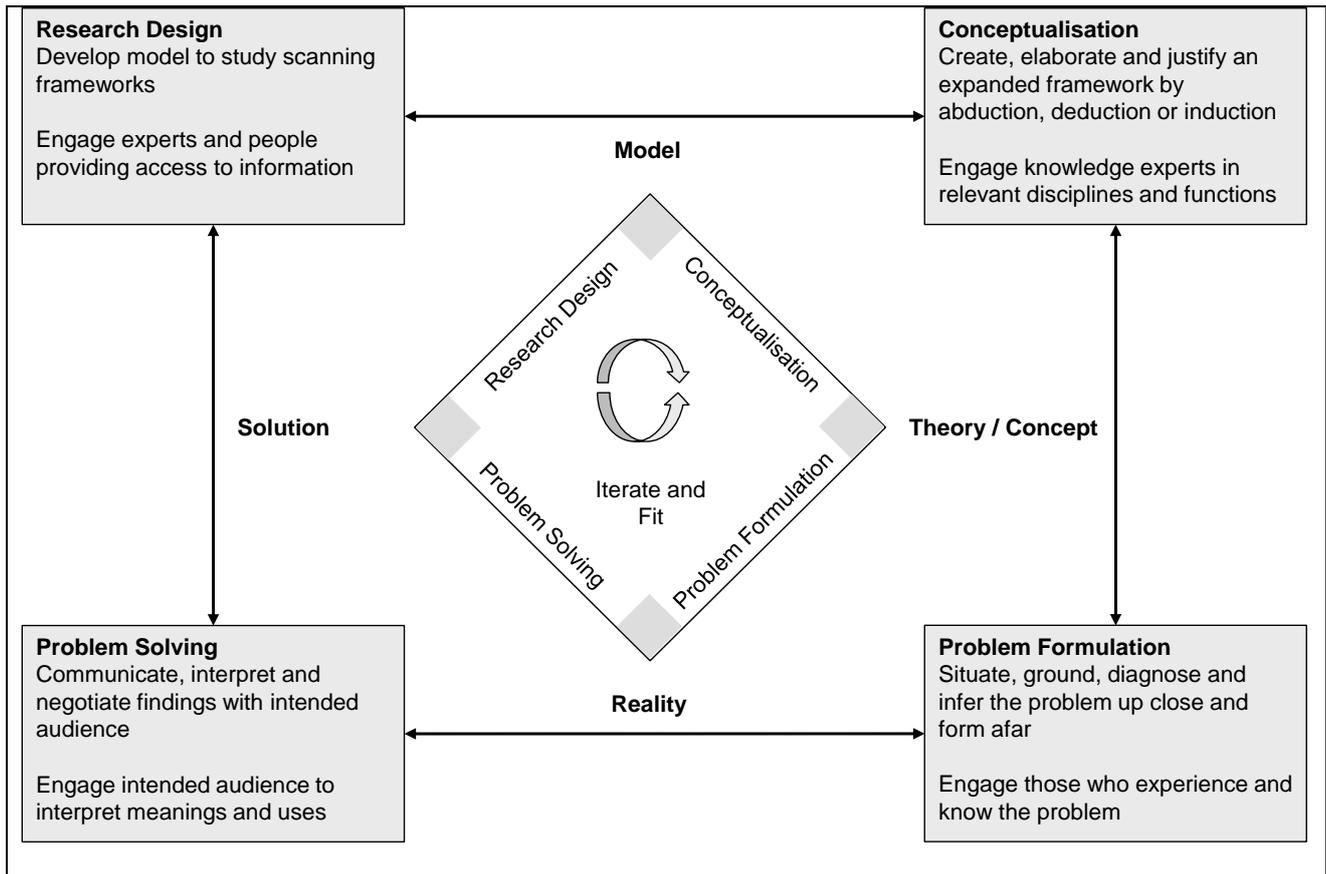
Figure 1.8: Practising engaged scholarship

Source: Van de Ven, 2007 (amended)

The qualitative qualification of the research process has to do with the research focus (Leedy and Ormrod, 2001:102). The focus is more holistic than specific, and deals with unknown variables in terms of a possible emergent design of an enhanced conceptual scanning framework. Simultaneously, the epistemological perspectives of individuals are included as a source of data, allowing for the personal views and opinions of those individuals involved in the primary research phase of this study as a selected sample of respondents. These distinguishing characteristics qualify this study as phenomenological (qualitative) research, as opposed to positivist (quantitative) research.

A Spearman's Rank Correlation coefficient is applied to the research results in order to determine the non-parametric measure of statistical dependence between the questionnaire statements (dependent variable), and the participants' mode of completion (independent variable). An analysis of variance (ANOVA) is also performed in order to provide a statistical account of whether or not the means of the responses to specific Likert scale questionnaire

categories are equal. The detail regarding these aspects of the research is presented in Chapter 4 of this study.

Inductive research logic is employed, and the outcome of the research is applied research, not basic research. This is because the outcome of the study relates to the application of the findings in order to address the specific and existing challenges associated with current environmental scanning.

The stages of the research are as follows:

- the literature review;
- the conceptualisation of an enhanced scanning framework;
- the primary research, including the survey instrument and measurement scale, data gathering and analysis, and reporting on the research findings;
- conclusions regarding the conceptualisation of an expanded scanning framework and the value of its application; and
- recommendations, including recommendations for further study.

The following paragraphs present more detail about these stages.

1.8.1   The literature review

The sources of information utilised for the literature review include the following:

- South African and international books, journals, peer reviewed articles, current topical articles and electronic media relevant to the topic;
- presentations and papers prepared for conferences on aspects of the topic area;
- documented interviews with South African and international experts in the field – both managers of organisations and independant business consultants;
- keyword searches in the full text academic research database of EBSCOhost;
- general searches on the internet via search engines such as Google and Yahoo; and
- business confidence and risk reports for businesses wishing to expand their national and international footprint through increased market penetration.

The literature review contains the various themes pertaining to this study. It presents information on the development of conceptual scanning frameworks and elaborates on how these are currently applied by businesses. It also presents the findings related to environmental hierarchical levels of influence between businesses and environmental systems, depicted in these frameworks, as well as the environmental systems constituting these hierarchical spheres. Scanning statements and concepts that form the basis for the

conceptualisation of an expanded scanning framework are identified during the literature review. These refer to those statements selected and presented to a sample of respondents during the empirical research component of this study. The detail of these statements, along with the proposed expanded conceptual scanning framework is presented in Chapter 3 of this study.

The review brings to light various viewpoints pertaining to the relation between scanning, information gathering, scenario planning, strategy selection and business performance. The section where these viewpoints are discussed contains a combination of the findings on scanning frameworks, methodologies, and scanning approaches. It includes current and historical scanning framework and methodology examples, as well as an investigation into the application of a systems thinking approach to scanning. In doing so, it establishes the context within which a potential expanded scanning framework can be conceptualised. The review distinguishes between three main pillars: conceptual scanning frameworks, application methodologies and techniques of scanning, and scanning approaches.

1.8.2   The conceptualisation of a scanning framework

Grant (2005:68-69) refers to the conceptual scanning frameworks used by business as "some kind of system or framework". The literature review has revealed numerous illustrations and explanations of conceptual scanning frameworks. The existing body of literature contains details of how researchers and scanners have constructed these frameworks over the recorded history of their development. In Chapter 3, the researcher presents an attempt at expanding on these current frameworks. This is based on the assumed theoretical accuracy of the information gleaned from literature review, and what has been observed regarding the phenomenon of scanning and its related derived activities.

1.8.3   The primary research

The primary research component of the study has been aimed at determining the extent to which businesses currently perform scanning and related activities, relative to the identified statements regarding these activities. Out of the literature reviewed, statements were identified and selected to constitute the basis for the conceptualisation of the expanded scanning framework. After the statements been gleaned from the review of the literature and the attempted expanded scanning framework conceptualised and proposed, the primary research component followed.

The detail regarding the statement selection process and subsequent compilation of questionnaires with a Likert scale measurement, being the preferred data collection instrument used, follows in Chapter 4 of this study.

1.8.3.1 *The survey instrument and data gathering*

Mouton (2002:103-104) cautions against the pitfalls of designing new instruments for gathering and measuring information when conducting social research. These are instruments such as questionnaires, scales, interview schedules and psychological tests. The survey instrument selected for this study is a set of Likert scale questionnaires, designed in accordance with the recommendations made by Mouton (2002:66) and with the assistance of two stakeholder groups. One of the groups is a team of independent experts on scanning and related matters, and the second team is a group of managers who perform scanning and related derivative activities in their workplace. Mode 2 research, stemming from the use of the Diamond Research Model (Van de Ven, 2007), provides the basis for this stakeholder participative method of research. The detail is provided in Chapter 4 of this study.

1.8.3.2 *Data analysis*

The questionnaires were compiled by utilising a seven-point Likert scale to measure the opinions expressed by the respondents. The researcher mailed the questionnaires to the participants and manually calculated and processed their responses. The findings are reported on and set the scene for the recommendations and conclusions for this study. The data analysis includes the results of performing an analysis of variance (ANOVA) test and a Spearman's rank correlation coefficient test on the Likert scale questionnaire responses. This is done in order to increase the validity and reliability of the research results.

1.8.3.3 *Reporting the findings*

Following on the collection and recording of data the data is described by means of classifying and interpreting it. The results are presented in written format in Chapter 5 of this study and are elucidated by means of tables and figures.

1.9 THE RESEARCH ASSUMPTIONS

Scanning and information gathering, information gathering and scenario planning, scenario planning and strategy selection, and strategy selection and business performance constitute the different activities related to scanning. In this study, these are referred to as scanning derivative activities. Each of these activities is grounded in an assumption, stated below. These activities, and how they relate to scanning, form the context within which the sample respondents had to respond to the five respective Likert scale questionnaires.

These assumptions are:

- that the information yield and its integrity (from the Latin adjective *integer*, meaning whole or complete) derived from scanning, is determined by the depth and width of the scanning framework and methodology applied (Hyde, 2000:26; Grundy, 2004:9; Voros, 2003:3; 19, 28; Fahey and Randall, 1998:86);

- that scenario planning is impacted on by the information yielded by the scanning process (Katsioloudes, 2006:47; Cothern and Ross, 1994:241; Kotler and Armstrong, 2003:223; Manning, 2004:76);

- that strategy selection is impacted on by the scenarios planned, based on the integrity of the information provided through scanning (Hamal and Prahalad, 1994:144; Miles and Snow, 1978:252-255; Thompson and Strickland, 1999:89; Bryson, 2004:46; Haines, 2000:93-99; Porter, 2004:183; Levicki, 1999:29);

- that business performance is determined by a selected strategy, as the juncture between performance and scanning, within the context of a specific environment (Grundy, 2004:9; Voros, 2003:10; Robbins and DeCenzo, 2005:84; Burgelman, 1996:493; Schemmerhorn, 2005:88; Wheelen and Hunger, 2002:9; Friedman, 2006:441); and

- that scanning is impacted on positively by the application of a systems thinking approach in an effort to increase the integrity of a scanning framework and methodology (Dostal, *et al.*, 2005:200; Walters and Tang, 2006:216; Linstone and Mitroff, 1994:23; Wilber, 2000:71; Boardman and Sauser, 2008:96).

1.10 OUTLINE OF THE STUDY

The contents of all the chapters of this study, apart from Chapter 1, are summarised in the form of executive summaries. The summaries of Chapter 2 to Chapter 6 are presented in the next section.

1.10.1 Chapter 2

Chapter 2 contains the findings from the literature review component of this study. The introductory section provides a brief background on the development of conceptual scanning frameworks currently used by businesses. Following on the introductory section, the information gathered from reviewing the literature on the relation between scanning and information gathering, information gathering and scenario planning, scenario planning and strategy selection, and strategy selection and business performance, is presented and discussed. The chapter concludes with a discussion of systems thinking as an approach to scanning, and the related impact thereof.

1.10.2   Chapter 3

Chapter 3 contains a proposal for an expanded conceptualised scanning framework. It presents a number of statements identified during the literature review, which are used as a basis for the conceptualised framework, in table format. These are the same statements as those used in the Likert scale questionnaires during the primary research component of this study. The chapter explains the research logic and process of progressing from the identification of these statements to that of conceptualising an expanded scanning framework.

1.10.3   Chapter 4

Chapter 4 focuses on the primary research component of this study, highlighting its methodology, the research design and research approach. It explains the operationalisation and sampling components of the research and elucidates the sources of error prevalent at the respective research stages. It continues with an explanation of endeavours to overcome these sources of error. The chapter discusses the rationale for the specific elements researched, as well as the motivation for using a seven-point Likert scale as the preferred data collection instrument.

1.10.4   Chapter 5

Chapter 5 presents the research results and findings, and describes the methodology applied during the primary research component of this study. The results reflect the extent to which current scanning practices are performed in relation to the identified scanning practice statements identified during the literature review. The results contain empirical evidence that illustrates to what extent and in which manner those businesses that participated in the research, currently perform scanning, scenario planning and strategy selection. It reveals how they view these activities in relation to information gathering, business performance and the application of a systems thinking approach to scanning.

1.10.5   Chapter 6

Chapter 6 contains conclusions and recommendations made on the basis of the results and findings of the research conducted. These are substantiated by the findings from the literature review and the primary research. Recommendations for further research, also in related fields, are also made.

1.11   CONCLUSION

Chapter 1 contextualises this study by providing the background to the study and the motivation thereof. It elaborates on how the researcher intends to achieve the aims of the study. The chapter provides clarification on the research question and defines the terminology used in formulating it. The chapter continues by expanding on the research topic, elucidating all it entails. The delimitation of the study is discussed with specific reference as to how complexus analysis relates to existing scanning framework conceptualisations, and where it fits in. The chapter closes with a brief description of the contents of the further chapters of the study, and some final remarks.

CHAPTER 2

A REVIEW OF THE LITERATURE ON SCANNING FRAMEWORKS, ENVIRONMENTAL SYSTEMS, AND SCANNING RELATED ACTIVITIES

2.1   INTRODUCTION

The research aims of this study are based on the assumption that an expanded conceptualised scanning framework has the potential of yielding an enhanced information compound whole (cf. 1.2), gleaned from the external environment. This in turn may increase the probability of more accurate scenario planning and strategy selection (Schmidt and Haines, 2005:2), leading to increased business performance. The findings from the literature review produce a platform for the conceptualisation of such an expanded scanning framework, presented in Chapter 3 of this study.

The literature review contains an analysis of current conceptual scanning frameworks, methodologies and approaches. It covers the point of information gathering and the correlated outcome of business performance (Auster and Choo, 1993:194). It elucidates the attempts made by other researchers to enhance scanning frameworks, methodologies and approaches. It discusses a wide field of concepts related to scanning that have been considered as possible components of improved business performance over a considerable period, dating back to the 1950s.

Cronje, Du Toit, Marais and Motlatla (2003:81-85) state that since the mid-1950s, environmental scanning has become increasingly more important to businesses, and that it has become an imperative for business performance and success. This imperative gained momentum from the 1970s onwards due to the amplified application of a systems thinking approach to management (Cronje, *et al.*, 2003:85). In the United States of America, businesses in the life insurance industries first recognised the importance of environmental scanning during the 1970s (Robbins and DeCenzo, 2005:100). Prior to this, government institutions such as the Central Intelligence Agency and National Security Agency of America were the organisations that typically would perform environmental scanning (Robbins and DeCenzo, 2005:100).

2.2   THE STRUCTURE AND FLOW OF CHAPTER 2

The literature review has revealed a number of differences in terminology, implied meaning, and perspective levels of understanding used by environmental scanners, business leaders and theorists in explaining the concept of business environment. Section 2.3 concludes by

giving the qualifications and motivation for a selection of preferred terms to discuss the review findings.

The term "environmental systems" is used to refer to those co-contributing entities that constitute the business environment. This includes a reference to sub-systems, larger systems, human systems and spatial configurations. The term "system" also refers to the units of informational analysis in a business environment.

Section 2.3 proceeds with a discussion of conceptual scanning frameworks. It presents the findings pertaining to environmental spheres and the hierarchical levels of influence between environmental systems. These systems include human systems (Hawk, 1999:62), sub-systems (Haines, 1999:2), larger systems (Haines, 2006:1) and spatial configurations (Juarrero, 1999:110). In Section 2.3, the researcher qualifies environmental system categories and aspects.

Section 2.4 discusses the relation between scanning and the information thus gathered. Section 2.5 presents the findings from the literature review on the relation between the integrity of the information gleaned from the environment, and scenario planning. The discussion includes references to the concepts of future predictability (Aaltonen and Sanders, 2006:29), forecasting (Slaughter, 2002:6), foresight (Aaltonen and Sanders, 2006:1-8) and ideal design (Horiuchi, 1999:182). The discussion focuses on systems aspects (Dostal, *et al.*, 2005:47), systems characteristics (Haines, 1999:1), systems dimensions (Del Valle, 1999:144) and systems qualities.

Section 2.6 discusses the relation between scenario planning and strategy selection (Thompson and Strickland, 1999:25), as well as between strategy selection and business performance (Auster and Choo, 1993:194). It focuses on the engagement between a business and its environment, through a better understanding of environmental dynamism and systems inter-relationships, rather than, according to Bernstein, Lebow, Stein and Weber (2000:43-76), advanced knowledge of the environment. Section 2.6 includes a discussion of complexus analysis and the application of a systems thinking approach to scanning, as well as its possible impact on scanning. Against the background of Wilber's (1995:37-38) cautioning, complexus analysis is not introduced as another reduced bit of the environment. This would only serve to increase empirical factual information. Rather, an attempt is made to increase the epistemological dimension of the scanner and broaden the ontological reality scanned in a designed manner (Voros, 2003:39), included as part of an expanded scanning framework.

2.3   CONCEPTUAL ENVIRONMENTAL SCANNING FRAMEWORKS

2.3.1   Environmental levels

In discussing scanning frameworks, a distinction is made between sources of information and units of analysis. The units of analysis include the conceptualised environmental levels or spheres, environmental systems constituting these spheres, and the phenomena of dynamism amongst environmental systems (cf. 1.3.4). Current conceptual scanning frameworks attempt to conceptualise these units of analysis and the relations amongst them (Grant, 2005:68). The sources of information include impersonal sources such as the print media and the Internet, as well as personal sources, such as colleagues, senior executives and peers in similar and different businesses (Auster and Choo, 1993:197).

The units of analysis are discussed with reference to the following:

- the different terminologies used to describe them;
- the implied meaning embedded in these descriptive terminologies; and
- the perceived levels of understanding of units of analysis as displayed by scanners, business experts, and theorists of environmental scanning.

The reason for pointing out the distinction between units of analysis and sources of information relates to how scanners view the environment through means of a framed conceptualisation. This impacts on how scanning is performed and on the resultant information compound whole, and its integrity, as an outcome of scanning (Sepulveda-Haugen and Testart-Tobar, 1999:1-2). Renfro (1993:19) presents a variety of taxonomies applied when businesses design conceptual scanning frameworks. He points out that, depending on the taxonomy applied by a business, scanners hold different views on what is contained in the environment, and similarly follow different approaches to scanning, through utilising different conceptual scanning frameworks.

Figure 2.1 is an example of such a scanning framework, illustrating the difference in environmental levels. Hellriegel, Jackson, Slocum, Staude, Amos, Klopper, Louw and Oosthuizen (2005:93) categorise these levels as a conceptualised competitive environment, technological forces, politico-legal forces and cultural forces. The figure categorises different environmental levels based on the relational status of influence between the business performing scanning and the components constituting the respective environmental spheres. Figure 2.1 depicts the ecosystem, political system, global considerations, economic system and demographics alongside one another, co-contributing to the formation of the general environment.
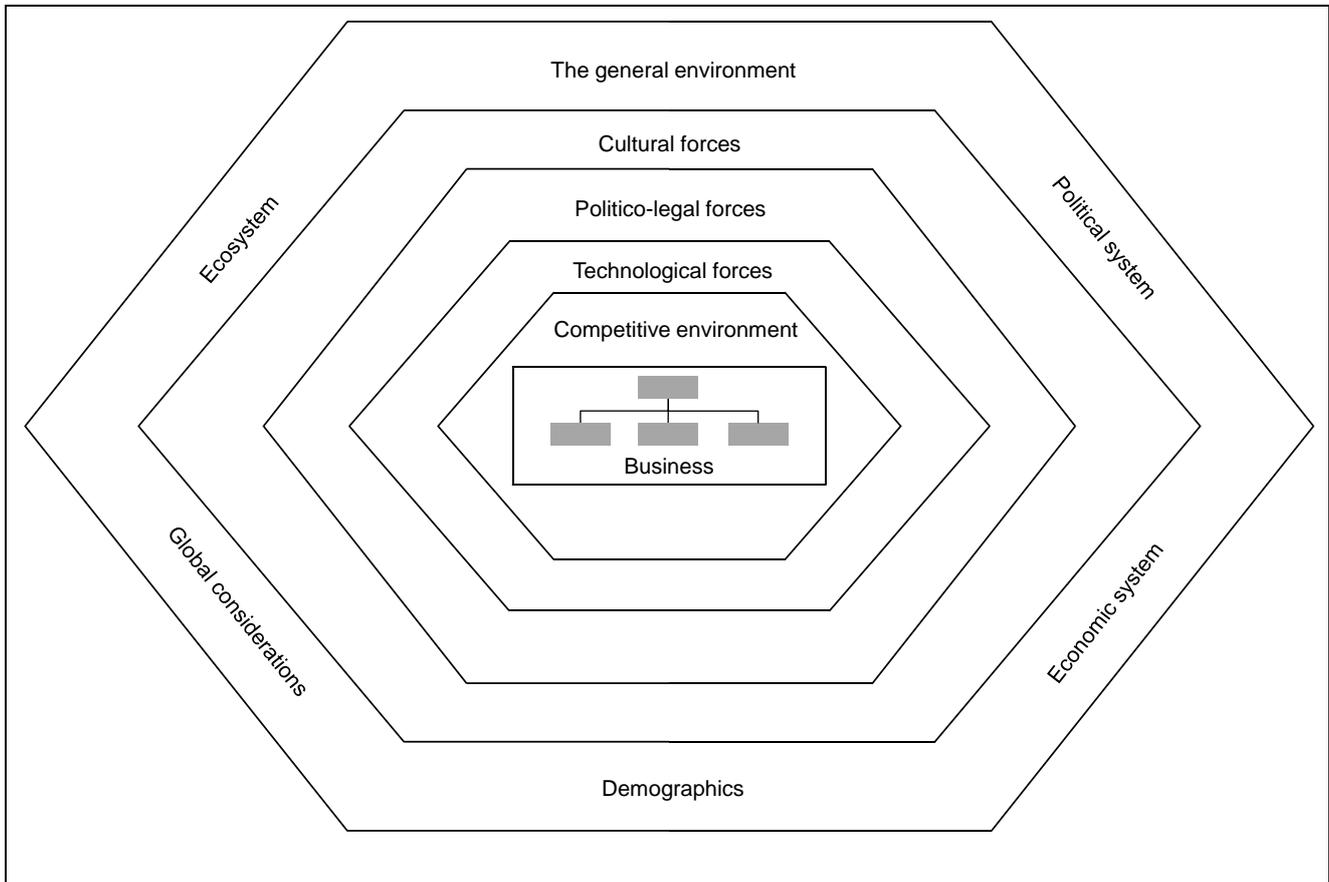
Figure 2.1: A conceptual scanning framework

Source: Hellriegel, et al. 2005:93

2.3.2   Hierarchical levels of influence

In Figure 2.1 the amplified bands around the centre square, depicting a business, represent environmental levels or spheres of influence between the business performing scanning and the components constituting these spheres (Hellriegel, *et al.*, 2005:93-94). Businesses differentiate between these spheres based on the proximity to the business of the environmental systems within the respective spheres (Grant, 2005:68). It ranges from the higher to the lower levels of influence that a business has over environmental systems (Boddy, 2002:207). The levels of influence are conceptualised through the proximity of the amplified bands to the centre square. The more amplified the band, the lower the level of influence that a business, depicted in the centre, has over the systems in that band.

Plunkett, *et al.* (2005:127) distinguish between the external environment containing the indirectly interactive forces namely technology, politico-legal, socio-cultural and economic forces, and the directly interactive forces represented by shareholders, customers, suppliers/partners, competitors and labour. Businesses make this distinction between direct

and indirect influences based on the conceptualised proximity between a business, as a system, to environmental systems or components (Plunkett, *et al.*, 2005:135-141).

Hellriegel, *et al.* (2005:102), make the point that taxonomic environmental classifications are not based on environmental systems as separate concepts, but rather a matter of degree relative to a business. The systems stand in a relational state of flux to the business, and to one another, depending on the relation between a business and the environmental system at a specific point in time (Dostal, *et al.*, 2005:55). The systems move between hierarchical levels of influence and are not limited to a specific level or band category based on the system itself (Dostal, *et al.*, 2005:55). Rather, the relational status between systems is either contextual (lower levels of influence, cf. 1.5.1) or transactional (higher levels of influence, cf. 1.5.1). The contextual environment is that part of the environment that affects businesses significantly. The transactional environment contains the systems that a business can influence to a larger or lesser extent. Scanning focuses on how the contextual environment may, according to Othman (2007:262), evolve. Changes in this environmental sphere might have serious repercussions for a business, as a business has very little or no influence over the systems constituting the contextual environment.

2.3.3 Human systems, larger systems, sub-systems and spatial configurations

Based on the requirement that current scanning frameworks need to cover all possible systems in the environment (Robbins and DeCenzo, 2005:34, 40-50, 83-84), this section advances the notion that environmental systems are categorised in terms of human systems, larger systems, sub-systems and spatial configurations (cf. 2.2).

Hirschhorn and Vasconcelos (1999:131) point out that human systems are created by people and therefore reflect the purposes and intentions of people. In this regard, human systems are institutions that consist of human regularity, governance, and concepts of law. Humans form social institutions that are influenced, designed, and created by humans (Hirschhorn and Vasconcelos, 1999:131). Figure 2.1 contains examples of such institutions, relevant for the conceptualisation of scanning frameworks. It includes stakeholders such as government, unionised/organised labour, supplier and buyer organisations, public pressure groups and rivals (Grant, 2005:68-83). The components are conceptualised as co-contributing to the formation of the competitive environment as depicted in Figure 2.1.

Whereas human systems have a particular shape in the form of governing bodies, organisational structures and/or committees, social systems in turn have a spatial configuration, although, according to Juarrero (1999:110), no shape or structure. In Figure 2.1,

the social systems conceptualised by Hellriegel, *et al.* (2005:93) include the political system, economic system and ecosystem. Voros (2003:59) conceptualises these systems in the lower right quadrant of the four-quadrant meta-scanning framework (cf. Figure 1.6), including the systems of technology and socio-culture. Relating to these social systems, also referred to as forces (McKiernan, 2006:19), Figure 2.1 refers to the cultural forces, politico-legal forces and technological forces.

The shaping phenomenon of human systems is based on the peculiar type of inter-relatedness that unifies and binds the system components in order to form structure (Juarrero, 1999:110). Those in a social system, however, are in a distance relation that configures the spatial relation, but does not structure it (Juarrero, 1999:109-110). In Figure 2.1, the system of the economy is an example of such a spatial configuration. Wilber (1995:87-89) calls this a spatial extension, which is co-contributed to by human systems, such as, amongst others, labour and government (Hellriegel, *et al.*, 2005:94).

Sub-systems and larger systems are related to one another in the sense that each system is seen as a part of a hierarchy. This means that systems, as sub-systems, co-contribute to the formation of larger systems (Puth and Lubbe, 1994:43). Lower level systems are more mechanistic and easier to understand compared to higher level and more complex systems (Puth and Lubbe, 1994:43). According to Wilber (1995:14-15, 192-197), these larger social systems develop in an evolutionary manner. Voros (2003:59) builds on this notion of evolutionary development, as conceptualised and illustrated in Figure 1.6 by means of indicating arrows (cf. 1.5.2). This implies that along with the fluctuation in the degree of influence that causes a system to be deemed as either transactional or contextual by relation (cf. 1.5.1) towards a business; social systems are internally in a state of evolutionary flux (Wilber, 1995:14-15).

Based on the level of influence of systems in the environment, according to Hellriegel, *et al.* (2005:92-110), businesses distinguish an internal- or micro-environment. This environment is the closest in proximity to the matters over which businesses have the highest levels of influence. A further distinction is that of the market- or task environment, which is also in close proximity and one over which a business has a fair level of influence. It is situated outside of the business itself, though. The third distinction that Hellriegel, *et al.* (2005:92-110) make, is that of the macro- or general environment. This consists of systems conceptually distant in proximity, and are systems over which businesses have very little or no influence.

From the literature review, it is apparent that systems can be human systems (Hawk, 1999:62), large systems (Kofman and Senge, 1993:13), sub-systems (Franco-Santos, *et al.*, 2007:27) or spatial configurations (Juarrero, 1999:110).

Each of these stands in a co-system/sub-system/larger-system relation to one another, implying that two human systems, as sub-systems, may co-contribute to the formation of a larger system, which may also be a human system. As an example, unionised labour, based on the aforementioned definition of a human system, qualifies as a human system. This being the case, unionised labour along with government, also a human system, co-contribute to a larger government/labour system. Should the larger government/labour system be one which is institutionalised, influenced, designed and created by the people, it qualifies as a larger system, but remains a human system (Hirschhorn and Vasconcelos, 1999:131). From the literature review, specifically regarding hierarchical levels of influence (Bryson, 2004:38) and the evolutionary state of flux of environmental systems (Wilber, 1995, 14-15, 192-197), it is apparent that systems from different environmental levels, or spheres, can co-contribute to the formation of systems in the same or a different level. The larger system may be in a conceptually distant relation to its co-contributing systems and can be either a larger human system, or a spatial configuration.

2.3.4   Environmental systems categories

To continue with reference to Figure 2.1, Renfro (1993:19) identifies a number of different generic environmental categories that jointly represent a conceptualisation of a business environment as has been proposed over the years. The acronym EPISTLE (Economic and Political systems, Institutional systems, Socio-cultural trends, Technological, Legislative and Ecosystems) represents such a categorisation. The EPISTLE methodology has considerable support amongst businesses (Renfro, 1993:19).

Acronym variations on EPISTLE include: PEST (**P**olitical-legal, **E**conomic, **S**ocio-cultural and **T**echnological analysis) (Wheelen and Hunger, 2002:52-53); STEEP (**S**ocial, **T**echnological, **E**conomic, **E**nvironmental and **P**olitical analysis); and PESTLE (**P**olitical, **E**conomic, **S**ocial, **T**echnological, **L**egal and **E**nvironmental analysis) (Voros, 2003:59).

These acronyms represent those environmental systems referred to as forces (Boddy, 2002, 67; McKiernan, 2006:19), or elements and components (Plunkett, *et al.*, 2005:127), or units of analysis in a conceptualised scanning framework. A business has different hierarchical levels of influence over these, depending on the temporal status of the relation between the system and the business at the time of scanning. According to Robbins and DeCenzo (2005:34), the

environmental systems over which a business could have higher levels of influence are competitors, government, labour, buyers, suppliers and public pressure groups. The relational status may change, however, from transactional to that of contextual (cf. 1.5.1), and back. Organised labour, according to Dostal, *et al.* (2005:54-57), is one such example. This movement between the spheres of influence between a business system and environmental systems is possible, as the categorisation of environmental systems is based on a matter of degree, and not a categorised static relational positioning.

Environmental systems, as units of analysis in scanning, are impacted on by a number of forces driving change. Businesses monitor these forces stay abreast of changes in the environment. According to Thompson and Strickland (1999:85-89), examples of such driving forces can be:

- customer and buying behavioural shifts;
- developments in the arena of possible new product innovation;
- advances in technology;
- new ways in which competitors market their products and/or services;
- the entry or exit of other larger competitive players in a specific industry;
- increasing globalisation of the industry;
- widening or shrinking differences in the costs and efficiencies among key competitors;
- regulatory influences and government policy changes;
- changing societal concerns, attitudes and lifestyles; and
- reductions in uncertainty and business risks in a specific industry.

A brief overview and definition of the systems comprising the business environment, as units of analysis, are provided in the following paragraphs. The discussion contains a variety of references that scanners, business leaders and theorists make with regard to these systems.

2.3.4.1   *Economic environment*

In Figure 2.1, the economic system is conceptualised as co-contributing, along with the political system and the ecosystem, to the general environment.

Over the past three decades, the assumption was that the economic environment would change slowly, rarely, or in predictable ways (Fahey and Randall, 1998:296), but lately the environment has been changing faster and in more unpredictable ways than before. With regard to economic change, the literature reviewed points to a number of change forces that affect the economic system, as a system or a spatial configuration. Examples of such forces are economic development in a specific region and the per capita income in that region

(Wheelen and Hunger, 2002:57) and, according to Fahey and Randall (1998:296), inflation, business cycle downturns, oil price volatility, exchange rates and likely major changes in a particular tax and regulatory environment.

The following is an example of how businesses may view the force of a change in per capita income. A high per capita income indicates the potential for high consumer spending, while a change in this figure, either up or down, might contribute to a change in the current consumer behaviour (Kotler, 2003:161). During a period of economic growth, businesses may choose a strategy to capitalise on the possibility of increased consumer spending (Katsioloudes, 2002:76). This may lead to businesses expanding, while an economic decline might bring about the opposite reaction.

Another example of the type of detail that businesses may glean from viewing the economic system is that which allows them to consider the relation between the dynamics of consumer credit funds being removed from the market and the serious long-term implications of large budget deficits, as predicted for the United States of America (Schmidt and Haines, 2005:2). This might affect the US Dollar's valuation against foreign currencies and international liquidity, the level of education among the population in economics, and inflation that could change spending patterns across the economy.

Other forces related to the economic system include taxes, gross domestic product trends, monetary and fiscal policies, employment levels, currency convertibility, membership in regional economic associations, and wage levels (Plunkett, *et al.*, 2005:138).

A total summation of the different forces and their interaction with one another, as well as the manner in which they collectively affect the economic system, is constructed by businesses in order to design the content conception of this specific environmental system, or category (Fahey and Randell, 1998:296-307).

Hellriegel, *et al.* (2005:94), make the point that even though businesses scan systems that co-contribute to their external environment, transactional and contextual, separately, the systems are linked across environmental spheres. An example is that a change in the nature of a labour system may have an impact on the economic system, and that whereas the labour system stands in a transactional relation towards business, the economic system stands in a contextual relation towards the same business. Based on this phenomenon it is possible that when scanning those forces that co-contribute to the status of a contextual environmental system, businesses may want to consider scanning other indirect forces that are affecting related sub-systems in the transactional environmental sphere.

2.3.4.2   Political-legal environment

In Figure 2.1, Hellriegel, *et al.* (2005:93) distinguish conceptually between politico-legal forces and the political system in the general environment. Plunkett, *et al.* (2005:139) describe the politico-legal forces as consisting of government, labour relations, tax and the regulatory movement. The political system in the general environment includes these aspects relating to legislation and regulation, but can also include the measure of political stability in a demographic region or the country as a whole. A deeper analysis and understanding of this system would cover the political ideologies and the issues driving particular ideologies.

Driving forces other than those identified by Plunkett, *et al.* (2005:139), may include a government's attitude towards foreign business ownership, and investment and trade regulations (Wheelen and Hunger, 2002:57). The temporal merged landscape of the geo-political character (global political inter-relatedness between countries) and economic neo-liberalism (movement away from state control or protection of the economy) that a country and other contemporaries enter into are scanned for significant differences (Adler and Webster, 2000:23).

As an example of the detail that businesses view relative to the political system, Schmidt and Haines (2005:3) highlight factors in the United States of America pertaining to China purchasing foreign bonds, which finance the former country's budget deficit. They make the point that legislation and regulations, which in effect impinge on a business's areas of concern, differ from business to business and from industry to industry. Using this example of scanning the political system, Schmidt and Haines (2005:3) recommend scanning legislation at national and international level. This would include consulting historical data on general trends over the past decade, the political climate regarding taxation, regulation and enforcement, and even the effect of the Internet on legal/political dynamics and outcomes (Schmidt and Haines, 2005:3).

2.3.4.3   Social environment

The social environment, according to Wheelen and Hunger (2002:57), contains information mostly about lifestyle, religious beliefs, human rights, literacy levels, social institutions, life expectancies and status symbols. The literature review indicates that businesses focus extensively on this category, and sometimes more intensely than on the other categories, as it contains key customer indicators related to the markets in which businesses compete for market share (Kotler, 2003:698). Businesses use their competitors' reaction to the changes in the socio-cultural system to correlate the substance of possible trend changes, identified through scanning this environmental system or spatial configuration (Porter, 1980:67-71).

As an example of the detail that businesses view relative to the social system, Schmidt and Haines (2005:3) look at global developments that are due to the impact of the media, such as the emerging English culture worldwide. They also allude to demographic changes, immigration, the "greying" of America, and changing ethnicity patterns. These have in turn resulted in differences in attitudes, beliefs and opinions by age, religion and social value divisions.

2.3.4.4 *Technological environment*

Regarding this system, businesses glean information from components of possible change, such as the availability of energy (Wheelen and Hunger, 2002:57). The technological environment holds the enabling potential for future product innovations by businesses (Meyer, 1998:56-68). Telecommunication infrastructure is an example of such an enabling infrastructure, where an increase in government and/or private sector spending on this type of infrastructure may also lead to business opportunities in the telecommunications, Internet and related services industries (Meyer, 1998:56-68).

At the consumer level, the change forces, as units of analysis, highlighted by Schmidt and Haines (2005:3), include continuous new advances in virtually every technology, and the resultant revolutionary new personal communication devices. From a business opportunity perspective, businesses scan the advances in miniaturisation and automation, and the resultant developments in materials forming and handling technologies, robotics and artificial intelligence.

Other change forces identified by Schmidt and Haines (2005:3) in scanning the technological system include:

- changes in metallurgy, micro- and molecular-level engineering;
- recent developments in chemistry, refining, and chemical engineering;
- genetic engineering, stem cell issues, cloning, and accompanying ethical issues;
- broader base of developers aware of rapid-development techniques; and
- light, laser, and holographic studies for information management technologies.

Based on the definitions of and distinctions made between human systems, sub-systems, larger systems and spatial configurations (cf. 2.3.3), it appears that systems standing in a contextual relation towards a business tend to be qualified as spatial configurations, rather than human systems.

The paragraphs that follow provide a description of external environmental systems, which appear to be more transactional by nature. They indicate a closer resemblance to the definition

of human systems (Hirschhorn and Vasconcelos, 1999:131) as opposed to that of spatial configurations (Juarrero, 1999:110). Having said this, though, the relational status of being either transactional or contextual remains based on the hierarchical levels of influence between a business and an environmental system at a specific point in time (Dostal, *et al.*, 2005:54-57), which is dynamic by nature.

With reference to Figure 2.1, the systems of suppliers, buyers and competitors (Grant, 2005:74) co-contribute to the conceptualised competitive environment.

2.3.4.5   Suppliers

Information gleaned from the supplier system, according to Kotler (2003:698), concern the availability of key resources used in production (throughput) in a business and the related trends among suppliers in this regard.

According to Porter (1980:122-123), the key issues on which information is required as far as suppliers are concerned, are:

- the stability and competitiveness of the supplier pool;
- the optimal degree of vertical integration and concentration of suppliers;
- the allocation of purchases amongst qualified suppliers; and
- the creation of maximum leverage with chosen suppliers.

Schmidt and Haines (2005:3) provide examples of some of the units of analysis in terms of the change factors affecting key suppliers in an industry. Among other things, these refer to industry consolidation and restructuring developments, as well as global sourcing and outsourcing dynamics. Businesses also scan the impact resulting from increased efficiencies in value chains (Casadesus-Masanell and Ricart, 2010:197) due to integrated systems and global quality control teams (Schmidt and Haines, 2005:3).

2.3.4.6   Buyers

Information relating to the buyer system concern the main trade channels (route to market) through which products and/or services can be delivered to a market segment (Kotler, 2003:698). Criteria affecting the selection of buyers include quality of service, overall capacity, financial stability and reliability, and general attitudinal values (Langley, Coyle, Gibson, Novack and Bard, 2008:518). Porter (1980:370) includes buyer behaviour and distribution channels as units of analysis when scanning buyers as systems that co-contribute to the competitive nature of a particular industry.

2.3.4.7   Competition

Schmidt and Haines (2005:2) state that there is increasing global competition in every industry. This increase has come about due to price competitiveness and the organisational flexibility of businesses, as well as the establishment of regional economic trading blocks. Schmidt and Haines (2005:2) recommend that businesses endeavour to gain more insight in what they refer to as the blurring of industry boundaries, which contributes to the increase in the number of new businesses entering the industry undetected. This includes niche players, local entrepreneurs, innovators, and inventors.

Porter (1980:47) indicates that the objective of scanning the competitor system, yielding what he refers to as competitor intelligence, is to develop a profile of the nature and success of the likely strategy changes each competitor might make. These include probable responses via strategic moves, and probable reactions to industry changes and broader environmental shifts that might occur. Competitor intelligence focuses on the actions, behaviours and options of one or more existing or potential future competitors (Choo, 2003:8). Businesses distinguish between competitor intelligence and competitive intelligence by referring to the latter as the analysis of competitors as well as competitive conditions in particular industries or regions.

This concludes the discussion of some of the more common environmental systems scanned by businesses. Following on this discussion, the next section contains the researcher's recommendations on the standardisation and qualification of preferred terminologies regarding the discussed topics.

2.3.4.8   Standardising and qualifying the preferred terminology for the study

The dynamism in the environment refers to environmental systems changing within the different spheres. According to Rodrı´guez and Yanes-Este´vez (2010:260-273), systems change within a certain sphere, while change may also include systems moving from one sphere to another. This movement is based on a matter of degree (McKiernan, 2006:13), as well as movement through the developmental stages of evolution of a particular system (Rodrı´guez and Yanes-Este´vez, 2010:262).

From the review, it is apparent that the literature does not define systems in terms of levels of hierarchical influence based on a system's nature itself, being human systems, sub-systems or larger systems, or spatial configurations. Rather, systems are defined in terms of their relational status towards one another, at a specific point in time. Any of the distinct systems can stand in either a transactional or a contextual relation towards another. This difference of perception relating to environmental systems' stadia of flux (Burt, *et al.*, 2006:71), impacts on

how the environment is conceptualised and consequently viewed (cf. 1.3.3.1), and impacts on the nature of information gleaned, and its integrity.

In the literature, systems that are contextual by degree based on the level of influence that a business has over them, are referred to as spatial configurations (Juarrero, 1999:110), macro-environmental systems or components (Burt, *et al.*, 2006:51), indirect interactive forces (Plunkett, *et al.*, 2005:127), segments (Jackson, 2007:8), categories (Wheelen and Hunger, 2002:52-53), and factors of influence. Henceforth, for purposes of clarity and ease of reference, the researcher will refer to systems that are contextual by degree as contextual factors of influence, referring to the influence that a business has over these systems. They can be categorised as spatial configurations, for example the conceptualised economic and/or socio-cultural external worlds, or as human institutionalised systems, such as unionised labour and government.

In the literature, those components which are viewed and conceptualised as having more of a direct interactive relation towards one another, are referred to as stakeholders (Liebl and Schwartz, 2009:321), components (Burt, *et al.*, 2006:51), institutions, task- or market environmental components or systems (Hong, Alapo, Glowacki, Shepard and Rathgeber, 2008:3), industry factors and competitive forces. Henceforth, for purposes of clarity and ease of reference, the researcher will refer to systems that are transactional by degree as transactional factors of influence, referring to the influence a business has over these systems.

By analogy, the classification of systems in a contextual or transactional relation towards one another is also based on the particular systems at hand. A government, as an example, may have more influence over the unionised labour in a particular country than what a lone-standing private business might have. Unionised labour may, in this example, stand in a contextual relation towards a particular business, but be in a transactional relation with the particular government system, of the same larger system.

The review indicates that the conceptualisation of the relational dynamism of environmental systems is required in order to prevent businesses from limiting the environment to existing categories of classification (Burt, *et al.*, 2006:51). Such a limitation might lead to formalising a routine of the past, whilst what scanning should attempt, is to open people's perception of the future environment (Bryson, 2004:40).

Within the context of this dynamism, the following section discusses the potential implication for businesses, should they view these factors of influence as systems within a systems thinking paradigm.

2.3.5   Environmental systems

Environmental complexity (Peale, 2005:59-31), uncertainty (Smart, 1989:334-382) and constant change (Bui and Baruch, 2010:217) are put forward as the motivation for a continuous enhancement of scanning frameworks, methodologies and approaches. Scanning the external business environment remains important beyond any specific time and place because of the great need that managers have to understand the changes that take place within the external business environment (Kourteli, 2000:406).

In this regard, a systems thinking approach to environmental scanning has been hailed as an approach that enables businesses to deal with environmental complexity, specifically related to the future. Haines (2000:37) identifies a number of benefits of a systems thinking approach and comes out strongly as to why businesses should adopt such an approach. Haines (2000:340-341) summarises its beneficial impact by stating that systems thinking contributes to a new and better orientation to success in life, and that it is the initiation point of thinking. The starting point is a thinking process with the ideal in mind, working backwards from an idealised future design (Phillips, 1996:10-18) as opposed to working forward towards a solution from within the level of the problem (Dostal, *et al.*, 2005:140-147). This refers to the intrinsic difference between analytical thinking and systems thinking. It contextualises the shortcomings of analytical thinking against those of systems thinking, based on a different departure point when viewing the future (Schlange and Jüttner, 1997:77).

Kourteli (2000:409) builds on this notion of having to improve on ways of thinking about the environment when scanning it, by referring to the empirical and conceptual pitfalls of scanning, based on Aguilar's (1967) recommended mechanistic scanning process. The basic aim of Aguilar's (1967) research was to analyse how managers gain relevant information about business opportunities and threats.

According to Kourteli (2000:408-409), the ways of gaining relevant information may include identifying the type of information managers seek and where they can improve their scanning of the environment. Furthermore, it includes determining how they can improve their scanning of the environment and what information is required to design major strategies. Finally, it includes the nature of information that is required to design long-term plans. This leads to a mechanistic scanning approach. It is structured around the principles of sources of scanning, types of information and ways of scanning. According to Aguilar (1967), these factors are regarded as pivotal to enhancing scanning and subsequent strategy selection. Kourteli (2000:409) is of the opinion that borrowing concepts from general systems thinking can assist in the required re-conceptualisations to overcome the empirical and theoretical shortcomings

of Aguilar's work. In this regard, Kourteli (2000:412) consults the work of Bertalanffy (1956), amongst others, on the theory of open systems in physics and biology.

According to Plunkett, *et al.* (2005:126), Bertalanffy (1956:1-10) was the first to call systems that interact with their environment "open systems". Similar to a business being an open system, regularly affected by the changes in its environment through the changes in the contextual and transactional factors of influence, environmental systems themselves are open systems (Plunkett, *et al.*, 2005:126-127). In this regard, human systems consist of organising forces that shape them in terms of behaviour and intent (Dostal, *et al.*, 2005:47).

Aspects of environmental systems gleaned from the literature, and as they relate to human systems – being both larger systems and sub-systems in the hierarchy of systems (Haines, 1999:2) – are discussed in the paragraphs that follow. These systems, as emerging entities, stem from the interplay of such systems aspects (Dostal, *et al.*, 2005:48).

