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Changes in sustainability reporting by an African defence contractor: a longitudinal analysis

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Changes in sustainability reporting by an African defence contractor: a longitudinal analysis

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Abstract

Purpose – The purpose of this paper is to establish the extent to which sustainability disclosures in a strategically important South African company have changed, in the light of the work by King.

Design/methodology/approach – The paper takes the form of a content analysis of the sustainability reports of a single reporting entity, Denel (Pty) Ltd (Denel), the largest manufacturer of defence equipment in South Africa. The computer assisted textual analysis software programme CATPAC II™ was used to undertake the investigation.

Findings – The paper finds that the emphasis of the sustainability reports changed each year over the period of the study. However, all the reports embody the principles and philosophical aspects of King (in 2002 and 2009). A year on year comparison of the 20 concepts identified as common to each data set over the period of the study found no substantial differences between them. This finding suggests an underlying consistency in their use by the prepares of the sustainability reports.

Research limitations/implications – This research is limited to the analysis of the sustainability reports contained within Denel's 2007 to 2011 annual reports.

Practical implications – The use of research techniques such as those described in this paper has practical implications for future research. Where legislative requirement requires corporate social responsibility reports to be prepared by private and public sector entities, this technique would be especially useful to establish the similarities and differences between them. Differences and the extent of the differences will be of interest to stakeholders groups, preparers and researchers as they will indicate how organisations in the different sectors view sustainability.

Originality/value – Although sustainability reporting has been the subject of extensive research, longitudinal studies are limited. This longitudinal study contributes to the limited CSR literature focusing on developing countries and, in particular, African countries, as well as on the defence or armaments industry.

Keywords Africa, Developing countries, Corporate social responsibility, Financial reporting, Defence sector, Integrated reporting, Sustainability, Transformation

Paper type Research paper

Introduction

Stakeholders increasingly demand that firms be held accountable for their actions and products (Werther and Chandler, 2005; Morsing and Schultz, 2006). This is especially the case where firms manufacture products that are considered by some parts of society to be socially unacceptable, sometimes referred to as "sin" industries, or those considered "bad" corporate citizens. Industries with this reputation include alcohol, tobacco, gambling, pornography, defence and mining companies as well as environmental polluters (Banerjee, 2008; Van der Laan *et al.*, 2008; Werther and Chandler, 2005; Morsing and Schultz, 2006). These firms do not adhere to the principle *primum non nocere* (Drucker, 1973; Palazzo and Richter, 2005). The common thread among these industries is that they are capable of generating substantial earnings from the destruction of the

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environment, misery from human frailties, and even death. Here the concept of corporate social responsibility (CSR) appears to be an anathema or contradiction, as companies engaged in these industries often find it difficult to convince parts of society of their legitimacy. In their study of the tobacco industry Moerman and Van Der Laan (2005) identify the pressures that create this "legitimacy gap" as including developments in health and public awareness, punitive litigation which includes class action lawsuits, as well as allegations of questionable ethical behaviour (also Palazzo and Richter, 2005). It is reasonable to expect that other organisations that manufacture or produce products considered socially or environmentally harmful face similar legitimacy issues, especially when the consequences of their production may manifest themselves only some time in the future. Werther and Chandler (2005, p. 319) describes this as "the application of today's standards to yesterday's actions".

Although CSR or sustainability reporting has been the subject of extensive research, studies incorporating longitudinal analyses of sustainability reports are limited (exceptions include Beck *et al.*, 2010; Tregidga and Milne, 2006). The objective of this paper is to ascertain the extent to which sustainability disclosures in a strategically important South African company have changed in the light of King (2009). In doing so it adds to the limited CSR literature focusing on developing countries and in particular an African context, as well as on the defence or armaments industry.