The systems aspects identified through the review are:

- culture and worldview (Bloisi, Cook and Hunsaker, 2007:51; Dostal, *et al.*, 2005:224);
- results/outputs (Haines, 2000:290);
- processes and activities (Christopher, 2005:78-79);
- structure (Senge, 1990:97);
- leadership and management (Shackleton, 1995:2); and
- financial, human, informational and infrastructural resources (Brummer, 2003:126).

Figure 2.2 illustrates an open system, conceptualised as a whole and containing the respective systems aspects. It illustrates the conceptualisation of these aspects, the directional flow of resources, environmental spheres and a closed feedback loop. It illustrates the linking of the respective aspects through means of cyclical flows, being movement from input to throughput to output and back to input via a feedback loop.

The processes of input, output, throughput and feedback, contain the flows of influence (Montuori, 2000:66) that impact on sequential actions based on causality, and may be linear, non-linear, or counterintuitive. Non-linearity is facilitated by means of the feedback loop principle, where the recipient of an impact is resistant to the influence contained in the impact, co-causing a creative tension (Stadtlander, 2006:19).
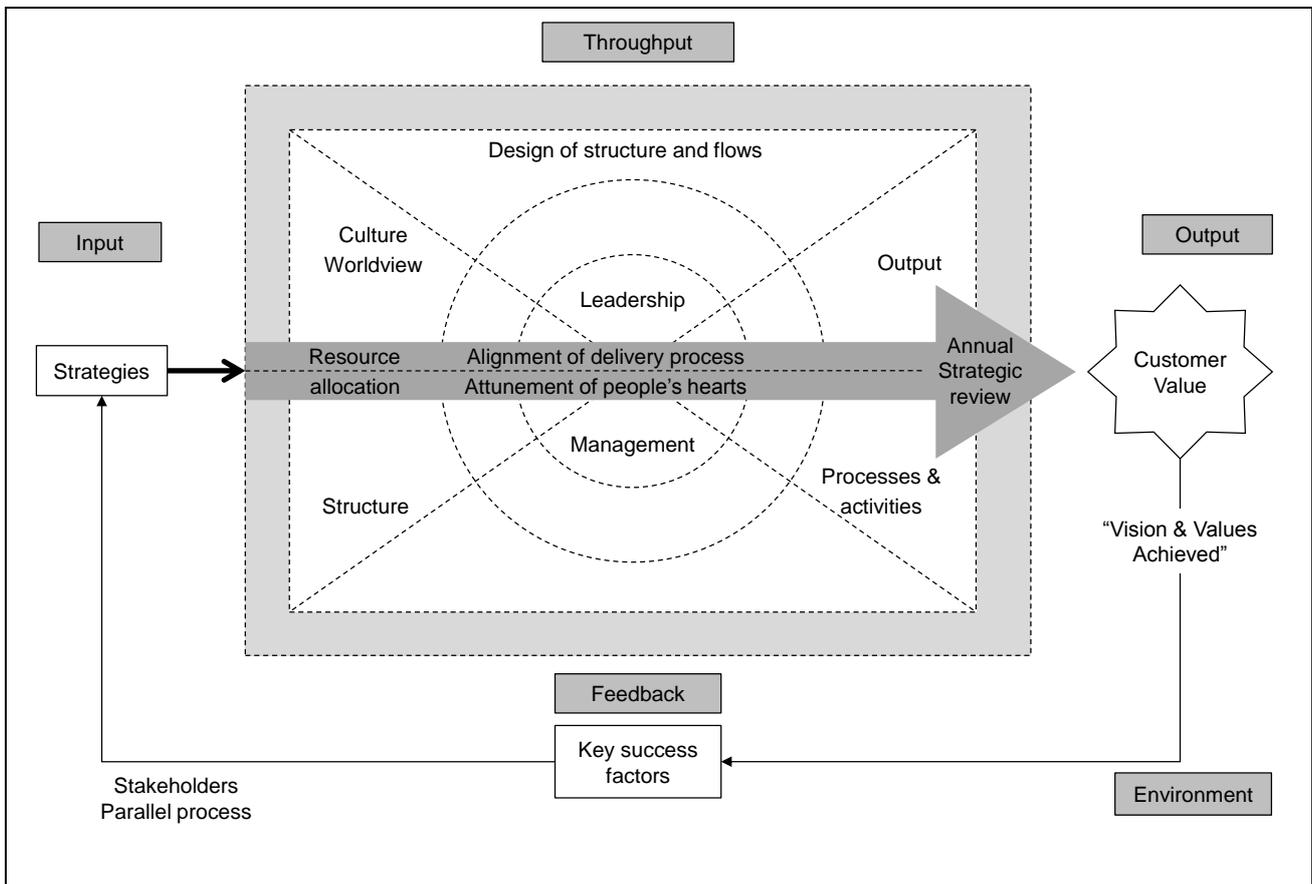
Figure 2.2: Systems aspects and flows

Source: Haines, 2000:290; Dostal, *et al.* 2005:49; Schmidt and Haines, 2005:1 (amended)

The following paragraphs explain the aspects of a system.

2.3.5.1 *Culture and worldview*

The first aspect is that of culture and worldview, also referred to as one of the co-contributing components of the ethos aspect (Dostal, *et al.*, 2005:58) of a system. Aspects similar to worldview and culture of a system are beliefs (Jansen van Vuuren, 2002:37), rituals (Cufuade, 2009:35), traditions (Slaughter, 2003:28) and ethics (Stadtlander, 2006:21). Thompson and Strickland (1999:262) identify the combination of inner values, beliefs, rituals, operating style, and political-social atmosphere as those components culminating in the culture of a system, driving specific behaviour.

Rippon (2002:20) states that the cultural values of a system determine the interaction between people in that system. Those values also determine the interaction between people in one system with people in another system and/or with the general environment as a whole. Bloisi, *et al.* (2007:751) add to this notion by describing a system's culture as consisting of the fundamental assumptions people share about that system's values, beliefs and rituals. These components give meaning to a system's members and provide guidance in terms of the

system's behaviour. According to Dostal, *et al.* (2005:58-66), not only does culture guide and influence or direct behaviour, it also contains part of the intent of a system. It is therefore apparent that attempting to influence a system speaks to influencing its culture, as this guides the behaviour of a system and influences it through its intent (Kofman and Senge, 1993:4-23).

The culture of a system is dynamic by nature and, according to Vogelsang (2004:4), reconstruction of the culture components occurs when sub-systems or smaller systems, as parts of larger systems, give rise to a new culture. This happens as they reorganise their relations at what Vogelsang (2004:4) calls the local level. Such smaller systems or agents (Vogelsang, 2004:4) come together continuously in order to increase their level of understanding of one another. This is based on different attributes and striving towards a sustainable relation. The emergent culture components remain in a state of flux as they construct, reconstruct and modify based on the systems' interactions (Jansen van Vuuren, 2002:33). Bui and Baruch (2010:212) categorise rituals as part of the culture aspect of a system along with values, beliefs, norms, symbols, language and myths. As systems interact with one another, co-contributing as sub-systems of a larger system, the self-organising characteristic of the systems, reconstruct the culture aspect. This depends on the inter-dependence, inter-relatedness and relation between the co-contributing systems. This, according to Vogelsang (2004:4-5), is possible as the agents reorganise their relations at the level of interaction. However, the probability of such re-organisation taking place is dependent on the level of understanding between the systems as sub-systems of a larger system, and on their intention towards the establishment of a sustainable relation. From this, Vogelsang (2004:7) draws the conclusion that the culture aspect remains in a state of flux as it constructs, reconstructs and modifies, based on the schemata interaction.

The worldview aspect of a system relates to the epistemological description of how people in a specific system understand the universe they live in (Dostal, *et al.*, 2005:224). Peale (2005:28) points out that in a human system the worldview of the system refers to the collective mind-set and the way in which individuals in that system understand the world in which the system operates. Wilber (1995:245) adds the characteristic of evolutionary development to this notion of a worldview. He points out that a worldview, which filters the perceived ontological reality, is based on the epistemological framework of understanding that an individual has developed. Referring to the four-quadrant/11-levels scanning framework (cf. 1.5.2), Voros (2003:54) builds on Wilber's (2000:132) notion that there is a direct correlation between epistemological development and what is viewed ontologically, i.e. the worldview.

Figure 2.3 represents the four-quadrant/11-levels scanning framework conceptualised by Voros (2003:53), and based on a combination of Wilber's four-quadrant framework (cf. Figure 1.5) and the Spiral Dynamics model of Beck and Cowan (1996).
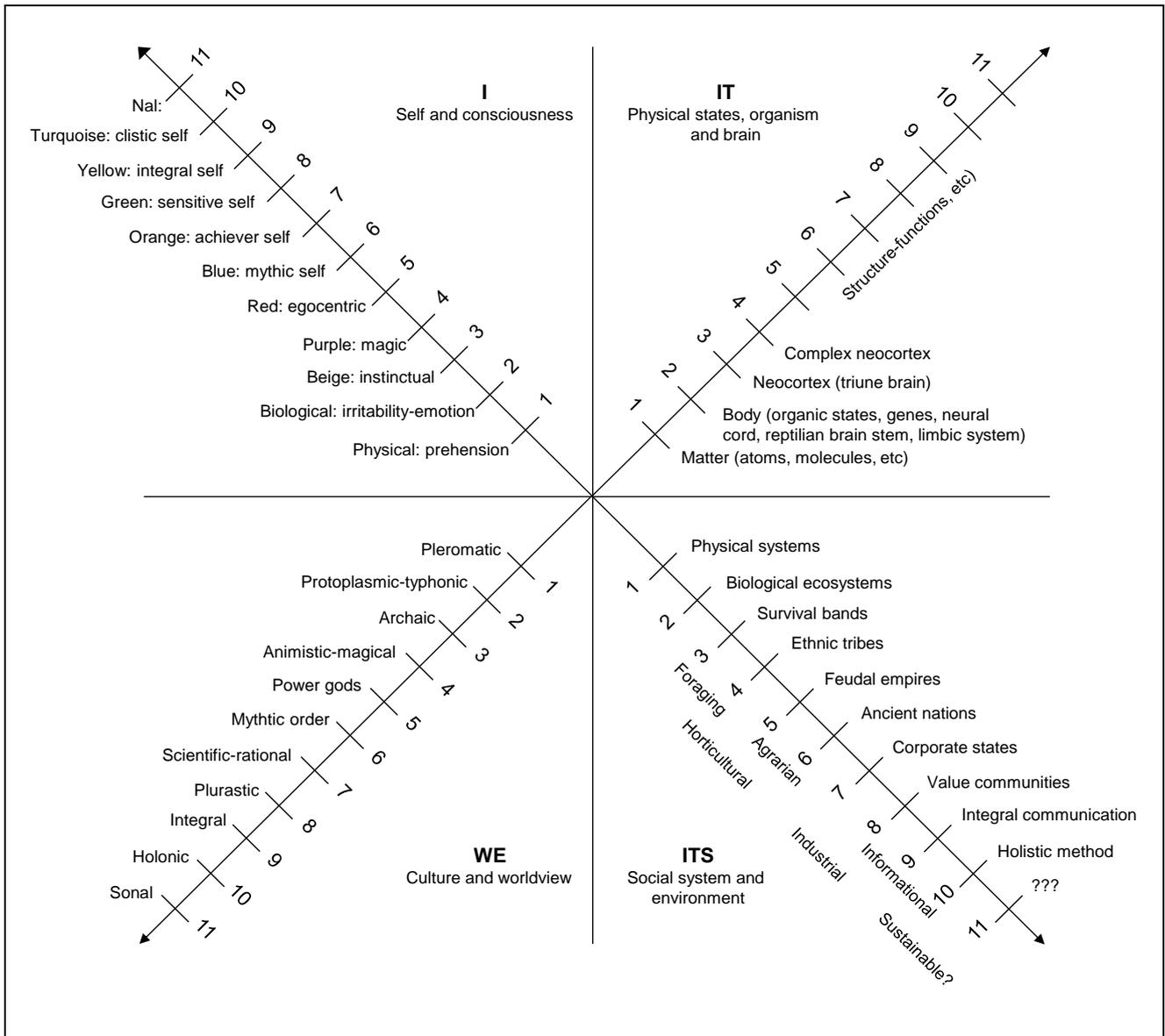
Figure 2.3: The evolutionary developed stages of the four quadrants

Source: Voros, 2003:53

Spiral Dynamics is a systems framework that categorises the manner in which human minds filter their observations of the world (Voros, 2003:44). This framework is discussed in more detail in Section 3.2.1 of Chapter 3 of this study when presenting the proposed expanded conceptualised scanning framework, being the primary aim of this study.

Voros (2003:37) refers to the four-quadrant/11-levels scanning framework as he endeavours to explain the principle of cross-level analysis between the quadrants, illustrated in Figure 2.3.

This represents an integral scanning methodology attempting to consider both the epistemological and ontological dimensions when scanning (Voros, 2003:55-58).

Voros (2003:55-58) explains that the level of epistemological development acts as a perceptual filter, being a worldview (Palmer, 1996:114). Figure 2.3 illustrates this level of development through reference to colour-coded levels of Spiral Dynamics in the upper left quadrant of the figure. A worldview filters what scanners are scanning when they scan the social systems of the environment in the lower right quadrant, depicted in Figure 2.3. This filtering also applies to the respective levels of worldview and culture in the lower left quadrant, and human behaviour in the upper right quadrant, as illustrated in the figure.

As the worldview of a human system refers to the collective mind-set of those individuals in the system (Peale, 2005:28), a business that scans another system in the environment scans such a system through a worldview as a perceptual filter, impacting on what the business is able to see, and what not (Voros, 2003:55).

2.3.5.2 *Output (results)*

The second aspect is the aspect of the output of a system, also known as the results aspect. Figure 2.2 illustrates the results aspect as being both internal and external to the system. The purpose of the output aspect within the system is to provide direction to the system by means of the quotidian vision and mission of a business (Dostal, *et al.*, 2005:66). In Figure 2.2, the external output represents the delivery of a service or product to a market, as the outcome of the throughput process in a business (Haines, 2000:287).

With regards to achieving the output goals of a system, Senge (1990:150-151) identifies a type of tension in a system. This tension is based on a gap between the achievement aspirations of the system in relation to the current reality of the system. Kourteli (2000:409) refers to this tension when he describes the intent of systems to work towards a state of equilibrium between themselves and their environment, but not always achieving the intention in terms of their behaviour.

However, in terms of complex adaptive systems (Clemens, 2009:258), this notion of equilibrium limits the identification of new initial conditions as influence points for the future, as these can only be identified in a state of non-equilibrium (Philippatos and Nawrocki, 1999:74-75). Senge (1990:150-151) explains this emergent reality of tension in the way in which it resides in people. Building on the notion that human systems consist of the collective of humans in a system (Peale, 2005:28), by implication the gap that Senge (1990:150-151) refers to may be resident in a human system, should the output of that system not be achieved. The

achievement, or not, of an envisaged vision and mission of a system is fed back into the system via a closed feedback loop, illustrated by the arrow in Figure 2.2, moving from the output to the strategy activity of a system. The information component of such a feedback loop influences the renewed direction that the system assumes, if required.

Building on the notion that human systems co-contribute to the emergence of a larger system, either as a human system or spatial configuration (cf. 2.3.3), the following concept is put forward.

A business, when scanning the relation between systems illustrated in the lower right quadrant of the four-quadrant/11-levels scanning framework (cf. Figure 2.3) as they co-contribute towards a larger configured system, takes into account the tension (Senge, 1990:150-151) within each system, and how it affects their relation with one another. Philippatos and Nawrocki (1999:75) support this notion by stating that the addition of people and institutions to systems and the environment, increases the systemic complexity, and finally transforms a system into a complex adaptive system. Such a new system contains new life-like characteristics and becomes more complex than the pieces that comprise the system (Philippatos and Nawrocki, 1999:75). In part, this complexity is caused by the self-organising characteristic (Vogelsang, 2004:9) and nature of open systems. In the instance of a human system, this refers to the system's self-organising characteristic and resilience in its transactional and contextual environment (Vogelsang, 2004:10). This life-like characteristic implies that human systems are, by definition, open systems and are self-organising (Parent, 1996) through interaction with their environment.

Figure 2.4 illustrates this emergence between systems, co-contributing to the emerging systems complexus, by means of enlarging the view on the complexus.

The figure further illustrates the hierarchical levels of influence indicated through those systems in a transactional relation to a business, and those in a contextual relation, as factors of influence (cf. 2.3.4).

The construct content of the relation between the two systems, enlarged in Figure 2.4, contains the same components as those in the co-contributing systems themselves. The system aspects, of which the output aspect is one, is thus also observable in the emerging systems complexus, as an emergent output aspect (Vogelsang, 2004:4).

Aligned to the culture and worldview of the system, the output aspect of a system purposefully steers the system in a direction of achievement and, together with the culture and worldview of

a system, co-contributes to the intention of such a system (Juarrero, 1999:29-30, 32-34, 92-94, 202-203).
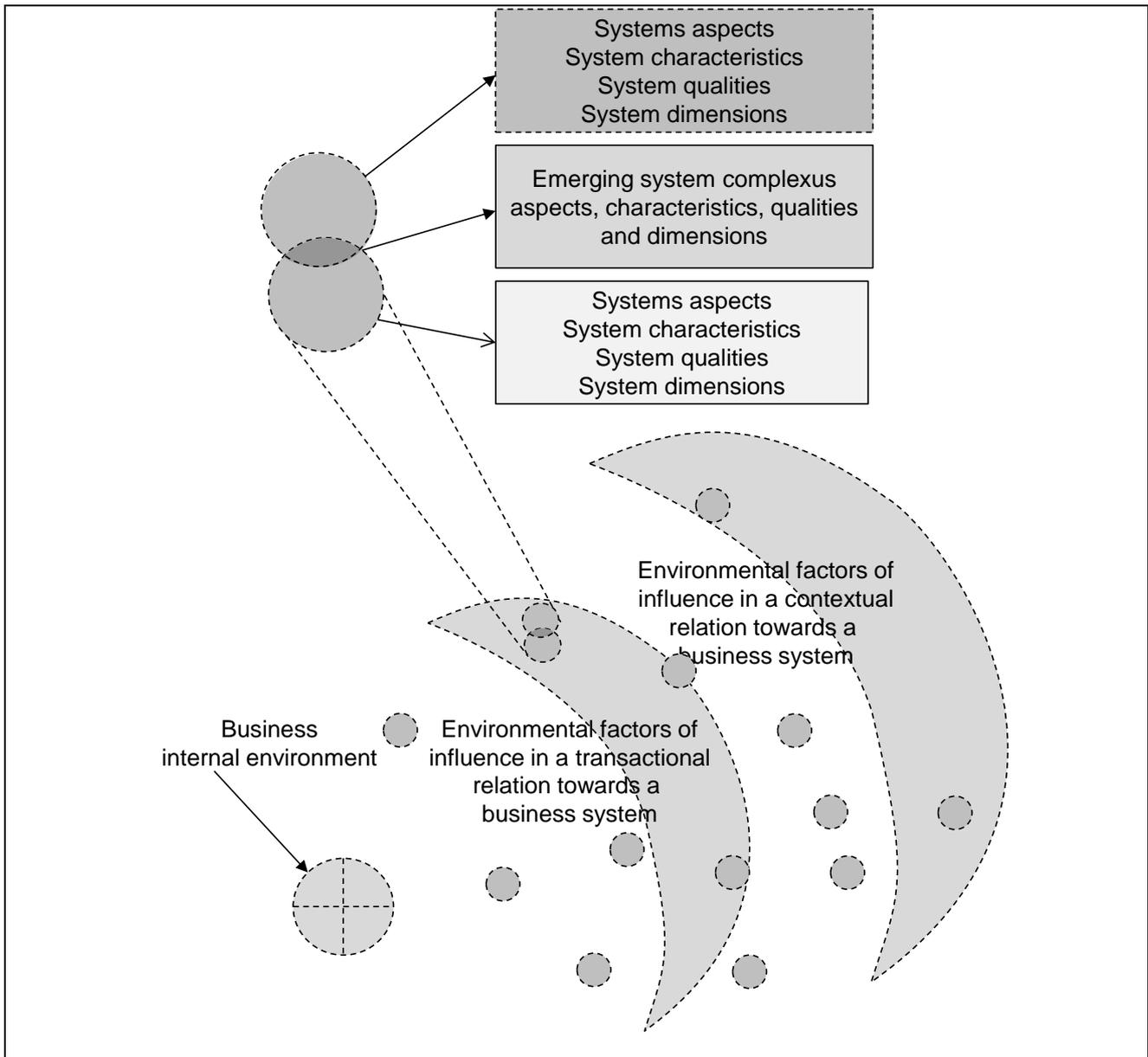
Figure 2.4: Aspects, characteristics, qualities and dimensions of the co-contributing systems and the emerging complexus

2.3.5.3   *Processes and activities*

The third systems aspect is that of processes and activities. Whereas Dostal, *et al.* (2005:112) refer to the intentional parts of a system as the conceptual reality, the processes and activities aspect forms part of the physical reality of a system. In Figure 2.2 these processes and activities, as an aspect of the system, are indicated below the arrow in the figure, where the arrow indicates the application of resources throughout the system. Figure 2.2 indicates the

flow of delivery processes throughout the system. As Teece (2010:184) says, processes flow through the depth and breadth of a system.

Haines (2000:290) highlights the fluidity of the processes of a system, and identifies the need for an alignment between the system processes and people in the system in terms of their attitude, or as he calls it, the *attunement* of people's hearts. In this sense, a system is not existent in itself, but exists through people. Moreover, both capability and competency (Bryson, 2004:41-42), relative to the output of a system, are present in the people responsible for the processes and activities, driving the output.

The people component of the processes and activities aspect requires systemic management (Christopher, 2005:231-258). Christopher (2005:231-258) explains the importance of systemic management when managing the risk of a business by managing the supply chain risk, which is directly related to the amplified volatility in the market place and related turbulence in the environment. According to Christopher (2005:280) internal processes and activities need to be fluid and able to integrate internally as well as with other systems in the environment, for purposes of adaptability, agility and flexibility. It is through the flow of the processes and activities in a system that the output aspect (delivery of customer value) of a system is either achieved, or not (Christopher, 2005:78-79).

Whilst the culture and worldview aspect of a system drives its behaviour, the output aspect provides direction for this drive, and the processes and activities aspect delivers the output aspect, to a greater or lesser extent. This implies that the competitiveness of the business, as a system, resides more in the processes and activities aspect of the business than in the conceptual reality (Mackay, Bititci, Maguire and Ates, 2008:22-37). The latter refers more to the conceptualising aspects of a system, and the former to the capabilities of a system and its physical design (Haines, 2000:287). In this regard, Rippon (2002:64) makes the point that all system processes and activities should be directed at realising the output aspect of a system.

The relevance that this notion has for scanning environmental systems is the necessity for businesses to scan both the system's intent and behaviour. This is supported by Hosley, Lau, Levy and Tan (1994:12). They state that scanning environmental components, as systems, relates to the ability of a business to understand a system by scanning all the interconnecting elements of such a system. Bui and Baruch (2010:217) elaborate on the necessity of businesses being able to identify the structures and patterns, or processes underlying the phenomena observed, when scanning a system. In this regard, the necessity of scanning a system's behaviour and not just its intent, relates to the notion that system behaviour is "not a function of parts but a function of how different parts interact" (Kofman and Senge, 1993:4-23).

2.3.5.4 Structure

Senge (1990:97-99) describes the structure aspect of a system as the physical structure of a system, being the infrastructure of the system, and the managerial structure. It is within the confines of the structure aspect that a system is either able to grow into a larger system or is limited in terms of growth (Senge, 1990:97).

The notion of a specific structure required for a specific type of business was raised in the late 1970's by Miles and Snow (1978:75). They concluded that the design of the structure aspect of a business follows on the strategy formulation of a business, the latter being part of the conceptual reality of a system (Dostal, *et al.*, 2005:114). Such a structure design is directed by the output aspect of a system. Although structure embeds a static meaning of immovability, it is very much an aspect that is in constant flux. This is because competitive forces regularly require a change in strategy and subsequent structural alignment (Miles and Snow, 1978:117-120).

Juarrero (1999:109-110) distinguishes between the organisation of a system, and the structure aspect of a system. He explains that the organisational aspect is related to the processes and activities aspect, referring to the relation amongst these system components, and that the structure aspect refers to a composite unity of a particular kind. To quote Juarrero (1999:110): "A system's structure consists in the actual components and the actual relations amongst them that, at any instance, realise a particular composite unity as a concrete static, or dynamic, entity".

2.3.5.5 Leadership and management

The fifth aspect of a system relates to its governance through the actions of its leadership and management.

According to Shackleton (1995:2), leadership refers to the ability of people in a system to influence other people in that system to attain the output aspect of the system. Haines (2000:10) elaborates on the notion that in the long term, leadership provides the ultimate ability to realise the intent of a system. Leaders achieve this by conceptualising the intent of a system through the conceptual reality aspects of the system, and implement such intent through the physical reality aspects of processes, activities and structure (Haines, 2000:10).

Latchem and Hanna (2001, 53-62) draw attention to the importance and purpose of the leadership aspect in a system. They point out that leadership needs to be value-driven, and should motivate the respective internal and external role players to enact the collective culture and worldview drivers of a system (Latchem and Hanna, 2001:57). The focus, therefore, is to

work towards the achievement of the overall output of a system, as opposed to individual self-interest. It is in this regard that the leadership aspect is the innovative creator of the vision of a system and enabler of a system's success (Latchem and Hanna, 2001:53).

2.3.5.6 *Resources*

The resources of a system include the financial resources of the system, its people as human resources, its infrastructure, and its information (Brummer, 2003:126).

In Figure 2.2, the arrow illustrates the application of these resources throughout the system. It illustrates how businesses apply resources in a patterned manner along the processes and the activities of the system (Haines, 2000:290). Whilst the application of resources concerns how they are applied in a system, relative to what is required as a priority to achieve the output (Bui and Baruch, 2010:209), the availability of resources concerns the strength and challenges within the system and impacts significantly on the intended strategic success possibility, and probability, of the system (Rippon, 2002:3).

In referring to the financial resources of a system, Schlange and Jüttner (1997:777) categorise these as a key strategic issue in a business from a management perspective. Equally, businesses regard human resources as pivotal in terms of success, relative to a system's goals, objectives and competitive ability (Fallon and Lucas, 1998:29).

In scanning environmental components as systems, the measure of financial resources available, and of skilled human resources, which are equally important, is indicative of the system's ability to achieve its targeted goals, based on its intent (Douglas, Lambert and Knemeyer, 2004:49).

2.3.5.7 *Summary and conclusions*

To summarise the preceding literature review section, the researcher refers to Figure 2.5. In the figure, the circle termed "internal environment" represents a business system. The shaded half-moon shapes represent the hierarchical levels of influence that the business system has over environmental systems constituting those spheres, relating to the concepts explained in Figures 1.3 and 1.4.

The enlarged illustration of a system in the top right hand corner of Figure 2.5 depicts a transactional factor of influence as a system. There is no significance in it being transactional. However, the principle of the illustration can only be applied to human systems (cf. 2.3.3), and not to spatial configurations. The reference to a business model in Figure 2.5 indicates a structured and patterned relationship between the business and respective stakeholders in the environment, external to the business system itself.

Figure 2.5 illustrates what businesses view in the environment when scanning environmental components as systems. The notion expressed through this illustration is that a business views a system in terms of its various aspects, in order to formulate a composite informational index of a system. This composite informational index reflects a system's intent (culture and worldview), its goals (output), its ability to deliver its intent (processes, activities and structure), and its ability to apply resources in order to achieve its output. Finally, it investigates whether the scanned system has the necessary leadership skills and will to ensure that the system achieves its output aspect.
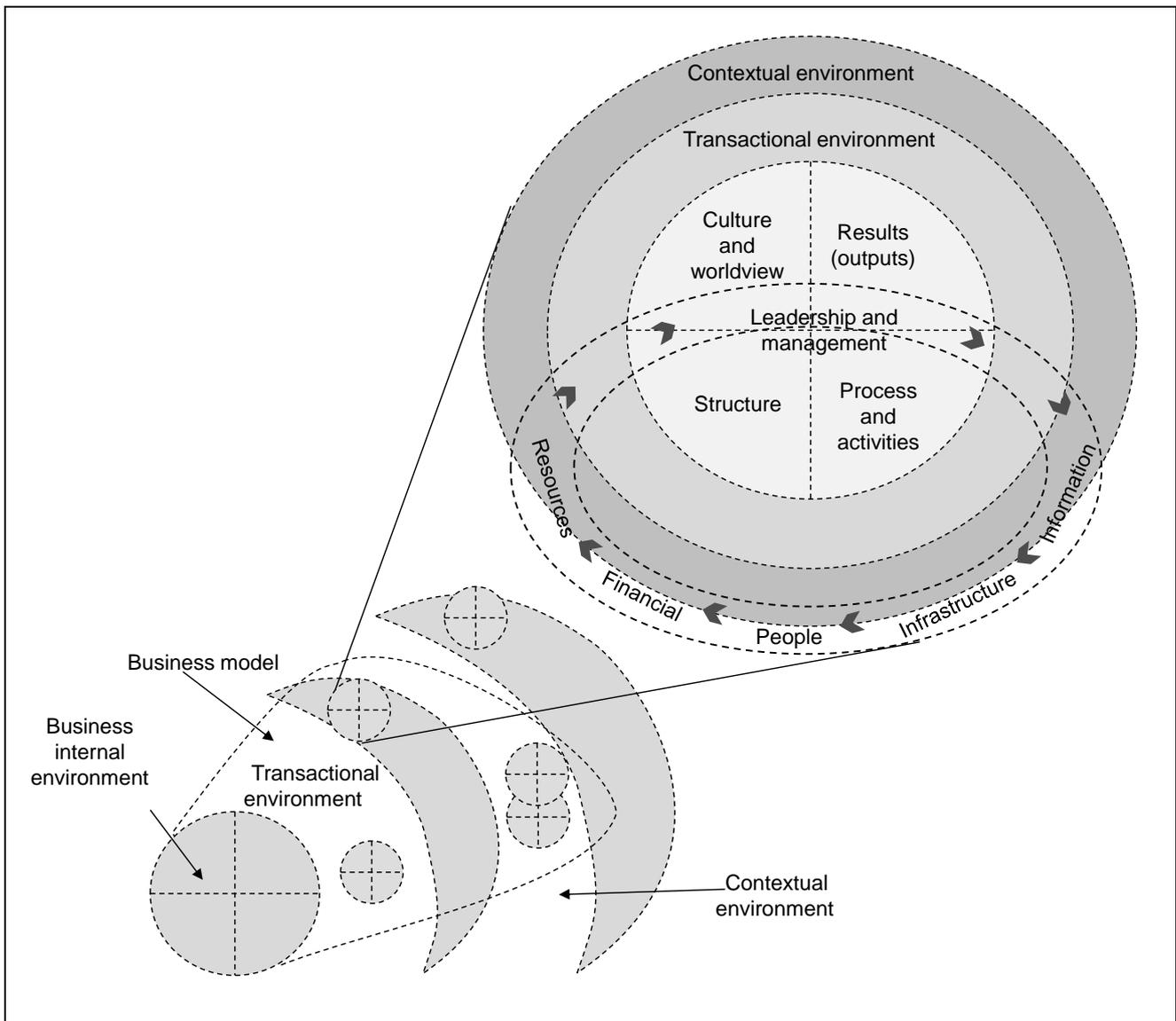
Figure 2.5: Scanning an environmental component as a system

Source: Haines, 2000:290; Dostal, *et al.* 2005:49; Schmidt and Haines, 2005:1 (amended)

The significance of viewing a system in this manner relates, amongst others, to the inclusion of the complexity of defining the content constructs of the emerging systems complexus between systems, as illustrated in Figure 2.4. This complexity is based on the notion of systems being

in a constant state of flux (Jansen van Vuuren, 2002:33), co-contributing to larger systems (Haines, 2006:1) and giving rise to new aspect content as they interact with one another (Vogelsang, 2005:4) and develop through evolution (Wilber, 1995:14-15). Cross-level analysis (cf. 2.3.5.1) points towards the evolutionary development in both the epistemological and ontological perspectives of the scanner. The complexity relates to viewing co-contributing systems in the environment and the difficulty embedded in identifying the new aspect content of an emerging complexus between them, should the evolutionary developed status, per co-contributing system, not be on the same level. The related tension (cf. 2.3.5) between two systems regarding the achievement of the output of their own respective systems, and the newly emerged output of the larger system, adds to the complexity of identifying the construct content of the emerging complexus.

From the preceding review, it is apparent that scanning the aspects of a human system largely relates to the scanning of human behaviour in that system (cf. 2.3.3).

This applies to every aspect of the system, being:

- leadership as a human skill and quality in itself;
- resources applied by people;
- culture and worldview as a collective view of people in a system;
- output achieved through people doing what is required;
- structures that are upheld by people; and
- processes and activities performed by people.

Concerning the discussion in Section 2.3.4.1 on an economic system, or spatial configuration, Hellriegel, *et al.* (2005:94) state that political decisions taken in the arena of labour, for example, may affect the economy, whereby labour is a human system and the economy a spatial configuration. In this example, businesses can get an indication of probable trend changes in the economy, being in a contextual relation with the business, by scanning labour and other co-contributing factors of influence towards the shaping of a particular spatial configuration, in this case, the economy. This hierarchical scanning is possible, based on the characteristic of circular causality between systems in the respective spheres of the environment and the principle of the formation of schemata (cf. 2.3.5.1). The review indicates that system adaptability is not a function of intent, but that of behaviour, limited or allowed by structure, its nature and its size. In scanning a human environmental system, scanning of both the conceptual and physical realities is required in order to provide an indication of not just the intention of a scanned system to change, but also of its capability to change.

2.4 ENVIRONMENTAL SCANNING AND THE INFORMATION YIELD

In terms of scanning methodologies, Hyde (2000:76-100) refers to, among other things, the Quick Environmental Scanning Technique (QUEST), the trend analysis and the Delphi technique, as well as Cross Impact Analysis.

Cross Impact Analysis is based on inter-related intuitive forecasts (Huss and Honton, 1987:24). It is used to analyse a trend in the light of the occurrence, or non-occurrence, of a series of related events (Weingand, 1995:6). This analysis is based on the assumption that the interaction between components and/or trends has a nature of its own, and is more important than the components and/or trends themselves (Schlange and Jüttner, 1997:781). The bearing that this has on this study relates to the researcher's attempt at providing content to the emerging complexus between systems, which is similar to the interaction mentioned above, and addressed through Cross Impact Analysis.

From different sources of information in current scanning practices and from the point of view of the information outcome required, businesses distinguish between external environmental scanning (Mackay, *et al.*, Ates, 2008:27), internal environmental scanning (Bodwell and Chermack, 2010:199) and scanning for weak signals (Walters and Tang, 2006:216-219). Walters and Tang (2006:216) define external scanning as looking for and at information available in six relevant areas comprising customers, suppliers, competition, socio-economics, technology and government. These areas embrace all domains for the gathering of facts from external sources such as competitive intelligence and market research, but from a more holistic and integrative perspective, which considers consumers, competitors and technological developments in similar and different industries.

In discussing the relation between scanning and the information yield, the researcher refers to the ongoing debate regarding the scope of environmental scanning, specifically regarding the balancing act between the drawbacks associated with information overflow, and the risk of ignoring or missing relevant facts by being too restrictive regarding scanning sources (Walters and Tang, 2006:216). This section of the study addresses these concerns when discussing two components of information gathering, namely sources of information and the manner of scanning.

The findings build on the opinion expressed by Kourteli (2000:408-409), that the research effort of Aguilar (1967) is too mechanistic (cf. 2.3.5), implying that scanning can be improved, provided businesses seek better sources, types of information and employ better methods of scanning. Kourteli (2000:408-409) elucidates the conceptual and empirical weakness in

Aguilar's (1967) work by pointing out that a mechanistic conceptualisation does not narrate the scanning method with the intensity of the dynamic characteristics of the external environment. The subsequent review findings distinguish between the same themes of information sources, types of information and methods of scanning, and elaborate on the extent to which the different environments require different scanning methodologies (Kourteli, 2000:409).

The section starts by highlighting some general sources of information. It progresses to the discussion related to the epistemological perspective of scanners (Voros, 2003:37) and its impact on the ontological reality scanned. This part of the review reflects on the emerging complexities of the current global business environment and the accompanying attempts of researchers to enable businesses, via the provision of scanning tools and/or conceptual scanning frameworks, to deal with these complexities. It highlights scanning dimensions based on differences in scanners' perspectives and focuses on how scanners scan, rather than only on the scanned ontological reality. This has a direct impact on the sources of information that are utilised when scanning.

The discussion continuous with the notion that scanning needs to move beyond empiricism and consider reframing options (cf. 1.7.1), which will include a more complete array of dimensions when the environment is scanned. In this discussion, the concepts of the evolutionary development of both the epistemological and the ontological dimension of scanning (cf. 1.5.2), and the resulting requirement of new and enhanced scanning foci (cf. 1.3.4), are reviewed.

The section ends with conclusions drawn from this discussion, in particular on the relation between information yield and scanning.

2.4.1 Sources of information

Whereas environmental factors of influence and their relational status towards one another are the units of analysis when scanning the environment, sources of information refer to either personal or impersonal sources that can provide businesses with the relevant information regarding the specific environment (cf. 1.3.2).

During the early 1990s, Auster and Choo (1993:197) conducted research to identify sources of information, which included both impersonal and personal sources. Impersonal sources include the mass media, publications and the Internet, whilst personal sources refer to colleagues, senior executives and peers in the same or similar businesses. Auster and Choo were not the first to draw this distinction between types of sources of information. Research going as far back as 1967, recorded by Aguilar (Auster and Choo, 1993:195), made this

distinction. At the time, it was found that businesses preferred personal sources of information to impersonal ones. Contrary to this early research on the types of sources of environmental information, Choo, Detlor and Turnbull (1998) proved that the Internet is the information source most widely used by business managers and leaders (Walters and Tang, 2006:216). Walters and Tang (2006:216) found that the most frequently used source of information is printed mass media, with the Internet being the second most frequently used. In contrast to the findings of the research for the period between the 1950s and 2000, new research indicates that personal sources, such as colleagues in the same departments of a business and other internal sources of information are only the third most frequently used source of information (Walters and Tang, 2006:216).

A common result from the research done on scanning is that a greater perception of uncertainty regarding the external environment leads to an increase in scanning activity (Morrison and Mecca, 1989:2; Huss and Honton, 1987:29; Slaughter, 2002:2; Sepulveda-Haugen and Testart-Tobar, 1999:2; Montuori, 2000:63). Furthermore, sources tend to be frequented more, depending on the quality of the source as well as its ease of accessibility (Auster and Choo, 1988:69-86). Scanning for information is regarded as a business imperative due to increased levels of future environmental uncertainty and its increased complexity. The resultant challenge to businesses is to make the right decisions in anticipating changing conditions in the future (Morrison, 1989:2). This raises the question about which sources of information to consult and how to view these sources. Garg, Walters and Priem (2003:725-744) state that the focus should be directed at sources related to areas considered important in the individual business environment, which may differ between business and industry types.

2.4.2   Manner of scanning

In discussing the manner of scanning, the epistemological perspective of scanning and its impact on the ontological component is analysed. The discussion highlights scanning dimensions based on the differences in the scanner's perspective; investigates the notion that scanning needs to move beyond empiricism; and considers scanning reframing options which will include a more complete array of dimensions when scanning the environment. Building on the research of Choo (2003), Voros (2003), Slaughter (2002, 2003) and Wilber (1995, 2000), the ontological component of the scanning environment can be viewed as an ever-evolving system, since the world does not consist of a static set of conditions that can be plotted on a matrix (Fahey and Randall, 1998:140), but is complex and dynamic (cf. 1.3.4).

In practice, scanners use conceptual scanning frameworks to account for what they observe (Del Valle, 1999:154). This accounting is concerned with the actual conceptual scanning

frameworks and not with the theories describing them (Del Valle, 1999:157). Examples of these conceptual scanning frameworks are to be found in Figures 1.1 to 1.6, and Figures 2.1 and 2.3 to 2.5. Such figures contain those components and situations within the scanner's understanding and control (Del Valle, 1999:158). They are antecedent by nature, meaning they continuously evolve through the culmination of history, background, previous circumstances, qualifications and experiences (Bui and Baruch, 2006:209).

Choo's (2003:3) specific contribution to the development of conceptual scanning frameworks is the distinction he makes between two main methods of scanning: viewing information and searching for information. These two activities are included in the current definition of external scanning formulated by Walters and Tang (2006:216). Choo's contribution relates to the manner of scanning and not the particular sources of information. The manner of scanning is influenced by how scanners conceptualise the ontological reality they are scanning, which implies that the conceptualisation of the environment precedes the manner of scanning. This in turn precedes the selection of sources of information (Voros, 2003:3; Ferguson, 1993:1-17; Beal, 2000:27-36), in other words what businesses view as units of analysis (cf. 2.3.1).

Concerning the integrity of information gleaned from the conceptualised environment, Choo (2003:34) introduces four main modes of scanning. These range from a broad-based view to a more focused search. Choo believes that scanning should incorporate a more complete perspective for which more views and perspectives need to be taken into account. This idea of a more thorough way of scanning requires involving more people for purposes of obtaining more perspectives, and increasing the integrity of the information gathered.

Figure 2.6 illustrates the flow of information as it is gathered by businesses through scanning a situational dimension, based on the perceived uncertainty and the correlating amount of scanning required.

Figure 2.6 illustrates the flow of information internally in a business through the direction of the arrows. These flow to and from the larger rectangle in the centre of the figure. Choo (2003:9) points out that information needs determine information seeking, which in turn affects information usage. In this regard, the flow between information needs, seeking and usage is cyclical. This indicates that information usage may also determine the next level of information required.

| Situational dimension
Perceived environmental uncertainty is a good predictor of the amount of scanning required | Organisational strategies
This is linked to the sophistication and scope of the scanning |

Information seeking
A wide range of sources is used, but personal sources are preferred

Information needs
Scanning is focussed on market-related sectors of the environment

Information use
Scanning information is used to drive strategic planning and business learning

Managerial traits
Upper-level managers increase their scanning involvement

Functional managers scan in a wider field than just their fields of specialisations

Figure 2.6: Environmental scanning and information flow

Source: Choo, 2003:9

Based on research by Aguilar; Weick, Daft and Whetten (1983:71-93), Choo (2003:11) proposes a structured methodology entailing a four-level funnelled approach for looking at and for information. The four levels are undirected viewing, conditioned viewing, informal search, and formal search.

In undirected viewing, according to Choo (2003:11), the scanner is exposed to information whilst not having any specific informational need, and thus becomes sensitive to selected areas or issues. Proceeding from this undirected viewing, the scanner employs conditioned viewing, through which the significance of information encountered is assessed, relative to the

nature and degree of its impact on the business. Should the impact be significant, the scanner intensifies the scanning by searching for information, and not just viewing it (Choo, 2003:11).

This is known as the informal search, whilst the fourth stage is known as the formal search (Choo and Detlor, Turnbull, 1998:12). Choo (2003:12) concludes that the effectiveness of external environmental scanning depends on the extent to which all four modes of scanning are executed.

Table 2.1 tabulates the relational components between information needs, usage, effort, resources and a recommended methodology per scanning mode.

Table 2.1: Modes of scanning

Scanning modes	Information needs	Information usage	Targeted effort employed	Number of sources	Methods
Undirected viewing	General areas of interest; specific needs to be revealed	Serendipitous discovery 'sensing'	Minimal Medium	Many	Scan broadly, a diversity of sources, easily accessible 'touring'
Conditioned viewing	Able to recognise topics of interest	Increase understanding 'making sense'	Low	Few	Browse in pre-selected sources on pre-specified topics 'tracking'
Informal search	Able to formulate queries	Increase knowledge with narrow limits 'learning'	Medium	Few	Search is focused on an issue or event, but a good-enough search is satisfactory 'satisfying'
Formal search	Able to specify targets	Formal use of information for planning, acting, 'deciding'	High	Many	Systematic gathering of information on a target, following some method or procedure 'retrieving'

Source: Choo, 2003:12

The point is made that whilst scanning requires a methodology and a structured process of execution, it should also allow participants (people) to challenge scanning assumptions and create new interpretations. This is based on the epistemological dimensions from where they view the environment and what they see differently.

Building on the notion of allowing different perspectives of the ontological reality, Slaughter (2003:19), proposes a multi-dimensional conceptual scanning framework (cf. Figure 1.5), which addresses the limiting effect of an empiricist-scanning frame (cf. 1.1). This implied

criticism of a too empirical way of scanning is nothing new. Hamel and Prahalad (1994:81-82) also refer to this limiting notion of only focusing on what is out there, when scanning the environment to gain industry foresight. In 1999, Slaughter (2003:20-21) gave reasons why an empiricist way of scanning was insufficient (cf. 1.1). Slaughter's research gave rise to the combination of the meta-framework of Wilber (1995:122) and the model of Spiral Dynamics (cf. 2.3.5.1), furthered by Voros (2003:53) through the integrated four-quadrant/11-levels conceptual scanning framework (cf. Figure 2.3).

Each of the four quadrants in Figure 2.3 includes the evolutionary levels of development. These levels of development are the self and consciousness in the upper left quadrant, the physical states of the organism and brain in the upper right quadrant, the societal culture and worldview in the lower left quadrant, and the social systems and environment in the lower right quadrant. Table 2.2 lists the development of the four-quadrant/11-levelsconceptual scanning framework, from the centre to the elevated zones, as illustrated in the figure. Appendix A contains the definitive descriptions of these evolutionary stages of development, illustrated in each of the four quadrants.

Table 2.2: Evolutionary developmental stages of the four-quadrant meta-scanning conceptual framework

Level of evolutionary development	Upper right quadrant Exterior-individual (Behavioural)	Upper left quadrant Interior-individual (Intentional)	Lower left quadrant Interior-collective (Cultural)	Lower right quadrant Exterior-collective (Social)
1	Matter	Prehension	Pleromatic	Physical systems
2	Body	Irritability-emotion	Protoplasmic-typhonic	Biological ecosystems
3	Neocortex	Instinctual	Archaic	Survival bands
4	Complex neocortex	Magic	Animistic-magical	Ethnic tribes
5	Structure-functions, etc.	Egocentric	Power gods	Feudal empires
6	"	Mythic self	Mythic order	Ancient nations
7	"	Achiever self	Scientific-rational	Corporate states
8	"	Sensitive self	Plurastic	Value communities
9	"	Integral self	Integral	Integral communication
10	"	Clistic self	Holonic	Holistic method
11	"		Sonal	

Source: Wilber, 1995:121

Wilber (1995:111-118) is of the opinion that the way in which environmental scanning is performed, inhibits much of the epistemological world, as it's primarily focus is on describing the external observable worlds of the upper right, lower left and lower right quadrants, as illustrated in Figure 2.3. Slaughter (2003:25) recommends a cultural recovery that reintegrates the epistemological and ontological dimensions when scanning the environment. His motivation for this cultural recovery is the need to re-establish a vertical dimension in the activity of scanning. He argues that the sources and resolutions of modern pathologies correspond to levels of evolution and that environmental scanning focuses on the external objectivist rationality only. He is of the opinion that a central role for human agency and aspiration needs to be re-established, and that there is a need to clarify and pursue further stages of personal and social development.