From a South African perspective, CSR became institutionalised with the publication of King (1994). The publication of this document coincided with the social and political transformation that occurred with the end of apartheid and the readmission of the country into the world economy (King, 2002). CSR reporting in developing countries, and in particular those in Africa, has been largely under-researched. Exceptions include research focusing on the environmental accounting (de Villiers and Barnard, 2000; de Villiers and Lubbe, 2001; de Villiers, 2003; Antonites and de Villiers, 2003; de Villiers and van Staden, 2006), mining industry (Kapelus, 2002; Hamann, 2003), HIV/AIDS (Lawrence and Samkin, 2005; Samkin and Lawrence, 2007), socially responsible investment (Kumar *et al.*, 2002), corporate environmental sustainability (Visser, 1999), sustainability reporting (Visser, 2002), and corporate governance (Roussouw *et al.*, 2002; West, 2006). In addition, there have been limited studies that have addressed issues of CSR in the defence or armaments industry (Mayer-Sommer and Roshwalb, 1996; Baker, 2005; Byrne, 2007 are exceptions). The reason for this position explains Baker (2005) is due in part to the issue's built-in oxymoron. Byrne (2007, p. 202) takes a more rational view when arguing:

> Arms industry actors are well aware of this normative agenda, but they see themselves as being outside the purview of CSR. Corroborating this view is the fact that their harm-facilitating business enjoys the collaboration, endorsement, and generosity of its principal customer, that is, government.

Textual information contained in CSR or sustainability reports is a form of communication. How CSR or sustainability reports communicate and emphasise information over a period of time is therefore of interest to stakeholders groups and researchers. This paper uses content analysis to identify the trends in, and emphases of, the sustainability reports of a single reporting entity. Rather than using traditional manual content analysis, which can be time consuming especially when lengthy documents are involved, computer assisted textual analysis software was used to facilitate the analysis and interpretation of the textual data. The organisation in question is Denel (Pty) Limited (Denel), a South African Schedule 2 public entity in terms

of the Public Finance Management Act, and the country's largest manufacturer of defence equipment. The paper found that although the emphasis of the sustainability reports changed over the period of the study, the reports embody the principles and philosophical aspects of King (2002, 2009). A year-on-year comparison of the common concepts over the period of the study found no substantial differences, suggesting an underlying consistency in their use.

The paper is structured as follows. First the concept of corporate social responsibility within a South African context is discussed. An overview of the defence contractor Denel is then provided. The use of the content analysis as the research method is then described. The research design is detailed. It includes an overview of the computer assisted textual analysis program CATPAC II™, and the process undertaken to perform the comparative analysis. The differences in the sustainability reports that form the basis of the study are then provided. A discussion of the results and the conclusion rounds out the paper.

Corporate social responsibility: a South African perspective

CSR is the obligation a firm has to society and in particular its stakeholders, in other words, those affected by corporate policies and practices (Lawrence and Samkin, 2005). It describes the social and environmental contributions and consequences of business activity (Jenkins and Yakovela, 2006). CSR or sustainability reports are used by companies to justify their activities. The reports are not only used to communicate economic information about operations but also to detail the adverse impacts that the entity's activities may have on the natural environment and stakeholders (Hirschhorn, 2004).

This overview of CSR is consistent with that provided by Popp (2009, p. 13) in an African context. Here CSR is more fully defined as:

> [. . .] accountability of companies, to both shareholders and stakeholders, for their utilisation of resources, for their means of production, for their treatment of workers and consumers, for their impact on the social and ecological environment in which they operate and for the way in which they exercise their legislative and fiduciary duties. It is thus treated as a comprehensive concept referring to the way in which companies exercise responsibility and accountability for the economic, social and environmental impact of their business decisions and behaviours. Such awareness and responsiveness become evident in how companies, in addition to their economic rationale, launch relevant initiatives or invest in the advancement of certain socially and/or environmentally defined needs in the communities that they operate in.

What is being described here is the notion of good corporate citizenship. However, in South Africa, CSR has been largely influenced and defined by the legacy of apartheid. The African National Congress's Reconstruction and Development Programme set out to address poverty alleviation, environment, health and safety issues, workplace empowerment, affirmative action and human rights (Hamann *et al.*, 2005; Visser, 2005). These issues have been largely addressed in various legislative reforms that have occurred since 1994 focusing on affirmative action and skills development. These include but are not limited to the Public Finance Management Act (PFMA) (No. 1 of 1999); Employment Equity Act (No. 55 of 1998), Skills Development Act and Broad-Based Black Economic Empowerment Act (No. 53 of 2003) Code of Good Practice (CoGP). Additionally other factors have influenced South African CSR. These include globalisation (Fig, 2005), stakeholder activism, ISO 14001 (Hamann *et al.*, 2005), HIV/AIDS (Popp, 2009; Lawrence and Samkin, 2005; Samkin and Lawrence, 2007), the establishment of the Johannesburg Stock Exchange (JSE) socially responsible

investment index (Skinner and Mersham, 2008; Popp, 2009; King, 2009), global standards and codes including the Global Reporting Initiative guidelines (Visser, 2005), and the local King report on corporate governance (King, 1994, 2002, 2009).

King reports on corporate governance

The various iterations of the King reports on corporate governance (King, 1994, 2002, 2009) have had a pervasive influence on reporting in South Africa. King (2002, 2009) is applicable to all public enterprises and agencies that fall under the auspices of the PFMA and set out to promote the highest standards of corporate governance (King, 2002). They advocate an integrated approach to governance "in the interests of a wide range of stakeholders having regard to the fundamental principles of good financial, social, ethical and environmental practice" (King, 2002, p. 5). Seven characteristics of good governance identified in the report are detailed in Table I.

King (2002) comprises six sections. These are: boards and directors; risk management; internal audit; integrated sustainability reporting; accounting and auditing; and compliance and enforcement. Each section comprises a number of chapters. These together with the chapter recommendations frame CSR reporting.

Sustainability according to King (2002, p. 96), focuses on those non-financial aspects of corporate practice that influence "the enterprise's ability to survive and prosper within the communities within which it operates, and so ensure future value creation". Sustainability then represents the essence of CSR (King, 2002). These varying influences, and in particular the role played by King (1994, 2002, 2009), mean that the South African notion of sustainability and good governance or corporate citizenship has a particular characteristic. King (2002, p. 99) describes it as being found within the concept of Ubuntu or "humanness" or "being human" and "includes supportiveness, co-operation and solidarity". King (2002) then took an inclusive approach to governance in that the board, although accountable to the company, should take into account the legitimate expectation of stakeholders when making decisions in the best interests of the company.

Characteristic	Description
Discipline	A commitment by senior management to adhere to behaviour that is universally recognised and accepted as correct and proper
Transparency	The ease with which an outsider is able to make a meaningful analysis of a company's actions, its economic fundamentals and non-financial aspects of the business
Independence	The extent to which mechanisms have been put in place to avoid or manage conflict
Accountability	The existence of mechanisms to ensure accountability by individuals or groups in an organisation
Responsibility	Behaviour that allows for corrective action and penalising mismanagement
Fairness	The systems that exist within an organisation that must be balanced in taking into account all those that have an interest in the company and its future
Social responsibility	Being aware of and responding to social issues including non-discriminatory, non-exploitative, and responsible with regard to environmental and human rights issues

Source: Adapted from King (2002, pp. 10-11)

Table I.
Seven characteristics of good corporate governance

King (2009) came into effect on 1 March 2010. As with King (2002) the 2009 iteration takes an inclusive stakeholder approach to governance while embracing the notion of integrated sustainability performance and reporting (King, 2009). King (2009) contained eight sections. These are: ethical leadership and corporate citizenship; boards and directors; audit committees; the governance of risk; the governance of information technology; compliance with laws, rules, codes and standards; internal audit; governing stakeholder relationships; and integrated reporting and disclosure. The philosophy of King (2009) revolves around leadership, sustainability and corporate citizenship (King, 2009, p. 10). Key aspects of the philosophy are detailed in Table II.