2.4.3   Summary

The summary contains remarks pertaining to the conceptualisation of conceptual scanning frameworks, and the hierarchical levels of influence between systems at play in the environment. It summarises the findings on environmental components as systems and the relation between scanning and information.

It concludes that the challenges facing the conceptualisation of conceptual scanning frameworks, relate to the state of flux of both the informational content of environmental systems and the relational status between these systems. There is a multi-dimensionality to this state of flux, comprising the changing status of the relation between systems as well as internal system changes. This is based on the system's aspects configuration and the continuous evolutionary development thereof. The benefits for businesses of viewing environmental components as systems are that it makes it possible to comprehend and manage the phenomenon of flux, while simultaneously avoiding an increase in complexity and information overflow.

The review elucidates the relation between scanning and its informational output. It discusses the way in which businesses scan for information, related to the sources of information (units of analysis) and how they co-contribute to the scanning output. The review reflects on the epistemological and ontological perspectives of scanners and highlights how these affect the scanning output. In this regard, the review substantiates the motivation for scanning to progress beyond an empirical dimension, adding to the discussion on the need to enhance existing conceptual scanning frameworks.

The enhancement of conceptual scanning frameworks occurs continuously and is driven by increased levels of environmental complexity, related to the uncertainty of the environment and of the future. The review implies that there is a need for scanning to move beyond its original apprehension of the external world. It needs to include different internal forms of knowledge and ways of knowing, both qualitative and quantitative. The challenge is to create conceptual scanning frameworks, methodologies and approaches that will be able to unearth and manage the complexities in data gleaned from the scanned environment, without reducing these complexities through reductionism.

The literature review points to how conceptual scanning frameworks, methodologies and approaches directly affect the integrity of information as an outcome of scanning. Enhancing the frameworks, methodologies and approaches is as much part of the scanning process as the action of scanning in itself. A strong argument could therefore be made for a continuous refining of the scanning frameworks, methodologies and approaches.

2.5 INFORMATION YIELD AND SCENARIO PLANNING

This section builds on the continuous debate among researchers regarding the most appropriate approach towards the future when planning scenarios. Findings emanating from the review reflect on both deterministic and probabilistic approaches towards the future. It reveals how these different approaches impact on scanning methodologies and framework conceptualisations.

Figure 2.7 graphically illustrates the positioning of scenario planning as the juncture between information gathering through scanning and probable future possibilities sketched. This section elucidates the findings on the relation between information gathering and scenario planning.
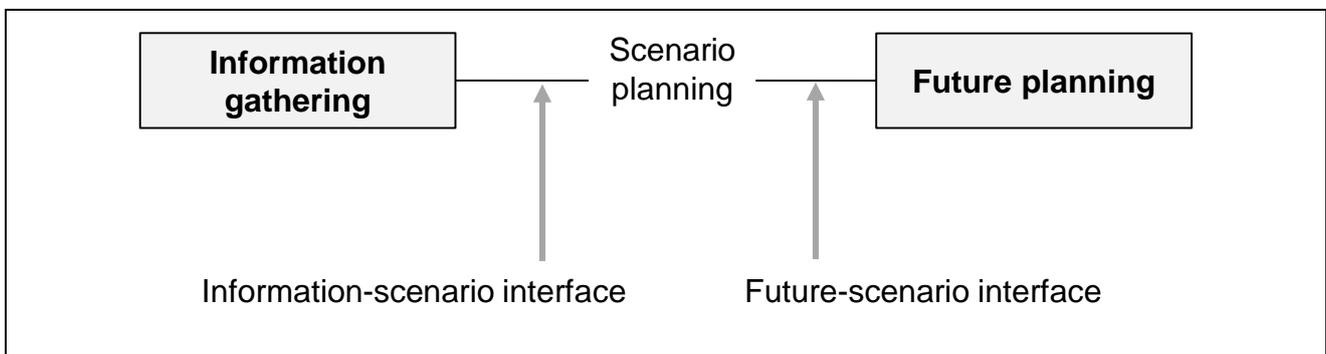
Figure 2.7: The information-scenario and future-scenario interface

The definition of scenario planning is applied as an expression of the scanner's mental model of the future, for purposes of better decision-making (Martelli, 2001:57-70). In this sense, scenario planning is a fundamental step in the progression from gathering information, to

selecting the correct and appropriate strategy. According to Bradfield, Wright, Burt, Cairns and Heijden (2005:795-812), there has been a clear revival of scenario planning in recent years, as evidenced by research on the topic.

Morrison and Mecca (1989:5) refer to the difference in approach towards the future as being either deterministic or probabilistic. They define prediction as an assertion about how some element in the future will materialise, whilst forecasting is defined as a probabilistic statement about some element of a possible future.

Hamal and Prahalad (1994:82) contrast forecasting with foresight as an approach in scenario planning. The latter has a strong systems thinking undertone. They state that in forecasting, scenario planning starts with what is, and then projects forward to what probable futures might realise. Foresight, by way of comparison, starts with what may be and then work back to what must happen, for that future to materialise. Aaltonen and Sanders (2006:28) reiterate that the fundamental view and approach that a business holds towards the future, significantly influences scenario planning. Applying forecasting as the outcome of scenario planning, businesses focus more on the current situation, with the view of predicting the future. On the other hand, foresight entails that businesses focus more on the causality of an emerged state with a view to influencing the likelihood of achieving a preferred future (Aaltonen and Sanders, 2006:28), or ideal future (Boardman and Sauser, 2008:2; Phillips, 1996:10-18).

Based on the aforementioned different approaches towards the future, systems thinking can assist with the way in which businesses view the future and how they approach scenario planning. The nature of this assistance depends on whether, as Aaltonen and Barth (2005:45-60) say, businesses believe that the future is intended, selected and planned, and that the emergent process is predictable and known; or, whether businesses view the future as continuously emerging and amplifying, with the emergent process being unpredictable and unknown.

The review points to a particular relation between information gleaned and scenario planning. Should a business view the future as a phenomenon that must happen (Hamel and Prahalad, 1994:82), the information that it gleans in terms of its information sources and manner of scanning (cf. 2.4.1 and 2.4.2), will differ significantly from that of a business that views the future as something that may happen. This difference in views gives rise to the concept of emerging newness (Vogelsang, 2004:4) (cf. 2.3.5.1) between environmental systems, as stakeholders in one another. The complexity surrounding this phenomenon, and the ability to understand complexity and subsequent possible future changes, as opposed to predicting it, is elaborated on in the following paragraphs.

2.5.1   Forecasting and foresight

Hamel and Prahalad (1994:82) propose a back-casting (Dostal, *et al.*, 2005:145) approach through which businesses can derive action plans from ideal futures (foresight). This is different to deriving action plans from forecasting, which entails planning from a point of current reality. Scenario planning endeavours to answer the question about the emergence of the future by viewing the current developed status of particular environmental systems, based on the forces (new patterns) that co-caused their status. According to Kermit (2005:1092), scenario planning considers the different impact scenarios, should businesses influence forces of change by bringing them into the business for early proactive planning.

The information about the status of a system depends on information integrity, which is a function of how businesses gather information through scanning, and what sources they use. Aaltonen and Sanders (2006:30) state that strategy selection for the future depends on finding those scanning methods that recognise new and initial conditions that could dramatically influence the future.

Haines (1999:3) suggests that a generalist systems thinking approach could benefit businesses in their attempt to comprehend the relation between systems in respect of creating a larger future system. These systems include those upon which the internal and external environmental forces of change (cf. 2.3.4) impact, identified by Thompson and Strickland (1999:85-89), and others. Systems thinking could assist businesses in comprehending the impact that change forces has on the environmental systems scanned, specifically relating to the matter of causality. Haines (1999:3) continues by saying that such an approach assists in understanding the complexity within systems related to the system's characteristic of multi-causation, and businesses should therefore be able to create foresight regarding the future in their specific industry, and not plan for probabilistic scenarios.

Kunc (2008:4), based on Senge's (1990) work on creating systemic communities, makes the point that the identification of dynamic complexities through the viewing of multiple cause-and-effect relationships over time, is made possible by wearing a systems thinking hat. Vogelsang (2004:4) subscribes to the possibility of foresight and states that environmental entities should be viewed as systems, as they interact with each other, making up new and more complicated systems. He refers to this phenomenon of co-contributing to a larger system as schemata (cf. 2.3.5.1).

The challenge addressed in this study relates to the manner in which the content of the emergent newness between systems is qualified. Vogelsang (2004:4-11) identifies specific

attribute compositions of larger systems (schemata), depending on the interaction between the co-contributing sub-systems (agents), which co-contribute to possible emergent future content and tendencies. He qualifies these attribute compositions as rituals, structured relationships, co-evolution at the edge of chaos, operating values and shared purpose. The implication of this conceptualisation is the notion that systems remain in flux with regard to all their aspects which, through interplay (Dostal, *et al.*, 2005:48) (cf. 2.3.5), make up the content constructs of a system.

2.5.2   Complex adaptive systems

Vogelsang (2004:4-11) explains emergent larger systems by explaining the emergence of patterns in the relations between the schemata. This emergence of patterns relates to the interaction between the agents and an adoption of each other, generating variety and complexity in their schemata. This gives content to the inter-relatedness, inter-dependence and relation between agents in terms of their rituals, structured relationships, communication systems, commonly held criteria for making decisions (operating values) and shared purpose. The emergence of self-organisation is not new to the dynamics of systems and was first identified by Nicolis and Prigogine (1977) when they referred to the tendency amongst agents to move from a state of non-equilibrium towards a state of equilibrium, in a self-organising manner. However, Philippatos and Nawrocki (1999:75) state that systems in equilibrium are dead, and that living systems exist in a state removed from equilibrium.

Concerning this phenomenon, Figure 2.8 illustrates the formation of a systems complexus, as part of the environment scanned by a business.

It contains a conceptualisation of the internal-, transactional- and contextual environmental spheres. It illustrates the formation of a larger complex adaptive system by co-contributing systems in all three environmental spheres. Of these co-contributing systems, some contribute to the emergence of the systems complexus, illustrated by the two overlapping systems in Figure 2.8, i.e. the overlap being the complexus, also referred to as emergent newness. This creates an environment of fluctuating entities and not fixed entities. Aaltonen and Sanders (2006:28-35) refer to this state of flux as the system's sensitive dependence on initial conditions, as a point of departure in determining the compositions relating to a future state.

Contextual environment

Transactional environment

Internal environment

Larger system consisting out of numerous systems, amongst others, also two systems co-contributing to a system complexus
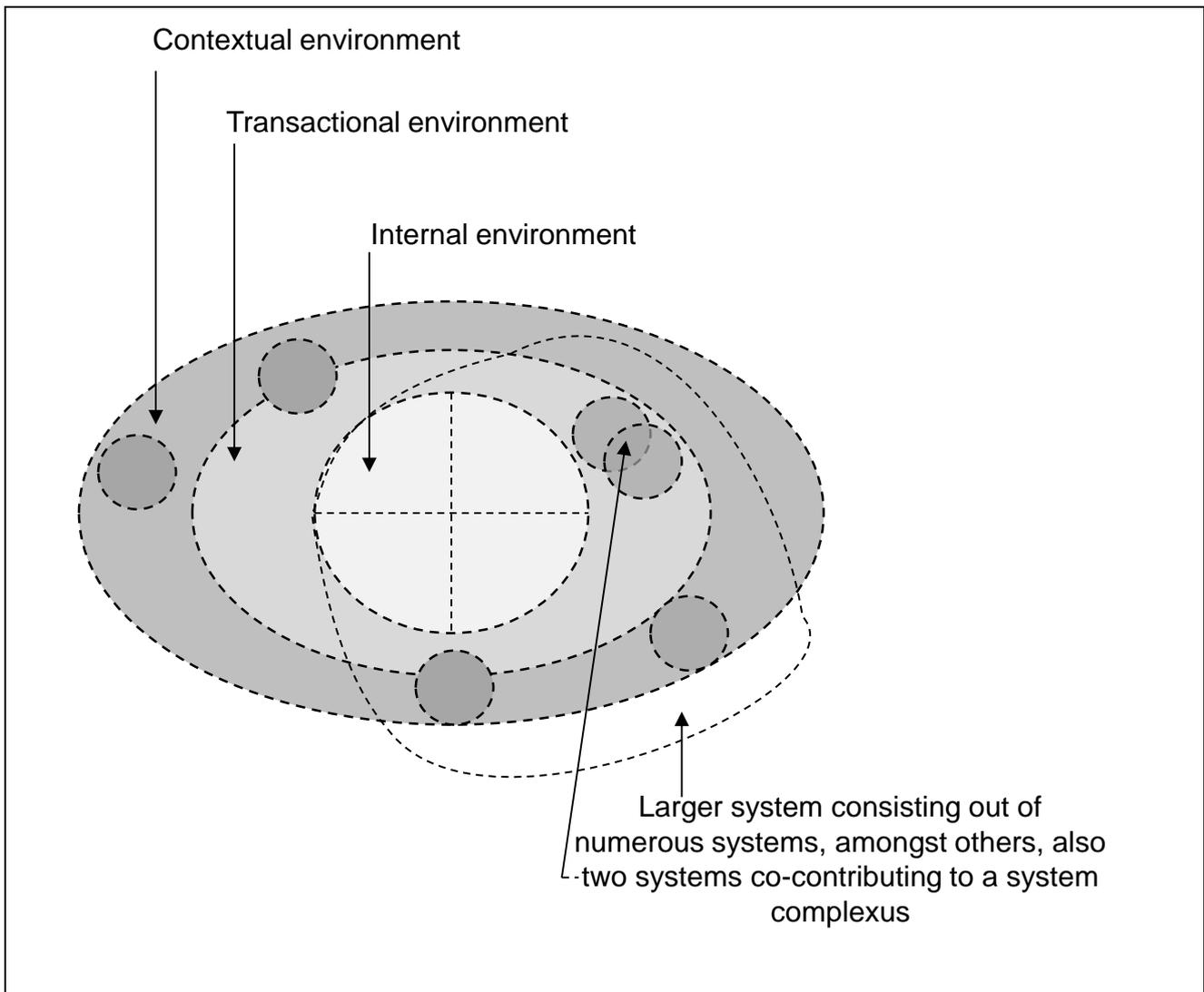
Figure 2.8: Sub-systems in relation to a larger system and the emerging systems complexus

The viewing of a complex adaptive system is especially beneficial to businesses scanning the environment, as it introduces a new theory-driven approach to foresight, as opposed to the conventional linear approach of forecasting (Aaltonen and Sanders, 2006:28). Aaltonen and Sanders (2006:29) make the point that the emergence of a selected foresight is not always the outcome of planned action. Sometimes it is a result of emergence because of interaction between the agents involved, without any master plan. As such, it is more an outcome of complex adaptive systems. This is due to unpredictability and uncertainty inherent in any future, either planned or unplanned. From this, it is apparent that a business cannot predict which variation will have the greatest influence on how the schemata are filled. Hence, scanners should rather view the future from a systems thinking perspective for purposes of understanding and reflecting upon it, as opposed to attempting to predict it (Schlange and Jüttner, 1997:779). Supporting this notion, Vogelsang (2004:4-11) endorses Mauboussin's

(1997) argument that the transition into larger complex adaptive systems self-organises criticality, and occurs without design or help from any outside agent

He argues that system variations cannot be directed from the outside, but can only be disturbed. Anderson (1999), Kaufman (1995), Pascale (1999:83-94), Rouse (2000:2), and Stacey (2001) agree that businesses cannot influence the rules, relationships and the choices made by both the co-contributing systems and the larger system lying outside of such schemata. Businesses can therefore only be mindful of the changes at the level of emergence and consider the content for purposes of scenario planning from a foresight perspective. Based on this mindfulness, Ing (1999:113) states that businesses need to become systemically sensitive and respond to environmental change, designing a purposeful, complex, and adaptive social system. The systemic sensitivity that Ing (1999:113) refers to needs to be aimed at the emergent operating values of the schemata, as these are the values that drive the behavioural actions of how systems enact with one another. Businesses also need to be sensitive towards the shared purpose, which refers to commonality, relative to the reason for the schemata to exist (Vogelsang, 2004:4).

Scanners measure the likelihood of changing conditions by examining indicators. There where indicators reveal a systematic and systemic variation over time, trends are defined (Costa, 1995:4-9). Vogelsang (2004:4) contextualises this phenomenon in terms of the characteristic of systems evolution and recombination, which is based upon interactions between the agents of schemata. These, in turn, are based on movements from the past, through patterns formed and reused with either slight diversions or large variations. Indicators form the building blocks of trends (cf. 2.3.4.1-2.3.4.8) and co-contribute to the formation of patterns, which scanners attempt to understand (Costa, 1995:4-9). Change, as a dimension of environmental scanning, represents the status of trends and patterns at any given time. The future is inclusive of the nature and content of change, and viewing it as such contributes to long-term planning. The latter becomes exponentially more difficult, since the notion of logical deduction is dependent on the temporal limitation of temporariness (Costa, 1995:4-9).

2.5.3   Stakeholder relation complexity

In this section, the term "stakeholders" is used to refer to those individuals or groups of people who participate in a scanning activity, either as scanners or as the subject of scanning. Schlange and Jüttner (1997:777) point out that the shortcomings of previous scenario planning approaches are directly linked to their inability to deal with the different stakeholder views, interests, concerns and expectations, as these are not easily quantifiable, if at all. This leads to an overreliance on quantitative data, creating an illusion of control over uncertain factors,

such as stakeholder differences and the subsequent emergence of schemata with characteristics different to those of the co-contributing agents (Schlange and Jüttner, 1997:778). With this challenge in mind, Schmidt and Haines (2005:2) recommend a parallel involvement from all stakeholders.

Stakeholder differences refer to:

- differences in views, which relate to a particular manner of looking at something;
- differences in interests, which relate to specific aspects of importance;
- differences in concerns, which relate to a certain mannerof being connected to the matter at hand; and
- differences in expectations.

The complexity arise from the challenge that stakeholders pose in terms of scenario planning, in that relationships with sets of stakeholder groupings, such as customers, suppliers, and competitors, form the core of a business's environment (Grant, 2005:68). Viewing this as the core and positioning relationships as a key enabler of success affects the approach towards a possible future scenario for the business. Businesses leverage this relationship factor in order to attain a future goal by balancing the competing demands of their stakeholders (Drotter, 2003:7).

Grant (2005:216) states that the social systems of politics, economics, social trend changes and technology as spatial configurations (Juarrero, 1999:110), need to be surmised in terms of their component configuration, as co-contributed to by those systems in the transactional environment (cf. 1.5.1). The transactional environment consists of the actual organisations, groups and persons with whom a business interacts and conducts business with, and thus defined as stakeholders (Schermerhorn, 2005:87). According to Dostal, *et al.* (2005:202), these stakeholders tend to be limited to the transactional environmental sphere, rather than the contextual environmental sphere. The contextual environmental sphere contains social systems as spatial configurations, not institutionalised structured shapes (Juarrero, 1999:110). Environmental systems in the transactional environmental sphere form the stakeholder groups of a business; moreover, they constitute the business model, along with a business (cf. Figure 2.5)

Amongst these stakeholders, independently and/or in a co-contributory way, there are different levels of power of influence (Boddy, 2002:361-362). The exertion of power relates to the actions necessary for stakeholders to achieve their respective expectations, and varies between formal, resource, and expert power (Boddy, 2002:361-362). According to Ferguson

(1993:2-4), stakeholders who are members of influential outside bodies exercise formal power. These can be bodies concerned with legislative and/or regulatory matters, and their influence may be experienced by businesses as either positive or negative (Boddy, 2002:92). In commercial terms, a large buyer of goods might leverage its capacity to buy in bulk in the form of resource power. In doing so, the buyer has power over the suppliers in terms of the price, quality and quantity of purchases (Boddy, 2002:92).Expert power follows the same lines, but refers to superior or exclusive information that businesses use to dictate commercial terms (Boddy, 2002:92,362).

Relative to scanning the environment, and based on determining foresight probability, businesses can use a structured process of stakeholder mapping to determine the levels of power applying in a specific instance (Boddy, 2002:93). Figure 2.9 is an example of such a classification matrix of stakeholder mapping. Identifying the intensity of the power exerted by stakeholders assists businesses in determining the likelihood of trend changes in the environment, specifically where conflicting stakeholder expectations are prominent in factors of influence making up the business environment (Boddy, 2002:92).

Referring back to Figure 2.8, it illustrates two systems co-contributing to the emerging systems complexus in the larger system (schemata). Each has a different level of power over the other.

	Low		
Level of power	Minimal effort	Keep informed	
	Keep satisfied	Key players	
High			
	Low	Level of interest	High

Figure 2.9: Stakeholder powers in the business environment

Source: Boddy, 2002: 93

Similarly, illustrated in Figure 2.8 the business, as part of a larger system, stands in a power relation towards each of the systems. A business may attempt to disturb a trend and the resultant pattern from these systems (stakeholders) (Vogelsang, 2004:4-11). However, this depends on the power relation between the two co-contributing systems. It does not merely

depend on the power relation between the business and either one of the two respective scanned systems. Complexus analysis may provide an indication of what possible new trends and subsequent patterns may develop based on the inter-relatedness, inter-dependence and relation between the two co-contributing systems of the complexus. This, in turn, may inform the related strategic response of the business.

2.5.4   Summary

This section contains the findings of the literature review, which is relevant to information gathering and its relation to scenario planning, focusing on what approach businesses take towards the environment and their future. The section builds on the notion that the way in which scanners approach the future and coinciding environmental changes, fundamentally affects how they conceptualise the future through conceptual scanning frameworks. This results in targeted sources of information and types of scanning. The findings of systems theory are discussed, progressing from simple systems to complex adaptive systems.

The section highlights relations between the separate systems that make up larger systems, and the relation between these systems, leading to a deeper understanding of the systems and their relation to one another. This understanding relates to the sense of a business's knowing of a scanned environmental system, through determining the nature of change. It limits its supposition to understanding the other system, and not necessarily to predicting change. The review reflects on the relation between systems in the environment, continuously changing through interaction, forging new and sustaining relations. This contributes towards constructing, reconstructing and modifying one another, as well the formation of larger schemata.

The view is articulated that scanning information includes environmental forces of change, which include the co-contributing sub-systems and the impact they have on creating larger systems. This co-contribution might reach beyond the spatial boundary of the particular environmental level in which a system operates, as those systems in the transactional environment influence the spatial configurations of social systems in the contextual environment (cf. 1.5.1).

Concerning forecasting and foresight, the review indicates that businesses are able to determine the likelihood of environmental changes. They do this by examining the indicators in an environmental sphere and the environmental system itself, and by determining how these affect one another. In cases where indicators reveal a systematic variation over time, businesses can determine certain trends, which they could utilise for scenario planning in a

back-casting manner, allowing proactive strategy selection. Change is therefore probably not a phenomenon, but rather a dimension of environmental scanning, forming part of the environmental systems' characteristics of trends and patterns. As such, change is part of the status of trends and patterns at any given time in itself.

2.6 SCENARIO PLANNING, STRATEGY SELECTION AND BUSINESS PERFORMANCE

A business environment on the one side and a particular business structure on the other side, shape the correlation between business strategy and business performance. According to Nandakumar, *et al.* (2010:911), the environment can be operationalised through the three constructs of dynamism, hostility, and complexity.

Dynamism refers to the rate of change in an industry as well as the randomness of how competitors and customers react to such change (Lawrence and Lorsch, 1967; Thompson, 1967; Burns and Stalker, 1994). Complexity refers to the change itself (Chandler, 1962; Khandwalla, 1972; Porter, 1979), whilst hostility refers to the possible threats that a business faces in terms of competition and trend changes in the industry.

Empirical studies (e.g. Homburg, *et al.*, 1999; Ward, *et al.*, 1996) point to a close correlation between the environment and a selected strategy, and indicate that some strategies are appropriate for some specific environments. Business performance thus depends largely on the strategy-environment fit for its own success.

In this sense, businesses tend to scan for opportunities in a stable environment, and for threats in a dynamic environment (Jennings and Lumpkin, 1992), where the environment determines the strategy, and influences what businesses scan. Examples of this could include a cost-leadership strategy in a stable and predictable environment. An example could also be a differentiation strategy in a dynamic and uncertain environment (Porter, 1980; Hambrick, 1983; Kim and Lim, 1988; Marlin, Hoffman and Lamont, 1994). According to Jennings and Lumpkin (1992:791-803), businesses with cost-leadership strategies tend to scan for opportunities, whilst those with a differentiation strategy tend to scan for threats.

Equally, in a business environment with low levels of complexity and dynamism, businesses tend to make large fixed investments to sustain low unit costs and mitigate risk (Marlin, *et al.*, 1994). Innovation is not required in such environments, as rivals normally do not make huge changes in their strategies (Kabadayi, Eyuboglu and Thomas, 2007). In hostile environments however, it is the opposite, as businesses need to enhance efficiencies and pursue differentiation (Hambrick, 1983; Ward, *et al.*, 1996).

Regarding the relation between business strategy, structure and the environment, Beal (2000:27-47) argues that businesses employing integrated strategies of cost-leadership and differentiation, tend to scan the external environment in relation to their own resources and capabilities.

In this section, strategy selection is discussed as the juncture between the scenario-strategy interface of a business and its performance-strategy interface, illustrated in Figure 2.10. According to Leemhuis (1985:30-37), the history of the use of scenarios in the business world goes back to the late 1970s. That being the case, scenario planning, as part of strategy selection, has been part of business for more than three decades.
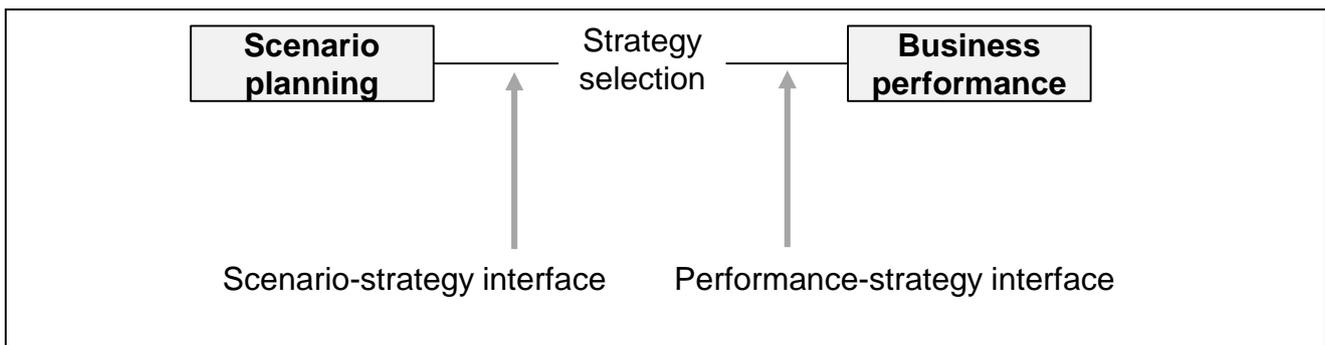
Figure 2.10: The scenario-strategy and strategy-performance interface

In discussing scenario planning in relation to strategy selection and business performance, its limitation as a linear extrapolation (Aaltonen and Sanders, 2006:29) is highlighted. The literature review focuses on scenarios within the reality of the temporal and relational boundaries, relevant for effective foresight (cf. 2.5.1). It considers the plurality that emerges in the environment due to changes in the environment. It shows that the subsequent newness of systems and their non-linearity (Aaltonen and Sanders, 2006:29) need to be taken into account when planning scenarios. The need for scenario planning in relation to strategy selection and business performance remains urgent, as current scanning remains hard pressed to cope with the instability and uncertainty of business environments and projections for the future (Montuori, 2000:69).

Based on the constant dynamism of the environment (cf. 2.3.1), the literature review indicates that businesses need to gear their planning activities to the strategic decision-making needs of businesses, and highlights the benefit of flexible scenario planning in this regard. It positions such flexible planning against conventional formal planning processes, which by their nature restrict business flexibility by virtue of the selected strategy (Sepulveda-Haugen and Testart-Tobar, 1999:1-12).

With regards to the relation between scenario planning and strategy selection, this section focuses on strategy as a response to changing market conditions, and the capabilities (strengths and weaknesses) that a business requires to compete sustainably in a specific business environment (market).

2.6.1   Scenario planning and strategy selection

Ansoff (1965:11-23) considers strategy to be part of a well formed, logical planning process and defines it as "moving from where you are to where you want to be in the future, through a sustainable competitive advantage". Mintzberg (1995) defines strategy as more fluid: "a pattern in a series of decisions or actions". Thompson and Strickland (1999:53) state that strategy is primarily concerned with how to grow a business, satisfy customers, compete with rivals, respond to changing market conditions, manage each functional sector, develop the necessary organisational capabilities and achieve strategic and financial objectives.

To enable the selection of an appropriate strategy in response to the above challenges, according to Miller (1998:97) scenarios are to include a description of the competitive environment. These scenarios should challenge common assumptions about the environment and detail possible future social trend changes and demand cycles. Moreover, they should measure the usefulness of a business strategy at the time, and indicate how the strategy needs to be amended and/or changed (Miller, 1998:97).

Porter (1980) suggests linking abusiness's external environment with its resources through the implimentation of his (Porter's) five forces or rules of competition (Fleisher and Bensoussan, 2007:61). Through scanning, businesses can grow their information compound, also referred to as its intelligence base, which can assist them in gaining insight into the competitveness of their immediate environment (Kotler and Armstrong, 2004:109).

Linking scenario planning to information gleaned from scanning the environment, the selected strategy requires structured flexibility as it breaks with the assumption that the environment will remain essentially static over time. It needs to incorporate the multi-complexity of the fact that the environment is composed of many variables affecting a business's competitiveness (Sepulveda-Haugen and Testart-Tobar, 1999:2). The literature indicates that, depending on how realistic a scenario is, it significantly affects the strategy selected as a response to the likelihood of such a scenario materialising.

In this regard, scenarios are methodologies for understanding the market, which can be instrumental in leading to a higher probability of competitive success. Langley, *et al.* (2008:235) make specific mention of a prepared responsiveness against future changes in

demand cycles and other environmental aspects. The probability of competitive success is based on both the appropriateness of the selected strategic response, and aligned business resource application (Robbins and DeCenzo, 2008, 87). The selection of a particular strategy is directly linked to competitor reaction and environmental change scenarios (Grant, 2005:132). It requires a characteristic of flexibility, based on competitor and market information, which provides businesses with insight pertaining to an appropriate response (Choo, 2003:8). Beal (2000:27-47) suggests that the scope of scanning facilitates the alignment of competitive selected strategies. Choo (2003:9) adds to this by saying that from the application of a business's intelligence base (information compound), businesses determine the situational dimensions of the environment, re-evaluate their strategies, determine information needs and view information seeking methodologies (cf. Table 2.1 and Figure 2.6). They decide how the information may be used and examine managerial traits based on this information compound (Choo, 2003:9).

However, strategy is not merely reactional by nature, but also proactive in the sense of leading an attack, stemming from the Greek term *strategos*. This Greek term refers to the art practised by a general when setting up military forces before a confrontation (Francis, 2010:25). Effective strategy requires pre-planning that is significantly impacted on by scenario planning (Peale, 2005:22). Ferguson (1993:1) states that scenario planning is driven by the need to manage the uncertainty embedded in any future, planned or unplanned. Amidst this uncertainty, according to Costa (1995:5), scenarios aim to assist businesses in being more proactive than reactive with regard to the future.

Figure 2.11 is an attempt by the researcher to graphically illustrate the ontological perspective on what is being scanned, the specific environmental spheres scanned, and the subsequent impact on strategy selection. In this figure, the scope of the environmental spheres is depicted at the top of the figure, spanning across the internal, transactional and contextual environments.
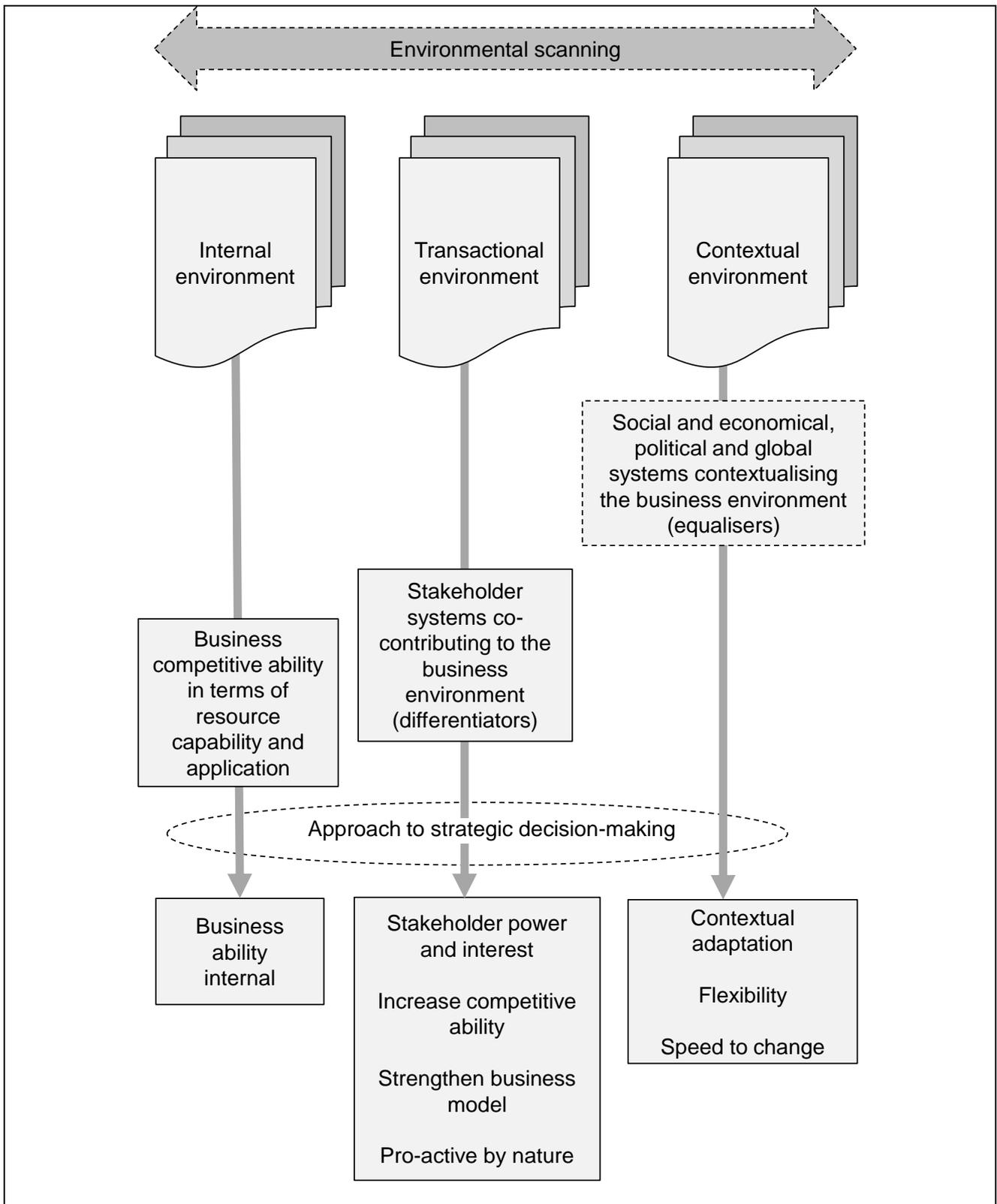
Figure 2.11: Levelled environmental scanning

What businesses scan for in relation to each sphere is depicted in the middle of the figure. For example: when scanning the internal environment, a business aims to determine its competitive ability, based on its resources and their application. When scanning the transactional environment, a business scans for stakeholders with whom it can foster

relationships in order to increase the barrier to entry in its competitor landscape. When businesses scan the contextual environment, they attempt to determine the status of those factors over which they have little or no influence, in order to react appropriately by selecting a reactional strategy.

Levelled environmental scanning, as illustrated in Figure 2.11, enables a business to determine its internal capabilities in order to increase its competitiveness through proactive stakeholder alignment. It also enables a business to construct flexible and adaptable structures for a changing environment. Figure 2.11 illustrates the impact of scenario planning on strategy selection, pointing to the fact that in each of the environmental spheres a different content is scanned for based on the strategic relevance and impact of that particular sphere on a particular strategy selected.

2.6.2   Scenario planning, strategy selection and systems thinking

Scenario planning takes the environmental characteristic of hierarchal levels of influence into account where systemic problems span over several levels in the systems hierarchy (Dostal, *et al.*, 2005:427). The impact of this characteristic on scenario planning and subsequent strategy selection lies in the construct of the theory that lower-level systems are comparatively simple and mechanistic, whilst systems display increasing complexity at the upper levels of the hierarchy (Puth and Lubbe, 1994:43). Businesses select different strategies, depending on the level of complexity and the relational status of the respective environmental systems scanned.

Jansen van Vuuren (2002:32) states that the hierarchical characteristic of systems means that scanning practices require a systems thinking approach to enable different scenario options. This is based on an integrative tendency of systems to function as part of the larger whole (cf. Figure 1.3), and a self-assertive tendency to preserve their individual autonomy. The complexity of this characteristic is embedded in the disposition that these two tendencies are not mutually exclusive. The status is thus one of stability and flexibility simultaneously (Jansen van Vuuren, 2002:32). This levelled complexity is enhanced by the phenomenon that changes in one system impact on another (Dostal, *et al.*, 2005:427), and the fact that this change is temporal (Dostal, *et al.*, 2005:139).

The different scenario dimensions considered are based on the types of challenges between environmental systems, adding to the change dynamic identified by Dostal, *et al.* (2005:425-426) and Vogelsang (2004:4).

These include:

- different stakeholders of a system holding conflicting values;

- a lack of alignment between systems due to different interests;

- an undermining of the functioning of the whole;

- a prevention of progress and maintaining an unproductive habitual behaviour; and

- negative self-fulfilling prophecies manifesting as a result of undermining beliefs and values.

Miller (1998:75-77) points out that scenario planning options are relative, based on the environmental system scanned, how they are scanned, and their relation to the business performing the scanning. Therefore, what may be a seemingly positive factor of influence for one business organisation may be negative for another. In this regard, the contextual environment can hold either opportunities or threats, as the relativity is embedded in a combination of environmental impact, the type of business, and strategic fit of the selected strategy. In designing the appropriate flexible strategy selection response, businesses consider the positioning of a factor of influence relative to their own competitive model. In this sense, it may prove unwise to structure the competitive edge of a business based on contextual factors beyond the business's control, as this could exponentially increase the risk factor of such a selected strategic model. Figure 2.12 illustrates this relation between competitive positioning and risk, in the context of the business model.

Figure 2.12uses the exchange rate as an example to illustrate this risk versus business model relation. It qualifies the exchange rate as a contextual factor of influence, because a business cannot influence the movement and volatility embedded in an exchange rate (Puth and Lubbe, 1994:43). Rather, there are other macro-factors at play which impact on the exchange rate, resulting in a corresponding movement in the exchange rate and subsequent influence on a business and its selected strategy. This impact is relative, depending on the design of the business model (cf. Figure 2.5and Figure 2.12) whereby businesses rely on the transactional factors of influence for purposes of increased business model flexibility. The competitiveness of a business, relative to contextual factors of influence, is based on adaptability and the ability to respond. In this regard, the contextual factors of influence are approached as equalising factors of influence, from a strategy selection point of view, as opposed to differentiating factors of influence (cf. Figure 2.11). Equalising, in this sense, refers to a similar impact that contextual factors of influence have on similar types of businesses in similar types of industries.
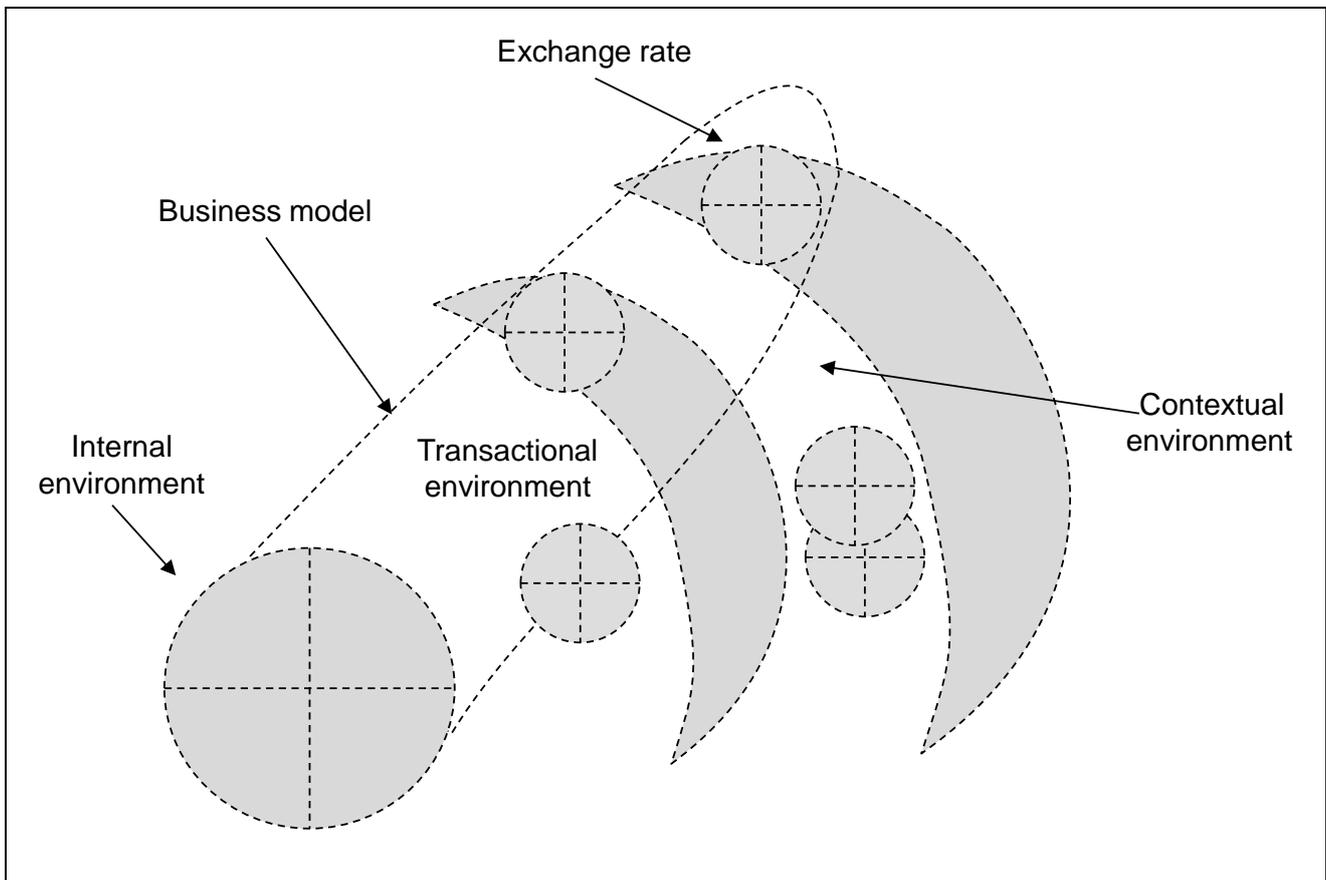
Figure 2.12: Competitive positioning and risk

2.7   CONCLUSION

The inter-relatedness and inter-dependencies between a business and the environment require a selected strategy that accommodates changes in the environment, affecting the strategic competitiveness of a business. Businesses employ either flexible adaptation as a competitive edge, or stakeholder alignment as a way of increasing the barrier to entry for its competitors, or a combination of both.

The systems theory applied in this study emphasises the dynamic nature of systems. More specifically, it emphasises the dynamic nature of open systems, concentrating on the emerging processes rather than the static structures. Open systems change and adapt because of their interaction with the environment, and respond to environmental conditions as they engage actively with the environment (Puth and Lubbe, 1994:44). An open system has permeable boundaries that permit the exchange of information, material, and energy within its environment. It therefore has the potential to evolve into a greater complexity (Puth and Lubbe, 1994:44). This dynamical dimension assists business analysts to take more of a long-term view on a system as they attempt to predict a status in terms of development in space, relative to a temporal development.

Sections 2.4, 2.5 and 2.6 above present the findings from the literature review on the relation between scanning, the resultant information yield, scenario planning, strategy selection and business performance.

In this discussion, the ontological and epistemological perspectives of scanning, and how they impact on information gathered, feature throughout. The challenge, as highlighted by the various researchers cited in the review, is to find a conceptual scanning framework which may increase both the completeness of information gathered, and the quality of the information yielded. Moreover, the challenge is to include the pre-conscious conditioners of perceptual filters, mind sets and worldviews in terms of what scanners view, how they view it, and what they see. The intention of conceptual scanning frameworks is to expand the perceptions of the current scanning that businesses perform; in order to become more adjusted to more of the world out there (Voros, 2003:61).

Chapter 3 of this study puts forward an attempt to form such an expanded conceptualised framework.

CHAPTER 3

A PROPOSED EXPANDED CONCEPTUAL SCANNING FRAMEWORK

3.1   INTRODUCTION

The research that drives the formation of an expanded conceptual scanning framework entails, as worded by Burt, *et al.* (2006:55), scanning on multiple levels of conceptualisation. The constant tension among the various points of environmental complexity and stability (Burt, *et al.*, 2006:55), as well as the identified need to conceptualise a framework depicting the evolving nature of the inter-relatedness, inter-dependence and relation between environmental systems, is indicative of the need for an expanded approach. Inter-relatedness refers to the notion that environmental systems are related. These systems contain patterns that are inextricably part of a greater flux of conditions (Burt, *et al.*, 2006:63). Inter-dependence refers to the notion that environmental systems are mutually dependent on one another (Burt, *et al.*, 2006:52), and relation refers to a significant association between two or more environmental systems (Johnston, *et al.*, 2008:1171).

The proposed expanded conceptual scanning framework is an attempt at building onto the progression in conceptual scanning frameworks, from focusing on the ontological behavioural reality, to including the epistemological subjective reality (Smircich and Stubbart, 1985:724-738). It is an attempt to graphically incorporate and represent statements recorded in the literature review regarding scanning and its derivatives activities.

The evolvement from viewing the environment as something out there, separate from a business, to viewing it as business specific (Burt, *et al.*, 2006:55), with a business as a part that co-contributes to a larger whole, questions the usefulness of the PEST taxonomy (cf. 2.3.4), and variations thereof. The conceptual scanning framework expansion articulated in this chapter, considers the criticism that environmental systems, such as those categorised through the PEST taxonomy, cannot be considered in isolation but rather require a framework of integrated conceptualisation, which in turn requires construct content and structure.

Expanding on the relation between gathering information through scanning, scenario planning and subsequent strategy selection, it makes sense to view the nature of a business environment as perceived by the decision-makers in a particular business (Sutcliffe and Huber, 1998:793-807). Their picture and insight encompass the information compound regarded as the input into the strategy selection process (Sutcliffe and Huber, 1998:793-807), and that which largely shapes the scanning process and conceptual environmental framework (Stewart, May and Kalia, 2008:83-106). With this in mind, the researcher has investigated the need to

inculcate the epistemological perspective into the conceptualisation of an expanded scanning framework. The researcher attempts such an inclusion through the application of general systems thinking concepts. This is treated as an embedded approach to scanning, which forms part of the expanded conceptual scanning framework. In doing so, an attempt is made at offering benefits to businesses over and above the conventional scanning mechanistic approach, highlighted by Farjoun (2002:561-594). These benefits refer to the consideration of environmental complexity and an understanding of the interdisciplinary character of the strategy selection process (Farjoun, 2002:562).

The expanded conceptual scanning framework endeavours to assist decision-makers to connect with the business environment, specifically the external environment, through a higher level of understanding of its dynamism and systemic inter-relatedness, inter-dependence and relation. This aim negates the misconception that the environment can be controlled through a higher-level knowledge (Bernstein, Lebow, Stein and Weber, 2000:43-76), and focuses on a higher-level understanding. The motivation for moving towards understanding as opposed to mere knowledge, lies in the paradigm shift that entails that scanners, in interacting with the external environment, participate in constructing the external environment (Wright, 2005:93).

Through the expanded conceptual scanning framework, the researcher aims to address the apparent lack of consideration in the current strategy management literature, given to the conceptualisation of the external environment. According to Mir and Watson (2000:941-953), this is primarily due to the dominance in strategic management literature of the realist paradigm. The expanded scanning framework is conceptualised through combining existing framework concepts, formulated through statements made by researchers in the field of scanning, and the inclusion of a systems thinking approach to its application.

3.2   STATEMENT GENERATION PROCESS

Regarding the identification and selection of statements that could be used in the questionnaires, the literature reviewed in the preceding chapters was scrutinised for claims made about scanning, scenario planning, strategy selection, business performance, and systems thinking as a scanning approach. Adding to this secondary source of potential statements, the researcher considered contributions by current business managers and independent experts to complement the statement selection process. According to Wright (2005:86-101), managers have specific expectations in terms of the practice of environmental scanning that need to be taken into account. In this regard, two research stakeholder groups, a current manager group and a group of independent practising experts, were consulted and actively participated in the statement selection process. The final statements selected are

presented in Tables 3.1 to 3.5 and were used in conceptualising the expanded scanning framework. The same statements were used to compile the Likert scale questionnaires used in collecting data during the primary research phase of the study.

The detail pertaining to the compilation of the Likert scale and the related matters of research validity and reliability is discussed in Chapter 4.

At this stage, however, for ease of reference the relevant statements are presented earlier (in Tables 3.1 to 3.5). The process of how these lists evolved from the initial stages of identification to those presented in Tables 3.1 to 3.5, is explained in the following paragraphs in an executive format. More details are provided in Chapter 4, where the validity and reliability of the data from the primary research are discussed.

Tables 3.1 to 3.5 contain statements within the context of scanning and information, information and scenario planning, scenario planning and strategy selection, strategy selection and business performance' and emerging systemic complexity (complexus analysis) and scanning.

Table 3.1: Statements pertaining to scanning and information

References	Statements
Burt, *et al.* 2006:55	Scanning should be performed from multiple levels of conceptualisation
Slaughter, 2002:5	Scanning is the single most effective data-input method available in yielding information
Expert group	Different businesses scan the same sources for information
Auster and Choo, 1993:195	Accessibility of information determines information source selection
McAdam and Bailie, 2002:972	Scanning is about gathering business environmental information with the aim of improving business performance
Goodman and Wright, 2001:1-16	Businesses tend to over-simplify scanning
Slaughter, 2002:13	Scanning is vulnerable to paradigm issues
Slaughter, 2003:19-20	Current scanning frameworks and methodologies exclude the scanner's perspective
Auster and Choo, 1993:195	Immediacy of information availability determines information source selection
Tevis, 2009:338	Information gathering depends on trend-breaking developments
Grant, 2005:68	Conceptual scanning frameworks are based on a perceived view of the environment
Auster and Choo, 1993:195	Higher levels of uncertainty relating to the environment, increase the need for enhanced environmental scanning
Burt, *et al.* 2006:51	In scanning, the emphasis is largely on the traditional, predominantly taxonomic classifications of the contextual or macro environment: Political, Economic, Social trend changes and Technology (PEST).
Stakeholder groups	Business information requirement determines the scanning mode
Stakeholder groups	Scanning is business specific

Table 3.2: Statements pertaining to information and scenario planning

References	Statements
Muhammed and Taib, 2009:1126	Scanning methodology correlates positively with decision quality
Guoia, Corley and Fabbri, 2002:622-634; Bodwell and Chermack, 2010:194-202	Foresight assumes that the future can inform the past
Aaltonen and Sanders, 2006:28	The future is continuously emerging and amplifying
McKiernan, 2006:18	Scenario planning is determined by environmental interpretive perspectives
MacKay, McKiernan, 2009: 274	Scenario planning assists in strategic management of resources
Stakeholder groups	Higher levels of perceived uncertainty correlate positively with scanning intensity
Burt, *et al.* 2006:55	The future is approached as deterministic
Martelli, 2001:57-70	Scenario planning is an expression of the scanner's mental model of the future
Stakeholder groups	Challenges facing the conceptualisation of scanning frameworks, relate to the state of flux, in terms of both environmental system informational content and the relational state between environmental systems
Miller, 1998:91-97; Katsioloudes , 2006:47; Cothern and Ross, 1994:241; Kotler and Armstrong, 2004:223; Manning, 2004:76	Scenario planning is dependent on the scanning information yield
Stakeholder groups	Foresight is an enhanced scenario planning methodology to that of forecasting
MacKay and McKiernan, 2010:275	Competing worldviews dominate the scenario planning process
Burt, *et al.* 2006:50	Scenario planning assists in understanding the environment
Slaughter, 2002:13	Scanning provides raw material for forward viewing
Varum and Melo, 2009:355-369	The future contains unpredictable and unknown emergent processes

Table 3.3: Statements pertaining to scenario planning and strategy selection

References	Statements
Peale, 2005:28	In a human system, the worldview of the system refers to the collective mind-set and the way in which individuals, in that system, understand the world in which it operates
Slaughter, 2002:1	Scanning has a positive correlation with correct strategy selection
Slaughter, 2002:1	Scanning has a positive correlation with appropriate strategy selection
Dostal, *et al.,* 2005:54-57	The hierarchical levels of influence between a business and an environmental system are dynamic
Kofman and Senge, 1993:6	Business considers itself as co-contributing to the status of a whole
Stakeholder groups	Systemically, scenario planning endeavours to answer the question about the emergence of the future, by looking at the current developed status of environmental systems
Schermerhorn, 2005:278	Strategy selection requires a level of future prediction
Selina, 2006:2	Scenarios are configured on both objective and subjective criteria
Voros, 2003:4	A team effort of diverse scanners, taking steps to broaden their views, is less likely to miss critical signals, than a homogeneous group of scanners
Othman, 2007:260	The strategy map is a snap shot depiction of the strategy at a particular point in time
Stakeholder groups	Strategy selection is reactional towards environmental components over which a business has limited influence
Plunkett, *et al.,* 2005:135-14	Strategy selection is determined by stakeholder hierarchical levels of influence
Dostal, *et al.,*114	Strategy selection is a conceptual business activity
Stakeholder groups	Strategy selection is dominated by differences in worldviews
Stakeholder groups	Scenario planning provides useful strategic information

Table 3.4: Statements pertaining to strategy selection and business performance

References	Statements
Franco-Santos, *et al.*, 2007:786	The social system components in the environment are the parts of other wholes, also being systems in themselves, referred to as sub-systems of a larger system
McEwan, 2008:6; Nandakumar, Ghobadian, O'Regan, 2010:907-939	Scanning correlates with business success
Dick, 2009:320	Environmental change is not a reactional phenomenon, but rather a managing characteristic
Senge and Kofman, 1993:3	We memorise isolated facts, read static accounts of history, study abstract theories, and acquire ideas unrelated to our life experience and personal aspirations
Stakeholder groups	Constant enhancement of scanning techniques is a pre-requisite for sustainable business competitiveness
Morrison, 2005:84	Similar external signals can lead to different reality experiences
Voros, 2003:4	Teams of diverse scanners consciously reflect on their preferred mind sets, and take steps to broaden their views
McEwen, 2008:10	Scanning information must be integrated with strategy in order to improve business performance
Stakeholder groups	Both cost-leadership and differentiation strategies are effective in environments with high levels of dynamism
Varum and Melo, 2009:355-369	The future consists of unknown emergent processes
Stakeholder groups	Business flexibility enhances competitive sustainability
Grundy, 2004:9; Voros, 2003:10; Robbins and DeCenzo, 2008:84; Burgelman, 1996:493; Schemmerhorn, 2005:88; Wheelen and Hunger, 2002:9; Friedman, 2006:441	Business performance is dependent on strategy selection as the juncture between performance and scanning
Farjoun, 2002:562	Epistemological perspectives have a sensitivity towards the interdisciplinary nature of strategy
Nandakumar, *et al.,* 2010:907-939	The relationship between business strategy and performance is influenced by the external environment
Nandakumar, *et al.,* 2010:907-939	The relationship between business strategy and performance is influenced by the business structure

Table 3.5: Statements pertaining to complexus analysis and scanning

References	Statements
Jansen van Vuuren, 2002:33	Complexity is based on the notion that systems are in a constant state of flux
Stakeholder groups	Scanning looks for those environmental systems initiating change and those opposing it
Choo, 2001	The level of knowledge and information available about the environment determines the scanning approach
Dostal, *et al.,* 2005:195	Systems are multi-dimensional
Vogelsang, 2004:4	Systems co-contribute to an emerging newness between them
Postma and Liebl, 2005:165	Managers use their mental models in scanning the environment, increasing their awareness of environmental uncertainties
Montgomery, *et al.*, 1998:189-197	Understanding the causal relations between environmental systems correlates positively with understanding the environment
Rodrı´guez and Yanes-Este´vez, 2010:260-273	Following the cognitive approach and the bounded rationality of individuals, reality that exists is the perceived reality
Slaughter, 2002:13	Scanning requires an integration of high level cognitive ability and sophisticated data-processing
Vogelsang, 2005:4	Systems' relations give rise to new aspect content as they interact with one another
Puth and Lubbe, 1994:43	Sub-systems and larger systems are related to one another in the sense that each system is seen as a part of some hierarchy, meaning systems as sub-systems, co-contribute to the formation of larger systems
Stakeholder groups	Businesses use their influence over one system to influence those over which they have very little, or no influence
Vogelsang, 2004:4	Simple patterns can combine to generate great complexity and variety, and emerging complexity can create many possibilities and many possible futures.
Stakeholder groups	Environmental systemic relational information contains new dimensions of scanning information
Varum and Melo, 2009:355-369	The future emergent processes is unpredictable and unknown
Othman, 2007:264	Scanning identifies discontinuities in the external environment

The researcher explored the notion of participating research stakeholder groups in order to determine which statements should be included in the endeavour to conceptualise an expanded scanning framework. For this purpose, the researcher applied an amended version of the Diamond Research Model (Van de Ven, 2007), depicted in Figure 3.1, allowing for engaged scholarship. The researcher applied the four stages of the Diamond Research Model in soliciting stakeholder group participation. The four stages are problem formulation, conceptualisation through induction or deduction, conversations held with knowledge experts from practice fields and functions where challenges have been addressed, and problem solving.
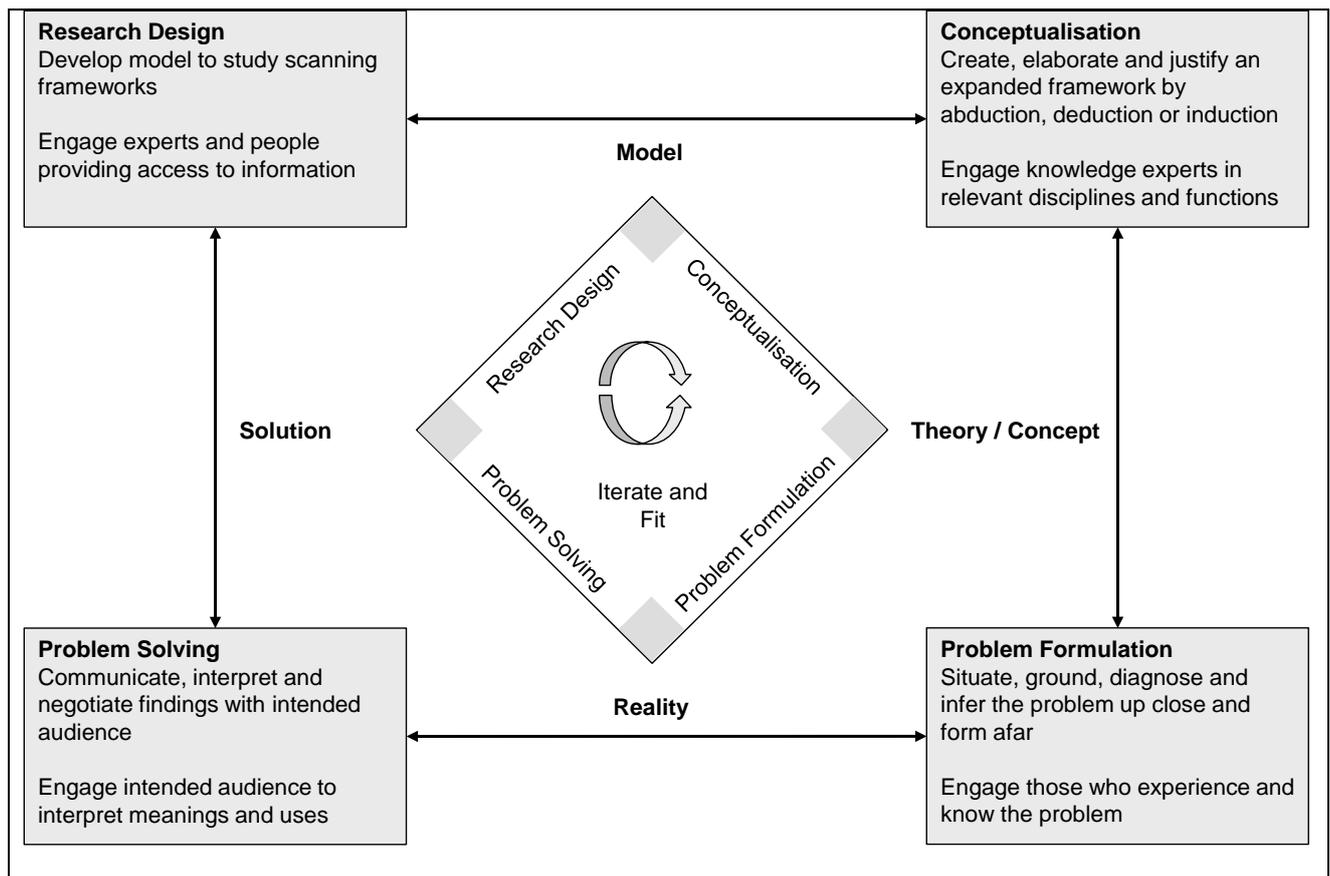
Figure 3.1: Practising engaged scholarship (repeated)

Source: Van de Ven, 2007 (amended)

As an outcome of this four-step process, an initial list of statements was compiled from which a statement selection questionnaire was constructed. This statement selection questionnaire was sent to the stakeholder groups to evaluate the statements and provide general input. Following on this, the statement selection questionnaire was amended and a revised questionnaire was sent to the same stakeholder groups for their input. Through this process, the statements presented in Tables 3.1 to 3.5 were yielded.

3.3   THE CONCEPTUALISATION METHODOLOGY AND LOGIC

This section explains the conceptualisation process and logic applied in conceptualising the expanded scanning framework. There is no significance to the selection of specific statements, as they are merely selected for explanatory purposes. The same process and logic of conceptualisation were applied to each of the statements considered during the conceptualisation of the expanded scanning framework.

The example statement referred to below is that of Slaughter (2003:19-20), stating that current scanning frameworks and methodologies exclude the scanner's perspective.

In considering this statement, and others, the researcher critically viewed frameworks identified through the literature review. This was done in order to ascertain whether current conceptual scanning frameworks do indeed reflect the sentiment expressed in statements, such as in this statement example, and others (Tables 3.1 to 3.5). Where examples were found that did contain a scanning characteristic, worded through a statement and illustrated in a conceptualisation thereof, the researcher endeavoured to expand on the particular conceptualisation. Where no examples of conceptualisation were found relating to specific identified statements, the researcher attempted to conceptualise it from afresh. By applying these two practices (methodologies), the researcher expanded on existing conceptualised scanning frameworks. In the example of this particular statement selected as an illustrative example, above, the concept of Spiral Dynamics (cf. 2.3.5.1) was added to the attempted expanded conceptual scanning framework, illustrated through Figures 3.2 and 3.3. In this case, the conceptualisation was done in an effort to represent the phenomenon, expressed through the statement, that scanning is susceptible to scanners' environmental perceptions.

To further the explanation of the logic and process behind the expanded conceptual scanning framework, another example, based on a statement taken from Table 3.2, follows below. Similar to the previous example, there is no significance to the selection of the specific statement; it is selected for explanatory purposes only.

Considering the statement that the future is continuously emerging (Aaltonen and Sanders, 2006:28), the researcher added the concept of environmental components as systems to the proposed expanded conceptual scanning framework. This requires businesses to view environmental components as systems, inclusive of their qualities, characteristics, dimensions and aspects. It meant that the researcher had to move beyond the static PESTLE-like categorisation of environmental components to that of emerging dynamic environmental systems and attempt to illustrate this characteristic through conceptualised expansion.

Another example, based on a statement taken from Table 3.3, follows below. Similar to the previous example, the statement is selected merely for explanatory purposes.

Considering the statement that scenarios are configured on objective and subjective criteria (Selina, 2006:2), the researcher added the epistemological dimension of the person performing the scanning (the scanner) to the conceptualised expanded framework. This was done by adding the concept of perceptual filters (cf. 1.7.1) through which scanners scan. Figures 3.2 and 3.3 illustrate this addition. The explanation thereof follows in Section 3.4. This statement concerns the requirements that businesses consider their own perceptual filters through which they do the scanning and which influences the ontological reality that they view. Conceptualising it in an expanded scanning framework meant that the researcher had to move beyond the uniform depiction of the environment of current conceptual scanning frameworks to an expanded framework, which allows businesses to individualise the environment that they scan, by considering and acknowledging their own scanning filter.

A similar logic and process of conceptualisation were applied to all the selected statements, identified through the literature review, some influencing the expanded conceptualisation more directly, and others more indirectly.

3.4   THE CONCEPTUALISED EXPANDED SCANNING FRAMEWORK

This section contains the proposed key concepts for an expanded conceptual scanning framework and presents the relevant graphic illustrations thereof. The graphic illustrations include the use of dotted lines, indications of conceptual distance and colour-codes of a business and environmental systems. These conceptualising tools were used to try and represent the environmental characteristics of dynamism, systems thinking as an approach to scanning, hierarchical levels of influence between a business system and its environmental systems, the movement of systems between different environmental spheres, the ontological and epistemological dimensions of scanning, the evolved levels of development of environmental systems and their worldview and the emerging newness between environmental systems.

The significance and meaning are explained in the section following on Figures 3.2 and 3.3.
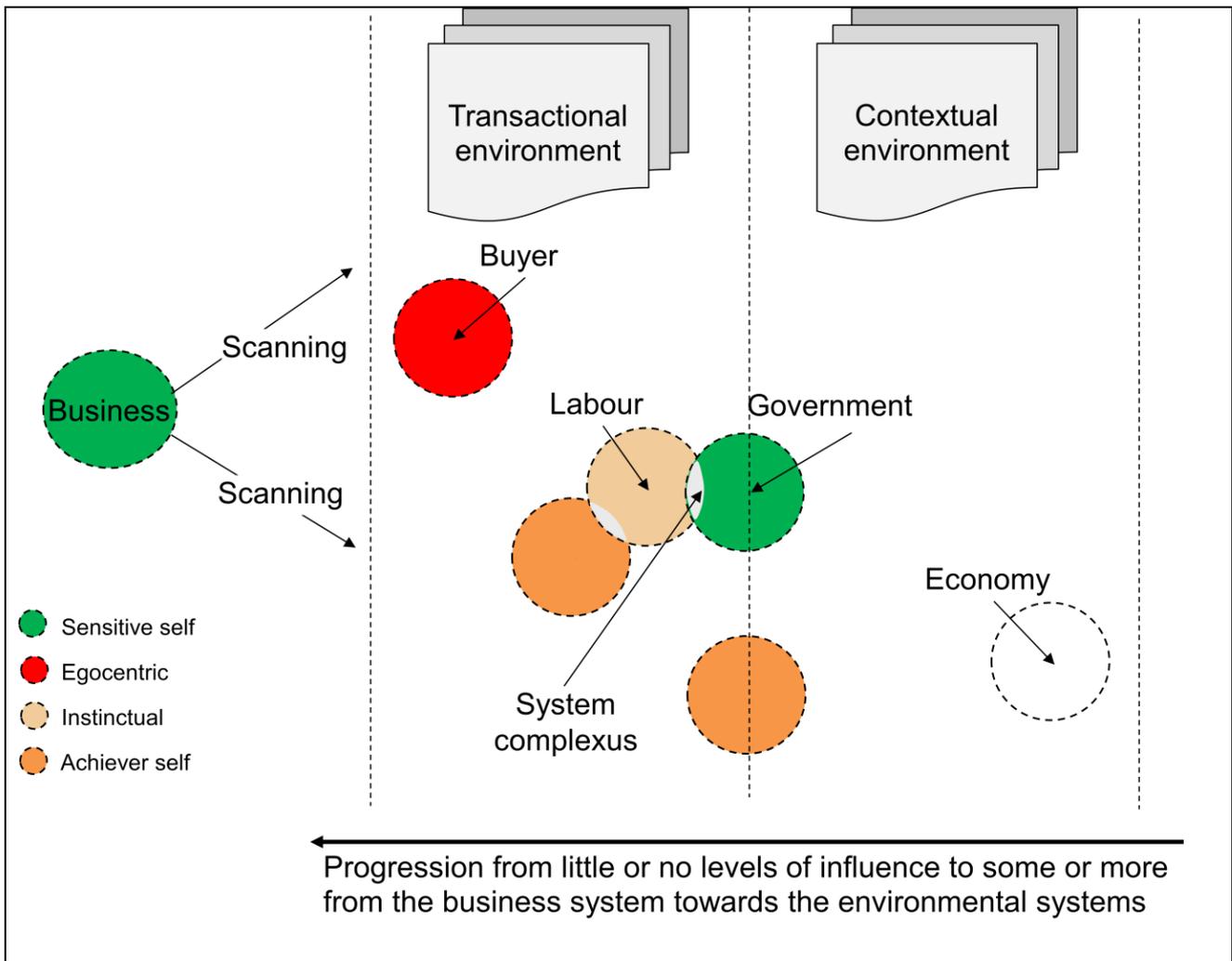
Figure 3.2: The expanded conceptual scanning framework

3.4.1   Dotted lines, distance (conceptual spacing) and colour

In Figures 3.2 and 3.3, the dotted lines signify openness and movement in environmental systems and spatial configurations. They signify openness between the internal, the transactional and the contextual environmental spheres (cf. 1.5.1). Figure 3.2 illustrates the phenomenon of openness and implies that environmental systems can move through the contextual and transactional environmental spheres, conceptualised in the external environment of a business. The proposed expanded conceptual scanning framework is thus an attempt to move beyond the traditional categorisation of the external environment through a PEST- or PESTLE-like analysis (cf. 2.3.4). These so-called environmental categories are depicted as ever-changing dynamic systems, moving between higher and lower levels of influence in their relation to one another, and to businesses scanning them. The arguments put forward by Mintzberg (1987:66-75), Quinn (1978:7-21), Montgomery *et al.* (1989:189-197), Berger and Luckman (1966), Eden (1992:799-811), Rowan (1981:99-112), Schein (1993:85-

92), and Burt, *et al.* (2006:52-52), challenge the value of the customary, mainly taxonomic, categorisation of the contextual environment.
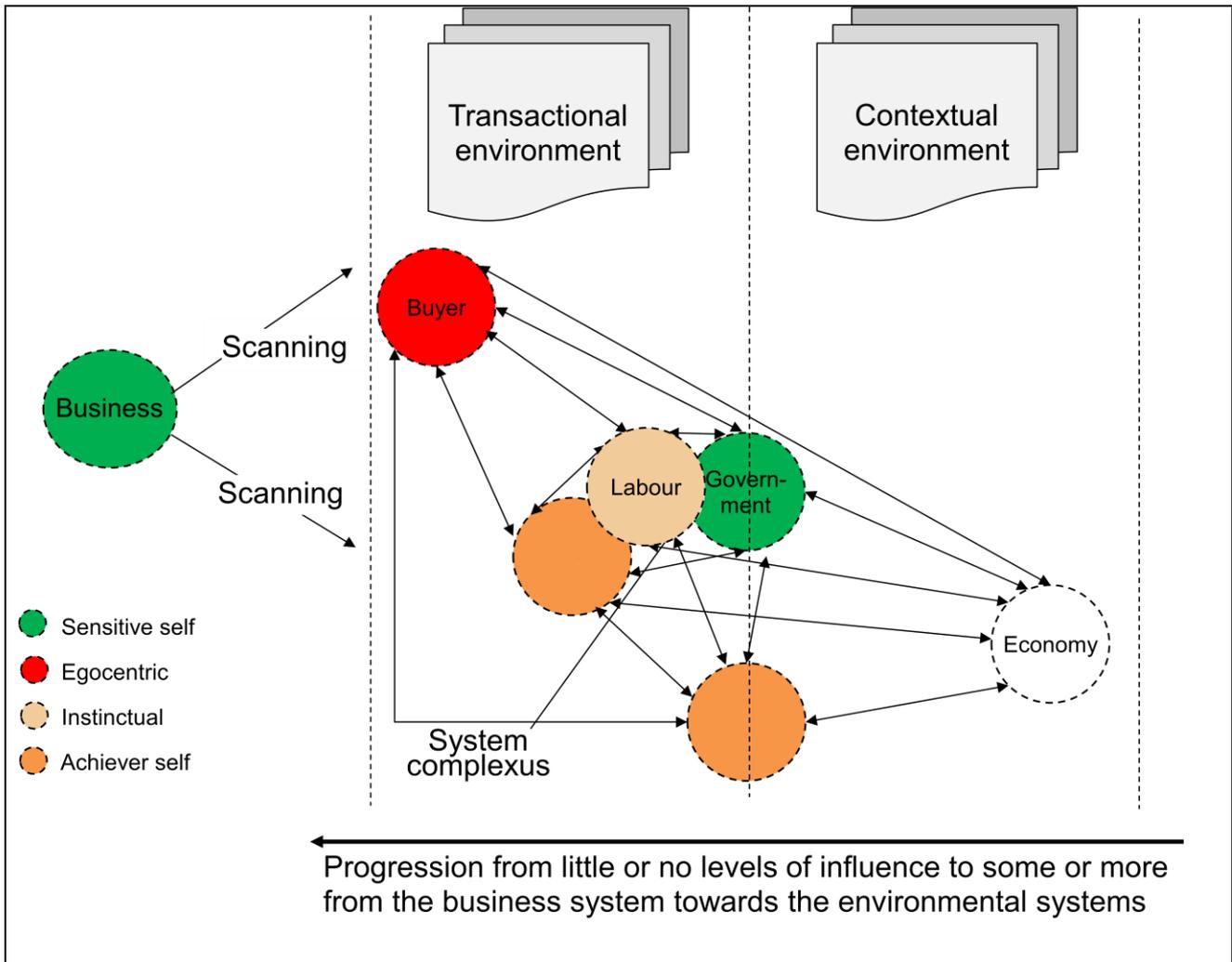
Figure 3.3: Systemic inter-relatedness in the expanded conceptual scanning framework

Some of the criticisms levelled at taxonomies like PEST and/or PESTLE are that these are too generic and do not provide for a complete understanding of the inter-relatedness, inter-dependence and relation among human systems and spatial configurations, or the cross-transactional and contextual interaction between these systems (Burt, *et al.*, 2006:52). The significance of this attempt at an expanded conceptual scanning framework is the fact that it allows scanners to consider such evolvement, and promotes an understanding thereof (Othman, 2007:262) when planning for the future through foresight. Mere taxonomic categorisation of the external environment lacks the ability to assist businesses in gaining a clear understanding of the probable external drivers of change. This includes not assisting them to gain an understanding of how the temporary status of an environmental system is affected.

Figures 3.2 and 3.3 may assist scanners to view businesses as part of what Koffman and Senge (1990:6) call a "creating community". By applying a systems thinking approach, they are able to move from the primacy of parts, or pieces, to focusing on the whole. This allows a business to consider itself as co-contributing to the status of such a whole. It coincides with the development of a way of thinking beyond conceptualising the world in terms of absolute truths, to one that considers coherent interpretations of people about the ontological observed reality. This process entails that businesses have started to think of themselves as part of a community and a larger system, as opposed to thinking of themselves as separate from the environment. The shift that this way of thinking introduces is that businesses need to deal with the information compound constituting the environment through creating systems. In this way, businesses contribute to better social systems, as opposed to merely dealing with challenges in the environment as problems that need solutions or fixing.

In summary, Figures 3.2 and 3.3 are an attempt to illustrate the environment as open, free, and not categorised through a PEST-like composition. The illustrations contain the internal business environment on the left side of the sketch, and the transactional and contextual environmental spheres to the right. Systems are positioned in either the transactional or the contextual spheres, but this positioning is not static, as indicated by the dotted lines. This positioning is based on the hierarchical levels of influence between a business and the identified systems, based on the temporal relational status between them at the time of scanning.

In Figure 3.2, distance (spacing) is also used to indicate hierarchical levels of influence between a business and environmental systems. The distance (conceptual spacing) is between the business performing the scanning and the environmental systems, as well as between the environmental systems themselves. It includes the hierarchical relation between transactional systems and contextual systems, or spatial configurations. It assumes that even though two or more systems might be in a transactional relation towards a business (cf. 2.3.4.1), the levels of influence that the business has over each system may possibly differ by hierarchical degree. This is the case even when the systems are within the same environmental sphere. The relative proximity between the systems scanned, signifies the level of direct- or indirect inter-activeness (cf. 1.4.2) between them. Higher levels of direct inter-activeness are displayed through an overlap between two or more systems, illustrating the emergence of a systems complexus. As an example, in Figure 3.2, government is depicted much closer to labour as to buyers in this specific instance.

The colour of the circles representing the systems in Figure 3.2 indicates the level of evolutionary development (Oreja-Rodrı´guez and Yanes-Este´vez, 2010:260-276) of those systems (cf. Table 2.2). The concept of levelled development is derived from Voros' four-quadrant/11-levelsconceptual scanning framework (cf. Figure 2.3). Level one (Physical prehension), as depicted in Figure 2.3, is the lowest recorded level of development, while level ten (Clistic self), is the highest recorded level. These levels of evolutionary development are depicted in the upper left quadrant of the four-quadrant/11-levels meta-scanning conceptual framework. The colour of the system, conceptualised in Figures 3.2 and 3.3, also indicates the current worldviews of those systems. The worldview is based on the impact of a system's immediate reality, as observed by that system (Voros, 2003:49).

The complete array of colour-codes, as per the Spiral Dynamics Model (cf. Appendix B) is:

- **Level 3: Beige: Instinctual**

The worldview: The world is a state of nature. The distinct "self" is barely awakened and motivation is largely physiological.

- **Level 4: Purple: Magic**

The worldview: The world is mysterious and frightening, full of spirits which have to be appeased.

- **Level 5: Red: Egocentric**

The worldview: The world is tough and hard, like a jungle full of threats and predators: the tough survive the weak serve or die.

- **Level 6: Blue: Mythic self**

The worldview: The world is divinely controlled and guided by a Higher Authority or Order, with a distinct right and wrong; those who are righteous are rewarded, those not, are punished, possibly forever.

- **Level 7: Orange: Achiever self**

The worldview: The world is a rational, well-oiled machine, full of viable options and plenty of opportunities and alternatives for success and prosperity.

- **Level 8: Green: Sensitive self**

The worldview: The world is the habitat for all humanity to share together and find affiliation, through consensus and reconciliation.

- **Level 9: Yellow: Integral self**

The worldview: The world is a chaotic organism where change is the norm and uncertainty an acceptable state of being; life is a kaleidoscope of natural systems and forms – there are natural "flows".

- **Level 10: Turquoise: Clistic self**

The worldview: The world is a single, dynamic organism with its own collective mind – a delicately balanced system of interlocking forces in jeopardy at humanity's hands.

A more detailed explanation follows below.

The four-quadrant/11-levelsconceptual scanning framework (cf. Figure 2.3) consists of four quadrants. These are the upper right, lower right, upper left and lower left quadrants. Each of these contains evolutionary levels of development.

The quadrants subjected to evolutionary development are the upper left quadrant (self and consciousness), the lower left quadrant (culture and worldview), the upper right quadrant (physical states, organism and brain), and the lower right quadrant (social systems and environment).

Spiral Dynamics (cf. 2.3.5.1) is a systems framework that categorises the manner in which human minds filter their observations of the world (Voros, 2003:44). It describes the upper left (self and consciousness) quadrant. According to Graves (1974:72-85), it is based on empirical studies of human beliefs and value systems. It is an illustration of and an attempt at explaining some arranging assumptions and identifiable development phases through which the human mind progresses (Voros, 2003:37). The phases refer to motivational factors, views of the world and the different ways in which the human mind thinks and perceives. Spiral Dynamics proposes a conceptual scanning framework that explains how people think; i.e. the process of thinking and not what they are thinking, i.e. the content (Voros, 2003:37).

The Spiral Dynamics framework attempts to merge the cognitive capacities of people with the life conditions during the afore-mentioned developmental stages. This is represented through colour-codes. These codes symbolise the interaction between life condition and cognitive capacity. The developmental stages represent and describe emergent thinking systems. These become more expansive as they are able to perceive a more exhaustive and broader worldview, the further the developmental level is in the sequence of development (Voros, 2003:45).

In the conceptual Spiral Dynamics framework, each level represents the following:

- a worldview;
- a value system;
- a level of psychological existence;
- a belief structure;
- an organising principle;
- a way of thinking; and
- a mode of living.

These are presented by colour-coded levels and applied in the illustration of the expanded conceptualised conceptual scanning framework in Figures 3.2 and 3.3. In this case, each colour-coded level contains the following descriptors:

- a basic theme which refers to a common discourse;
- a popular name which refers to a favourable designation accepted by people;
- a level which refers to the uniform status of the Spiral Dynamic;
- a worldview which refers to a world perspective held by individuals or a group; and
- a characteristic energy which refers to a distinguishing activity.

Appendix A contains the descriptions, by definition, of the developmental phases of the four quadrants of the four-quadrant/11-levels conceptual scanning framework. Appendix B contains the descriptions and meaning of the colour-coded levels in the upper left quadrant, categorised according to the Spiral Dynamics framework.

The purpose of including the Spiral Dynamics categorisation into the proposed expanded conceptual scanning framework is to assist businesses with factoring in the perceptual filter through which they scan the external world. Simultaneously, the inclusion considers the level of development of those systems scanned and how they, in return, view the world.

As an example, a business may scan through a red colour-coded filter, meaning it views the world as tough and hard, like a jungle, full of threats and predators. Therefore, the business, according to its Spiral Dynamic categorisation, displays the basic belief that to succeed in the world of business, it needs to be tough in conducting business. Conversely, as an example, the same business may scan a system like government, which in turn might have a perceptual filter of orange. According to the Spiral Dynamics framework, this means that government views the world as a rational, well-oiled machine, full of viable options and plenty of opportunities and alternatives for success and prosperity. This example illustrates that there needs to be consideration for the worldview filter of scanned environmental systems. The

reason for this is that the difference, or similarity, between the scanner's worldview and the scanned environmental system's worldview may impact significantly on the selected strategic reaction of the particular business.

Figures 3.2 and 3.3 are attempts at conceptualising the differences in evolutionary developmental levels and coinciding worldviews of the environmental systems that businesses scan. They allow for the possibility of incorporating the epistemological reality with that of the ontological environment scanned. In this regard, the expanded conceptual scanning framework may assist businesses to understand that different people in different systems have different worldviews. This might assist the strategy selection process as, according to MacKay and McKiernan (2010:275), competing worldviews can dominate the scenario planning process in a business.

Figures 3.2 and 3.3 illustrate the developed levels of the relevant systems included in this example through the colour-codes of beige, green, red and orange. According to the Spiral Dynamics categorisation, beige refers to a developed level of being instinctual, green refers to the developed level of being sensitive, red to that of being egocentric and orange to that of being an achiever self. The arrows in Figure 3.3 indicate the inter-relatedness, inter-dependence and relation between all of the systems represented in the figure, including that of the business system, incorporated into this illustration. The reason for a separate figure illustrating this dynamism is merely for purposes of clarity.

In applying general systems thinking concepts, the expanded conceptual scanning framework is an attempt at depicting the progression from the dominance of taxonomic categorised pieces to what Kofman and Senge (1993:6) call the primacy of the whole. By incorporating the business's worldview and evolutionary level of development into the expanded conceptual scanning framework, the researcher attempts to provide the scanner with the probability of progressing from absolute knowledge-based truths to coherent interpretations. It will assist the scanner to think beyond just solving problems or managing situations, to creating an evolving and adapting system along with the co-contributing systems in the environment.

In Figures 3.2 and 3.3, the dotted lines and distance (conceptual spacing) between the systems represent movement and levels of influence between the systems. The expanded conceptual scanning framework is therefore an attempt at conceptualising the principles of dynamism in the business environment, based on statements pertaining to this dynamism, as identified through the literature review. Figures 3.2 and 3.3 also contain the concepts of worldview and levels of evolutionary development of the respective systems conceptualised, including that of the business performing the scanning. These two concepts are also based on

relevant statements identified through the literature review. Whether businesses currently consider the concepts alluded to in these statements when scanning the environment and whether they incorporate some or all of these into their scanning practices, have been determined through the primary research conducted and reported on in Chapter 4 of this study.

In Figures 3.2 and 3.3, the business system is conceptualised and represented by a green circle, a rival business by a red and labour by a beige circle. Each of these colour-codes is categorised through a basic theme, popular name, level of evolutionary development, worldview and characteristic energy descriptors, presented in Table 3.6. As such, Table 3.6, as an example, forms part of the expanded conceptual scanning framework tool. The descriptors of the basic theme, popular name, level, worldview and characteristic energy in Table 3.6, is based a Spiral Dynamics (Voros, 2003: 46-48) classification.

Table 3.6: Example of colour-code descriptors of scanned environmental systems

Descriptor	Business	Competition	Labour
Basic theme	Seek peace within the inner self and explore, with others, the caring dimensions of community	Be what you are and do what you want	Do what you must to just stay alive
Popular name	Human bond	Power gods	Survival sense
Level	Join communities to experience harmony, love, and mutual growth for self and others	Fight to survive and dominate others without guilt and to avoid shame	Basic survival, food, warmth, sex, water and safety
Worldview	The world is the habitat for all humanity to share together and find affiliation, through consensus and reconciliation	The world is tough and hard, like a jungle full of threats and predators: the tough survive the weak serve or die	The world is a state of nature. The distinct "self" is barely awakened and motivation is largely physiological
Characteristic energy	Communitarian – thinking is relativistic; structures are egalitarian and heterarchical, yielding social networks; processes are consensual	Impulse – thinking is egocentric; others do not figure, so processes can tend to be exploitive of others	Survivalistic – thinking is automatic, processes are instinctive

Through this categorisation, the researcher endeavours to conceptualise the environmental systems in such a way as to allow for the consideration of these descriptors, per system scanned. It is not intended to be another variation on the taxonomic categorisation of environmental systems, but more a categorisation that enables businesses to understand the scanned environmental systems better, and allow for differences in terms of evolutionary developed levels and worldviews. Further, the categorisation is not static and therefore differs

considerably from the mechanistic and conventional categorisation of the environment through a PESTLE-like framework. The categorisation, as illustrated in Figures 3.2 and 3.3, detailed in Table 3.6, considers the temporary status of the environmental systems at the time of scanning, and recognises that these may change over time.

The expanded conceptual scanning framework is an endeavour to address the multi-dimensionality of systems scanned and, among other things, applies concepts from the four-quadrant/11-levels conceptual scanning framework, and the Spiral Dynamics framework, to assist in this endeavour. The expanded conceptual scanning framework also endeavours to illustrate added foci, which contribute to the understanding and management of the complexity encompassed between systems, including the emergent newness.

The added foci are:

- scanning for the changes in people values, perceptions and goals (upper left quadrant);
- scanning for shared collective structures (lower left quadrant);
- scanning for changes in the way people act externally, such as voting patterns; consumer behaviour and reproductive practices (upper right quadrant); and
- scanning for objectively measurable changes in natural and constructed external environments (lower right quadrant).

Figures 3.2 and 3.3 allow the scanner the opportunity to consider the various dimensions of inter-relatedness, inter-dependence and relation among business systems, human systems and spatial configurations.

The inter-relatedness, inter-dependence and relation dimensions include those between the business and human systems, the business and spatial configurations, the human systems among themselves, the spatial configurations among themselves, and those between the human systems and spatial configurations. Figure 3.3 illustrates this multi-directional inter-relatedness, inter-dependence and relation between the afore-mentioned systems and spatial configurations.

Other than the mere directional inter-relatedness, inter-dependence and relation between the factors of influence in the business environment, the direct and indirect relational statuses are also determined in terms of their intensity. Referring to Figure 3.2, this is signified through nearer or further proximity between the environmental factors of influence.

The multi-dimensionality of systems implies that the scanned environment consists of systems within systems (Dostal, *et al.*, 2005:38), and that scanning needs to include multiple perspectives in order to increase the depth and width with which businesses currently scan the

environment (Slaughter, 2003:19). According to Liebl and Schwarz (2009:313), typical pop-futurism such as that of Naisbitt (1982) and Popcorn (1991), lacks deeper scientific research. It requires enhancement of epistemological scanning, permitting and guiding the methodological restructuring of the basis of the social order. This has substantial implications for businesses, pertaining to whether the future should be treated as probabilistic, or deterministic (Slaughter, 2003:27).

3.5   CONCLUSION

The researcher commenced the process of developing an expanded conceptualised scanning framework by analysing the conceptualisation and application of current conceptual scanning frameworks. In order to do so, information was gathered through the literature review, which provided details on current conceptual scanning frameworks, methodologies, and approaches to scanning. This information contains both an affirmation and criticism of the current scanning practices performed by businesses. The researcher has responded to the criticism by proposing an expanded conceptual scanning framework, based on statements pertaining to scanning, information gathering, scenario planning, strategy selection, business performance, and systems thinking as identified during the literature review.

Figures 3.2 and 3.3 illustrate the researcher's proposed expanded conceptual scanning framework. The framework is an endeavour to encapsulate the concepts developed in response to the criticism levelled at existing scanning taxonomies (cf. 2.3.1) and current frameworks. In conceptualising the framework, the researcher has given expression to the theoretical concepts of levels of influence, dynamism, movement, evolutionary development, systemic inter-relatedness, inter-dependence and relation, and ontological and epistemological dimensions to scanning.

Chapter 4 aims to illustrate whether the social world of business operates in a manner that can substantiate the statements identified via the literature review, and whether the researcher, in developing an expanded conceptual scanning framework, can apply these statements.

CHAPTER 4
RESEARCH DESIGN AND METHODOLOGY

4.1   INTRODUCTION

Chapter 4 contains an explanation of the research design and methodology utilised as part of the primary research component of the study. It provides a set of guidelines and details pertaining to the procedural framework within which the research was conducted. The chapter focuses on the researcher's attempts to provide conclusive recommendations pertaining to the research question. This is done by determining the extent to which businesses perform scanning and related derivative activities as per the findings of the literature review, which, in turn, form the basis of the expanded conceptual scanning framework presented in Chapter 3.

The survey instrument, a set of five seven-point Likert scale questionnaires used for the collection of the primary data, is described and reasons for its selection is given in Chapter 4. The chapter explains the evolving process of the research with regard to environmental scanning, from the discussions in the previous chapters of the study to the creation of the questionnaires.

As discussed in Chapter 3, statements pertaining to scanning and its derivative activities (cf. Table3.1, 3.2, 3.3, 3.4 and 3.5) form the basis of the proposed expanded conceptual scanning framework. These statements were presented via the five separate Likert scale questionnaires to the sample group of participants in the primary research. The purpose of the survey was to establish whether businesses currently perform scanning in the ways described and claimed in these statements. Continuing with the process of identifying and selecting statements as presented in Chapter 3, Chapter 4 provides more detail on the process of determining which statements should have been included in the Likert scale questionnaires, and which not.

The research builds on the opinions of researchers in the field of scanning and its derivative activities, as elucidated through the literature review. These opinions refer to environmental complexity and support the view that it has become an imperative for businesses to constantly enhance and expand their current frameworks and methodologies of, and approaches to, environmental scanning. It implies a move beyond traditional models of scanning primarily built on the theory of reductionism and derivatives thereof (cf. 1.3.3.4) (MacKay and McKiernan, 2009:273; Kofman and Senge, 1993:10; Slaughter, 2003:31).

The causal claim of the study, as Mouton (1996:102, 192) phrases it, refers to the application of a systems thinking approach to scanning, and the *a priori* inclusion of concepts such as environmental systems movement, distance (conceptual spacing), hierarchical levels of

influence, worldview, a system's evolutionary developed status, and an epistemological dimension in current conceptual scanning frameworks. The claim is that the inclusion of such concepts might assist in increasing the information compound whole of scanning through a structured approach, and contribute to a subsequent increase in appropriate strategies being selected and resultant business performance (cf. 1.2). The claim is based on the notion highlighted by Aaltonen and Sanders (2006:28) that, systemic future creation (Kofman and Senge, 1993:6, Juarrero, 1999) requires a reconstruction and rethink of the causal mechanisms (Mouton, 1996:192-194) that produce certain outcomes.

The causal claim relates to the commonality between the fundamental approach towards the future, as highlighted by Varum and Melo (2009:355-369), and the concept of the emerging newness between systems. The commonality relates to the characteristics of emergence (Burt, *et al.*, 2006:63), unpredictability (Varum and Melo, 2009:356), new and unknown complex interrelatedness between environmental components (Vogelsang, 2004:4), and how to conceptualise and think about them (Clemens, 2009:263). Currently scanners treat the emergent space between environmental systems as both unpredictable and unknown (Borjeson, *et al.*, 2006:727). There is, however, also the notion of a future that can be created (Senge and Kofman, 1993:6), as opposed to being pre-determined (Burt, *et al.,* 2006:55).

4.2 RESEARCH OBJECTIVES

Mouton (1996:101) points out that at least two factors influence decisions on a study's research objectives, both of which are driven by the researcher. One relates to the researcher's background knowledge of the phenomenon to be researched, and the other to the researcher's interests, intent, and preferences. In the case of this study, the researcher has been involved in international business development through strategic and operational consulting interventions, performed on a large number of businesses in various industries. Appendix C contains a list of businesses and industries for which the researcher has consulted during the past 21 years. During this involvement, the researcher has dealt extensively with the embedded challenges that businesses face regarding environmental scanning and strategy selection. These challenges are partly echoed in the opening paragraphs of this study in the words of Taleb (2007:8-9), who refers to "the triplet of opacity". The first element of the triplet is the illusion that people are under when they think they know what is going on in the world, when in fact, the world has become much more complicated and random than what they realise.