Central to CSR in South Africa then is how corporations address socio-economic challenges through the provision of economic access, social transformation and other opportunities to previously disadvantaged and excluded communities. Thus, concepts such as transformation, equity and ownership are integrally entwined within South African CSR (Popp, 2009).

Although CSR disclosures are laudable they have not been universally welcomed. Fig (2005) goes so far as to suggest South African companies' CSR contributions are nothing more than cosmetic and self-serving. Issues such as environmental care and protection are often ignored (Popp, 2009).

Overview of Denel (Pty) Limited

The restructuring of Armscor[1] in 1991 by the South African Government led to the incorporation on 1 April 1992 of Denel (Pty) Limited (Denel). Under the terms of the restructuring Denel became responsible for the development and manufacturing of armaments, while Armscor became the procurement arm of the South African National Defence Force (SANDF). As part of further restructuring in 2006, the constituent businesses were unbundled and incorporated into stand-alone entities, each with their own board of directors (Denel (Pty) Limited, 2010). The South African Government is Denel's sole shareholder.

Good governance	Essentially about effective leadership. Leader should rise to the challenges of modern governance. Such leadership is characterised by the ethical values of responsibility, accountability, fairness and transparency and based on moral duties that find expression in the concept of Ubuntu. Responsible leaders direct company strategies and operations with a view to achieving sustainable economic, social and environmental performance
Sustainability	Is the primary moral and economic imperative of the 21st century. It is one of the most important sources of both opportunities and risks for businesses. Nature, society, and business are interconnected in complex ways that should be understood by decision-makers. Most importantly, current incremental changes towards sustainability are not sufficient – we need a fundamental shift in the way companies and directors act and organise themselves
Corporate citizenship	The concept of corporate citizenship flows from the fact that the company is a person and should operate in a sustainable manner. Sustainability considerations are rooted in the South African constitution which is the basic social contract that South Africans have entered into. The constitution imposes responsibilities upon individuals and juristic persons for the realisation of the most fundamental rights

Table II.
Key philosophical aspects of King (2009)

Source: King (2009, pp. 10-11)

Denel is the largest manufacturer of defence equipment in South Africa. The company operates in the aerospace and landward, as well as maritime, defence industries. Denel provides high-tech engineering, systems supply, maintenance and full lifecycle support capabilities to the SANDF (Denel (Pty) Limited, 2008, 2009). Denel is an original equipment manufacturer[2]. It also undertakes overhauling, maintenance, repair, refurbishment and upgrading of systems of the SANDF's arsenal. The company has developed niche technologies in areas including artillery, composite aerostructures, aircraft maintenance, mine clearance, missiles, munitions, aircraft subassembly, and unmanned aerial vehicles (UAVs) (Denel (Pty) Limited, 2008). Systems and consumables as well as sub-systems and components are supplied to international clients. Denel then plays an important role in expanding South Africa's industrial, technological and manufacturing base, and as such, is considered to be a strategic asset of the South African Government.

During the period of the study Denel has experienced financial difficulties. The South African Government's ownership of Denel, as well as its position as the preferred supplier to the SANDF, means that the organisation is not susceptible to the same competition and growth pressures faced by other businesses that compete in free markets. Nevertheless, during the period of the study, the financial difficulties experienced by the company meant that the appropriateness of the going concern basis for the preparation of the financial statements was considered annually. As a strategic asset, the Shareholder provided financial support by means of a recapitalisation of R3.5bn between 2007 and 2010, as well as providing a written undertaking that it would assist the directors in maintaining the company's going concern status. The registration of a Domestic Medium Term Note Programme to meet future group funding requirements (Denel (Pty) Limited, 2007) as well as government guarantees to support short-term borrowings and working capital requirements ensured the maintenance of the going concern status.

Content analysis

Content analysis has been described as "a research technique for the objective, systematic and quantitative description of the manifest content of communication" (Berelson, 1952, p. 5). Krippendorff (2004, p. 18) describes content analysis as a "research technique for making replicable and valid inferences from texts (or other meaningful matter) to the context of their use". As a process, content analysis involves the systematic coding or classification of qualitative textual data that can take the form of texts, images and symbols (Krippendorff, 2004).