The primary motivation for the study lies in the ongoing challenges businesses face, according to Ansoff and Sullivan (1993:11-23), when they scan the environment. This refers to the

necessity of managing the ever-increasing environmental complexity (McKiernan, 2006:12). The challenge relates to the praxis of strategy selection (Schlange and Juttner, 1997:778), scenario planning and business performance, which stands in a dependent relation to the information yielded by scanning the environment (Hyde, 2000:56). In this regard, the primary objective of this study is to create an expanded conceptual scanning framework, with systems thinking as an approach. The researcher endeavours to bridge the research-practice gap (Gray, Iles and Watson, 2010:247) between the study's aim and the scanning practices followed by businesses. The researcher investigates whether current conceptual scanning frameworks can be expanded, based on using selected statements identified through the literature review. Presenting such an expanded conceptual scanning framework does not negate the possibility of other supplementary approaches that could enhance current conceptual scanning frameworks.

A secondary objective of the study, which flows from the primary aim, is to re-confirm the relation between the activities of scanning, information gathering, scenario planning, strategy selection and business performance, the latter being an outcome of strategy selection. It does so by attempting to find substance in the business (social) world (Gilbert, 2008) that would support the notion of a need for an expanded conceptual scanning framework.

4.3   INFORMATION REQUIREMENT

Regarding the information requirement of the study, the units of analysis are as follows.

4.3.1   Units of analysis

The units of analysis include businesses, environmental scanners, and the environmental systems constituting the environment scanned.

4.3.1.1   Businesses as units of analysis

Part of the motivation for creating an expanded conceptual scanning framework is to assist businesses to be more competitive in an ever-changing (Hosley, *et al*., 1994:5-15) and increasingly more complex (Wright, 2005:95) environment. Hence, businesses are considered as units of analysis in this study. Varum and Melo (2010:365) state that, in terms of scanning and its derivative activities, this field of research and practice are predominantly occupied by business.

4.3.1.2   Individuals as units of analysis

Scanning is performed by individuals in a business (Lester and Parnell, 2008:545), referred to as scanners (Patton, 2005:1086). Hence, individuals have been added as units of analysis of this study.

In treating scanners as units of analysis, particular attention is given to the epistemological dimension (Wright, 2005:93) of these scanners. This is done in support of the envisaged expansion of the conceptual scanning framework, which includes the epistemological dimension in what Voros (2003:39) terms a structured manner. The reason for including this dimension is the advantage that it brings to current scanning alternatives, which are mechanistic. Wright (2005:93) states that this advantage is embedded in the apprehension of environmental complexity that the epistemological perspective affords, as well as sensitivity towards the interdisciplinary nature of strategy selection (Farjoun, 2002:562).

A related factor, which makes it important to treat scanners as units of analysis, has to do with the phenomenon that businesses, following on scanning and the gathering of information, configure scenarios on both objective and subjective criteria in trying to establish validity (Selina, 2006:2). The subjectivity lies with the scanner, for whom similar external signals can lead to different experiences of reality (Morrison, 2005:84).

4.3.1.3   Environmental systems as units of analysis

The environmental components used to depict a conceptual scanning framework for a business specific environment (Montgomery, *et al.*, 1989:189-197), are added as units of analysis to the study. These are contained in the traditional taxonomic categorisation of PESTLE (Burt, *et al.*, 2006:56) and derivatives thereof, and include the aspects of environmental systems that are in either a transactional or contextual relation to a business. This particular source of information, in the instance of environmental systems, moves beyond a mere categorisation of these systems to include the inter-dependence, inter-relatedness and relation amongst them as well, creating an emerging newness.

4.3.2   Sources of information

To determine appropriate sources of information for this study, the relevant literature was scrutinised for sources used by other researchers in a similar field. Table 4.1 contains these sources of information.

Table 4.1: List of sources

List of sources	References
Internet	Tonn, 2007:596
Published articles	Tonn, 2007:596 and Dick, 2008:514
Business managers and employees (internal stakeholders)	Costa, 1995:4-8
People external to a business (stakeholder parties)	Franco-Santos, *et al.*, 2007:784-802
Books, books' chapters, conference papers and working papers	Franco-Santos, *et al.*, 2007:784-802
Conferences, blogs, journals and magazines	Singer and Piluso, 2009:19

4.4   RESEARCH APPROACH, PROCESS AND LOGIC

The approach taken in this research is a theoretical one. The researcher has studied the subject matter at hand based on the contributions of other researchers in this field. He then reflected on these by applying his intellectual capabilities to construct an expanded view (Watkins, 2010:7) of the phenomenon of scanning in order to propose an expanded conceptual scanning framework.

Regarding the research purpose, the researcher had a choice between exploratory, descriptive, analytical and predictive (Watkins, 2010:4) types of research. An analytical research purpose was selected since the research aims to comprehend the phenomenon researched more completely (Watkins, 2010:5). The researcher follows a qualitative process whilst applying an inductive logic. Statistical analysis is applied for purposes of increasing the validity and reliability of the findings of the research. An analysis of variance (ANOVA) is performed, in which the observed variance between different categories of the sample respondent responses to the Likert scale questionnaires is measured. The sample is partitioned into categories that deliver different sources of variation. In its simplest form, the ANOVA performed on the research results provides a statistical account of whether or not the means of the responses of these categories are equal. The detail of the categorisation is presented in Table 4.8 and follows later in this chapter.

According to Leedy and Ormrod (2001:102), qualifying the research process as qualitative has to do with the research focus. The focus of this study is more holistic than specific, and deals with unknown variables in terms of a possible expanded design for a conceptual scanning framework. At the same time, the epistemological perspectives of people are included as a source of data, allowing for the inclusion of the personal views and opinions of those individuals involved in the research, through the sample selected. These distinguishing

characteristics qualify this study as phenomenological (qualitative) research, as opposed to positivist (quantitative) research.

The researcher selected inductive research logic for this study, as the aim was to develop an expanded conceptual scanning framework based on observations in the empirical reality (Watkins, 2010:5). According to Burney (2008), the difference between an inductive and deductive approach lies at the starting point, where the deductive approach starts with a grounded theory, and the inductive approach starts with what has been observed. Following on the inductive research logic employed, the outcome of the research is applied research, and not basic research. This holds true since the outcome of the study relates to the application of the findings to address specific and existing challenges related to the practice of environmental scanning.

4.5   DATA VALIDITY AND RELIABILITY

Collins and Hussey (2003:186) define validity as being concerned with the degree to which the research outcomes accurately represent what is happening in practice, and whether the data is an authentic picture of what is being studied.

Joppe (2000) defines reliability as the extent to which the research results are consistent over time, and to what extent it is an accurate representation of the total population under study. It includes whether the research results can be reproduced under a similar methodology, deeming the research instrument to be reliable.

The validity presented in this section refers to what Cooper and Schindler (2006:318-320) term content and criterion validity.

The content validity is a non-statistical type of validity, illustrated through the systematic examination of the research findings. In the case of this study, the systematic examination is done in order to determine whether it reflects a true representation of how scanning is performed by scanners. The methodology in generating the statements researched (cf. Tables 3.1 to 3.5) is detailed in the following paragraphs. It is an attempt to illustrate the criterion validity. It includes the relation between the Likert scale questionnaires and what the researcher aimed to determine through presenting the questionnaires to a selected sample of respondents.

According to Mouton (1996:111), data validity and reliability are achieved through the following steps:

- validation of the respective stages in the research;
- mitigating the main sources of error of a specific stage;

- the methodological strategy of that stage;

- an explanation of the outcome of each stage; and

- an explanation of the validity-related criteria per stage.

The stages through which validity is achieved are operationalisation and sampling (Mouton, 1996:111). Table 4.2, amended from Mouton (1996:111), presents a validity framework instituted and applied for this study.

Table 4.2: The validity framework

Stage in research process	Sources of error	Methodological strategy	Outcome	Epistemic quality or criterion
Operationalisation	Poor sampling of concepts Leading questions Scaling errors	Scale validation Face validity Pilot test	Measuring instrument	Measurement and construct validity
Sampling	Bias Heterogeneous populations Incomplete sampling frame	Probability sampling Stratification Optimal sample size	Sample	Representa-tiveness

Source: Mouton, 1996:111 (amended)

Related to the data validity and reliability is the question of what value the study holds for those who might benefit from it. At the most basic level the study aims to determine whether businesses might benefit from the application of an expanded conceptual scanning framework. In pursuing this aim, the study compares the statements on which the expanded conceptual scanning framework is based with current scanning practices in what Gilbert (2008) terms the social world. In addressing the issue of validity and reliability, the researcher asks the question of how the development of an expanded conceptual scanning framework can be made more relevant to practitioners. In this regard, Gray, *et al.* (2010:249), recommend Mode 2 research, as a possible methodology to address the question.

Mode 2 research is different to that of normal science (Kuhn, 1970) which is referred to as Mode 1 research. Mode 2 research is applied to bridge the academic-practitioner gap, whilst Mode 1 research aims to generalise cause-effect relations. In this sense, Mode 2 research considers a different evidence base. This different evidence base, referred to as short-term faith validity (Anderson, Herriot and Hodgkinson, 2001:391-411), considers generating knowledge in the context of multi-stakeholder teams. These teams transcend the boundaries of traditional disciplines and are consciously trans-disciplinary as opposed to just multi-disciplinary, with the latter referring to knowledge associated with more than one existing

academic discipline or profession. Trans-disciplinary implies a research strategy crossing multiple disciplinary boundaries in order to construct a holistic approach to the matter at hand. This methodology has proved exceptionally useful in this study, since scanning was researched within the context of its derivative activities.

To support the creation of valid and reliable knowledge through this study, individuals who are potential users of this knowledge were consulted to contribute towards its validity and reliability, and as such were involved in a structured manner. These individuals are the current manager and independent practitioner groups mentioned earlier (cf. 3.1). The methodology of drawing on stakeholder groups, builds on Anderson, *et al.'s* (2001:391-411) typology of a fourfold research matrix. It refers to a classification matrix that considers a combination of methodological research rigour and practical relevance. Lynham (2002:221-241) enhances this matrix through creating the General Method of research. This method of knowledge creation includes both conceptualisation and application, and consists of the phases of idea formulation, operationalisation, confirmation or disconfirmation, application and continuous refinement and development of these phases.

Similar to the process of statement identification and selection discussed in Chapter 3, the researcher explored the notion of participating research stakeholder groups to determine which statements should be included in the Likert scale questionnaires. For this purpose, the researcher applied an amended version of the Diamond Research Model (Van de Ven, 2007), repeated here for ease of reference in Figure 4.1. Through such engagement, the perspectives of researchers, users, consultants, and practitioners were used to formalise and structure participative research (Gray, *et al.*, 2010:252). For this study, the stakeholders considered were a group of independent experts in scanning and related fields, and a group of present-day business managers who practise scanning and/or related derivative activities.

Section 4.6.1.1 contains the discussion on the sample formulation for the study and includes an explanation of the method and motivation for the systematic selection of the members of the two stakeholder groups. This explanation also elucidates the selection criteria applied in selecting the sample participants of these two groups.

To contribute to the validity and reliability of the research results, the researcher applied the four stages of the Diamond Research Model in soliciting the participation of stakeholder groups. This was done in acknowledgement of Van de Ven's (2007) assertion that, because social research is an intensely social process, stakeholders have to be engaged in all four stages of the model.
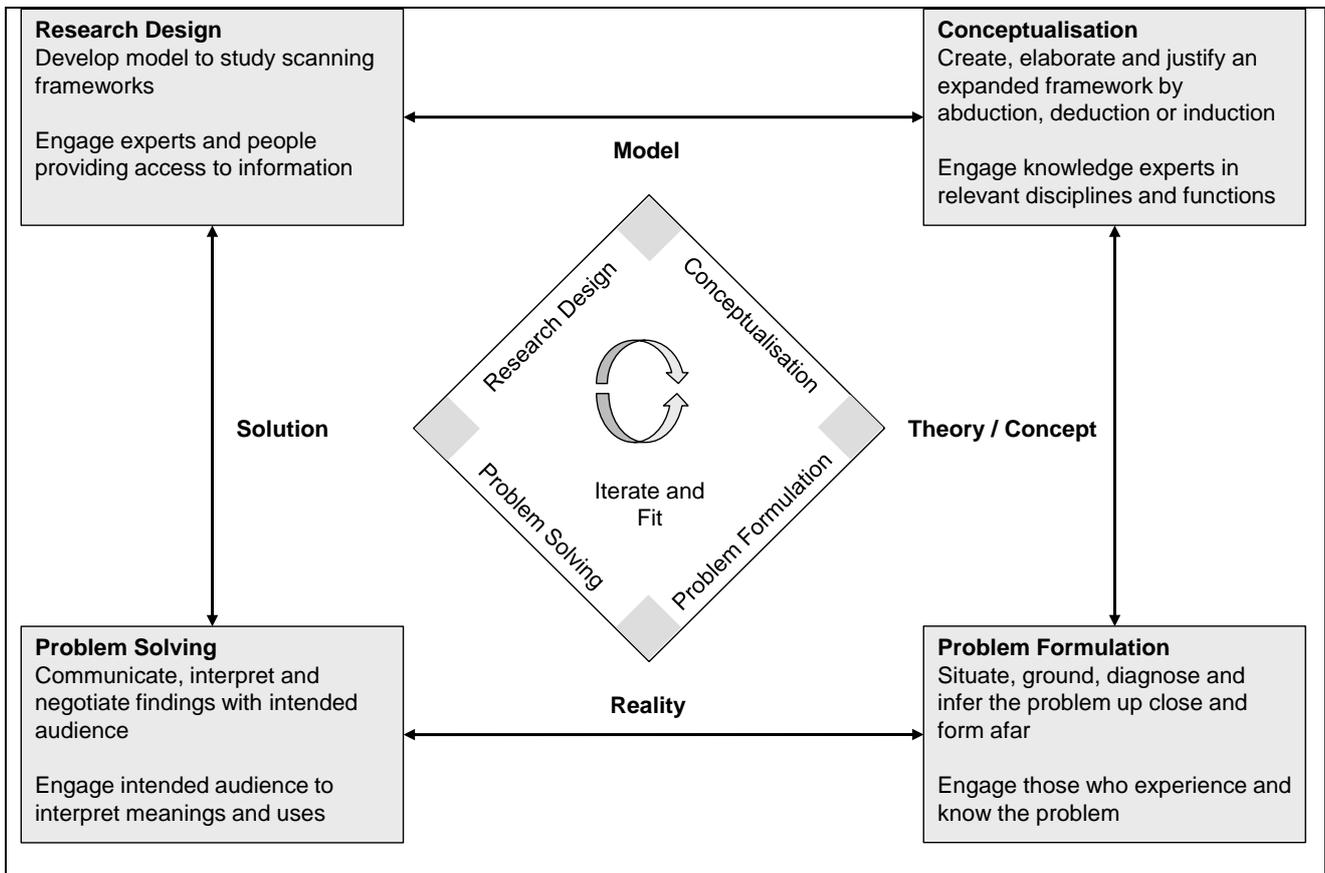
Figure 4.1: Practising engaged scholarship (Second repetition)

Source: Van de Ven, 2007(amended)

The application of the Diamond Research Model started with the formulation of the problem, during which stage the researcher conversed with people who are experiencing the problem and reviewed the available literature. Step 2 consisted of conceptualisation through induction or deduction, and emanated from having had conversations with knowledge experts from practice fields and functions where challenges were being addressed. Thereafter Step 3 focused on the research design, whereby the researcher formulated an appropriate methodology and shared it with technical experts. During this step, the researcher also consulted people who could provide access to data, as well as the respondents. Step 4 entailed problem solving, whereby the communication and application of the research findings were shared with the intended audience in order to interpret the meanings and uses thereof.

4.5.1   Operationalisation

During this stage, the methodology of scale validation, face value validation and pilot testing was applied in an attempt to mitigate the main sources of possible error. Sources of error could include poor statement sampling, leading questions and scaling errors.

The outcome of this stage yielded the Likert scale questionnaire instrument. The methodological criteria for the construction of a questionnaire in a valid manner, according to Mouton (1996:110), pertain to how questionnaire concepts, or statements in the case of this study, are selected. The validity of the questionnaires relate to their unambiguous, mutually exclusive nature and the unidimensionality of the statements.

4.5.1.1   *Statements generation*

The statements included in the construction of the Likert scale questionnaires, were sourced from the literature study relating to scanning, scenario planning, strategy selection, business performance and systems thinking, as a scanning approach (ref. Chapter 2). These were presented in Tables 3.1 to 3.5. (ref. Chapter 3). In order to identify valid, reliable and appropriate statements to be used in the Likert scale questionnaires, the following steps were followed:

- statementswere sourced from the literature reviewed;
- initial discussions were then held with a group of scanning, strategy, scenario planning and systems thinking consulting practitioners, referred to as the expert group;
- an initial list of statements was compiled, from which a statement selection questionnaire was constructed;
- this statement selection questionnaire was sent to the expert group for their evaluation and input;
- the statement selection questionnaire was amended, based on the results of the previous step; and
- a revised questionnaire was sent to a systematically selected business manager group,as a second paticipating stakeholder group, and the results from their input were processed.

The sample was systematically drawn, being a consecutive type of non-probability sample, as opposed to a probability sample. The reason for the non-probability sample selection is based on an attempt to include all the accessible respondents as part of the sample. This would make the sample a better representation of the entire population, as opposed to convenience sampling, which limits the probability of generalising the research results.

The following paragraphs provide the detail of the steps indicated above.

(a)   Sourced statements from the literature review

During the literature review, the researcher identified statements that could contribute to the basis of the expanded conceptual scanning framework. These statements were selected by critically investigating current conceptual scanning frameworks in order to determine to what

extent the statements were already reflected in current frameworks. In cases where a clear and direct relation between current conceptual scanning frameworks and the identified statements could not be established, a statement was selected for potential inclusion in the relevant statement list for the research study.

(b)   Initial discussions with a group of scanning, strategy, scenario planning, business performance and systems thinking consulting practitioners

The researcher consulted two stakeholder groups to assist in executing the Diamond Research Model for this study. The stakeholders considered were a group of independent experts in scanning and related fields, and a group of present-day business managers who practise scanning and/or related derivative activities. The independent experts in scanning and related fields were chosen in order to meet the requirement of using a trans-disciplinary team as part of the stakeholder group participating in the research, in accordance with the Diamond Research Model. Equally, a second group of stakeholders, namely present-day business managers, were chosen in accordance with the phenomenon identified by Wright (2005:86-101), that managers have specific expectations of the practice of environmental scanning that need to be taken into account. Henceforth the researcher will be referring to the Expert Group and the Manager Group. Applying the Diamond Research Model, contributions by both these groups were considered in compiling, designing and constructing the Likert scale questionnaires.

The motivation for selecting a seven-point Likert scale is provided in Section 4.5.1.1 (d) when discussing the scale validation of this data collection instrument.

To initiate the process of involvement, informal discussions were held with individuals in the expert group, in order to compile initial lists of statement to be used in the construction of the Likert scale questionnaire. The expert group consisted of colleagues and peers in a professional consultant and part-time lecturing capacity at the University of Stellenbosch Business School (USB), the USB Executive Development Company, the Da Vinci Institute, the Business School of the Netherlands, and smaller executive management training and development business concerns.

During the initial informal discussions, their assistance was requested, and an explanation given of what would be required of them in this regard. Appendix D presents a list of the expert group's professional qualifications, fields of expertise and years of practice in their respective fields of specialisation. A diverse group of individuals were invited, as their input was sought

into both the content of the topic investigated and the technical side of the construction of the Likert scale questionnaire.

Of the 39 individuals invited to provide assistance, 22 indicated their willingness to participate, of which 11 eventually participated actively.

Appendix E presents the e-mail correspondence sent to the members of the expert group.

(c)   Constructing the statement questionnaire

The statements in Tables 3.1 to 3.5 (cf. 3.2) were influential in shaping the researcher's thoughts regarding the conceptualisation of the expanded scanning framework. These statements were used in the final Likert scale questionnaires, and therefore have a dual purpose. One purpose relates directly to the conceptualisation of the expanded scanning framework, whilst the second purpose relates to what Collins and Hussey (2003:186) call the degree to which the statements accurately represent what is happening in practice.

During the stage of statement selection, the expert group were afforded the opportunity to indicate, via a statement questionnaire, which of the statements should be included in or excluded from the Likert scale questionnaire. This was done via an *include/unsure/exclude* response option. The first statement questionnaire is presented in Appendix G and the coinciding letter in Appendix F.

The group were also afforded the opportunity to add statements and make general comments pertaining to the matter at hand. In evaluating the responses from the expert group based on percentages, only the *include/exclude* statement responses were taken into account. The response range is indicated in Table 4.3.

Table 4.3: Response range for initial statement questionnaire

Range	Include	Exclude
Highest percentage per statement	100%	73%
Lowest percentage per statement	9%	0%

A vast majority of the expert group indicated that 20 of the75 initial statements should be excluded from the Likert scale questionnaire, or in the least be replaced by more appropriate and relevant statements.

Reasons advanced for excluding a statement are as follows:

- the statement appears to be too obvious and not of conclusive value in terms of what the study aims to research;
- the statement is unrelated to the field of scanning, and/or its derivative activities;

- the statement is duplicated elsewhere in the questionnaire; and

- the statement is multi-dimensional.

Amongst the responses received from the expert group, there were seven unsure options selected. The reasons for these related to the relevance of the statement being uncertain, the statement being unclear, and the response having the possibility of being either *include* or *exclude*, depending on the context in which the statement was worded.

The feedback from the expert group implied that the researcher had to search for more statements, as it was argued that 55 statements would not be exhaustive enough in terms of Likert scale questionnaire validity and reliability. A new revised list of 75 statements was constructed (Appendix H).

(d)   Send the revised statement questionnaire to the manager stakeholder group

This stage entailed that the researcher requested contributions from a second stakeholder group in terms of the Diamond Research Model applied. The group consisted of 20 business managers, selected systematically from the database used during the research study.

This group of managers were from various industries. An e-mail message was sent to each member of the group, along with the revised statement questionnaire. The e-mail message explained the purpose of the questionnaire and the importance of the participants' contributions to the research process. Sixteen of the selected managers completed the questionnaire. Those that did not participate cited time constraints as the main reason for not participating.

To express the responses as percentages, only the *include/exclude* responses were taken into account. The total number of *include/exclude* responses constitutes 100%. *Unsure* responses were discarded. The response range is indicated in Table 4.4.

Table 4.4: Response range for second statement questionnaire

Range	Include	Exclude
Highest percentage per statement	94%	12%
Lowest percentage per statement	82%	0%

Except for the selection of some exclude and unsure options (12% being the highest per category), the manager group made no recommendation regarding any changes to the selected 75 statements. However, valuable contributions were received in terms of the general composition of the questionnaire. These recommendations were adopted in the construction of the final version of the Likert scale questionnaires. The following section expands on the

recommendations made by the manager group. In the process of discussing these recommendations, the researcher further elucidates the Likert scale questionnaire validation process.

4.5.1.2 *Likert scale questionnaire design and validation*

The aspects pertaining to the validation of the Likert scale questionnaire include the following:

- Standardisation of terminology;
- embedded qualifying criteria;
- questionnaire length; and
- scale validation.

(a)   Standardisation of terminology

The manager group contributed the following ideas, which were considered by the researcher in compiling the Likert scale questionnaire.

They requested that the terminology used in the questionnaire be standardised by providing definitions for specific terms. The reason put forward for this request was that, according to them, current business management literature, specifically the literature related to the fields of strategy, scanning, scenario planning and business performance, contains a vast number of different descriptive terms and definitions. These tend to be customised in organisations, thus leading to terminology variation. The request for standardisation by means of definitions echoed the attempt at the standardisation of terminology, as presented in Section 2.3 of Chapter 2 of this study. Based on the manager group's recommendations, and subsequent consultation with the expert group, a foreword was developed for each Likert scale questionnaire, which provided definitions of applicable terminologies.

An extract of this component of the questionnaire is presented in Table 4.5. The five Likert scale questionnaires are presented in Appendix K.

Table 4.5: Terminology and definitions in the foreword of each questionnaire

External environmental scanning; referred to as scanning	In this questionnaire, the term scanning pertains to conceptual scanning frameworks, scanning methodologies and scanning approaches. It refers to monitoring the external environment with the purpose of gathering specific information required
Conceptual scanning framework	This refers to the illustrations that organisations use to conceptualise the external environment that they scan
Scanning methodology	This refers to a set of practices, procedures, and rules applied by organisations, when scanning the environment
Scanning approach	This refers to how organisations view the environment that they scan, i.e. their perception of the observed environmental reality
Information yield	This refers to the sum total of the information gathered through scanning, and the integrity of that information
Scenario planning	This refers to planning for the future through sketching different possible future scenarios
Strategy selection	This refers to choosing a strategy that is appropriate for a particular point in time
Organisational performance	This refers to how well the organisation performs, measured in terms of a generic balanced scorecard, financial sustainability, organisational flexibility and adaptability
Systems thinking	This refers to a holistic approach towards the environment, underpinned by a focus on the relation between observed environmental components, approached as systems
Complexus analysis	This refers to the analysis of the inter-dependence, inter-relatedness and relation between the systems, which make up the business environment

(b)   Embedded qualifying criteria

The final version of the Likert scale questionnaire consists of five separate questionnaires (Appendix K). Each questionnaire contains statements that had to be responded to within a specific context. The context, per respective questionnaire, was that of scanning and information, information and scenario planning, scenario planning and strategy selection, strategy selection and business performance, and complexus analysis and scanning.

Pertaining to these contexts, 12 of the 16 respondents of the Manager Group noted that such categorisation is useful. They argued that in some instances a person might have more experience in one field of scanning than in another. Should this be the case, there may be a need to consult with peers and colleagues when responding to statements pertaining to a specific context with which a participant is not comfortable. The remaining four respondents of the Manager Group did not have any comment regarding the separate contexts of the questionnaires.

To respond to this concern, five separate questionnaires were constructed, including a question about whether the questionnaire in hand had been completed independently, or with

assistance. Table 4.6 presents an extract of this component of the questionnaires, which followed at the end of each questionnaire.

Table 4.6: The section in the questionnaire indicating completion with or without assistance

I completed this questionnaire	On my own	With the assistance of other people

Another qualifying question that was added to the questionnaire during construction was whether a respondent completed the questionnaire in their capacity as a practising business manager, or independent consultant. This addition was made in response to an inquiry made by three of the 16 managers on how one should respond to the statements in the questionnaire if you are a consultant and not an employee.

Table 4.7 presents this component of the questionnaire design.

Table 4.7: The section in the questionnaire indicating completion as an employee or a consultant

I completed this questionnaire as a(n) …	Employee	Consultant

Other contributions made by the manager group that were incorporated into the qualifying questionnaire component of the Likert scale questionnaires, refer to the following:

- the management level of the respondents;
- their fields of expertise;
- the size of the business where they are employed;
- the level of global infrastructure of the business; and
- the participant's understanding of systems thinking.

Members of the Manager Group were of the opinion that these aspects affect the responses to the statements in the five respective questionnaires in a valid and reliable manner. Table 4.8 presents this component of the questionnaire. In cases where more than one option is applicable, respondents were invited to indicate it as such, but on this questionnaire only. The inclusion of these qualifying questions was for purposes of establishing whether there were significant differences in the responses given in different response categories.

Table 4.8: The qualifying component of the questionnaire

I currently manage/consult on … level	Middle	Senior	Executive	Director	Shareholder	
I am primarily involved in	Scanning	Scenario planning	Strategy selection	Organisation performance	Others: specify	
My organisation/client's organisation employs…	> 100 people	100 > 500 people	500 > 1000 people	More than 1000 people	I am unsure	
My organisation/client's organisation has…	Offices in other countries			Offices only in one country		
I am familiar with systems thinking	Not at all		Slightly	Fairly	Very	100%

In processing the results of the research, an analysis of variance (ANOVA) was performed on two of the qualifying categories contained in Table 4.8. These are the management/consulting level category, and the fields of expertise category. The ANOVA was performed on these statements in order to provide a statistical account of whether or not the means of the responses per different categories were equal.

The results of the ANOVA performed follows in Chapter 5.

(c)   Questionnaire length

Seventeen respondents in the manager group commented that, should the 75 statements be forwarded as one questionnaire, the questionnaire would be considered as being too long.

A preference was indicated for rather more questionnaires, but shorter ones at a time.

This preference contributed to the notion that five separate questionnaires should rather be constructed, each with statements pertaining to a specific context, as opposed to one longer questionnaire. This resulted in five seven-point Likert scale questionnaires being designed, with 15 statements each.

Regarding the length of the statements, the respondents appeared mostly content with the length of the actual statements.

It is common for respondents to request shorter questionnaires. According to Morrison (2005:175), one of the challenges concerning questionnaire surveys is the issue of response rate and its relation to the length of a questionnaire. In this regard, the appropriate length of the questionnaire, which should be exhaustive enough to achieve accuracy and reliability

whilst simultaneously allowing a meaningful number of responses to be received from the selected sample (Van der Post, De Coning and Smit, 1997:147-168), was one of the aspects considered by the researcher in designing the questionnaires.

(d)   Scale validation

A Likert scale was chosen as the preferred measurement tool for the study as it is considered symmetric. This is due to the construction of the scale having an equal amounts of positive and negative positions from which the respondents can select their responses. A seven-point scale was selected based on a recent empirical study (Dawes, 2008:61-77) which found that this range of scale might produce slightly higher mean scores relative to the highest possible attainable score, compared to those produced from a ten-point scale.

Internationally, Likert scales are widely used in questionnaire research (Wuensch, 2005). Besides their frequency of use, Likert scales have a number of benefits over other techniques (Nunnally, 1978:604). Amongst others, they are fairly simple to design and have a proven record of producing significant results, which are reliable and trustworthy.

For the design of the five questionnaires, the choice of response categories was considered carefully, together with the contributions made by the expert and manager groups. The background to this careful consideration was Czaja and Blair's (1996:73) concern about the concept of scaled agreement. According to them, respondents tend to a greater or lesser degree to agree rather than disagree when presented with a scale, which requires them to either agree or disagree. Despite this concern, however, the researcher found enough evidence to suggest that, depending on the formulation of a question, the agree/disagree scale can be used to produce reliable results.

Table 4.9 provides the guiding principles applied to the Likert scale questionnaire construction.

Table 4.9: Questionnaire guiding principles

Guiding principle	Reference
Avoid double-barrel questions	Babbie, 1989:141; Czaja and Blair, 1996:73; Oppenheim, 1992:126
Avoid questions that contain more than one question	Mouton, 1996
Avoid questions that might confuse and/or irritate	Hendriks, Hofstee and De Raad, 1999:310
Avoid ambiguity	Babbie, 1989:141; Hendriks, *et al.* 1999:310; Oppenheim, 1992:129
Avoid questions of which the result can contribute to more than one specific aspect	Oppenheim, 1992:126
Avoid questions that are worded in a double negative way	Oppenheim, 1992, 126
Word the questions in a simple and straight forward manner	Babbie, 1989:141; Hendriks, *et al.* 1999:310; Oppenheim, 1992:129
Avoid questions that are worded in a negative manner	Hendriks, Hofstee and De Raad, 1999:310

(e)   Measuring instruments: Questionnaire design

The aspect of sufficient response variance was considered next. Nunnally (1978:605) states that questions should be posed to have a moderate inclination, either negative or positive, to assist in achieving sufficient variance. In this respect, an attempt was made in the design of each questionnaire to achieve an even distribution between negative and positive statements. This equal division between the direction of questions was also aimed for because of the view expressed by Hendriks, Hofstee and De Raad (1999:310), namely that negatively worded questions tend to confuse and irritate respondents. The statements were worded carefully, using positive terminology where possible, even in cases where negative aspects were put forward in the questionnaires.

(f)   Initial questionnaire validation

A draft version of the final Likert scale questionnaires was sent to the expert and manager groups for their input. On face value validity, both groups agreed that the five questionnaires were designed and compiled in a manner that would be functional and would probably deliver useful and valuable data. However, they again expressed their concern about complex questions, in particular about complex terminology used in some statements. It was primarily the manager group who expressed this concern.

In this regard they referred specifically to terminology pertaining to the context of systems thinking and scanning, more particularly that of the complexus analysis and scanning. The manager group was of the opinion that most managers involved in scanning should be

comfortable with the terminology pertaining to strategy, scanning, and scenario planning and business performance. According to them, systems thinking, and more specifically complexus analysis, required more qualification preceding the actual statements in this particular questionnaire. A second stage validation of the questionnaires was therefore effected by presenting the designed questionnaires to a sample of respondents for pilot testing.

(g)   Second stage validation: Pilot testing

A final draft version of the Likert scale questionnaires was presented to a systematically selected group of students at the University of Stellenbosch Business School. These students were undergoing training in scanning and related fields of management. The degree programmes from which the sample of respondents was drawn included the Masters in Business Administration and the Masters in Futures Studies. In addition, senior managers enrolled for executive development programmes at the USB Executive Development Company, were included in the pilot sample selected. These three groups constituted the population from which the researcher selected a pilot sample of respondents who could comment on the final draft version of the Likert scale questionnaires.

Other than studying in the field of scanning and/or its derivative activities, the selection criterion for this sample was that the participants had to be active practitioners in scanning and/or a related field at the time of their participation in this research. The recommendation from the expert and manager groups in terms of the pilot sample was that the respondents had to be employed in a business that practises environmental scanning in a structured, methodological manner.

The final draft version of the questionnaires for the pilot study was presented to 50 respondents. The questionnaires were e-mailed in a Microsoft Word document in which the respondents could indicate their responses by placing a tick mark in the appropriate tick box. The document (Appendix I) was attached to an e-mail containing an explanatory message. Twenty-seven responses were received.

From the responses, it appeared that all the statements were clearly understood by the 27 respondents. No statements were left unanswered and the answers contained very little significant differences between them. The totals of the Likert scale questionnaires statements were summed and presented as a percentage per statement. Some respondents commented on the terminology used in some of the statements, leading to further refinement of the wording and terminology of the final Likert scale questionnaire.

The preceding steps of validation are judged to have mitigated the identified sources of error sufficiently. These sources of error refer to different perceptions and understanding of the selected statements observed among respondents, and pertaining to specific concepts. The possibility of potential bias was closely linked to such perceptual differences.

(h)   Final validation stage

The researcher constructed an improved version of the Likert scale questionnaires, taking the recommendations and considerations of the expert and manager groups into account. Once no further amendments were deemed necessary, and following the positive results from the pilot study, a larger sample of individuals was invited for participation in the research. A description of this process of engagement is given in the next section.

4.6   SAMPLING

To determine what would constitute an acceptable sample size, similar research projects in this field of study were reviewed. Acceptable, in this regard, relates specifically to the validity and reliability of the possible results and findings, as well as the extent to which these can be generalised.

4.6.1   Population framework

From the literature review, it is apparent that, in a business, management is regarded as a preferred and appropriate population from which to select a sample to conduct research of this nature. A guideline shared by Gordon and DiTomaso (1992:788) in this regard is that senior management tend to give more favourable responses to questions concerning their businesses, in comparison to the lower level employees of the same businesses (Morrison, 2005:167). This was taken into account in terms of configuring the population framework.

4.6.1.1   Sample formulation

The literature review (ref. Chapter 2) shed little light on whether the individuals involved in scanning are employed by businesses in specific industries, or types of businesses, or belong to a homogeneous group, for example a stock exchange or some professional membership body. What was indicated though, was that most businesses perform scanning (Wright, 2005:88), but that the consistency and systemic manner (Patton, 2005:1083) in which they do it differ from business to business. This opened a field from which to configure the population of respondents.

An investigation was conducted to identify businesses that practise environmental scanning and employ people that could significantly contribute to this study. The literature review

indicated significant differences between businesses as far as scanning is concerned, especially with regard to focus, methodology, frameworks applied, and approach (ref. Chapter 2). The challenge was to identify a population of individuals, in businesses, that would be representative enough to contribute to valid research findings.

The database for an invitation to partake in the research consisted of:

- a company and individual database from the University of Stellenbosch Business School (USB);

- a company and individual database from the USB Institute for Futures Research;

- a company and individual database from the the USB Executive Development Company;

- the researcher's client database;

- the database of clients of the expert group; and

- fellow alumni at the USB, The Da Vinci Institute and The Business School of the Netherlands.

This yielded a total of 1221 individuals. The random starting point for the systematically selected sample was 38.

The following criteria were applied for sample selection, yielding the 473 strong sample size, selected systematically:

- individuals that have a prepared human mind in terms of scanning, meaning they can discern information, knowledge and insight from the information gathered through environmental scanning;

- decision makers that are conscious of current potential changes in the business's contextual and transactional environment and can plan strategically;

- diverse individuals from different business units and different cultural backgrounds;

- individuals that are professionals in any one or more of the fields of scanning, scenario planning, strategy selection, business performance and systems thinking;

- managers and/or business owners, at a middle, senior, executive, directors and/or shareholders level involved in business environmental scanning, directly or indirectly; and

- managers not necessarily directly active and experienced in scanning in their respective areas of employment, who have had some exposure to scanning techniques and frameworks, as well as systems thinking, even if only through external or internal training, or other means of having been informed.

A limitation to bear in mind, according to Podsakoff and Organ (1986:531-544) and Podsakoff, P.M., MacKenzie, Lee and Podsakoff, N.P. (2003:879-903), is the truism that questionnaire

responses may contain a subjective component which is experiential by nature, differing from individual to individual. The use of a questionnaire with a seven-point Likert scale may therefore lead to respondents automatically under- or overvaluing the statements presented. Similarly, it is difficult to distinguish whether some respondents tend to give higher scores by default and others lower scores, on the same Likert scale.

In order to achieve a response and activate participation from respondents, it was agreed between the researcher and the expert and manager groups that an attempt should be made at constructing a large sample. Applying the sample criteria, 473 individuals were drawn systematically from a database of 1221 individuals. The assumption was that such an extensive invitation of 473 would yield the intended number of respondents. In this case, the sample size is also a function of the availability of a database of this nature, which constitutes the population framework size for this study.

The expert group, manager group, and sample respondents were selected systematically. Systematic selection was chosen over that of simple random and stratified random sampling selection, primarily because of its convenience and relative ease of administration (Black, 2004:227). In order to attempt soliciting a large response, $k = 2.5$, $N = 1221$ and $n =$ sample size, where $k = N/n.$ In the case of the expert and manager stakeholder groups, the same methodology was applied, yielding two stakeholder groups that actively contributed to the research process. In the case of the final Likert scale questionnaires, the selection formula yielded a sample size of 473 individuals, selected from the database.

Besides the convenience factor mentioned above, another advantage of choosing systematic sampling selection refers to the ease of determining whether a sampling plan was followed in the study. This is possible as systematic sampling is evenly distributed across the frame (Black, 2004:227). The systematic sampling methodology, applied in the study, was based on the assumption that the source of population elements was random.

As five different Likert scale questionnaires were used, the same sample was used for each questionnaire in order to keep possible partiality and prejudice (Glick, 1985:608), per questionnaire, consistent.

The type of research selected for this study, being phenomenological (cf. 1.8 and 4.4), meant that no specific industry was emphasised. Hence, the population framework was constructed across industries and types of businesses. What is important though, as a selection criterion in terms of the population formulation, is that only individuals employed by businesses that actively perform scanning were considered. Based on the specificity of what is researched,

and the requirements in terms of validity and reliability, this was strongly recommended by both the expert and manager groups.

A further criterion for sample selection was that in those businesses that performed scanning, it had to be performed by teams of scanners, and not individuals. This criterion is derived from Voros (2003:4), who states that a team effort of diverse scanners lessons the chance of missing critical signals when scanning the environment. Schmidt and Haines (2005:3) adds to this motivation, stating that different scanning teams should focus on different aspects, or categories, scanned.

Further criteria applied in terms of the population formulation are the size of the business, the management level and the scanning approach. In the following paragraphs each of these is discussed.

4.6.1.2   The size of the business

The validity challenge is whether the business where a selected participant is employed, practises environmental scanning to a sufficient extent, so that the response inputs towards research of this nature can be regarded as valuable and weighed. Furthermore, a criterion that addresses the issue of business selection is the size of the business (Morrison, 2005:187; Hosley, 1994:10; Bradfield, *et al.*, 2005:804).

This criterion was difficult to apply, since a quantitative indication of what a "sizable" business is could not be established from the literature review, even though reference is constantly made to sizable businesses. Therefore, a question on the size of the business was included as part of the qualifying questionnaire. The necessity for this qualification also became apparent from the recommendations made by the manager group in the evaluation of the revised statement questionnaire, which they had completed.

4.6.1.3   The management level

From the literature review (ref. Chapter 2), it is evident that managers are tasked with the duty of performing scanning, scenario planning, strategy selection and ensuring business performance. However, for this research project management as such was not considered a default qualifier to participate in the completion of the Likert scale questionnaires. Rather, the extent to which responding managers illustrated an understanding of the statements in the five Likert scale questionnaires was considered.

4.6.1.4 The scanning approach

Another criterion applied in selecting the sample relates to the scanning approach applied, with specific reference to a systems thinking approach. Early indications during the construction phase of the Likert scale questionnaires were that not all current scanners are necessarily familiar and comfortable with systems thinking as a scanning approach. The same applies to those involved in the related derivative activities of scenario planning, strategy selection, and monitoring business performance.

The sample selection process included three steps to ensure that those responding to the questionnaires were comfortable with a systems thinking approach.

- **Step 1**

In sending the initial invitation (Appendix J), to participate in the research, it was mentioned to the sample respondents that a level of understanding of systems thinking was required in order to participate in a sensible manner.

- **Step 2**

A definition of a systems thinking approach was included as part of the Likert scale questionnaires. Respondents were requested to acknowledge whether they were familiar and comfortable with this approach.

- **Step 3**

Each Likert scale questionnaire contained questions that required an understanding of systems thinking in order to be able to respond in a sensible manner. In this way, an indication as to whether or not the respondent was familiar with systems thinking was gained through the response per Likert scale questionnaire.

A Spearman's Rank Correlation coefficient was applied to the results of the Likert scale questionnaires. This was done to determine the non-parametric measure of statistical dependence between the questionnaire statements (dependent variable), and the participants' level of systems thinking understanding (independent variable). The results of this application are presented in Chapter 5.

4.6.1.5 Respondent participation

To ensure successful participation from respondents, a letter of invitation in which the purpose of the research was explained and their participation requested, was sent to the 473 individuals selected from the database (cf. 4.4.1.1). The willingness of individuals to participate varied per business type, industry type, and geographical region. In some instances, the

researcher had to encourage individuals to participate either by phone or in a face-to-face encounter. Some of the reasons cited for a lack of participation were related to the complexity of the principle of complexus analysis. Once clarity had been provided, participants were keen to participate.

Table 4.10 contains a summary of the responses received.

Table 4.10: Response statistics and sequential process of the final Likert scale questionnaires

Step	Action	Percentage
1st Step	Send initial qualifying invitation to full sample of 473 individuals	
1st Response	145 indicated a willingness to participate	30.66%
	78 indicated that they did not wish to participate	16.50%
	21 had send/receive failures and the e-mail invitations did not reach them	4.44%
	229 did not respond at all	48.40%
2nd Step	Send Likert scale Questionnaire 1, to 145 respondents	
2nd Response	121 returned Questionnaire 1	83.45%
	20 indicated that they no longer wished to participate	13.79%
	4 did not respond at all	2.76%
3rd Step	Send Likert scale Questionnaire 2, to 125 respondents	
3rd Response	121 returned Questionnaire 2	96.80%
	4 indicated that they no longer wished to participate	3.2%
4th Step	Send Likert scale Questionnaire 3, to 121 respondents	
4th Response	104 returned Questionnaire 3	85.95%
	17 did not respond at all	14.05%
5th Step	Send Likert scale Questionnaire 4, to 121 respondents	
5th Response	92 returned Questionnaire 4	76.03%
	29 did not respond at all	23.97%
6th Step	Send Likert scale Questionnaire 5, to 121 respondents	
6th Response	81 returned Questionnaire 5	66.93%
	20 indicated that they were not able to complete the questionnaire	16.52%
	21 did not respond at all	17.35%

It was challenging to find individuals who were equally comfortable with every questionnaire, and unfortunately, this created reluctance amongst some individuals to partake. Not all the participants completed all five questionnaires. Only 81 completed all five the Likert scale questionnaires sent out, 92 completed four, 104 completed three, and 121 completed two of the five questionnaires.

The drop in the response rate pertaining to Questionnaire 3, 4 and 5, is due to a number of reasons. A number of participants stated that the frequency with which they were requested to

participate in research of this nature, not just the one applicable to this study, was too much. They also expressed an opinion that the five questionnaires, although short per questionnaire, cumulatively, it was too long. Some participants found the Likert scale too difficult and the research topic, per specific questionnaires, not always applicable to their own interests. Overall, a lack of time was cited as the most limiting factor to partake in the total research process regarding all five questionnaires.

The letter presented in Appendix J refers to some of these aspects and attempted to address them in a constructive and proactive manner. Further, the benefit to participate for both the individual and the business employing him/her was elucidated in the letter.

4.7 CONCLUSION

Chapter 4 elaborated on the research aims of this study and provided details on the related information requirement for purposes of achieving the aims of the study. It did so by discussing the units of analysis of the study as well as the sources of information consulted. A large part of Chapter 4 was devoted to the process of creating validity and reliability in terms of the designed Likert scale questionnaires used as the primary data collection tool. A part of this validity and reliability relates to the sampling process used to identify appropriate individuals who could be targeted to complete the questionnaires. Consideration was given to the structure/composition of a population framework from which to select a sample, guided by the respective selection criteria.

The chapter concluded with information related to the success of the response rate and set the tone for presenting the research results and findings in Chapter 5.

CHAPTER 5

RESEARCH RESULTS AND FINDINGS

5.1   INTRODUCTION

Chapter 5 presents the research results and findings and describes the methodology applied during the primary research component of this study. The results reflect the extent to which current scanning practices are performed in accordance with the scanning practice statements (cf. Tables 3.1 to 3.5) identified in the literature review. Determining this extent may support the notion of a need for an expanded conceptual scanning framework such as the one conceptualised and proposed in Chapter 3, which incorporates these statements. Such a framework may enable businesses to deal more successfully with the challenges manifesting in an ever-changing, emerging and unknown future business landscape. It may also positively affect scenario planning, strategy selection and business performance. The results illustrate to what extent and in what manner those businesses that participated in the research currently practice scanning, scenario planning and strategy selection. It also indicates how they view these activities in relation to information gathering, business performance and the application of a systems thinking approach to scanning.

5.2   REPRESENTATIVENESS OF THE RESULTS

Appendix J contains the invitation to participate in the research. It was sent to individuals in business organisations and to independent consultants active in scanning and related fields. To those who had responded positively to the invitation, five Likert scale questionnaires were sent for completion, in order to gather data for this study. In order to perform an analysis of variance (ANOVA) and Spearman's rank correlation coefficient test on questionnaire results, data was collected via a qualifying questionnaire, as part of Questionnaire 1.

The qualifying questionnaire contains details regarding the following:

- the management position currently held by the respondent, or, as a consultant, the management level that he/she consults on;
- the primary field(s) of the respondent's employment/consultancy with regards to scanning, scenario planning, strategy selection, business performance and systems thinking;
- the size of the business where the respondent currently works/consults in terms of the number of employees;
- the international infrastructural footprint of the business; and
- how familiar, in general, the respondent is with general systems thinking.

Respondents had to indicate whether they answered the respective questionnaires independently or with assistance, and whether they responded as an employee or a consultant.

Table 5.1 reflects the qualifying questionnaire results received from the sample of 121 respondents (cf. Table 4.10).

Table 5.1: Percentage breakdown of the qualifying questionnaire section

I currently manage/consult on … level	Middle	Senior	Executive	Director	Share-holder
	3.31%	45.45%	28.10%	18.18%	4.96%
I am primarily involved in...	Scanning	Scenario planning	Strategy selection	Organisation performance	Others: specify
	36.36%	19.01%	25.62%	19.01%	0.00%
My organisation/client's organisation employs…	0 > 100 people	100 > 500 people	500 > 1000 people	More than 1000 people	I am unsure
	14.88%	19.83%	27.27%	33.88%	4.13%
My organisation/client's organisation has…	Offices in other countries	Offices only in one country			
	53.72%	46.28%			
I am familiar with systems thinking...	Not at all	Slightly	Fairly	Very	100%
	0.00%	13.22%	28.93%	42.98%	14.88%
I completed this questionnaire as a …	Employee		Consultant		
	72.73%		27.27%		

A concern regarding the findings of this study could be the representativeness of the findings and the extent to which it can be generalised to a larger population, in this case the larger business community. The researcher treated the responses qualitatively in order to extract evidence that could be considered significant, and from which some degree of generalisation could be drawn. In this regard, aspects include business industry types and the geographical representation of the sample. Table 5.2 presents the respective industries in which the respondents were active at the time of participating in the research.

From the literature review (ref. Chapter 2) it was not possible to identify and categorise a homogeneous group of businesses performing scanning and related derivative activities. It was apparent from the review that reference is made mainly to most organisations when referring to these activities, implying that it is performed by most businesses (cf. 4.6.1.1). With this in mind, it was endeavoured to include as large a variety as possible of businesses in

various industries in the sample selection process. This contributed to a higher likelihood of accurate generalisation in terms of the results of this research.

Table 5.2: The industries in which the respondents are active

Industry type	Number of respondents	As a % of the total number of questionnaires completed
Beverage	8	6.61%
Electronic media	7	5.79%
Technology	6	4.96%
Financial (Banking)	12	9.92%
Construction	12	9.92%
Print media	7	5.79%
Manufacturing	10	8.26%
Oil	6	4.96%
Insurance	8	6.61%
Logistics	6	4.96%
Chemical	6	4.96%
Agriculture	13	10.74%
Pharmaceutical	13	10.74%
Suppliers to the military	7	5.79%
Total participants	121	100%

Geographically, the researcher included businesses from a number of different countries. Environmental scanning is business specific and closely linked to the actual environment in which a business operates in terms of a particular political and/or economic landscape, a developed technological platform and specific social trend changes (PEST, cf.2.3.5). Geographic representation was increased by inviting respondents in businesses from Ghana, Nigeria, Botswana, Namibia, Sudan and countries from the East African Community (EAC); the regional intergovernmental organisation of the Republics of Burundi, Kenya, Rwanda, Uganda and Tanzania. This enhanced the likelihood of being able to generalise the research results.

Table 5.3 contains the geographical representation in percentages of the 121 participants.

Following on Table 5.3, this section continues with a qualitative procedure to measure the extent to which the results support the need for an expanded conceptual scanning framework, founded and conceptualised on substantiating statements (cf. Table 3.1 to 3.5) identified through the literature study (ref. Chapter 3).

Table 5.3: Geographic representation of completed questionnaires

Country/Region	Number of questionnaires completed	As a % of the questionnaires completed
South Africa	39	32.23%
Northern Sudan	13	10.74%
Uganda	7	5.79%
Ghana	17	14.05%
Botswana	17	14.05%
Namibia	28	23.14%
Total participants	121	100%

5.3   METHOD OF REPORTING THE RESULTS

The research results are presented graphically in Figures 5.1 to 5.15, with five statements per Figure. Each Likert scale questionnaire had 15 statements, meaning that the results are presented through three figures, per respective questionnaire. Using the Likert scale measurement, respondents had to indicate the extent to which they agreed or disagreed with each particular statement. Each questionnaire had a specific context within which the statements were formulated (cf. 4.5.1.2 b).

The paragraph below contains this context per questionnaire, and words each context in the same manner as it appeared in the actual questionnaires:

- **Questionnaire 1**

With regards to scanning practices and information gathered, indicate to what extent you agree that in your organisation/your client's organisation…

- **Questionnaire 2**

With regards to scenario planning and information gathered, indicate to what extent you agree that in your organisation/your client's organisation…

- **Questionnaire 3**

With regards to strategy selection and scenario planning, indicate to what extent you agree that in your organisation/your client's organisation…

- **Questionnaire 4**

With regards to business performance and strategy selection, indicate to what extent you agree that in your organisation/your client's organisation…

- **Questionnaire 5**

With regards to complexus analysis and scanning, indicate to what extent you agree that in your organisation/your client's organisation…

The context sentence, and each statement, had to be read as one continuous sentence to which the responded then responded. In other words, if a respondent for example had to respond to the first statement in Questionnaire 1, the complete statement would read as follows:

"With regards to scanning practices and information gathered, indicate to what extent you agree that in your organisation/your client's organisation scanning is regarded as an effective practice to gather information."

The same methodology applied to the remainder of the statements in all five questionnaires.

The options for a response were strong disagreement (1), fair disagreement (2), slight disagreement (3), indecisiveness (4), slight agreement (5), fair agreement (6), and strong agreement (7).

The complete and final questionnaires are presented in Appendix K.

5.4 RESULTS

This section contains the results from the five questionnaires. As the statements are presented in Figures 5.1 to 5.15 in the exact same manner as in the actual Likert scale questionnaires, the following abbreviations are relevant:

- ES: Environmental systems
- PESTLE: Political, Economic, Social, Technological, Legal and Environmental analysis
- SP: Scenario planning
- SS: Strategy selection

5.4.1 Questionnaire 1

Figure 5.1 reflects the results of the first five statements of Questionnaire 1. The statements are contained in the figure presented, with the response percentages indicated in the figure, per statement, per Likert scale response.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
■ 1. Scanning is regarded as an effective practice to gather information	5.80%	7.44%	8.26%	6.61%	15.70%	33.88%	22.31%
■ 2. Similar sources of information are scanned, as those sources scanned by other organisations	0.00%	0.00%	9.92%	9.09%	19.01%	39.67%	22.31%
■ 3. Scanning is susceptible to the scanner(s)' environmental perception	0.00%	5.79%	6.61%	6.61%	21.49%	33.88%	25.62%
■ 4. Scanning considers the multiple dimensions of environmental systems (ES)	0.00%	7.44%	8.26%	11.57%	21.49%	35.54%	15.70%
■ 5. Scanning is over-simplified	8.26%	9.09%	11.57%	14.05%	23.97%	18.18%	14.88%

Figure 5.1: Results from Statements 1 to 5 of Questionnaire 1

- **Statement 1: Scanning is regarded as an effective practice to gather information**

Figure 5.1 reflects that 22.31% of respondents strongly agreed with this statement. A further 33.88% of the respondents indicated fair agreement, and 15.70% slight agreement. Only 6.61% of respondents were undecided, whilst 8.26% disagreed slightly, 7.44% disagreed fairly and 5.80% disagreed strongly with the statement.

- **Statement 2: Similar sources of information are scanned, as those sources scanned by other organisations**

Figure 5.1 reflects that 22.31% of respondents strongly agreed with this statement. A further 39.67% of the respondents indicated fair agreement with this statement, and 19.01% agreed slightly. A mere 9.09% of respondents were undecided, whilst 9.92% disagreed slightly. None of the respondents disagreed fairly or strongly with this statement.

- **Statement 3: Scanning is susceptible to the scanner(s)' environmental perception**

Figure 5.1 reflects a strong level of agreement regarding this statement amongst 25.62% of respondents. A further 33.88% of the respondents indicated that they fairly agree, and 21.49% indicated slight agreement. A total 6.61% of respondents were undecided and 6.61% disagreed slightly. Only 5.79% of respondents disagreed fairly and no respondents disagreed strongly with this statement.

- **Statement 4: Scanning considers the multiple dimensions of environmental systems**

Figure 5.1 reflects that 15.70% of respondents strongly agreed with this statement. A further 35.54% of the respondents indicated fair agreement, and 21.49% agreed slightly with the statement. In comparison to the other statements measured in this questionnaire, a relatively high 11.57% of respondents were undecided. Only 8.26% disagreed slightly, 7.44% disagreed fairly and no one disagreed strongly with the statement.

- **Statement 5: Scanning is over-simplified**

Figure 5.1 reflects that 14.88% of respondents agreed strongly with this statement, whilst 18.18% agreed fairly. A further 23.97% agreed slightly and 14.05% remained undecided in their response to this statement. A total of 11.57% disagreed slightly, 9.09% disagreed fairly, and 8.26% disagreed strongly.

Figure 5.2 contains the results from Statements 6 to 10 of Questionnaire 1.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
6. Scanning sources are selected on the basis of their accessibility	5.79%	8.26%	6.61%	7.44%	19.01%	31.40%	21.49%
7. Scanning is constantly enhanced	6.61%	6.61%	21.49%	11.57%	21.49%	20.66%	11.57%
8. Scanning focuses on identifying new trends	9.92%	0.00%	7.44%	8.26%	22.31%	33.89%	18.18%
9. Scanning is performed in a mechanistic manner	7.44%	10.74%	12.39%	9.92%	20.66%	26.45%	12.40%
10. Scanning relates directly to business performance	0.00%	7.44%	13.22%	9.92%	23.14%	28.93%	17.35%

Figure 5.2: Results from Statements 6 to 10 of Questionnaire 1

- **Statement 6: Scanning sources are selected on the basis of their accessibility**

Figure 5.2 reflects that 21.49% of the respondents strongly agreed with this statement. A further 31.40% of the respondents indicated fair agreement with this statement, and 19.01% of respondents agreed slightly. Only 7.44% were undecided, whilst 6.61% disagreed slightly, 8.26% disagreed fairly and 5.79% disagreed strongly with this statement.

- **Statement 7: Scanning is constantly enhanced**

Regarding this statement, 11.57% of respondents were undecided, whilst 34.71%, did not agree, in varying degrees. Only 11.57% of respondents agreed strongly, 20.66% fairly agreed and 21.49% agreed slightly with this statement.

- **Statement 8: Scanning focuses on identifying new trends**

Figure 5.2 reflects that 18.18% of respondents strongly agreed with this statement. A further 33.89% of respondents indicated fair agreement with this statement, and 22.31% agreed slightly. Only 8.26% of respondents were undecided, whilst 7.44% disagreed slightly. No respondent disagreed fairly, but 9.92% disagreed strongly with this statement.

- **Statement 9: Scanning is performed in a mechanistic manner**

Regarding this statement, 59.51% of the responses fall into the agreeing categories. Only 9.92% of the respondents were undecided and a relatively high number, 30.57%, did not agree, in varying degrees. Only 12.40% of respondents agreed strongly, 26.45% fairly agreed and 20.66% agreed slightly with this statement. 7.44% of respondents strongly disagreed, 10.74% fairly disagreed, and 12.39% disagreed slightly.

- **Statement 10: Scanning relates directly to business performance**

Figure 5.2 reflects that 17.35% of respondents agreed strongly with this statement. A further 28.93% of respondents agreed fairly and 23.14% agreed slightly. Only 9.92% of respondents were undecided, whilst a relatively high 13.22% disagreed slightly. A mere 7.44% disagreed fairly, but no respondent disagreed strongly with this statement.

Figure 5.3 contains the results from Statements 11 to 15 of Questionnaire 1.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
11. Scanning sources are selected on the basis of how readily available those sources are	7.44%	9.92%	0.00%	9.09%	24.79%	26.45%	22.31%
12. Scanning frameworks are dominated by the scanner(s)' environmental perceptions	5.79%	5.79%	9.09%	9.09%	19.83%	29.75%	20.66%
13. When scanning, the environment is divided into manageable sections through a PESTLE-like categorisation	5.79%	11.57%	7.43%	7.44%	17.36%	27.27%	23.14%
14. The organisation's information requirements determine how scanning is done	5.79%	5.79%	8.25%	10.74%	19.01%	28.93%	21.49%
15. Scanning is viewed as organisation specific	8.26%	12.40%	9.09%	9.92%	23.14%	23.14%	14.05%

Figure 5.3: Results from Statements 11 to 15 of Questionnaire 1

Statement 11: Scanning sources are selected on the basis of how readily available those sources are

Figure 5.3 reflects that 22.31% of respondents agreed strongly with this statement, confirming the respondents' view that scanning sources are selected based on how readily available they are. A further 26.45% of the respondents indicated fair agreement with this statement, whilst 24.79% agreed slightly. Only 9.09% of respondents were undecided. No respondent indicated slight disagreement, 9.92% disagreed fairly, and 7.44% disagreed strongly with this statement.

Whilst Statement 6 of Questionnaire 1 refers to the ease of availability of information, Statement 11 is more concerned with the speed with which the information is obtainable. However, these two statements can easily be confused as stating the same phenomenon, and in hindsight, maybe just one of the two statements would have sufficed.

- **Statement 12: Scanning frameworks are dominated by the scanner(s)' environmental perceptions**

Figure 5.3 reflects that 20.66% of respondents agreed strongly with this statement. A further 29.75% of respondents indicated fair agreement with this statement, whilst 19.83% agreed slightly. Only 9.09% of respondents were undecided on the matter, with 9.09% also disagreeing slightly. As little as 5.79% disagreed fairly, whilst 5.79% of respondents disagreed strongly with this statement.

- **Statement 13: When scanning, the environment is divided into manageable sections through a PESTLE-like categorisation**

23.14% of respondents strongly agreed with this statement, indicating their perception that businesses apply the traditional PESTLE-like conceptual scanning framework and methodology when scanning the environment. A further 27.27% of the respondents indicated fair agreement, and 17.36% agreed slightly. Only 7.44% of respondents were undecided on the matter, whilst 7.43% disagreed slightly. A total 11.57% disagreed fairly and 5.79% disagreed strongly with this statement.

- **Statement 14: The organisation's information requirements determine how scanning is done**

Figure 5.3 reflects that 21.49% of respondents agreed strongly with this statement. A further 28.93% of the respondents indicated a fair agreement with this statement, and 19.01% agreed slightly. A mere 10.74% of respondents were undecided, whilst 8.25% disagreed slightly. As little as 5.79% disagreed fairly, and 5.79% disagreed strongly with this statement.

- **Statement 15: Scanning is viewed as organisation specific**

Regarding this statement, Figure 5.3 reflects that only 14.05% of respondents agreed strongly. 23.14% of the respondents indicated fair agreement with this statement, and 23.14% agreed slightly. A mere 9.92% of respondents were undecided, whilst 9.09% disagreed slightly. A relatively high 12.40% disagreed fairly, whilst 8.26% disagreed strongly with this statement.

Table 5.4 contains the percentage respondents who completed Questionnaire 1 unaided, and those who completed it with assistance.

Table 5.4: Questionnaire 1 completion

I completed this questionnaire	On my own	With the assistance of other people
	95.06%	4.94%

5.4.2 Questionnaire 2

The context, in which participants had to indicate their level of agreement or non-agreement for Questionnaire 2, is that of scenario planning and information gathered through scanning.

Figure 5.4 contains the results from Statements 1 to 5 of Questionnaire 2.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
■ The information yield from scanning impacts directly on the validity of scenario planning (SP)	4.96%	8.26%	7.44%	7.44%	17.36%	31.40%	23.14%
■ SP starts with the end in mind	5.79%	9.09%	14.05%	8.26%	20.66%	23.14%	19.01%
■ The future is approached as continuously emerging	1.65%	2.48%	4.13%	9.92%	21.49%	29.75%	30.58%
■ SP is shaped by the planner(s)' interpretive perceptions of possible futures	5.78%	5.79%	6.61%	6.61%	19.01%	33.06%	23.14%
■ SP assists in the strategic management of business resources	1.65%	3.31%	4.96%	1.65%	23.14%	39.67%	25.62%

Figure 5.4: Results from Statements 1 to 5 of Questionnaire 2

- **Statement 1: The information yield from scanning impacts directly on the validity of scenario planning**

Figure 5.4 reflects a strong level of agreement with this statement amongst 23.41% of respondents. A further 31.40% of respondents indicated fair agreement with this statement, and 17.36% agreed slightly. Only 7.44% of respondents remained were undecided about the matter, whilst 7.44% disagreed slightly. A mere 8.26% of respondents disagreed fairly and 4.96% disagreed strongly with this statement.

- **Statement 2: Scenario planning starts with the end in mind**

Figure 5.4 reflects that 19.01% of respondents indicated a strong level of agreement with this statement. A further 23.14% of respondents indicated fair agreement and 20.66% agreed slightly. Only 8.26% of respondents were undecided, whilst 14.05% of the respondents disagreed slightly. A total of 9.09% disagreed fairly and 5.79% disagreed strongly with this statement.

- **Statement 3: The future is approached as continuously emerging**

Figure 5.4 reflects a strong level of agreement amongst 30.58% of respondents regarding this statement. As much as 29.75% of respondents indicated fair agreement with this statement, and 21.49% agreed slightly. Only 9.92% of respondents were undecided on the matter, whilst 4.13% disagreed slightly. As little as 2.48% disagreed fairly, whilst 1.65% disagreed strongly with this statement.

- **Statement 4: Scenario planning is shaped by the planner(s)' interpretive perceptions of possible futures**

Figure 5.4 reflects a strong level of agreement amongst 23.14% of respondents regarding this statement. A relatively high 33.06% of respondents indicated fair agreement with the statement, and 19.01% agreed slightly. Only 6.61% of respondents were undecided, whilst 6.61% disagreed slightly. As little as 5.79% of respondents disagreed fairly, whilst 5.78% disagreed strongly with this statement.

- **Statement 5: Scenario planning assists in the strategic management of business resources**

Figure 5.4 reflects that 25.62% of respondents agreed strongly with this statement. A relatively high 39.67% of the respondents indicated fair agreement with the statement, and 23.14% agreed slightly. As little as 1.65% of respondents were undecided on the matter, whilst 4.96%

disagreed slightly. Only 3.31% disagreed fairly and 1.65% disagreed strongly with this statement.

Figure 5.5 contains the results from Statements 6 to 10 of Questionnaire 2.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
■ 6. Environmental scanning always precedes SP	0.00%	9.09%	11.57%	14.88%	22.31%	23.97%	18.18%
■ 7. SP considers the future relation that exists between environmental systems (ES)	0.00%	7.44%	9.09%	15.70%	40.50%	15.70%	11.57%
■ 8. It is believed that the future can be forecasted	8.27%	10.74%	9.92%	10.74%	23.14%	26.45%	10.74%
■ 9. The different world views of those involved in SP are taken into account	0.00%	9.09%	19.83%	16.53%	20.66%	21.49%	12.40%
■ 10. The different world views of ES are considered	0.00%	12.40%	12.40%	15.70%	24.79%	22.31%	12.40%

Figure 5.5: Results from Statements 6 to 10 of Questionnaire 2

- **Statement 6: Environmental scanning always precedes scenario planning**

Figure 5.5 reflects a strong level of agreement amongst 18.18% of respondents regarding this statement. A further 23.97% of the respondents indicated fair agreement with this statement, whilst 22.31% agreed slightly. A relatively high 14.88% of respondents were undecided on the matter, whilst 11.57% disagreed slightly. None of the respondents disagreed strongly, but 9.09% disagreed fairly with this statement.

- **Statement 7: Scenario planning considers the future relation that exists between environmental systems**

Figure 5.5 reflects that a relatively low 11.57% of respondents agreed strongly regarding this statement. Only 15.70% of the respondents indicated fair agreement with this statement, and a relatively high 40.50% of respondents agreed slightly. In total 15.70% of the respondents were undecided, whilst 9.09% disagreed slightly. Only 7.44% disagreed fairly and none of the respondents disagreed strongly with this statement.

- **Statement 8: It is believed that the future can be forecasted**

Figure 5.5 reflects a strong level of agreement amongst only 10.74% of respondents, whilst 26.45% of respondents indicated fair agreement with this statement. A further 23.14% agreed slightly and 10.74% of respondents were undecided. Only 9.92% disagreed slightly, whilst 10.74% disagreed fairly and 8.27% disagreed strongly with this statement.

- **Statement 9: The different worldviews of those involved in scenario planning are taken into account**

Figure 5.5 reflects a strong level of agreement amongst 12.40% of respondents, with a further 21.49% indicating fair agreement with this statement. As much as 20.66% agreed slightly, whilst 45.45% of respondents accounted for the categories of "undecided" and "disagree". As much as 16.53% of respondents were undecided and a relatively high 19.83% of respondents disagreed slightly. Only 9.09% disagreed fairly, but none of the respondents disagreed strongly with this statement.

- **Statement 10: The different worldviews of environmental systems are considered**

Figure 5.5 reflects that 12.40% of respondents agreed strongly with this statement. A further 22.31% of the respondents indicated fair agreement with this statement and 24.79% agreed slightly, whilst 40.50% of respondents contributed to the "undecided" and "disagree" categories. A total 15.70% of respondents were undecided and 12.40% disagreed slightly. As much as 12.40% disagreed fairly, but none of the respondents disagreed strongly with this statement.

Figure 5.6 contains the results from Statements 11 to 15 of Questionnaire 2.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
■ 11. The future is approached as deterministic	9.92%	9.92%	13.22%	13.22%	29.75%	16.53%	7.44%
■ 12. Scanning intensifies as perceived future uncertainty increases	3.31%	4.13%	5.79%	7.44%	24.79%	32.23%	22.31%
■ 13. SP assists in understanding the environment	0.00%	0.00%	12.39%	7.44%	23.97%	32.23%	23.97%
■ 14. SP engages with unknown emergent processes between ES	0.00%	9.92%	14.05%	17.36%	19.83%	24.79%	14.05%
■ 15. SP prefers foresight over forecasting as a methodology in planning for the future	0.00%	12.40%	14.87%	24.79%	18.18%	17.36%	12.40%

Figure 5.6: Results from Statements 11 to 15 of Questionnaire 2

- **Statement 11: The future is approached as deterministic**

Figure 5.6 reflects that only 7.44% of respondents agreed strongly with this statement and a further 16.53% of the respondents indicated fair agreement with this statement. Those that agreed slightly made up 29.75%, but 46.28% of respondents indicated that they were either undecided or disagreed. Of this percentage, 13.22% were undecided and 13.22% disagreed, whilst 9.92% disagreed fairly 9.92% disagreed strongly with this statement.

- **Statement 12: Scanning intensifies as perceived future uncertainty increases**

Figure 5.6 reflects a strong level of agreement regarding this statement amongst a relatively high 22.31% of respondents. A further 32.23% of the respondents indicated fair agreement with this statement, and 24.79% agreed slightly. Only 7.44% of respondents were undecided on the matter, whilst 5.79% disagreed slightly. A mere 4.13% disagreed fairly and 3.31% disagreed strongly with the statement.

- **Statement 13: Scenario planning assists in understanding the environment**

Figure 5.6 reflects that a relatively high 23.97% of respondents agreed strongly with this statement. A further 32.23% of respondents indicated fair agreement with this statement, whilst 23.97% agreed slightly. Only 7.44% of respondents were undecided, whilst 12.39% disagreed slightly. None of the respondents disagreed fairly or strongly with this statement.

- **Statement 14: Scenario planning engages with unknown emergent processes between environmental systems**

Figure 5.6 reflects a strong level of agreement amongst 14.05% of respondents regarding this statement. As much as 24.79% of respondents indicated fair agreement with this statement, whilst 19.83% agreed slightly. A relatively high percentage of 17.36% of respondents were undecided on the matter, whilst 14.05% disagreed slightly. Only 9.92% disagreed fairly and none of the respondents disagreed strongly with this statement.

- **Statement 15: Scenario planning prefers foresight over forecasting as a methodology in planning for the future**

Figure 5.6 reflects that only 12.40% of respondents agreed strongly with this statement. A further 17.36% of the respondents indicated fair agreement, and 18.18% agreed slightly. A relatively high 52.06% of respondents accounted for the "undecided" and "disagree" categories. Of these respondents, 24.79% were undecided, whilst 14.87% disagreed slightly. Only 12.40% disagreed fairly and none of the respondents disagreed strongly with this statement.

Table 5.5 reflects the percentage of respondents who completed Questionnaire 2 without help, and those who completed it with assistance.

Table 5.5: Questionnaire 2 completion

I completed this questionnaire	On my own	With the assistance of other people
	62.81%	37.19%

5.4.3   Questionnaire 3

The context in which participants had to indicate their level of agreement or non-agreement for Questionnaire 3 is that of strategy selection and scenario planning.

Figure 5.7 contains the results from Statements 1 to 5.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
■ 1. Strategy is dominated by the different world views amongst strategists	9.62%	9.62%	13.46%	8.65%	21.15%	20.19%	17.31%
■ 2. Management regards the organisation as contributing to shaping the environment	0.00%	9.61%	10.58%	8.65%	17.31%	34.62%	19.23%
■ 3. The relation that the organisation has with environmental systems (ES) shapes strategy selection	0.00%	8.65%	9.62%	12.50%	21.15%	31.73%	16.35%
■ 4. A selected strategy has to be correct	0.00%	9.62%	14.42%	12.50%	20.19%	23.08%	20.19%
■ 5. A selected strategy has to be appropriate	8.65%	0.00%	0.00%	12.50%	16.35%	27.88%	34.62%

Figure 5.7: Results from Statements 1 to 5 of Questionnaire 3

- **Statement 1: Strategy is dominated by the different worldviews amongst strategists**

Figure 5.7 reflects a strong level of agreement amongst 17.31% of respondents regarding this statement. A further 20.19% of the respondents indicated fair agreement with this statement, and 21.15% agreed slightly. A mere 8.65% of respondents were undecided, whilst 13.46% of respondents disagreed slightly. Only 9.62% of respondents disagreed fairly and 9.62% disagreed strongly with this statement.

- **Statement 2: Management regards the organisation as contributing to shaping the environment**

Figure 5.7 reflects a strong level of agreement amongst 19.23% of respondents regarding this statement. A further 34.62% of the respondents indicated fair agreement with this statement, and 17.31% agreed slightly. Only 8.65% of respondents were undecided, whilst 10.58% disagreed slightly. Only 9.61% of the respondents disagreed fairly and none of the respondents disagreed strongly with this statement.

- **Statement 3: The relation that the organisation has with environmental systems shapes strategy selection**

Figure 5.7 reflects a strong level of agreement amongst 16.35% of respondents regarding this statement. A further 31.73% of the respondents indicated a fair agreement with this statement, and 21.15% agreed slightly. A mere 12.50% were undecided, whilst 9.62% disagreed slightly and 8.65% of respondents disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 4: A selected strategy has to be correct**

Figure 5.7 reflects a strong level of agreement amongst 20.19% of respondents regarding this statement. A further 23.08% of respondents indicated fair agreement with this statement, and 20.19% agreed slightly. A mere 12.50% of respondents were undecided, whilst a further 14.42% of respondents disagreed slightly. Only 9.62% disagreed fairly, but none of the respondents disagreed strongly with this statement.

- **Statement 5: A selected strategy has to be appropriate**

Figure 5.7 reflects a strong level of agreement amongst 34.62% of respondents regarding this statement. A further 27.88% of respondents indicated a fair agreement with this statement whilst 16.35% of respondents agreed slightly. Only 12.50% were undecided, whilst 8.65% disagreed strongly. None of the respondents disagreed slightly or fairly regarding this statement.

Figure 5.8 contains the results from Statements 6 to 10 of Questionnaire 3.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
6. The developed status of different ES are taken into account when scanning them	6.73%	7.69%	8.65%	15.38%	22.12%	24.04%	15.39%
7. The organisation's world view towards the selected strategy is considered	6.73%	6.73%	8.65%	10.58%	23.08%	28.85%	15.38%
8. Strategy selection is dependent upon future prediction of some sort	0.00%	0.00%	8.65%	10.58%	18.27%	28.85%	33.65%
9. Scenarios are shaped by considering both objective and subjective criteria	0.00%	0.00%	12.50%	0.00%	20.19%	41.35%	25.96%
10. Scenario planning guides strategy selection	5.77%	6.73%	9.62%	7.69%	15.38%	29.81%	25.00%

Figure 5.8: Results from Statements 6 to 10 of Questionnaire 3

- **Statement 6: The developed status of different environmental systems is taken into account when scanning them**

Figure 5.8 reflects a strong level of agreement amongst 15.39% of respondents regarding this statement. A further 24.04% of respondents indicated fair agreement with this statement and 22.12% agreed slightly. However, 15.38% of respondents were undecided and another 8.65% disagreed slightly. Only 7.69% of respondents disagreed fairly and 6.73% disagreed strongly with this statement.

- **Statement 7: The organisation's worldview towards the selected strategy is considered**

Figure 5.8 reflects that only 15.38% of respondents agreed strongly with this statement whilst 28.85% of respondents indicated a fair agreement with this statement, and 23.08% agreed slightly. Only 10.58% of respondents were undecided, whilst 8.65% disagreed slightly. A mere 6.73% disagreed fairly and 6.73% disagreed strongly with this statement.

- **Statement 8: Strategy selection is dependent upon future prediction of some sort**

Figure 5.8 reflects a strong level of agreement amongst 33.65% of respondents regarding this statement. A further 28.85% of the respondents indicated fair agreement with this statement, and 18.27% agreed slightly. Only 10.58% of respondents were undecided, whilst 8.65% disagreed slightly. None of the respondents disagreed fairly or strongly with this statement.

- **Statement 9: Scenarios are shaped by considering both objective and subjective criteria**

Figure 5.8 reflects a strong level of agreement amongst 25.96% of respondents regarding this statement. A further 41.35% of respondents indicated fair agreement with this statement, and 21.09% agreed slightly. Only 12.50% disagreed slightly, but none of the respondents disagreed fairly, strongly, or was undecided on the statement.

- **Statement 10: Scenario planning guides strategy selection**

Figure 5.8 reflects a strong level of agreement amongst 25.00% of respondents regarding this statement. A further 29.81% of the respondents indicated a fair agreement with this statement, and 15.38% agreed slightly. Only 7.69% of respondents were undecided, whilst 9.62% disagreed slightly. Another 6.73% of respondents disagreed fairly and 5.77% disagreed strongly.

Figure 5.9 contains the results from Statements 11 to 15 of Questionnaire 3.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
11. Strategy is reactional by nature towards ES over which the organisation has limited influence	6.73%	8.65%	9.62%	10.58%	28.85%	20.19%	15.38%
12. The relation between the organisation and ES is approached as dynamic	0.00%	9.62%	9.62%	14.42%	20.19%	31.73%	14.42%
13. The organisation compiles its own scanning framework of the environment when scanning	0.00%	11.54%	8.65%	13.46%	19.23%	34.62%	12.50%
14. Strategy selection is based on how things are at a specific point in time	0.00%	7.69%	13.46%	8.65%	18.27%	31.73%	20.20%
15. Environmental complexity is dealt with through diverse perspectives	8.65%	13.46%	15.38%	13.46%	16.35%	16.35%	16.35%

Figure 5.9: Results from Statements 11 to 15 of Questionnaire 3

- **Statement 11: Strategy is reactional by nature towards environmental systems over which the organisation has limited influence**

Figure 5.9 reflects a strong level of agreement amongst 15.38% of respondents regarding this statement. A further 20.19% of respondents indicated fair agreement with this statement, whilst 28.85% agreed slightly. However, 10.58% of respondents were undecided, whilst 9.62% disagreed slightly. Only 8.65% of respondents disagreed fairly and 6.73% disagreed strongly.

- **Statement 12: The relation between the organisation and environmental systems is approached as dynamic**

Figure 5.9 reflects a strong level of agreement amongst 14.42% of respondents regarding this statement. Another 31.73% of respondents indicated fair agreement with this statement, and 20.19% agreed slightly. A further 14.42% of respondents were undecided, 9.62% disagreed slightly, and 9.62% disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 13: The organisation compiles its own scanning framework of the environment when scanning**

Figure 5.9 reflects a strong level of agreement amongst 12.50% of respondents regarding this statement. A further 34.62% of respondents indicated fair agreement with this statement, and 19.23% agreed slightly. However, 13.46% of respondents were undecided, whilst 8.65% disagreed slightly. Only 11.54% disagreed fairly, and none of the respondents disagreed strongly with this statement.

- **Statement 14: Strategy selection is based on how things are at a specific point in time**

Figure 5.9 reflects a strong level of agreement amongst 20.20% of respondents regarding this statement. Another 31.73% of respondents indicated fair agreement with this statement, and 18.27% agreed slightly. Only 8.65% of respondents were undecided, whilst 13.46% disagreed slightly. A mere 7.69% disagreed fairly, but none of the respondents disagreed strongly with this statement.

- **Statement 15: Environmental complexity is dealt with through diverse perspectives**

Figure 5.9 reflects a strong level of agreement amongst 16.35% of respondents regarding this statement. A further 16.35% agreed fairly and 16.35% agreed slightly. However, 13.46% remained undecided, 15.38% disagreed slightly, 13.46% disagreed fairly and 8.65% of respondents disagreed strongly with this statement.

Table 5.6 indicates the percentage of respondents that completed the questionnaire unaided, and those who completed it with assistance.

Table 5.6: Questionnaire 3 completion

I completed this questionnaire	On my own	With the assistance of other people
	93.83%	6.17%

5.4.4 Questionnaire 4

The context, within which participants had to indicate their level of agreement or non-agreement for Questionnaire 4, is that of business performance and strategy selection. Figure 5.10 contains the results from Statements 1 to 5 of Questionnaire 4.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
1. Proven facts dominate what is regarded as useful information	0.00%	6.52%	10.87%	6.52%	17.39%	32.61%	26.09%
2. People's interpretive perceptions dominate what is regarded as useful information	5.43%	0.00%	10.87%	6.52%	22.83%	38.04%	16.31%
3. The business is viewed as a sub-system of the larger environment	0.00%	5.43%	7.61%	8.70%	21.74%	28.26%	28.26%
4. The approach to strategy selection (SS) is constantly enhanced	4.35%	6.52%	9.78%	8.70%	16.30%	30.43%	23.92%
5. Different perceptions of the same trend signals are taken into account	7.61%	7.61%	13.04%	9.78%	20.65%	25.00%	16.31%

Figure 5.10: Results from Statements 1 to 5 of Questionnaire 4

- **Statement 1: Proven facts dominate what is regarded as useful information**

Figure 5.10 reflects a strong level of agreement amongst 26.09% of respondents regarding this statement. A further 32.61% of respondents indicated fair agreement with this statement, and 17.39% agreed slightly. Only 6.52% of respondents were undecided, whilst 10.87% disagreed slightly and 6.52% of respondents disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 2: People's interpretive perceptions dominate what is regarded as useful information**

Figure 5.10 reflects a strong level of agreement amongst 16.31% of respondents regarding this statement. A further 38.04% of respondents indicated fair agreement with this statement, and 22.83% of respondents agreed slightly. Only 6.52% of respondents were undecided, 10.87% disagreed slightly and 5.43% disagreed strongly. None of the respondents disagreed fairly with the statement.

- **Statement 3: The business is viewed as a sub-system of the larger environment**

Figure 5.10 reflects a strong level of agreement amongst 28.26% of respondents regarding this statement. A further 28.26% of respondents indicated fair agreement with this statement, and 21.74% agreed slightly. Only 8.70% of respondents were undecided, whilst 7.61% disagreed slightly and 5.43% disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 4: The approach to strategy selection is constantly enhanced**

Figure 5.10 reflects a strong level of agreement amongst 23.92% of respondents regarding this statement. Another 30.43% of respondents indicated fair agreement with this statement, and 16.30% agreed slightly. Only 8.70% of respondents were undecided, 9.78% disagreed slightly, 6.52% disagreed fairly and 4.35% of respondents disagreed strongly with this statement.

- **Statement 5: Different perceptions of the same trend signals are taken into account**

Figure 5.10 reflects a strong level of agreement amongst 16.31% of respondents regarding this statement. A further 25.00% of respondents indicated fair agreement with this statement, and 20.65% agreed slightly. A mere 9.78% of respondents were undecided, whilst 13.04% disagreed slightly, 7.61% disagreed fairly and 7.61% disagreed strongly with this statement.

Figure 5.11 contains the results from Statements 6 to 10 of Questionnaire 4.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
6. SS is performed in a team	5.43%	5.43%	11.96%	6.52%	16.30%	30.43%	23.93%
7. SS is reactional by nature	5.43%	9.78%	11.95%	8.70%	29.35%	22.83%	11.96%
8. SS takes the relation between environmental systems into account	4.35%	5.43%	9.78%	8.70%	20.65%	33.70%	17.39%
9. Organisational flexibility determines sustainable competitiveness	0.00%	5.43%	6.52%	7.61%	11.96%	23.91%	44.57%
10. Enhanced SS ability leads to increased competitive ability	0.00%	4.35%	4.34%	4.35%	9.78%	40.22%	36.96%

Figure 5.11: Results from Statements 6 to 10 of Questionnaire 4

- **Statement 6: Strategy selection is performed in a team**

Figure 5.11 reflects a strong level of agreement amongst 23.93% of respondents regarding this statement. A further 30.43% of respondents indicated fair agreement with this statement, and 16.30% of respondents agreed slightly. Only 6.52% of respondents were undecided, whilst 11.96% disagreed slightly, 5.43% disagreed fairly and 5.43% disagreed strongly with this statement.

- **Statement 7: Strategy selection is reactional by nature**

Figure 5.11 reflects a strong level of agreement amongst 11.96% of respondents regarding this statement. A further 22.83% of the respondents indicated fair agreement with this statement, and 29.35% agreed slightly. A mere 8.70% of respondents were undecided, whilst 11.95% disagreed slightly, 9.78% disagreed fairly and 5.43% of respondents disagreed strongly with this statement.

- **Statement 8: Strategy selection takes the relation between environmental systems into account**

Figure 5.11 reflects a strong level of agreement amongst 17.39% of respondents regarding this statement. However, 33.70% of respondents indicated fair agreement with this statement, and 20.65% agreed slightly. Only 8.70% of respondents were undecided, whilst 9.78% disagreed slightly, 5.43% disagreed fairly and 4.35% of respondents disagreed strongly with this statement.

- **Statement 9: Organisational flexibility determines sustainable competitiveness**

Figure 5.11 reflects a strong level of agreement amongst 44.57% of respondents regarding this statement. A further 23.91% of respondents indicated fair agreement with this statement, and 11.96% agreed slightly. A mere 7.61% of respondents were undecided, whilst 6.52% disagreed slightly and 5.43% of respondents disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 10: Enhanced strategy selection ability leads to increased competitive ability**

Figure 5.11 reflects a strong level of agreement amongst 36.96% of respondents regarding this statement. A further 40.22% of respondents indicated fair agreement with this statement, and 9.78% agreed slightly. Only 4.35% of respondents were undecided, whilst 4.34% disagreed slightly and 4.35% of respondents disagreed fairly. None of the respondents disagreed strongly with this statement.

Figure 5.12 contains the results from Statements 11 to 15 of Questionnaire 4.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
■ 11. SS is viewed as the juncture between performance and scanning	0.00%	7.61%	7.61%	16.30%	19.57%	34.78%	14.13%
■ 12. Scanning information is integrated with strategy to improve performance	0.00%	8.70%	8.68%	8.70%	15.22%	36.96%	21.74%
■ 3. The relationship between SS and performance is impacted on by the external environment	0.00%	0.00%	13.04%	10.87%	17.39%	39.13%	19.57%
■ 14. The relationship between SS and performance is impacted on by the business structure	0.00%	0.00%	0.00%	0.00%	23.91%	46.74%	29.35%
■ 15. The future is treated as consisting of unknown emergent processes	0.00%	18.48%	19.55%	0.00%	19.57%	22.83%	19.57%

Figure 5.12: Results from Statements 11 to 15 of Questionnaire 4

- **Statement 11: Strategy selection is viewed as the juncture between performance and scanning**

Figure 5.12 reflects a strong level of agreement amongst 14.13% of respondents regarding this statement. A further 34.78% of respondents indicated fair agreement with this statement, and 19.57% agreed slightly. However, 16.30% of respondents were undecided, whilst 7.61% disagreed slightly and 7.61% of respondents disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 12: Scanning information is integrated with strategy to improve performance**

Figure 5.12 reflects a strong level of agreement amongst 21.74% regarding this statement. A further 36.96% of respondents indicated fair agreement with this statement and 15.22% of respondents agreed slightly with the statement. A mere 8.70% of respondents were undecided, whilst 8.68% disagreed slightly and 8.70% disagreed fairly. None of the respondents disagreed strongly with the statement.

- **Statement 13: The relationship between strategy selection and performance is impacted on by the external environment**

Figure 5.12 reflects a strong level of agreement amongst 19.57% of respondents regarding this statement. However, 39.13% of respondents indicated fair agreement with this statement, and 17.39% agreed slightly. Only 10.87% of respondents were undecided, whilst 13.04% disagreed slightly. None of the respondents disagreed either fairly or strongly with this statement.

- **Statement 14: The relationship between strategy selection and performance is impacted on by the business structure**

Figure 5.12 reflects a strong level of agreement amongst 29.35% of respondents regarding this statement. However, 46.74% of respondents indicated fair agreement with this statement, and 23.91% of respondents agreed slightly. None of the respondents was undecided or disagreed slightly, fairly or strongly with this statement.

- **Statement 15: The future is treated as consisting of unknown emergent processes**

Figure 5.12 reflects a strong level of agreement amongst 19.57% of respondents regarding this statement. A further 22.83% of respondents indicated fair agreement with this statement, and 19.57% agreed slightly. None of the respondents was undecided, whilst 19.55% disagreed slightly and 18.48% disagreed fairly. None of the respondents disagreed strongly with the statement.

Table 5.7 indicates the percentage of respondents that completed the questionnaire unaided, and those who completed it with assistance.

Table 5.7: Questionnaire 4 completion

I completed this questionnaire	On my own	With the assistance of other people
	73.83%	26.17%

5.4.5 Questionnaire 5

The context in which participants had to indicate their level of agreement or non-agreement for Questionnaire 5 is that of complexus analysis and scanning.

Figure 5.13 contains the results of Statements 1 to 5 of Questionnaire 5.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
1. Direct and indirect inter-activeness between environmental systems (ES) are analysed	6.17%	11.11%	11.11%	13.58%	23.46%	19.75%	14.82%
2. Preconceived ideas about the environment determine the scanning approach	6.17%	4.94%	7.41%	6.17%	25.93%	32.10%	17.28%
3. Emerging complexities are considered between ES that are scanned	3.70%	4.93%	12.35%	9.88%	25.93%	28.40%	14.81%
4. The relation between ES is scanned via a preconceived structure of the relation	3.70%	4.94%	7.41%	17.28%	33.34%	27.16%	6.17%
5. Scanning is dominated by the scanner(s)' cognitive ability	0.00%	6.17%	7.41%	9.88%	27.16%	34.57%	14.81%

Figure 5.13: Results from Statements 1 to 5 of Questionnaire 5

- **Statement 1: Direct and indirect inter-activeness between environmental systems are analysed**

Figure 5.13 reflects that 14.82% of respondents strongly agreed with this statement. A further 19.75% of respondents indicated fair agreement, whilst 23.46% agreed slightly. A relatively high 13.58% of respondents were undecided on the matter, whilst 11.11% disagreed slightly. Only 11.11% disagreed fairly and 6.17% disagreed strongly with the statement.

- **Statement 2: Preconceived ideas about the environment determine the scanning approach**

Figure 5.13 reflects a strong level of agreement amongst 17.28% of respondents regarding this statement. A further 32.10% of the respondents indicated fair agreement with this statement, whilst 25.93% agreed slightly. Only 6.17% of respondents were undecided on the matter, whilst 7.41% disagreed slightly. A mere 4.94% disagreed fairly and 6.17% disagreed strongly with this statement.

- **Statement 3: Emerging complexities are considered between environmental systems that are scanned**

Figure 5.13 reflects that a relatively low 14.81% of respondents indicated a strong level of agreement with this statement. A further 28.40% of the respondents indicated fair agreement, whilst 25.93% agreed slightly. Only 9.88% of respondents were undecided on the matter, whilst 12.35% disagreed slightly. As little as 4.93% disagreed fairly, and 3.70% disagreed strongly with the statement.

- **Statement 4: The relation between environmental systems is scanned via a preconceived structure of the relation**

Figure 5.13 reflects a relatively low 6.17% of respondents that agreed strongly with this statement. However, 27.16% of respondents indicated fair agreement with this statement. A further 33.34% agreed slightly. A relatively high 17.28% of respondents remained undecided on the matter, whilst 7.41% disagreed slightly. Only 4.94% disagreed fairly and even less, 3.70% of respondents, disagreed strongly with this statement.

- **Statement 5: Scanning is dominated by the scanner(s)' cognitive ability**

Figure 5.13 reflects a strong level of agreement amongst 14.81% of respondents regarding this statement. A further 34.57% of the respondents indicated fair agreement with this statement, whilst 27.16% agreed slightly. Only 9.88% of respondents were undecided on the matter, whilst 7.41% disagreed slightly. As little as 6.17% disagreed fairly, whilst none of the respondents disagreed strongly with the statement.

Figure 5.14 reflects the results of Statements 6 to 10 of Questionnaire 5.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
■ 6. Scanning seeks to qualify the relation between ES scanned	4.94%	7.41%	11.11%	11.11%	20.99%	27.16%	17.28%
■ 7. Scanning identifies ES that initiate change and those opposing it	4.94%	7.41%	8.64%	12.35%	20.99%	30.86%	14.81%
■ 8. The organisation attempts to influence contextual ES via its relation with transactional ES	3.70%	11.11%	7.41%	19.75%	19.75%	25.93%	12.35%
■ 9. Scanning considers emerging unanticipated environmental trend signals	0.00%	4.94%	16.04%	12.35%	25.93%	20.99%	19.75%
■ 10. Scanning includes identifying emerging unknown information	0.00%	9.88%	13.57%	7.41%	25.93%	29.63%	13.58%

Figure 5.14: Results from Statements 6 to 10 of Questionnaire 5

- **Statement 6: Scanning seeks to qualify the relation between environmental systems scanned**

Figure 5.14 reflects a strong level of agreement amongst 17.28% of respondents regarding this statement, whilst 27.16% of respondents indicated fair agreement. A further 20.99% agreed slightly, but 11.11% of respondents remained undecided on the matter. A total of 11.11% disagreed slightly, 7.41% disagreed fairly, and 4.94% disagreed strongly with this statement.

- **Statement 7: Scanning identifies environmental systems that initiate change and those opposing it**

Figure 5.14 reflects a strong level of agreement amongst 14.81% of respondents regarding this statement. A further 30.86% of respondents indicated fair agreement with this statement, and 20.99% agreed slightly. Only 12.35% of respondents were undecided, whilst 8.64% disagreed slightly, 7.41% disagreed fairly and 4.94% of respondents disagreed strongly with this statement.