Whether the content analysis is performed at the word, sentence, paragraph, page proportion, or clause/phrase level has been widely discussed in the literature (Milne and Adler, 1999; Guthrie *et al.*, 2004; Beattie and Thomson, 2007; Beck *et al.*, 2010). The utilisation of the word unit of analysis is useful when the meaning of each is considered before it is included in the analysis (Campbell and Abdul Rahman, 2010). Frequency word counts are used to highlight or identify various themes and sub-themes (Varadarajan and Ramanujam, 1990). While some researchers consider the sentence to be a more reliable unit of analysis (Milne and Adler, 1999; Gray *et al.*, 1995), coding problems can occur when a sentence contains more than one category of content or its meaning is ambiguous (Campbell and Abdul Rahman, 2010). While the use of paragraphs to perform content analysis can be relatively straightforward, they generally contain several categories of content. As such they are incapable of describing anything other than a single "large" category of reporting (Campbell and Abdul Rahman, 2010).

Content analysis can be applied to any publically available information so that it can be analysed in a systematic, objective and reliable manner (Krippendorff, 2004; Guthrie and Parker, 1990). Three distinguishing characteristics are however considered necessary for a reliable content analysis study. These are: objectivity, systematisation and quantification (Kassarjian, 1977; Salisbury, 2001; Chhabra, 2009; Doherty, 2011). What this means is that if different analysts apply identical rules and procedures to qualitative textual data, the same generalisable results are obtained (Doherty, 2011).

Objectivity requires that researcher bias is not introduced into the analysis and development of themes and sub-themes. For a manual content analysis, objectivity requires the development of explicit sets of rules in advance to ensure that any traces of subjectivity are eliminated (Kassarjian, 1977; Salisbury, 2001; Chhabra, 2009). This process ensures reliability of the study and facilitates replication. Systemisation requires the consistent application of predetermined rules for inclusion or exclusion of content to ensure partial or biased analysis does not occur on the part of the researcher and also ensures the extracted themes have theoretical relevance (Kassarjian, 1977; Salisbury, 2001; Chhabra, 2009). Quantification is the process by which qualitative data is transformed to a form suitable for statistical analysis (Kassarjian, 1977). This process distinguishes content analysis from a critical reading of the text (Salisbury, 2001; Chhabra, 2009).

Within accounting, content analysis has been widely applied to the analysis of non-statutory disclosures of corporate social and environmental and intellectual capital reporting practices contained in annual reports. For example, de Villiers and van Staden (2006), Jose and Lee (2007), Patten (2002) and Smith and Taffler (2000) have used content analysis to investigate corporate social reporting practices, while Bozzolan *et al.* (2003), Brennan (2001), Guthrie *et al.* (2004) and Olsson (2001) have used the same approach to examine intellectual capital reporting practices. Subbarao and Zeghal (1997) have used this approach to investigate the differences in intellectual capital reporting across firms in different countries.

Research design

This study takes the form of a longitudinal study of a single reporting entity (Lincoln and Guba, 1985; Ryan *et al.*, 2002). The subject of this study is the sustainability sections of the annual reports of Denel (Pty) Limited, the largest manufacturer of defence equipment in South Africa. The selection of Denel for this study was predicated on the following:

- As an armaments manufacturer, Denel can be grouped with other companies traditionally seen as being "bad" corporate citizens. As arms manufacturers are supported by their principle customer, that is government, Byrne (2007) argues that they see themselves as being outside the purview of CSR.
- Over the period of the study the annual report has undergone some changes. The first formal sustainability report was produced in the 2008 reporting period as the first step towards fully complying with the Global Reporting Initiative (GRI) requirements (Denel (Pty) Limited, 2008).
- The South African Government considers Denel to be the custodian of South Africa's technological capabilities and a driver of skills development in the engineering and high technology disciplines (Denel (Pty) Limited, 2007, p. 2).