- **Statement 8: The organisation attempts to influence contextual environmental systems via its relation with transactional environmental systems**

Figure 5.14 reflects a strong level of agreement amongst 12.35% of respondents regarding this statement. A further 25.93% of respondents indicated fair agreement with this statement, and 19.75% agreed slightly. However, 19.75% of respondents were undecided, whilst 7.41% disagreed slightly, 11.11% disagreed fairly and 3.70% of respondents disagreed strongly with this statement.

- **Statement 9: Scanning considers emerging unanticipated environmental trend signals**

Figure 5.14 reflects a strong level of agreement amongst 19.75% of respondents regarding this statement. Another 20.99% of respondents indicated fair agreement with this statement, and 25.93% of respondents agreed slightly with this statement. Only 12.35% of respondents were undecided, whilst 16.04% disagreed slightly and 4.94% disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 10: Scanning includes identifying emerging unknown information**

Figure 5.14 reflects a strong level of agreement amongst 13.58% of respondents regarding this statement. A further 29.63% of respondents indicated fair agreement with this statement, and 25.93% agreed slightly. A mere 7.41% of respondents were undecided, whilst 13.57% disagreed slightly and 9.88% disagreed fairly. None of the respondents disagreed strongly with this statement.

Figure 5.15 reflects the responses to Statements 11 to 15 of Questionnaire 5.

	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
11. Scanning views ES in a multi-dimensional manner	0.00%	7.41%	12.33%	9.88%	23.46%	28.40%	18.52%
12. ES in a relation with one another are scanned as a larger system of sub-systems	0.00%	12.35%	11.10%	16.05%	20.99%	18.52%	20.99%
13. The relation between ES shapes scanning	0.00%	12.35%	12.34%	13.58%	20.99%	24.69%	16.05%
14. The relation between ES signifies the possibility of change	0.00%	11.11%	6.17%	17.28%	28.40%	25.93%	11.11%
15. Scanning is aimed at confirming known information	0.00%	7.41%	9.87%	4.94%	29.63%	38.27%	9.88%

Figure 5.15: Results from Statements 11 to 15 of Questionnaire 5

- **Statement 11: Scanning views environmental systems in a multi-dimensional manner**

Figure 5.15 reflects a strong level of agreement amongst 18.52% of responders regarding this statement. A further 28.40% of respondents indicated fair agreement with this statement, and 23.46% agreed slightly. However, 9.88% of respondents were undecided, whilst 12.33% disagreed slightly and 7.41% of respondents disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 12: Environmental systems in a relation with one another are scanned as a larger system of sub-systems**

Figure 5.15 reflects a strong level of agreement amongst 20.99% of responders regarding this statement. Another 18.52% of respondents indicated fair agreement with this statement, and 20.99% of respondents agreed slightly. A further 16.05% of respondents were undecided, whilst 11.10% disagreed slightly and 12.35% disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 13: The relation between environmental systems shapes scanning**

Figure 5.15 reflects a strong level of agreement amongst 16.05% of respondents regarding this statement. A further 24.69% of respondents indicated fair agreement with this statement, and 20.99% agreed slightly. Another 13.58% of respondents were undecided, whilst 12.35% disagreed slightly and 12.34% of respondents disagreed fairly. None of the respondents disagreed strongly with this statement.

- **Statement 14: The relation between environmental systems signifies the possibility of change**

Figure 5.15 reflects a strong level of agreement amongst 11.11% of respondents regarding this statement. Another 25.93% of respondents indicated fair agreement with this statement, and 28.40% of respondents agreed slightly with this statement. A further 17.28% of respondents were undecided, whilst 6.17% disagreed slightly, 11.11% disagreed fairly, and none of the respondents disagreed strongly with this statement.

- **Statement 15: Scanning is aimed at confirming known information**

Figure 5.15 reflects a strong level of agreement amongst only 9.88% of respondents regarding this statement. However, 38.27% of respondents indicated fair agreement with this statement, and 29.63% of respondents agreed slightly. Only 4.94% of respondents were undecided, whilst 9.87% disagreed slightly and 7.41% disagreed fairly. None of the respondents disagreed strongly with this statement.

Table 5.8 reflects the percentage of respondents who completed the questionnaire unaided, and those who completed it with assistance.

Table 5.8: Questionnaire 5 completion

I completed this questionnaire	On my own	With the assistance of other people
	87.65%	12.35%

5.5   ANALYSIS OF VARIANCE

The researcher performed an analysis of variance (ANOVA) on the responses in order to provide a statistical account as to whether or not the means of the responses to the respective statements of specific Likert scale categories, are equal. The purpose of the ANOVA performed was to enhance the reliability of the research results, as participants from different categories (cf. Table 4.8) completed the questionnaires. According to Weiner (2007), reliability relates to the extent to which a research measurement can deliver consistent results when it is again applied, and therefore the issue of the sample of respondents belonging to different categories in this study had to be considered in terms of the difference in responses between the categories. In performing ANOVA the researcher aimed to indicate the extent of the difference in the responses between the categories, if any. If significant, one would be able to draw further conclusions regarding the reliability of the results.

Two independent variables were selected from the qualifying questionnaire component of the Likert scale questionnaire. These were the management level of respondents and the area of their expertise.

Although determining whether the different categories of respondents responded differently to the Likert scale questionnaires was not the primary aim of this study, performing the ANOVA did provide more insight into the nature of the results and may assist in enhancing the interpretation thereof.

As an example, the ANOVA outcome for Statement 3 of Questionnaire 1 is explained in the following paragraphs.

5.5.1   ANOVA Result for Statement 3 of Questionnaire 1

Statement 3, within the context of Questionnaire 1 on scanning and information gathered reads as follows:

With regards to scanning practices and information gathered, indicate to what extent you agree that in your organisation/your client's organisation scanning is susceptible to the scanner's environmental perception.

In terms of ANOVA performed, the statement is the dependent variable and depicted along the y-axis of Figure 5.16. The area of employment of the respondent, being either one of scanning, strategy selection, scenario planning or business performance, is the independent variable and depicted along the x-axis of Figure 5.16. The purpose of ANOVA is to determine whether there are significant differences in the mean Likert scores.
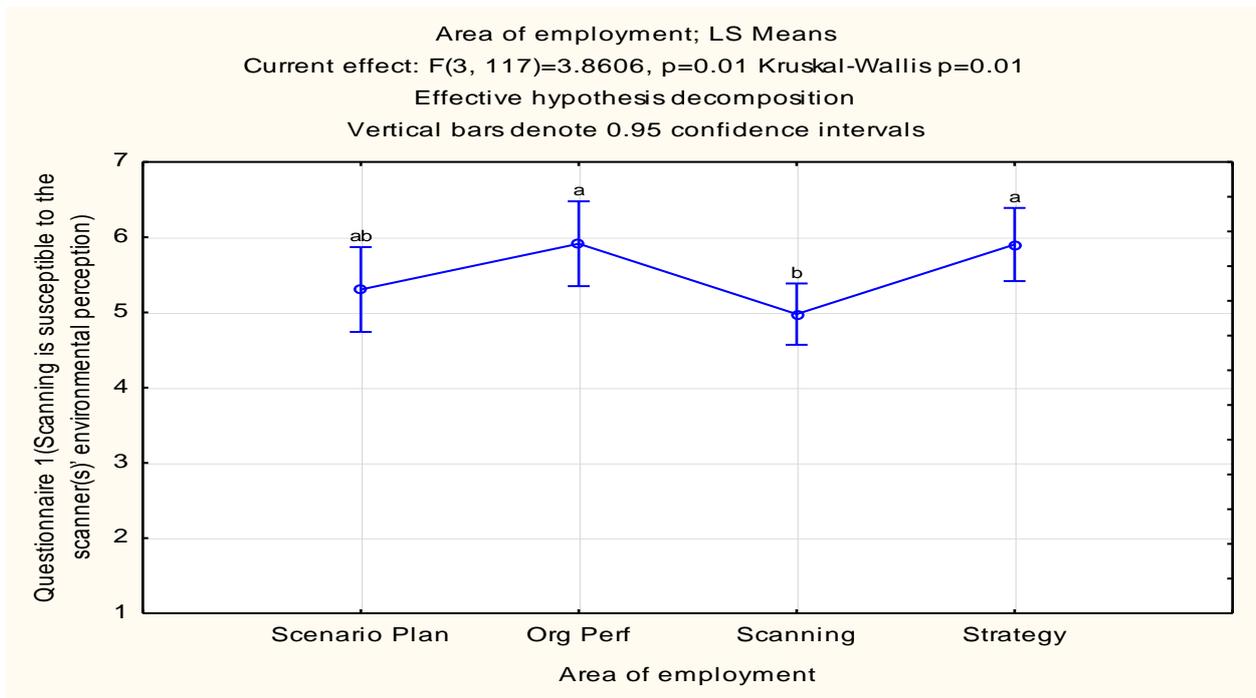
Figure 5.16: ANOVA result for Statement 3of Questionnaire 1 (Discipline)

The second independent variable tested through ANOVA is that of the level on which the respondent currently holds a management position in his/her business. Figure 5.17 below reflects the results of the ANOVA performed on the same statement, but with the second independent variable. In this instance, there is significant differences in the mean Likert scale responses between those respondents in middle management and those on executive management, director and shareholder levels. There is little variance between middle and senior management respondents in terms of their responses to this particular statement. There also appears to be only a slight variance between the senior management levels and the executive management, director and shareholder levels. It has to be noted that both middle management and shareholder respondents are a small group, with four respondents per category, and it might be prudent to consider only the variances in results between the senior management, executive, and director participants.

The responses received in this example assists in the interpretation of the thereof as, according to Gordon and DiTomaso (1992:788), senior management tend to give more favourable responses to questions concerning their businesses, compared to the lower level employees of the same businesses.
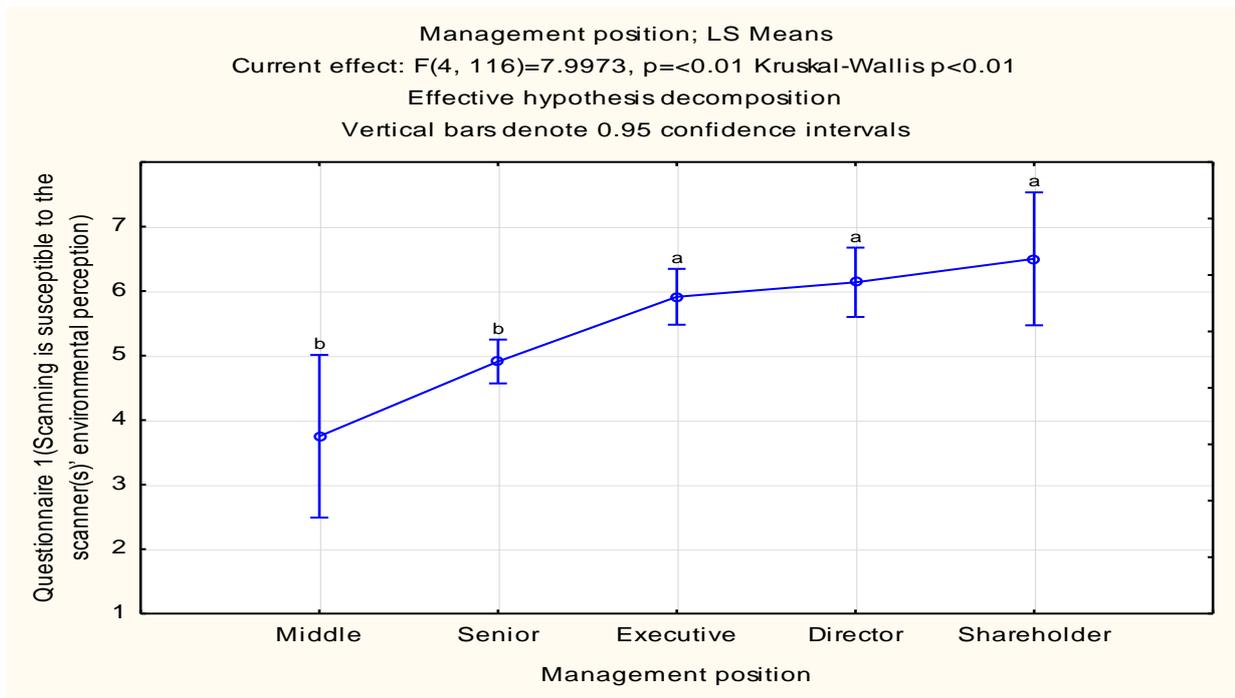
Figure 5.17: ANOVA result for Statement 3of Questionnaire 1 (Management)

5.6   SPEARMAN'S RANK CORRELATION COEFFICIENT TEST

Due to the inclusion of a systems thinking approach in the conceptualisation of an expanded conceptual scanning framework, the researcher applied the Spearman's rank correlation coefficient test to determine the non-parametric measurement of statistical dependence between the questionnaire statements (dependent variable), and the participants' mode of completion (independent variable). In this case, selected statements were measured against the systems thinking ability of the participant responding to the questionnaire statements. Determining the systems thinking ability is part of the qualifying questionnaire component of the Likert scale questionnaire. Table 5.9 contains the results of the Spearman's rank correlation coefficient test performed on a selected number of statements. From Table 5.9 it is apparent that there is a few positive correlations between the dependent and independent variables. This allows for possible more accurate research findings and their generalisation through interpretations, based on the nature of the overall responses as illustrated through the Spearman's rank correlation coefficient test.

Table 5.9: Results of the Spearman's rank correlation coefficient test

Questionnaire 1	Context: Scanning and information gathered			
Independent variable	**Dependent variable**	**Spear-man**	**Spearman p-val**	**# cases**
Systems thinking understanding	Scanning is regarded as an effective practice to gather information	0.29	<0.01	121
Systems thinking understanding	Scanning is susceptible to scanners' environmental perception	0.15	0.09	121
Systems thinking understanding	Scanning is performed in a mechanistic manner	0.03	0.71	121
Systems thinking understanding	Scanning relates directly to business performance	0.15	0.11	121
Systems thinking understanding	Scanning frameworks are dominated by the scanners environmental perceptions	-0.07	0.48	121
Systems thinking understanding	When scanning, the environment is divided into manageable sections through a PESTLE-like categorisation	0.16	0.09	121
Systems thinking understanding	Scanning is viewed as organisation specific	0.19	0.04	121
Questionnaire 2	**Context: Information gathered and scenario planning**			
Systems thinking understanding	The information yield from scanning impacts directly on the validity of scenario planning	-0.03	0.74	121
Systems thinking understanding	The future is approached as continuously emerging	0.06	0.5	121
Systems thinking understanding	Scenario planning is shaped by the planner's interpretive perceptions of possible futures	0.05	0.62	121
Systems thinking understanding	Environmental scanning always precedes scenario planning	0.07	0.44	121
Systems thinking understanding	SP considers the future relation that exists between environmental systems	0.04	0.68	121
Systems thinking understanding	The different worldviews of environmental systems are considered	0.10	0.27	121
Systems thinking understanding	The future is approached as deterministic	-0.11	0.24	121
Systems thinking understanding	Scenario planning engages with unknown emergent processes between environmental systems	0.15	0.11	121

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Independent variable	Dependent variable	Spear-man	Spearman p-val	# cases
Questionnaire 3	**Context: Scenario planning and strategy selection**			
Systems thinking understanding	Strategy is dominated by the different worldviews amongst strategists	0.26	<0.01	104
Systems thinking understanding	Management regards the organisation as contributing to shaping the environment	0.02	0.87	104
Systems thinking understanding	The developed status of different environmental systems is taken into account when scanning them	0.07	0.46	104
Systems thinking understanding	The organisation's worldview towards the selected strategy is considered	0.01	0.9	104
Systems thinking understanding	Scenario planning guides strategy selection	0.09	0.36	104
Systems thinking understanding	The relation between the organisation and environmental systems is approached as dynamic	0.02	0.87	104
Systems thinking understanding	The organisation compiles its own scanning framework of the environment when scanning	-0.14	0.17	104
Systems thinking understanding	Environmental complexity is dealt with through diverse perspectives	-0.02	0.83	104
Questionnaire 4	**Context: Strategy selection and business performance**			
Systems thinking understanding	The business is viewed as a sub-system of the larger environment	0.12	0.22	92
Systems thinking understanding	Strategy selection takes the relation between environmental systems into account	0.23	0.03	92
Systems thinking understanding	Enhanced SS ability leads to increased competitive ability	0.22	0.03	92
Systems thinking understanding	The future is treated as consisting of unknown emergent processes	0.24	0.02	92
Questionnaire 5	**Context: Scanning and complexus analysis**			
Systems thinking understanding	Direct and indirect inter-activeness between environmental systems are analysed	0.00	0.98	81
Systems thinking understanding	Emerging complexities are considered between environmental systems that are scanned	-0.08	0.49	81
Systems thinking understanding	Scanning seeks to qualify the relation between environmental systems scanned	-0.02	0.87	81
Systems thinking understanding	The organisation attempts to influence contextual environmental systems via its relation with transactional environmental systems	0.17	0.13	81
Systems thinking understanding	Scanning includes identifying emerging unknown information	0.06	0.57	81
Systems thinking understanding	Scanning views environmental systems in a multi-dimensional manner	-0.01	0.94	81

5.7 CONCLUSION

In an effort to ensure reliable and valid research results, the researcher allowed the Likert scale questionnaires used as the data gathering tool during the empirical phase of this study, to evolve into a particular design, considering a number of variables. These variables were added to Questionnaire 1 as a qualifying section to the questionnaire.

Through this addition, the researcher was able to determine variances and correlations between specified dependent and independent variables regarding the responses to statements. Both the Spearman's rank correlation coefficient test and ANOVA pointed towards very little significant variances, as well as little or no correlations in the nature of responses between the different respondent categories. This implies an increased possibility to generalise the overall research results.

Regarding the actual responses, as reflected in Figures 5.1 to 5.15, it appears that respondents largely indicated varying levels of agreement with the statements posed in the questionnaires, rather than varying levels of disagreement. This implies that respondents do indeed perform scanning and related derivative activities as described in the selected statements presented through the Likert scale questionnaire. Since these statements form the basis for the conceptualisation of an expanded scanning framework, this implies that businesses may find value in the application of the framework.

Chapter 6 contains recommendations and conclusions regarding the research results and findings.

CHAPTER 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1   INTRODUCTION

Scanning is an effective manner through which businesses gain insight into their environment. Moreover, it is pivotal in shaping the sequential scanning derivative activities of scenario planning and strategy selection, which in turn determine business performance. In an ever-changing business environment, businesses need to constantly enhance their conceptual scanning frameworks to keep abreast of the competition and remain in touch with the dynamics of the environment. The findings of this study are therefore relevant, not only because of what they contribute to the existing body of knowledge, but also because of the value that these findings offer to present-day businesses. This value stems from the possibility of more appropriate strategy selection and therefore better business performance, as an outflow of applying an expanded conceptual scanning framework.

In Chapter 6, the researcher makes recommendations on the basis of the research findings. Probable shortcomings of the study are also considered, as well as their implications for the ability to generalise the findings and recommendations to the larger business community. The recommendations include possible further fields of study flowing from the findings.

This study has addressed the question of whether there is a need for an expanded conceptual scanning framework that may benefit present-day businesses. It has addressed this question through the conceptualisation of an expanded conceptual scanning framework, based on findings from the literature review of the study. Through the primary research phase the study has extended its efforts to provide conclusive recommendations pertaining to the research question. The extent to which businesses perform scanning and related derivative activities as per the findings of the literature review has been determined through means of a Likert scale questionnaire presented to a sample of respondents.

The study achieves its aim of conceptualising an expanded scanning framework through combining aspects and components of the ontological and epistemological dimensions, prevalent in scanning and its derivative activities. These dimensions are proposed as part of the *a-priori* conceptual design of the expanded framework, and offer the opportunity for present-day scanners to deal with matters of environmental dynamism more effectively through increased understanding of the environment. The design of the proposed expanded conceptual scanning framework thus moves the practice of scanning the environment beyond

the empiricist mode and mere knowledge, according to what scanners know about the environment, to how they should approach, view, understand and manage it.

6.2 THE PURPOSE OF THE RESEARCH

The study focuses on challenges faced by businesses regarding business environmental scanning, more particularly, the effective application of conceptual scanning frameworks. The challenges that businesses face are substantial, and are identified and elaborated on through means of the literature review. The call for a constant enhancement of conceptual scanning frameworks, methodologies and approaches is quite apparent from the literature review, with researchers, authors, academia, and business leaders very outspoken in this regard.

The motivation for the study is based on the assumption that an expanded conceptual scanning framework will impact positively on current scanning practices and related fields of management. The main question is whether there is a need for such an expanded conceptual scanning framework and to what extent businesses may derive value from its use. This defines the main aim of the study, which is to propose an expanded conceptual scanning framework and determine the extent to which businesses currently perform scanning, relative to the statements underlying the conceptualised expanded framework.

The researcher's review of the literature relevant to the topic of this study, yielded sufficient material to define how scanning could be performed. This material includes dimensions of conceptual scanning frameworks, methodologies and approaches. Through means of a thorough study of the available literature, current conceptual scanning frameworks were analysed and compared with statements relating to scanning and gathered from the same literature. The conceptual scanning frameworks and the statements that shape the framework conceptualisations were viewed critically, as the researcher endeavoured to establish whether there is a need to expand on current conceptual scanning frameworks similar to those identified through the literature review.

While the emphasis of this study is on conceptual scanning frameworks, the derivative activities of scanning, being scenario planning and strategy selection, and their impact on business performance, were also studied.

6.3 THE PRIMARY RESEARCH PHASE

For the collection of data, a sample of respondents was requested to complete a set of questionnaires. Each respondent received five questionnaires to complete, each containing 15 statements, which had to be responded to through a seven-point Likert scale measurement tool. Each questionnaire was presented within a particular context, namely scanning and

information gathered, information gathered and scenario planning, scenario planning and strategy selection, strategy selection and business performance, scanning and complexus analysis.

Empirically, it was difficult to categorise the population for this study from which the type of individual, targeted as a participant in the data gathering process, was selected. The researcher addressed this difficulty by compiling a database of individuals who were considered as meeting the criteria that the researcher had identified for the target population. Two stakeholder groups, namely independent consulting experts and practicing managers in the relevant fields of endeavour, were consulted in compiling the target population.

A database of 1221 individuals was compiled, from which 473 individuals were approached as the sample of respondents. Of the 473 individuals invited to participate, 121 indicated an interest to participate. Of these121 individuals, 81 completed all five questionnaires, 92 completed four questionnaires, 104 completed three questionnaires, and 121 completed two of the five questionnaires.

The questionnaires returned had been completed in a satisfactory manner and were taken into account for the data to be used for the qualitative results as well as statistical analysis. A Spearman's rank correlation coefficient was applied to the research results in order to determine the non-parametric measure of statistical dependence between the questionnaire statements (dependent variable), and the participants' mode of completion (independent variable). An analysis of variance (ANOVA) was performed on the research results in order to provide a statistical account of whether or not the means of the results from specific questionnaire categories were equal.

6.4   THE RESEARCH FINDINGS

The secondary research of the study revealed a relation between scanning and the information it yields, the application of this information in planning scenarios, selecting a strategy on the basis of the various scenarios planned and managing a business's performance as an outcome of this selection. Furthermore, the literature review elucidated the value of a systems thinking approach to scanning, whilst the relation between the aforementioned components found further support in the results of the primary research of the study.

The study consolidated data that advocate the need for the enhancement of current scanning practices. Through primary research, the study proved that those businesses that partook in the research do indeed, to a large extent, perform scanning and its derivative activities, as revealed through the literature review. This provided the opportunity for proposing an

expanded conceptual scanning framework based on the combined findings of the secondary and primary research phases of the study.

The statistical analyses indicate that there is little significant variance between the responses received from the different categories of management, as well as those from the different categories of management/practice fields. This allows for further generalisation of the research results and findings, clearly indicating the reliability and validity of the results and findings. From the statistical analyses it is evident that there is very little, and in the case of most of the responses, no significant correlation between the level of understanding of systems thinking as an approach to scanning, and the responses itself. This impacts positively on the integrity of the research results and findings, as participants with differences in their levels of understanding of systems thinking yielded similar replies to the statements contained in the questionnaires.

From the research results in Figures 5.1 to 5.15, presented in Chapter 5, it is clear that the majority of participants agreed, to various degrees (slightly, fairly and strongly), with the majority of the statements presented in the questionnaires. This has specific implications for the practice of scanning, particularly pertaining to the conceptual scanning frameworks applied by businesses when performing scanning. These implications are elaborated on in the following paragraphs, and recommendations are made regarding the application of an expanded conceptual scanning framework such as the one proposed in Chapter 3.

6.5   CONSIDERATIONS FOR SCANNING

The primary research conducted during the study, revealed that those businesses that took part in the research, do indeed up to a large extent, perform scanning in the way described through the statements selected from the literature review. This being the case, the researcher recommends that scanners apply the expanded conceptual scanning framework, presented in Chapter 3.

6.5.1   Applying the expanded conceptual scanning framework

The researcher recommends that the following steps be implemented during the application of the expanded conceptual scanning framework. Furthermore, it is recommended that these steps are kept open and dynamic as the selection of units of analysis, the scanning approach and scanning sources of information may evolve as the scanning activity progresses.

This evolvement implies that the mental models (thought processes) of scanners may change as scanning progresses and shape their views of the ontological scanned reality, which refers to the representation of the environment scanned.

The researcher explains this evolvement of mental models below, through comparing the concepts of single, double and triple-loop feedback, or learning.

In single-loop feedback, the mental model stays the same, whereas in double-loop feedback, the mental model changes and includes a shift in understanding. This shift is from a simple and static to a broader and more dynamic way of thinking. Triple-loop feedback goes a step further and involves transforming who we are by creating a shift in our context, or point of view, about ourselves. This links to the notion that the environment is business specific, and that businesses scan the environment from a context of a co-contributing part to a larger environmental whole (cf. 1.4.2).

The steps recommended for the application of the expanded conceptual scanning framework starts with the identification of a scanning team. The second step refers to determining the scanning approach, upon which the units of analysis are identified. Step 4 entails the identification of the sources of information to be used in the scanning process, whilst Step 5 includes the analysis of the emerging systems complexus identified in the business environment.

In the following paragraphs, the researcher provides more detail for each of these recommended steps.

6.5.1.1   Step 1: Identify the scanning team

To ensure diversity (cf. 1.4.2) and to deal with the complexity of the environment, it is recommended that a team of individuals be involved in the scanning process by means of pre-arranged brainstorming sessions (MacKay and McKiernan, 2009:275). This recommendation is based on the notion that common scenarios are often criticised for being too hierarchical and individualist, and not accommodating enough in terms of different worldviews. Patton (2005:1082-1093) shares a motivation for the capabilities of teamed scanners to identify significant change drivers and trends in the environment.

It is recommended that the compilation of a scanning team takes place against the following criteria:

- team members are required to have a prepared human mind (cf. 1.7.2) in terms of scanning;
- team members are required to be decision makers and strategy planners that are conscious of current and potential changes in the business's contextual and transactional environment;

- team members are required to be diverse individuals from different business units and preferably different cultural backgrounds;

- participation needs to be voluntary;

- team members are required to be professional;

- team members are required to have the capability of evaluating the environmental changes in the context of the current strategy and business competencies; and

- the team should include researchers and analysts, technology monitors, strategy consultants, marketing and sales staff, as well as people from academia.

6.5.1.2   Step 2: Determine the scanning approach

In determining the scanning approach, it is recommended that scanners use the expanded conceptual scanning framework to address the type of information required by a business to remain or become more competitive in a sustainable manner. This is expected to be different from business to business, depending on the life-cycle stage of a particular business (Lester and Parnell, 2008:546). It is recommended that, in Step 2, scanners consider the following, as identified in Chapter 2, Section 2.5:

- Does the business want to know what the future is going to look like in a deterministic manner?

- Does the business want to understand the future and the business environment better, through a more integrated approach?

- What in particular does the business need to know about its competitors?

- Is scanning required to lead to a prediction of future trends?

- Is scanning required to lead to a better understanding of the environment and possible futures?

- Is the scanning approach governed by the need to create an ideal future?

- Is the approach governed by the need to plan better for possible futures?

- Should the focus be on operational flexibility, due to the factor of non-predictability of the future?

- Should the focus be on foresight (cf. 2.5.1), enabling a business to aspire towards establishing a social system in which change is not a reactional phenomenon, but rather a managing characteristic?

With the scanning team identified and the scanning approach agreed upon, the proposed next step is to determine the units of analysis, specific to the scanning aim(s) of a particular business.

6.5.1.3   Step 3: Identify the units of analysis

In order to progress beyond the taxonomies of paradigmatic categorisation of the environment (cf. 2.3.1), it is recommended in Step 3 that scanners identify the human systems and spatial configurations that have to be scanned in terms of their direct and indirect relation to a business (cf. 1.4.1). Adopting the principle of creating an environmental community (cf. 3.2.1), it is recommended that scanners focus on those co-contributing systems relative to such a community. This should include scanning the inter-relatedness, inter-dependence and relation between those systems comprising the scanning landscape and conceptualised through the expanded scanning framework.

The dimensions of inter-relatedness, inter-dependence, and relation should include those between the business and human systems, the business and spatial configurations, the human systems amongst themselves, the spatial configurations amongst themselves, as well as those between the human systems to be scanned, and the spatial configurations (cf. Figure 3.2). It is recommended that the hierarchical levels of influence between environmental systems, and the level of direct and indirect inter-activeness between the systems, be determined. Scanners should identify those matters of concern, or impact, that are held at the point of equilibrium by the interaction of two disparate sets of forces, present in the respective systems scanned (cf. 2.3.5). It is recommended that scanners identify the disparate forces driving change in a system, versus those propagating and promoting the status quo, opposing change (cf. 2.3.5).

6.5.1.4   Step 4: Identify the sources of information

In this step, the researcher recommends that businesses make use of impersonal sources, such as the printed media, and the Internet, as well as personal sources, such as work colleagues, senior executives and peers in the same business, as sources of information. Furthermore, it is recommended that they distinguish between primary sources, as the producers of information, secondary sources, as information gathered from other scanners, and tertiary sources, as scanners of other scanners.

The sources of information used for this study may also prove to be valuable sources of information and include the following:

- South African and international business specific and appropriate books, journals, peer reviewed articles, current topical articles and electronic media;

- presentations and papers prepared for conferences on related aspects specific to the business performing the scanning; and

- business confidence and risk reports specific to a business pertaining to its growth expectations and plans.

6.5.1.5 Step 5: Analyse the emerging complexus

Regarding Step 5, it is recommended that the content of the emerging systems complexus be approached as either a combination of the aspects, characteristics, qualities and dimensions of the co-contributing systems (cf. 2.3.5), or as complete newness, in terms of systems evolution (cf. 2.5.1). In the final instance, it may be a combination of both these approaches.

In analysing the emerging complexus, the researcher recommends that the multiple causes contributing to the complexus be identified. These include those single actions which may have multiple outcomes, some unintended. The motivation for this recommendation is embedded in the notion that it may enable scanners to identify the inter-relatedness, inter-dependence, and relation between systems, and their patterns of change, as opposed to static snapshots of environmental systems. In this way, it is recommended that scanners apply the expanded conceptual scanning framework to differentiate between a complexity where many variables are used, and a complexity where cause and effect are not close in time or space, and the obvious interventions are counterintuitive.

The following paragraphs contain a proposal for a complexus analysis methodology specific to Step 5. The recommended methodology is explained through a simulation where a business example scans the labour and government systems in its business environment, as well as the emerging complexus between them. This simulation is an illustrative example, and the selection of these two systems bears no significance.

For ease of reference, the expanded conceptual scanning framework presented in Chapter 3 (cf. Figure 3.2) and the evolutionary developed stages of the four quadrants presented in Chapter 2 (cf. Figure 2.3), are repeated here.

It is recommended that scanners construct an expanded conceptual scanning framework similar to the one in Figure 6.1, but one that is business specific and cognisant of the business reality at the time of scanning, inclusive of both ontological reality and epistemological dimension.
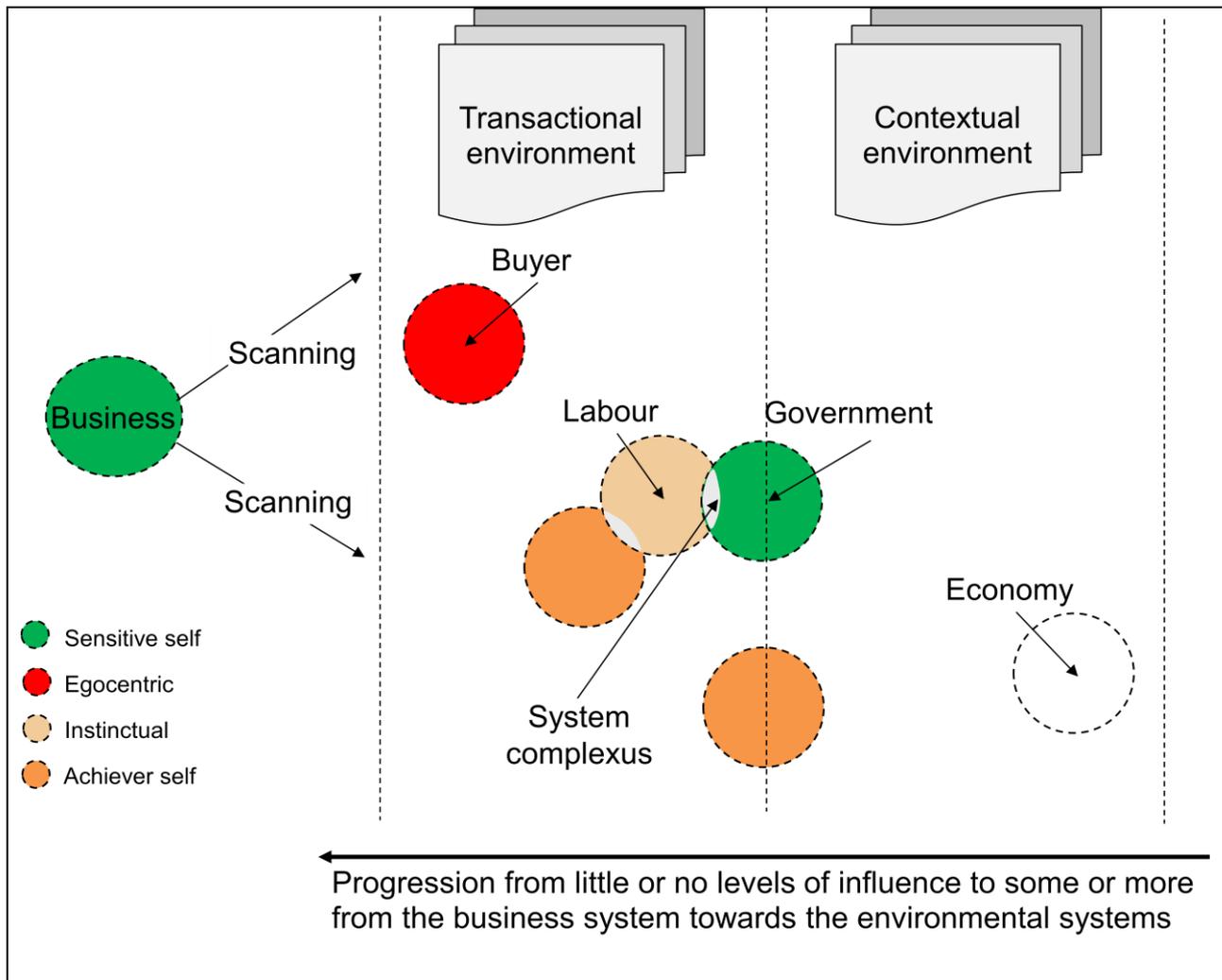
Figure 6.1: The expanded conceptual scanning framework (repeated)

In Chapter 2 of this study, the principle of cross-level analysis, in which the subject-object locations of scanning are positioned, is explained. With reference to this, in recommending how to perform complexus analysis, the researcher uses the shorthand description of scanning proposed by Voros (2003:55), as explained in the following paragraphs.

The four quadrants illustrated in Figure 6.2, relevant in terms of the shorthand method, refer to the upper left, lower left, upper right and lower right quadrants of the four-quadrant/11-levels conceptual scanning framework (cf. 3.2.1.3).

Cross-level analysis (Voros, 2003:37) is an analytical tool with which scanning considers both the perceptual filters through which scanners scan, and the filters of the scanned object. Referring to Figure 6.1, an example could be a scanning filter Level 8, colour-coded through the use of Spiral Dynamics (cf. 3.2.1.3), as green. In Figure 6.1, the expanded conceptual scanning framework depicts the particular business as such, by colour coding it as green. This indicates a particular business scanning through a specific categorised perceptual filter, affecting the scanned ontological reality of that business. The filter influences the units of

analysis and sources of information, based on the epistemological position from where the scanning is done. The quadrants indicated in Figure 6.2, allow for the structured inclusion of the epistemological dimension in the expanded scanning framework.
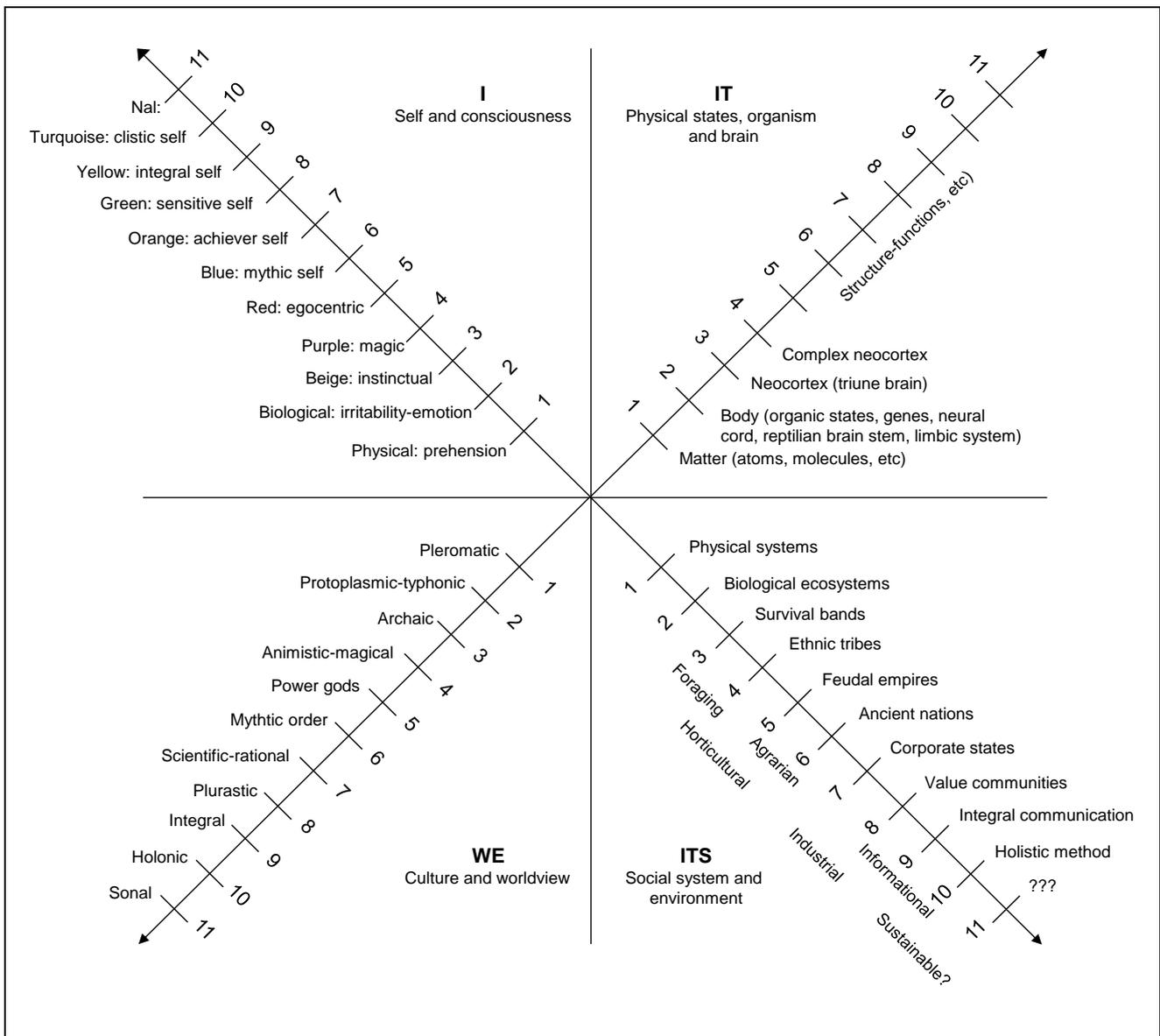
Figure 6.2: The evolutionary developed stages of the four quadrants (repeated)

Source: Voros, 2003:53

From an epistemological perspective, the upper left quadrant represents the intentional subjective "I", containing the filters through which the scanner scans the other three quadrants. These include the lower left quadrant, representing the inter-subjective cultural world of the "we", the lower right quadrant of the inter-objective social world of the "its" and the upper right quadrant containing the behavioural objective world of the "it". (Voros, 2003:5). Epistemologically, the upper left and right quadrants represents individual world, whilst the two lower quadrants represent the social world. In simple terms the scanner scans from within the

position of the upper left quadrant, through a particular perceptual filter; at individual behaviour of people in the upper right quadrant and at the cultural behaviours of people in the lower left quadrant, and at the larger social world in the lower right quadrant.

Each quadrant contains the evolutionary developed levels of the observed entities in that quadrant. These include the evolutionary developed levels of individuals (upper right quadrant), of cultural societies (lower left quadrant) and of the social systems in the larger external environment (lower right quadrant). The relevance of the identification of the specific levels of development pertains to the perceptual filters of the entities in those respective quadrants and their related worldview(s). This identification is particularly helpful in the application of cross-level analysis, explained in the next paragraph.

Cross-level analysis implies that, when a scanner scans from a particular level in terms of his/her own level of evolutionary development (cf. 2.3.5.7.), the scanner would exercise a natural tendency to scan at the similar evolutionary level of development in the other quadrants, representing the ontological reality scanned. However, epistemologically the scanner needs to be cognisant of the worldview of the scanned entities as these may be of a different nature to that of the scanner, based on the particular evolutionary level of development of the scanned entity, or entities. This optimises the understanding of the environment scanned and could lead to a more effective management thereof.

Voros (2003:56) uses a shorthand notion to illustrate the scanning position from where the scanner scans, whilst at the same time depicting the aspect scanned.

The shorthand method is explained below:

Scanner | Filtering structures ⟶ Quadrant (Levels)

- Voros replaces scanner with the name of the scanner;
- the upright line separates the scanner name from the filter;
- the filtering structure could be any one of the Spiral Dynamics levels of development (Appendix B);
- the arrow indicates scanning of a scanned aspect taking place;
- quadrant means any of the upper right, lower right or lower left quadrants of the four-quadrant/11-levels conceptual scanning framework (cf. 3.2.1.3); and
- levels mean the evolutionary level of development that is being scanned.

In the following paragraphs, an example of scanning the labour and government systems illustrates the practical application of this shorthand method, in combination with the expanded conceptual scanning framework.

- the scanner is ABC Financial Services, as an example;
- the filtering structure is orange (Spiral Dynamics Level seven) (Appendix B);
- the quadrant is the lower left quadrant of the four-quadrant/11-levels conceptual scanning framework (cf. 3.2.1.3); and
- (levels) is level seven (Corporate states) (Appendix A).

The shorthand version, for this example, should look like this:

ABC Financial Services │ Green ⟶ Lower left (Labour) (Seven – Corporate states)

Pertaining to further recommendations, made by the researcher in this chapter, it is recommended that the scanning team select different levels to scan in terms of the aspects that they want to scan.

As an example, ABC Financial Solutions scans unionised labour, through the filter of Green: Sensitive self. The evolutionary developed level of unionised labour might be level 7, i.e. Orange: Achiever self (Appendix B).

The shorthand method expressing the complete scanned reality, inclusive of the perceptual filter from where the scanning is performed, as well as the ontological dimension of what is being scanned, can be illustrated as:

ABC │ Green ⟶ lower right (Labour) (Orange)

The selection of orange as a Spiral Dynamics level, pertaining to the worldview of a scanned system, is both one of choice and of reality, in terms of the actual developed level of that system. The choice refers to that of the scanner, who may want to look for specific information in the scanned system relating to a particular level of development.

In the case of the business environment of the example illustrated in Figure 6.1, the respective systems scanned, are colour-coded according to their evolutionary developed levels. The business performing the scanning, may however purposefully, scan for types of information on the other evolutionary developed levels of the scanned systems. In this sense, the business can change the naturally developed colour-coded level of the scanned system and look for information in the other levels.

Continuing with the same example, ABC now performs the same exercise on government.

ABC | Green ⟶ lower right (Government) (Green)

Continuing with the same example, ABC now performs the same exercise, but on the government/labour complexus.

ABC | Green ⟶ lower right (Government/labour complexus)

Based on the literature review in Chapter 2 of this study there are a number of aspects that, through their interplay, give rise to a system. These are

- culture and worldview;
- output (results);
- processes and activities;
- structure;
- leadership and management; and
- resources.

In the example of government/labour complexus analysis, the emerging systems complexus could consist of the qualification of the inter-relatedness, inter-dependence and relation between government and labour, taking the different developmental levels of these two systems into account. Based on the assumption that the content of a systems complexus comprises a combination of the system aspects, characteristics, qualities and dimensions of the co-contributing systems, it is recommended that the findings of the analysis be presented in the following manner:

- the content of each system aspect of government as a whole system;
- the content of each system aspect of labour as a whole system; and
- the content of each system aspect in terms of the emerging systems complexus between the government and labour systems, referring specifically to the inter-relatedness, inter-dependence and relation between the chosen systems (cf. Figure 2.4).

Table 6.1 illustrates a recommended format for recording the outcome of the emerging complexus analysis. In this case, it depicts the outcome of scanning done on the ethos aspect of the co-contributing systems, and that of the emerging complexus.

Table 6.1: Government and labour system ethos analysis example

Government
High regard for the human price of freedom and democracy
Respecting all citizens contributing to the construction of our land
Promoting unity amongst diversity
Labour
Committed to a unified democratic South Africa
Freedom from oppression
Freedom from economic exploitation
Just standards of living, social security and fair conditions of work for all
Source – as an example
Constitution of the Republic of South Africa: Number 108 of 1996, COSATU constitution as amended at the 8th National Congress in 2003

At this point, the researcher recommends a structured qualitative analysis of the inter-relation, inter-dependence and relation between the scanned systems, inclusive of the identification of synergy and/or entropy between them. Synergy implies that the interaction between the systems is greater than the sum of their separate effects, whilst entropy refers to possible disorder, and the extent thereof, between the same systems. When analysing inter-relatedness, there is specific reference to the notion that these components are related reciprocally, and contain patterns that are inextricably part of a greater flux of conditions (cf. 1.4.1). When analysing inter-dependence, there is specific reference to the notion that these components are mutually dependent upon one another (cf. 1.4.1). When analysing relation, there is specific reference to the notion of the significance in the association between the respective systems (cf. 1.4.1).

Table 6.2 illustrates a recommended format for recording the outcome of the analysis.

With Step 5 executed, the application of the expanded conceptual scanning framework is complete. All that remains is to recommend that Steps 1 to 5 be executed per system aspects (cf. 2.3.5), system qualities, characteristics and dimensions.

Table 6.2: Complexus analysis ethos example

Inter-relatedness
Mutual respect in terms of the historical bond through means of the struggle against a former system of government, viewed as oppressive
Ethos driven more through political ideology by labour, as opposed to economic fundamentals by government
Inter-dependence
The two systems are stronger together than independently, hence the differences, but not independence from one another
Relation
A democratic state is kept in power through majority vote, making the association between these two systems significant, relative to labour leveraging political power for purposes of achieving stakeholder expectation
Source – as an example
Hassan, 2004:1-79

6.6 SHORTCOMINGS AND LIMITATIONS FOR GENERALISING THE RESEARCH FINDINGS

6.6.1 Geographical validity

The database from which a sample was drawn for the empirical research phase of the study was confined to individuals employed in specific countries on the African continent. A number of countries were selected in compiling the population; however, a large number of countries were still omitted. Although the researcher consulted material published on an international scale, the empirical research part of the study lacks a similar international scope but has at least an intra-continental scope. It is thus recommended that generalising the findings be confined to those countries that formed a part of the participative sample of respondents.

6.6.2 The sampling size

Although a fairly large database was used from which a sample was drawn for the empirical research, it can be assumed that several more businesses and independent consultants practice scanning and/or derivative activities thereof than presented in this sample. One could therefore suppose that a broadened investigation of the population might have brought to the fore many more potential participants meeting the sample selection criteria.

The possibility of a broader investigation was limited, because the criteria for sample selection could not be clearly defined from the literature review during the secondary research phase of the study. Instead, the criteria contained open-ended definitions such as "a prepared human mind" (cf. 1.7.2) concerning possible scanners. This rendered the sample selection process tedious and time consuming, thus limiting the size of the sample selected. Instead, the researcher aimed at selecting as wide a variety as possible of individuals who perform

scanning and derivative activities, and in this manner attempted to compile a balanced and representative sample. Due to the difficulty in identifying those individuals conforming to the sample selection criteria, the sampling method was specific and non-probable, as opposed to random and probable.

6.6.3 Assumption and impact of the study

The study is based on the assumption that an expanded conceptual scanning framework would yield a more complete basket of information, which, in turn, could impact positively on scenario planning, strategy selection and subsequent business performance. Throughout the study, the relation between these activities was applied as the pillars upon which the researcher would base the proposed expanded conceptual scanning framework. The relation between these scanning derivative activities, as well as the relation between scanning and a systems thinking approach, was used to provide the context within which each of the five Likert scale questionnaires was designed, and had to be answered.

However, the study has failed to address the probability of increased business success as an outcome of the application of the more complete information yield. It assumes that one activity should lead to the other. The human factor of managing the information yielded by scanning and achieving higher business success falls outside the scope of this study. The primary focus of the study has been to develop and propose an expanded conceptual scanning framework, and substantiate such a proposal. The application of the expanded conceptual scanning framework, and resultant outcome thereof, might be an area of concern that could be addressed in a further study.

6.6.4 Literature study

Given the fact that the study was conducted over an extended time period, a final literature study was conducted which focussed mainly on recent articles pertaining to the study field. This was done in order to check for both relevance as well as shifts in the context, content and related processes of scanning and related subjects. The list of these articles is presented in Table 6.3.

The literature review was concluded during 2010, as the basis for conceptualising the expanded scanning framework as well as the construction and design of the Likert scale questionnaires. The primary research component was executed during 2011, of which the documentation of the results and findings were completed during 2012. This sequence and timeframes of completion of the respective research phases resulted in less than 5% of the literature sources, referenced in the study, stemming from the latter timeframe of the study.

Table 6.3: Contemporary literature sources of information

Author (s)	Title	Date published and publisher/journal
Franco, Haase, Magrinho and Silva	Scanning practices and information sources: an empirical study of firm size	2011, Journal of Enterprise Information Management, Vol. 24 Iss: 3 pp. 268 – 287
Bérard and Delerue	A cross-cultural analysis of intellectual asset protection in SMEs: The effect of environmental scanning	2010, Journal of Small Business and Enterprise Development, Vol. 17 Iss: 2 pp. 167 - 183
Chrusciel	Environmental scan: influence on strategic direction	2011, Journal of Facilities Management, Vol. 9 Iss: 1 pp. 7 – 15
General review: Emerald Group Publishing Limited	Environmental scanning in a public institution: Intelligent facilities management can help deliver the services of the future	2011, Strategic Direction, Vol. 27 Iss: 11 pp. 22 – 24
Rohrbeck and Bade	Environmental scanning, futures research, strategic foresight and organizational future orientation: a review, integration, and future research directions	2012, ISPIM Annual Conference, Barcelona, Spain, pg. 14
Saadeghvaziri, Khaef, Motaqi and Esfahani	Environmental scanning and performance: A study of Iranian automobile parts manufacturers	2012, African Journal of Business Management Vol. 6(14), pp. 4921-4925
Haase and Franco	Information sources for environmental scanning: do industry and firm size matter?	2011, Management Decision, Vol. 49 Iss: 10 pp. 1642 - 1657
Oreja-Rodríguez and Vanessa Yanes-Estévez	Environmental scanning: Dynamism with rack and stack from Rasch model	Management Decision, Vol. 48 Iss: 2 pp. 260 - 276
Angriawan and Abebe	Chief Executive Background Characteristics and Environmental Scanning Emphasis: An Empirical Investigation	2011, Journal of Business Strategies
Zhang, Majid and Foo	Environmental Scanning Practices of Travel Agent Companies in Singapore	2012, Asia Pacific Journal of Tourism Research, DOI: 10.1080/10941665.2012.708353
Campbell and Cook	A proposed investigation of environmental scanning practices by entrepreneurs	2010, Small Business Institute National Conference Proceedings, Vol. 34, No. 1
Olamade, Oyebisi, Egbetokun and Adebowale	Environmental scanning strategy of manufacturing companies in south-western Nigeria	2011, Technology Analysis and Strategic Management, 23:4, 367 - 381

Although the final literature review was limited to these sources, no significant shifts were observed in this list of articles and papers that could affect the context, content, research methodology, or findings of the study.

However, a useful observation was made in the paper on scanning practices and information sources by Franco, Haase, Magrinho and Silva (2011:268-287). The purpose of this paper was to analyse the environmental scanning practices and information sources used by large organisations as well as by small and medium-sized enterprises (SMEs). The study found that smaller organisations do not scan as broadly and as frequently as their larger counterparts do. It also found a positive relationship between the exploitation of information sources and the size of organisations. This information was viewed as significant by the researcher as, in constructing and designing the five Likert scale questionnaires (Appendix K), a qualification of the size of organisations were included as part of the qualifying questionnaire (Table 5.1) of the first Likert scale questionnaire. The inclusion of this qualification was based on the lack of conclusive evidence from the literature review previously that the size of organisations affected their scanning practices and that it would be different for different sizes of organisations.

However, the article does not contain sufficient evidence to qualify the extent to which respondents from different sizes of organisations might have responded differently to the specific statements in the five Likert scale questionnaires (Appendix K) in this research study. Hence, the researcher added this permutation of a response type, based on the size of an organisation, to the recommendations for further study, discussed in the next section.

6.7   RECOMMENDATIONS FOR FURTHER STUDIES

This study has revealed the need for an expanded conceptual scanning framework and the value it holds for scanners who use it. Whereas most of the proof for this need was derived from the literature review, the empirical component largely indicated that the practice of scanning, and related derivative activities, is indeed performed as indicated through the literature review. Since the literature review revealed the statements pertaining to scanning and its derivative activities used in conceptualising an expanded conceptual scanning framework, it was deducted that, based on the empirical research results and findings, scanners would find the use of the expanded conceptual scanning framework valuable.

The study does not present proof of this value, as this falls outside the scope of the study. The application of this framework and the value it holds for scanners in present-day businesses, could be considered as a further topic related to this field of study. It may also include more options regarding the application of the framework.

Another field of study emanating from this investigation is research to determine the different ways in which individuals operating on different management levels in organisations appear to view matters of business concern. A similar recommendation could be considered for scanning

methodologies and the nature of scanning as performed by different sizes of organisations. Particular attention could be given to the differences, if any, between how small-, medium sized and large organisations scan the environment.

Research can also be intensified by focusing a research study on just one of the relations between the activities of scanning, information gathering, scenario planning, strategy selection and business performance.

6.8   FINAL CONCLUSION

This study was aimed at developing an expanded conceptual scanning framework through which business organisations can improve their current scanning activities and increase their ability to select appropriate strategies with a view to enhancing their competitive success. Based on the outcome of both the secondary and primary research components of the study, it is judged that the study by and large accomplished the objectives set at its initial stages.

Research on the subject of business environmental scanning, stemming from the literature review, offered multiple consolidated arguments pertaining to the need for businesses to enhance their environmental scanning activities constantly and in a consistent manner. Based on these arguments and evidence base, the motivation for this study and the need for an expanded conceptual scanning framework were self-evident.

Empirically, the researcher has succeeded in elucidating the current scanning activities of modern-day business organisations and managed to link the outcome of the empirical research results to that of the expanded conceptual scanning framework. This was achieved through conceptualising a framework from which business organisations could probably benefit, and that is based on the same statements that contributed to its conceptualisation and those which were established empirically to reflect the nature of current scanning practices.

Further empirical research pertaining to the application and use of the proposed expanded conceptual scanning framework is recommended, in order further to enrich the scanning practices of modern-day business organisations as we venture into a faster, ever-changing business environment, where the future dynamics are complex and unsure.

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APPENDICES

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APPENDIX A

DEFINITIONS OF THE EVOLUTIONARY STAGES OF DEVELOPMENT AS PER THE FOUR-QUADRANT/ELEVEN-LEVELS CONCEPTUAL SCANNING FRAMEWORK

UPPER RIGHT QUADRANT: PHYSICAL STATES, ORGANISM AND BRAIN DEFINITIONS

- **Level 1: Matter (Atoms, molecules)**

Atoms

The smallest unit of matter indivisible by chemical means (Biology Online, 2008)

Molecules

The smallest unit of an element or compound, made up of two or more atoms held together by a strong chemical bond (Biology Online, 2009)

- **Level 2: Body (Organic states, genes, neural cord, reptilian brain stem, limbic system)**

Neural cord

A long, thin, tubular bundle of nervous tissue and support cells that extends from the brain

It has three major functions:

a) Serve as a conduit for motor information, which travels down the spinal cord

b) Serve as a conduit for sensory information, which travels up the spinal cord

c) Serve as a centre for coordinating certain reflexes

Reptilian brain stem

The reptilian complex refers to the structures derived from the floor of the forebrain during development. It is responsible for species' typical instinctual behaviours involved in aggression, dominance, territoriality, and ritual displays (The Freedictionary, 2010).

Limbic system

The limbic system is a set of brain structures including the hippocampus, amygdale, anterior thalamic nuclei, and limbic cortex, which suggestively support a variety of functions including emotion, behaviour, long term memory, and olfaction.

- **Level 3 and 4: Neocortex (triune brain) and complex neocortex**

The neocortex is thought to be responsible for higher-level cognitive functions, such as language, learning, memory, and complex thought (Biochem, 2004). The triune brain is a model of the evolution of the vertebrate forebrain and behaviour proposed by the American physician and neuroscientist Paul D. MacLean. It consists of the reptilian complex, the pale

mammalian complex (limbic system), and the neo-mammalian complex (neocortex), viewed as structures sequentially added to the forebrain in the course of evolution (Biochem, 2004).

- **Level 5: Structure-functions**

Neural organisms

Neural networks are sometimes used to model the brain. Organisms are generally constructed with pre-defined and fixed behaviours. The interactions of all these types of neurons form neural circuits, and generate an organism's perception of the world and determine its behaviour.

Prokaryotes

The prokaryotes are a group of organisms that lack a cell nucleus, or any other membrane-bound organelles. Most prokaryotes are unicellular, but a few such as myxobacteria have multi-cellular stages in their life cycles.

Eukaryotes

The organisms that have a cell nucleus are called eukaryotes.

LOWER RIGHT QUADRANT: SOCIAL SYSTEM AND ENVIRONMENT

- **Level 1: Physical systems**

The portion of the environment chosen for analysis

- **Level 2: Biological ecosystems**

An ecosystem is a biological environment consisting of all the organisms living in a particular area, as well as all the non-living, physical components of the environment with which the organisms interact, such as air, soil, water, and sunlight.

- **Level 3: Survival bands**

Groups of humans driven by their physical senses, which dictate their state of being

- **Level 4: Ethnic tribes**

A unit of socio-political organisation consisting of a number of families, clans, or other groups who share a common ancestry and culture and among whom leadership is typically neither formalised nor permanent (Answers, 2010)

- **Level 5: Feudal empires**

Politically, an empire is a graphically extensive group of states and people (ethnic groups) united and ruled by a monarch (emperor, empress) or an oligarchy

- **Level 6: Ancient nations**

A political unit consisting of an autonomous state inhabited predominantly by a people sharing a common culture, history, and language (Freedictionary, 2009)

- **Level 7: Corporate states**

A political culture, which is a form of corporatism whose adherents hold that corporate interests (rather than individual) are the foundations of the state

- **Level 8: Value communities**

A group of people sharing beliefs that appears only after the formation of a basic set of values

- **Level 9: Integral communication**

Community integration, reflecting the capacity of the family's social environment to support and sustain them physically, socially, and psychologically

- **Level 10: Holistic method**

Comprehension of the parts of something as intimately interconnected and explicable only by reference to the whole (Freedictionary.com)

Foraging

Foraging refers to the act of looking for food (Freedictionary.com)

Horticultural

Horticulture is the industry and science of plant cultivation including the process of preparing soil for the planting of seeds, tubers, or cuttings.

Agrarian

Agrarian refers to the characteristic of farmers, or their way of life, which is organised or designed to promote agricultural interests (Merriam-Webster, 2010).

Industrial

Industrial means that something results from industry, i.e. industrial output.

LOWER LEFT QUADRANT: CULTURE AND WORLDVIEW

- **Level 1: Pleromatic**

Pleromatic refers to the search for meaning in the experience of the fullness of reality (Earthlink, 1997)

- **Level 2: Protoplasmic-typhonic**

The complex, semi-fluid, translucent substance that constitutes the living matter of plant and animal cells and manifests the essential life functions of a cell (Freedictionary, 2010)

- **Level 3: Archaic**

Having the characteristics of the language of the past and surviving chiefly in specialised uses, belonging to the early or formative phases of culture and development (Merriam-Webster, 2010)

- **Level 4: Animistic-magical**

The practice of using charms, spells, or rituals to attempt to produce supernatural effects or control events in nature, the charms, spells, and rituals so used (Answers, 2010)

- **Level 5: Power gods**

The gods and goddesses and myths of ancient society

- **Level 6: Mythic order**

Having the nature of myth; "a novel of almost mythic consequence", based on or told of in traditional stories; lacking factual basis or historical validity

- **Level 7: Scientific rational**

A reason, based on supporting scientific evidence, that a particular action is chosen (Medical Dictionary, 2010)

- **Level 8: Plurastic**

The belief that distinct ethnic, cultural, or religious groups can exist together in society (Freedictionary.com)

- **Level 9: Integral**

The act or process of integrating (Freedictionary.com)

- **Level 10: Holonic**

Something that is simultaneously a whole and part

- **Level 11: Sonal**

Sonal is a name

APPENDIX B
SPIRAL DYNAMICS

UPPER LEFT QUADRANT: SELF AND CONSCIOUSNESS

- **Level 1: Physical: Prehension**

Prehension

The act of grasping something with the senses or the mind (Freedictionary, 2009)

Physical

The properties of matter and energy other than those peculiar to living matter (Freedictionary, 2010)

- **Level 2: Biological: Irritability-emotion**

Emotion

The internal state of a person's being, normally based in or tied to their internal (physical) and external (social) sensory feeling (Wordiq, 2010)

Irritability

The state of being irritable, considered pathologically abnormal as an excessive sensitivity of a body organ or part to a stimulus (Freedictionary, 2009)

- **Level 3: Beige: Instinctual**

Basic theme: Do what you must to just stay alive

Popular name: Survival sense

The level: Basic survival, food, warmth, sex, water and safety

The worldview: The world is a state of nature. The distinct 'self' is barely awakened and motivation is largely physiological

The characteristic 'energy': Survivalistic – thinking is automatic, processes are instinctive

- **Level 4: Purple: Magic**

Basic theme: Keep the spirits happy and the tribe's nest warm and safe

Popular name: Kin spirits

The level: Safety and to honour tradition as well as ancestors

The worldview: The world is mysterious and frightening, full of spirits which have to be appeased

The characteristic 'energy': Magic – thinking involves animism and magic, the processes are circular

- **Level 5: Red: Egocentric**

Basic theme: Be what you are and do what you want

Popular name: Power gods

The level: Fight to survive and dominate others without guilt and to avoid shame

The worldview: The world is tough and hard, like a jungle full of threats and predators: the tough survive the weak serve or die

The characteristic 'energy': Impulse – thinking is egocentric; others do not figure, so processes can tend to be exploitive of others

- **Level 6: Blue: Mythic self**

Basic theme: Life has meaning

Popular name: Truth force

The level: Obey rightful higher authority and find meaning and purpose in sacrificing individual desires for later reward

The worldview: The world is divinely controlled and guided by a Higher Authority or Order, with a distinct right and wrong; those who are righteous are rewarded, those not, are punished, possibly forever

The characteristic 'energy': Purposeful – thinking tends to be absolutistic, the processes authoritarian

- **Level 7: Orange: Achiever self**

Basic theme: Act in your own self-interest by playing the game to win

Popular name: Strive drive

The level: Test options for greater autonomy and compete for success and influence

The worldview: The world is a rational, well – oiled machine, full of viable options and plenty of opportunities and alternatives for success and prosperity

The characteristic 'energy': Achievist – thinking is multiplistic, processes are strategic

- **Level 8: Green: Sensitive self**

Basic theme: Seek peace within the inner self and explore, with others, the caring dimensions of community

Popular name: Human bond

The level: Join communities to experience harmony, love, and mutual growth for self and others

The worldview: The world is the habitat for all humanity to share together and find affiliation, through consensus and reconciliation

The characteristic 'energy': Communitarian – thinking is relativistic; structures are egalitarian and heterarchical, yielding social networks; processes are consensual

- **Level 9: Yellow: Integral self**

Basic theme: Live fully and responsibly as you are, and learn to 'become'

Popular name: Flex flow

The level: Learn and discover what it is be human without doing harm to others or the environment

The worldview: The world is a chaotic organism where change is the norm and uncertainty an acceptable state of being, life is a kaleidoscope of natural systems and forms – there are natural 'flows'

The characteristic 'energy': Integrative – thinking is systemic; processes are integrative; structures are interactive (systemic processes open to negotiations)

- **Level 10: Turquoise: Clistic self**

Basic theme: Experience the wholeness of existence through body, mind and spirit

Popular name: Whole view

The level: Experience the wholeness of existence, in a holistic way, through body, mind and spirit, with others

The worldview: The world is a single, dynamic organism with its own collective mind – a delicately balanced system of interlocking forces in jeopardy at humanity's hands

The characteristic 'energy': Holistic – thinking sees and uses the entire Spiral, sees multiple levels of interactions, and detects harmonics and undertones

APPENDIX C
CONSULTING CLIENT LIST

Industries	Retail (FMCG and Textile), manufacturing, production, telecoms, training, oil, agriculture, wine, SHERQ, exports/imports, construction, some smaller ones
Client – 1	Nyansa Africa (Pty) Ltd (October 2009 to current)
Client – 2	International Global Holdings (Pty) Ltd (December 2008 – January 2010)
Client – 3	Sudanese Dutch Management Centre (June 2009 – January 2010)
Client – 4	The Foschini Group (January 2008 – January 2010)
Client – 5	Fair Cape Dairies (March 2004 – 2006)

Training clients during 2003 to 2010 and subject matters	
Clients	**Subject matter**
University of Stellenbosch Business School Executive Development **Da Vinci Institute** **GIMT** **Sudanese Dutch Management Institute** **Institute for Futures Research**	Systems Thinking Strategy Supply Chain Management General Management Organisational Functions Labour Law Business Plan Writing Presentation Skills Leadership Coaching

Smaller Lateral Dimensions (Pty) Ltd. consulting contracts between 1990 to 2010 on business plan composition, strategy, marketing planning and market expansion, market share growth and sales strategies
Distell, First National Bank, Kumba Iron Ore, Katrivier Wines (Pty) Ltd., University of Stellenbosch Executive Development, Protea Finance (Pty) Ltd., Magnet Technologies (Pty) Ltd., Medi-Clinic Stellenbosch, Western Cape Milling, Cedar Mountain Products, PrionTex (Pty) Ltd., Sir Dicks Uniforms, Curtain Warehouse (Pty) Ltd., Solz Dynamics, Bug Zoo, Woolworths, Kwezi V3 Engineers

APPENDIX D
EXPERT GROUP PROFILES

Expert	Highest qualification	Profession	Years in practice
1	M.Commerce, HED MPhil (Futures Thinking)	Economist Industrial Psychologist Futurist Strategist	25
2	Bcomm Hons. MPhil in process	Organisation change and transformation practitioner	15
3	Ph.D.	Strategist Business Philosopher	10
4	B.Soc. Sc, DPLR, MBA	Business Strategist Human Capital practitioner Systems Thinker	22
5	PhD	Futures researcher Systems thinker Organisation and business developer Organisational and societal problem dissolver and ideal system re-designer	15
6	MBA PHD	CEO Financial Services Industry	
7	PhD	Organisational Psychologist	26
8	MBA	Marketing strategist	35
9	M.Econ	Globalisation economist Change management practitioner	26
10	Not sent		
11	Not sent		

APPENDIX E

TEMPLATE LETTER OF INVITATION TO EXPERT GROUP FOR INITIAL STATEMENT SELECTION ASSISTANCE

Dear

I am currently pursuing my PHD and respectfully request your assistance in this regard.

Part of the initial stages of my questionnaire design, is to invite a group of experts, such as you, to contribute towards the selection of statements that I plan to use in the Likert scale questionnaires of the research, in accordance with the aim of my study.

Should you be willing to assist me with this, please respond "yes" to this email.

Should you reply "yes", you will receive an *include/exclude/unsure* option questionnaire with the initially selected statements listed. Please indicate whether you are of the opinion that a selected statement should be included or not, when the research is conducted in the fields of scanning, strategy selection, scenario planning, business performance, and systems thinking.

The full detail of how to complete this statement selection questionnaire will be provided to you in this follow-up email, should you want to participate.

The questionnaire should no more than 20 minutes of your time.

Please advise me of your intention

Kind regards

Steyn Heckroodt

APPENDIX F

RESPONSE LETTER TEMPLATE TO THOSE INDIVIDUALS OF THE EXPERT GROUP WHO RESPONDED POSITIVELY TOWARDS THE STATEMENT SELECTION ASSISTANCE INVITATION PLUS FOLLOW-UP LETTER

Dear

Thank you very much for agreeing to assist me with the statement selection process of my research project.

Attached is the statement selection document, including the detail of what is required.

I attached the abstract/opsomming of the study, as it appears in the thesis document, in case you require more clarity before completing the questionnaire.

Thank you

Kind regards

Steyn Heckroodt

Dear

I have received a "yes" response from you regarding assistance with my Doctoral study. I have sent you a reply, containing a request to indicate whether you are the opinion that a selected statement should be included or not, when the research is conducted in the fields of scanning, strategy selection, scenario planning, business performance, and systems thinking.

Please try to find the time to return this to me as soon as possible.

Your assistance is much appreciated

Kind regards

Steyn Heckroodt

PS. Remember – any comment is valuable at this point in time, as I am still in the early stages of constructing the Likert scale questionnaires. Any feedback, even if you are unclear of what is required of you at this stage, is welcome. Please send such communication to me via email.

APPENDIX G

INITIAL STATEMENT SELECTION QUESTIONNAIRE SENT TO EXPERT GROUP

Statement selection process:

The statements tabled in this questionnaire need to be responded to within the context, stated below, respectively:

- scanning and information gathering;

- information gathering and scenario planning;

- scenario planning and strategy selection;

- strategy selection and business performance; and

- scanning and the application of a systems thinking process in terms of analysing systems complexities (complexus analysis), when scanning.

The aim of the research is to determine the need for an expanded conceptual scanning framework and propose such a framework, should the need exist. In the research, the researcher proposes such a framework, conceptualised based on a number of selected statements, i.e., the ones presented to you in the attached tables. However, to motivate the need for such an expanded conceptual scanning framework, the researcher needs to determine whether scanning is currently performed, in practice, by practitioners in the field, in the way as claimed in the statements presented.

The request to you is to indicate whether you are of the opinion that the selected statements presented are appropriate and relevant and will assist in achieving the aim of this study.

Each table of selected statements relate to one of the contexts stated above. The statements were selected based on their appropriateness and relevance to the specified context, stated at the beginning of each table. The statements listed per table have been identified via secondary sources of information through a literature study. These statements are to be filtered for selection in the Likert scale questionnaire, which the researcher aims to send to a sample of managers and practitioners in the fields of scanning, scenario planning, strategy selection, business performance, and systems thinking.

Please feel free to add any other comments, at this stage that you feel might assist in the final Likert scale construction, based on your opinion, experience and expertise.

Kind regards and thank you very much for participating.
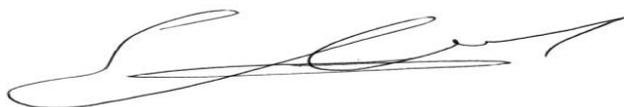
Steyn Heckroodt

In your opinion, please indicate whether the selected statements tabled below should be included or excluded in order for the researcher to achieve the aim of this study, as explained above. If you are unsure, then please indicate this option.

Please tick the column indicating your opinion.

Questionnaire 1: Statements pertaining to scanning and information

Statements	Include	Exclude	Unsure
Scanning is regarded as an effective practice to gather information	82%	18%	
Organisations use scanning as a primary method of information gathering	9%	73%	18%
Scanning is susceptible to scanners' environmental perception	91%		9%
Scanning considers the multiple dimensions of environmental systems (ES)*	100%		
Scanning is over-simplified	82%	18%	
Scanning sources are selected on the basis of their accessibility	100%		
Organisations scan in order to enhance competitiveness	9%	73%	18%
Scanning focuses on identifying new trends	82%	18%	
Scanning is performed in a mechanistic* manner	100%		
Information holds the key to better business performance	18%	73%	9%
Scanning sources are selected on the basis of how readily available those sources are	91%		9%
Conceptual scanning frameworks are dominated by the scanners' environmental perceptions	100%		
Scanning requires a taxonomic categorisation of the environment		73%	27%
The organisation's information requirements determine how scanning is done	100%		
Scanning is viewed as organisation specific	82%	9%	9%

Questionnaire 2: Statements pertaining to information and scenario planning

Statement	Include	Exclude	Unsure
The information yield from scanning impacts directly on the validity of scenario planning (SP)	91%		9%
SP starts with the end in mind	82%	18%	
The future is approached as continuously emerging	100%		
SP is shaped by the planner's interpretive perceptions of possible futures	100%		
SP assists in strategy management		73%	27%
SP is done in a back casting way		73%	27%
SP considers the future relation that exists between environmental systems (ES)	100%		
It is believed that the future can be forecasted*	100%		
The different worldview(s)* of scenario planners are considered	73%		27%
The different worldviews of ES are considered	100%		
The future needs to be projected	9%	73%	18%
Scanning intensifies as perceived future uncertainty increases	100%		
SP assists in understanding the environment	91%		9%
SP engages with unknown emergent processes between ES	91%		9%
SP prefers foresight* over forecasting* as a methodology in planning for the future	100%		

Questionnaire 3: Statements pertaining to scenario planning and strategy selection

Statement	Include	Exclude	Unsure
Strategy is dominated by the different worldviews amongst strategists	100%		
Management regards the organisation as part of the community	18%	73%	9%
A selected strategy needs to be an organisational-environmental fit		73%	27%
A selected strategy has to be correct*	100%		
A selected strategy has to be appropriate*	100%		
Personal criteria needs to be considered in SP	27%	73%	
Organisations should attempt to predict the future through SP	27%	73%	
Strategy selection is dependent upon future prediction of some sort	100%		
Scenarios are shaped by considering both objective and subjective criteria	100%		
Diversity deals best with complexity	18%	73%	9%
Strategy needs to be both reactional and pro-active		73%	27%
The relation between the organisation and ES is temporary		73%	27%
The organisation compiles its own conceptual scanning framework of the environment when scanning	100%		
Strategy selection is based on how things are at a specific point in time	100%		
Environmental complexity is dealt with through diverse perspectives	100%		

Questionnaire 4: Statements pertaining to strategy selection and business performance

Statement	Include	Exclude	Unsure
Proven facts dominate what is regarded as useful information	100%		
People's interpretive perceptions dominate what is regarded as useful information	100%		
SS needs to be constantly reviewed	9%	73%	18%
The approach to strategy selection (SS) is constantly enhanced	91%		9%
Different perceptions of the same trend signals are taken into account	100%		
SS is performed in a team	82%	18%	
SS is reactional by nature	100%		
SS takes the relation between environmental systems into account	82%	18%	
SS teams requires leadership to en-act performance	9%	73%	18%
Enhanced SS ability leads to increased competitive ability	100%		
SS is viewed as the juncture between performance and scanning	100%		
Scanning information is integrated with strategy to improve performance	100%		
The relationship between SS and performance is impacted on by the external environment	100%		
The relationship between SS and performance is impacted on by the business structure	100%		
The future is treated as consisting of unknown emergent processes	100%		

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Questionnaire 5: Statements pertaining to complexus analysis and scanning

Statement	Include	Exclude	Unsure
Levels of inter-activeness between environmental systems (ES) are analysed	18%	73%	9%
Preconceived ideas about the environment determines the scanning approach	91%		9%
Emerging complexities are considered between ES that are scanned	91%		9%
Scanners' abilities to scan determines the scanning process	18%	73%	9%
Scanning is dominated by scanners' cognitive ability	82%		18%
Scanning seeks to qualify the relation between ES scanned	100%		
Scanning identifies ES that initiates change and those opposing it	100%		
Scanning considers changing trend signals		73%	27%
Scanning considers emerging unanticipated environmental trend signals	100%		
Scanning includes identifying emerging unknown information	100%		
Scanning requires ES multi-dimensionality	18%	73%	9%
ES in a relation with one another is scanned as a larger system of sub-systems	100%		
The relation between ES shapes scanning	100%		
The relation between ES signifies the possibility of change	100%		
Scanning is aimed at confirming known information	100%		

APPENDIX H

REVISED STATEMENT SELECTION QUESTIONNAIRE SENT TO MANAGER GROUP

In your opinion, please indicate whether the selected statements tabled below should be included or excluded in order for the researcher to achieve the aim of this study, as explained above. If you are unsure, then please indicate this option.

Please tick the column indicating your opinion.

Questionnaire 1: Statements pertaining to scanning and information

Statements	Include	Exclude	Unsure
Scanning is regarded as an effective practice to gather information	88%	12%	
Similar sources of information are scanned, as those sources scanned by other organisations	88%		12%
Scanning is susceptible to scanners' environmental perception	94%		6%
Scanning considers the multiple dimensions of environmental systems (ES)*	94%		
Scanning is over-simplified	88%	12%	
Scanning sources are selected on the basis of their accessibility	94%		
Scanning is constantly enhanced	82%	12%	6%
Scanning focuses on identifying new trends	82%	12%	6%
Scanning is performed in a mechanistic* manner	94%		6%
Scanning relates directly to business performance	94%		6%
Scanning sources are selected on the basis of how readily available those sources are	94%		6%
Conceptual scanning frameworks are dominated by the scanners' environmental perceptions	94%	6%	
When scanning, the environment is divided into manageable sections through a PESTLE-like* categorisation	94%		6%
The organisation's information requirements determine how scanning is done	94%	6%	
Scanning is viewed as organisation specific	88%	12%	

Questionnaire 2: Statements pertaining to information and scenario planning

Statement	Include	Exclude	Unsure
The information yield from scanning impacts directly on the validity of scenario planning (SP)	94%		6%
SP starts with the end in mind	88%	12%	
The future is approached as continuously emerging	94%		6%
SP is shaped by the planner's interpretive perceptions of possible futures	94%		6%
SP assists in the strategic management of business resources	88%	12%	
Environmental scanning always precedes SP	94%		6%
SP considers the future relation that exists between environmental systems (ES)	94%	6%	
It is believed that the future can be forecasted*	94%	6%	
The different worldview(s)* of scenario planners are considered	94%		6%
The different worldviews of ES are considered	94%		
The future is approached as deterministic	82%	6%	12%
Scanning intensifies as perceived future uncertainty increases	94%		
SP assists in understanding the environment	94%		6%
SP engages with unknown emergent processes between ES	94%		6%
SP prefers foresight* over forecasting* as a methodology in planning for the future	94%	6%	

Questionnaire 3: Statements pertaining to scenario planning and strategy selection

Statement	*Include*	*Exclude*	*Unsure*
Strategy is dominated by the different worldviews amongst strategists	94%	6%	
Management regards the organisation as contributing to shaping the environment	94%	6%	
The relation that the organisation has with environmental systems (ES) shapes strategy selection	94%		6%
A selected strategy has to be correct*	94%		
A selected strategy has to be appropriate*	82%	6%	12%
The developed status* of different ES are taken into account when scanning them	94%		
The organisation's worldview towards the selected strategy is considered	94%		6%
Strategy selection is dependent upon future prediction of some sort	94%		6%
Scenarios are shaped by considering both objective and subjective criteria	94%	6%	
Scenario planning guides strategy selection	82%	6%	12%
Strategy is reactional by nature towards ES over which the organisation has limited influence	94%		
The relation between the organisation and ES is approached as dynamic	94%		6%
The organisation compiles its own conceptual scanning framework of the environment when scanning	82%	6%	12%
Strategy selection is based on how things are at a specific point in time	94%		
Environmental complexity is dealt with through diverse perspectives	94%		6%

Questionnaire 4: Statements pertaining to strategy selection and business performance

Statement	*Include*	*Exclude*	*Unsure*
Proven facts dominate what is regarded as useful information	94%		
People's interpretive perceptions dominate what is regarded as useful information	82%	6%	12%
The business is viewed as a sub-system* of the larger environment	94%		
The approach to strategy selection (SS) is constantly enhanced	94%		6%
Different perceptions of the same trend signals are taken into account	94%		6%
SS is performed in a team	94%	6%	
SS is reactional by nature	82%	6%	12%
SS takes the relation between environmental systems into account	94%		
Organisational flexibility determines sustainable competitiveness	94%		6%
Enhanced SS ability leads to increased competitive ability	82%	6%	12%
SS is viewed as the juncture between performance and scanning	94%		6%
Scanning information is integrated with strategy to improve performance	94%		6%
The relationship between SS and performance is impacted on by the external environment	94%		6%
The relationship between SS and performance is impacted on by the business structure	94%	6%	
The future is treated as consisting of unknown emergent processes	82%	6%	12%

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Questionnaire 5: Statements pertaining to complexus analysis and scanning

Statement	*Include*	*Exclude*	*Unsure*
Direct and indirect inter-activeness between environmental systems (ES) are analysed	94%		6%
Preconceived ideas about the environment determines the scanning approach	94%		6%
Emerging complexities are considered between ES that are scanned	94%	6%	
The relation between ES is scanned via a preconceived structure of the relation	82%	6%	12%
Scanning is dominated by scanners' cognitive ability	94%		6%
Scanning seeks to qualify the relation between ES scanned	94%		6%
Scanning identifies ES that initiates change and those opposing it	94%	6%	
The organisation attempts influencing Contextual* ES via its relation with transactional* ES	82%	6%	12%
Scanning considers emerging unanticipated environmental trend signals	94%		6%
Scanning includes identifying emerging unknown information	94%	6%	
Scanning views ES in a multi-dimensional manner	94%		6%
ES in a relation with one another is scanned as a larger system of sub-systems	94%		6%
The relation between ES shapes scanning	94%	6%	
The relation between ES signifies the possibility of change	82%	6%	12%
Scanning is aimed at confirming known information	94%		6%

APPENDIX I

PILOT STUDY INVITATION TO PARTICIPATE

Dear student

Please be so kind as to assist the researcher in constructing a research questionnaire, which will be used as part of a Doctoral thesis.

The instrument contains 75 statements constructed to determine how practitioners currently practice aspects relating to business environmental scanning, scenario planning, strategy selection, business performance and systems thinking in your organisation.

The statements listed in the questionnaire test the conceptual scanning frameworks, the process of scanning and the approach towards scanning applied by your organisation.

The pages following contain the full description of how the questionnaires need to be completed.

Thank you kindly for your assistance

Steyn Heckroodt

APPENDIX J

FINAL INVITATION TO PARTICIPATE

Dear

I am in the final stages of completing my PHD at the **University of Stellenbosch Business School,** and would appreciate your assistance in this regard.

My topic of research is the contribution that can be made to business environmental scanning, by analysing the inter-relatedness, inter-dependence and relationships among environmental systems within an environment. I aim to propose a conceptual scanning framework and methodology that expand on those currently in use.

The value to businesses of such a framework and methodology would be an increased ability to manage environmental complexity and uncertainty. My sample consists of individuals who are involved in any of the five fields related to scanning including:

- scanning itself;
- scenario planning;
- strategy crafting/selecting;
- business performance; and
- systems thinking.

You are invited to participate in this research project. Should you volunteer your assistance, you will receive five short questionnaires of 15 statements each. Each questionnaire follows the previous one, once completed and returned. Each one should take no longer than 10 minutes to complete. Please consider this request and respond with a "yes" to this email, upon which the process will be initiated.

Your willingness to contribute is sincerely appreciated.

Thank you kindly

Steyn Heckroodt.

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APPENDIX K

FINAL LIKERT SCALE QUESTIONNAIRES

QUESTIONNAIRE 1:

This questionnaire has 15 statements pertaining to the context of ***scanning and information gathered*** through this practice.

Please indicate your level of agreement or non-agreement to the extent which the statements accurately reflect the current practice in your organisation. Indicating your response in the appropriate column next to the statement, marking it with an **X**. Your opinion should reflect your experiences of the issue addressed in the statement in terms of how this is currently being done in your organisation. Rate each statement on the 7-point Likert scale by selecting one (1) option, ranging from *strongly disagree* to *strongly agree.*

If you are a practicing business consultant, then please answer the questionnaire by using one of your clients, as an example organisation.

Each statement needs to be read in the context of the opening line in the first row of each table.

- **Example:**

With regards to scanning and information, indicate to what extent you agree that in your organisation/your client's organisation…							
Statements	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
Scanning is susceptible to peoples' perception of the environment					X		

The questionnaire should take you no more than 10 minutes to complete, and your participation will be treated as confidential.

Upon completion of this questionnaire, and returning it to the researcher, the next questionnaire will be sent to you. There are a total of five questionnaires.

CONCEPT DEFINITIONS APPLIED IN THIS QUESTIONNAIRE:

- **External environmental scanning; referred to as scanning**

In the questionnaire, the term scanning pertains to conceptual scanning frameworks, scanning methodologies and scanning approaches. It refers to monitoring the external environment with the purpose of gathering specific information required.

- **Conceptual scanning framework**

This refers to the illustrations that business organisations use to conceptualise the external environment that they scan.

- **Scanning methodology**

This refers to a set of practices, procedures and rules applied by organisations when scanning the environment.

- **Scanning approach**

This refers to how organisations view the environment that they scan, i.e. their perception of the observed environmental reality.

- **Information yield**

This refers to the sum total of the information gathered through scanning, and the integrity of that information.

- **Scenario planning**

This refers to planning for the future through sketching different possible future scenarios.

- **Strategy selection**

This refers to choosing a strategy that is appropriate at a particular point in time.

- **Organisational performance**

This refers to how well the organisation performs, measured in terms of a generic balanced scorecard, financial sustainability, organisational flexibility and adaptability.

- **Systems thinking**

This refers to a holistic approach towards the environment, underpinned by a focus on the relation between observed environmental components, approached as systems.

- **Complexus analysis**

This refers to the analysis of the inter-dependence, inter-relatedness and relation between the systems, which make up the business environment.

QUALIFYING QUESTIONNAIRE:

Please complete the questionnaire below before commencing with the main questionnaire. You may indicate more than one answer in this questionnaire only.

I currently manage/consult on … level	Middle		Senior		Executive		Director		Shareholder
I am primarily involved in	Scanning		Scenario planning		Strategy selection		Organisation performance		Others: specify

My organisation/client's organisation employs…	Less than 100 people	100 > 500 people	500 > 1000 people	More than 1000 people	I am unsure

My organisation/client's organisation has…	Offices in other countries		Offices only in one country	

I am familiar with systems thinking	Not at all	Slightly	Fairly	Very	100%

Now, please continue with the questionnaire.

Thank you kindly

With regards to scanning practices and information gathered, indicate to what extent you agree that in your organisation/your client's organisation…							
Statements	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
Scanning is regarded as an effective practice to gather information							
Similar sources of information are scanned, as those sources scanned by other organisations							
Scanning is susceptible to scanners' environmental perception							
Scanning considers the multiple dimensions of environmental systems (ES)*							
Scanning is over-simplified							
Scanning sources are selected on the basis of their accessibility							
Scanning is constantly enhanced							
Scanning focuses on identifying new trends							
Scanning is performed in a mechanistic* manner							
Scanning relates directly to business performance							
Scanning sources are selected on the basis of how readily available those sources are							
Conceptual scanning frameworks are dominated by the scanners' environmental perceptions							

Statements	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
When scanning, the environment is divided into manageable sections through a PESTLE-like* categorisation							
The organisation's information requirements determine how scanning is done							
Scanning is viewed as organisation specific							

*Environmental systems refer to institutions in the external environment like a government, labour unions, supplier groups, buyer groups and other stakeholders, which are approached as systems within a general systems thinking framework.

*A PESTLE-like categorisation refers to dividing the external environment into segments, like a Political, Economic, Social, Technological, Legal an Environmental (Green) segment, or category.

*Mechanistic refers to the scanning methodology being set, non-flexible and not open to interpretive perceptions of the scanner(s).

I completed this questionnaire	On my own	With the assistance of other people
I completed this questionnaire as a …	Employee	Consultant

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QUESTIONNAIRE 2:

With regards to scenario planning and information gathered, indicate to what extent you agree that in your organisation/your client's organisation…							
Statements	*Strongly disagree*	*Fairly disagree*	*Slightly disagree*	*Un-decided*	*Slightly agree*	*Fairly agree*	*Strongly agree*
The information yield from scanning impacts directly on the validity of scenario planning (SP)							
SP starts with the end in mind							
The future is approached as continuously emerging							
SP is shaped by the planner's interpretive perceptions of possible futures							
SP assists in the strategic management of business resources							
Environmental scanning always precedes SP							
SP considers the future relation that exists between environmental systems (ES)							
It is believed that the future can be forecasted*							
The different worldview(s)* of scenario planners are considered							

Statements	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
The different worldviews of ES are considered							
The future is approached as deterministic							
Scanning intensifies as perceived future uncertainty increases							
SP assists in understanding the environment							
SP engages with unknown emergent processes between ES							
SP prefers foresight* over forecasting* as a methodology in planning for the future							

*Forecasting starts with what currently is, and then project forward to possible scenarios.

* A worldview refers to a perception of reality, about the world, life, beliefs, and us. It shapes the approach taken towards this reality; past, present and future. People and institutions, like environmental systems, can have a worldview.

*Foresight starts planning for the future with the end goal (ideal state) in mind.

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QUESTIONNAIRE 3:

With regards to strategy selection and scenario planning, indicate to what extent you agree that in your organisation/your client's organisation…							
Statements	*Strongly disagree*	*Fairly disagree*	*Slightly disagree*	*Un-decided*	*Slightly agree*	*Fairly agree*	*Strongly agree*
Strategy is dominated by the different worldviews amongst strategists							
Management regards the organisation as contributing to shaping the environment							
The relation that the organisation has with environmental systems (ES) shapes strategy selection							
A selected strategy has to be correct*							
A selected strategy has to be appropriate*							
The developed status* of different ES are taken into account when scanning them							
The organisation's worldview towards the selected strategy is considered							

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Statements	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
Strategy selection is dependent upon future prediction of some sort							
Scenarios are shaped by considering both objective and subjective criteria							
Scenario planning guides strategy selection							
Strategy is reactional by nature towards ES over which the organisation has limited influence							
The relation between the organisation and ES is approached as dynamic							
The organisation compiles its own conceptual scanning framework of the environment when scanning							
Strategy selection is based on how things are at a specific point in time							
Environmental complexity is dealt with through diverse perspectives							

*Correct refers to making to right strategy selection, within the context of the organisational

goals.

*Appropriate refers to selecting the most suitable strategy given the volatility of stability of the business environment, at the time.

*Developed status refers to the evolutionary level of development that the entity is on, impacting on its worldview.

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QUESTIONNAIRE 4:

With regards to business performance and strategy selection, indicate to what extent you agree that in your organisation/your client's organisation…							
Statements	**Strongly disagree**	**Fairly disagree**	**Slightly disagree**	**Un-decided**	**Slightly agree**	**Fairly agree**	**Strongly agree**
Proven facts dominate what is regarded as useful information							
People's interpretive perceptions dominate what is regarded as useful information							
The business is viewed as a sub-system* of the larger environment							
The approach to strategy selection (SS) is constantly enhanced							
Different perceptions of the same trend signals are taken into account							
SS is performed in a team							
SS is reactional by nature							
SS takes the relation between environmental systems into account							

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Statements	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
Organisational flexibility determines sustainable competitiveness							
Enhanced SS ability leads to increased competitive ability							
SS is viewed as the juncture between performance and scanning							
Scanning information is integrated with strategy to improve performance							
The relationship between SS and performance is impacted on by the external environment							
The relationship between SS and performance is impacted on by the business structure							
The future is treated as consisting of unknown emergent processes							

*Sub-system refers to a smaller system, or component, of a larger system, which consists of more than one system, or component.

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QUESTIONNAIRE 5:

With regards to complexus analysis and scanning, indicate to what extent you agree that in your organisation/your client's organisation…

Statements	*Strongly disagree*	*Fairly disagree*	*Slightly disagree*	*Un-decided*	*Slightly agree*	*Fairly agree*	*Strongly agree*
Direct and indirect inter-activeness between environmental systems (ES) are analysed							
Preconceived ideas about the environment determines the scanning approach							
Emerging complexities are considered between ES that are scanned							
The relation between ES is scanned via a preconceived structure of the relation							
Scanning is dominated by scanners' cognitive ability							
Scanning seeks to qualify the relation between ES scanned							
Scanning identifies ES that initiates change and those opposing it							

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Statements	Strongly disagree	Fairly disagree	Slightly disagree	Un-decided	Slightly agree	Fairly agree	Strongly agree
The organisation attempts influencing Contextual*ES via its relation with transactional* ES							
Scanning considers emerging unanticipated environmental trend signals							
Scanning includes identifying emerging unknown information							
Scanning views ES in a multi-dimensional manner							
ES in a relation with one another is scanned as a larger system of sub-systems							
The relation between ES shapes scanning							
The relation between ES signifies the possibility of change							
Scanning is aimed at confirming known information							

*Contextual environmental systems are those systems over which the business has little or no control.

*Transactional environmental systems are those systems over which the business has some or more control.