All the annual reports for the period under review were available electronically on the Denel web site. The management of Denel has complete editorial control over the content of the annual report including the sustainability section. Additionally, the annual report, and by association the sustainability report, is arguably the most widely distributed accountability document produced by Denel. Although the 2007 annual report did not contain a formal sustainability report, it included sections that formed parts of subsequent sustainability reports.

The annual reports for 2007-2011 were available in pdf file format from the Denel web site (www.denel.co.za/annual_report.html). The sustainability reports increased in page length from 18 in 2007, to 39 in 2008, to 69 in 2009, to 85 in 2010 before reducing to 66 in 2011. The report style changed from 2009 with increased use of background colour and design elements. Diagrams and graphs were included in the sustainability reports from 2011.

The pdf files were downloaded and the sustainability report sections converted into separate Microsoft Word™ files. Text included in tables such as those that detailed significant risks to Denel together with the initiatives and controls implemented to mitigate them, as well as the tables detailing the company's engagement with stakeholders during the financial period, were included in the analysis. Photographs and tables containing only numbers, such as the value-added statement and ten-year review, were excluded. Sentences that made reference to tables or figures in the sustainability report, other sections of the annual report or the GRI content index did not form part of the analysis.

CATPAC II™ software

The computer assisted textual analysis program used in this study is CATPAC II™. This is a self-organising artificial neural network software program used to identify the unique concepts that are the subject of the analysis (Woelfel, 1998; Green *et al.*, 2000). These unique concepts are described by Schmidt (2001, p. 104) "as those words that carry valuable information or content concerning the phenomena under study". The software scans the text document to determine the patterns of similarity based on how often particular words are used (Woelfel, 1998). After scanning, the program builds a neural network based on the grammatical classification of words and syntactic patterns of language it has in its memory (Woelfel, 1998). A scanning window of n words, where n is the parameter set by the user, is run through the text (Salisbury, 2001; Schmidt, 2001). A neuron is assigned to each major word in the text. The neuron representing a word becomes active when that word appears in the window, and remains active for as long as the word remains in the window. Contingency theory suggests that where two or more neurons are active simultaneously, the connection between them is strengthened (Woelfel, 1998; Jörgensen, 2005; Thomas and Mills, 2006). Neurons that appear in the jth window but are absent in the jth + 1 are weakened meaning the connections between words are weakened (Schmidt, 2001; Jörgensen, 2005) simulating what happens in the human brain. At the end of its processing, CATPAC II™ moves its matrix of strength of concept connections into clustering and multidimensional scaling programs enabling the spatial relationships among words to be visualised (Malhotra and Peterson, 2001).

A number of steps must be taken before the program is run. These involve identifying the dataset, selecting the number of key words to be used in the analysis, making decisions on the setting of parameters in the software, and preparing the data. This process is considered in more detail in the paragraphs that follow.

Data preparation

The texts were read to identify grammatical variants (derivatives) of the same stem or root of a word (plural, singular, verb or noun, etc.). This identification was necessary so as to ensure that a uniform way of spelling alternative grammatical variants of the same stem or root of a word (plural, singular, verb or noun, etc.) can be decided on (Schmidt, 2001). In this analysis examples include "skill" and "skills" which were standardised as "skills", "group" and "group's" became "group" while "risk and risks" became "risk". Abbreviations contained in the text were also treated in the same way. For example, "CEO"; "CEOs" and "CEO's" became CEO. Where abbreviations were used care was taken to ensure the same abbreviation was used in all texts. The five datasets were also examined for synonyms and homonyms. There were no synonyms in the five data sets that required attention. Within the datasets homonyms included the word "management" which had different meanings. While it was primarily used to refer to the risk management, it also referred to individuals who participated in the management of the company. Where the word "management" referred to individuals the word was replaced with "managers". Where the words "South African" referred to individuals rather than the country, it was replaced with "SouthAfrican". Finally the datasets were read to identify any non-keywords that contain a negative value orientation, such as: not; no; never; bad; miss; hate; dislike, as they may bias environing keywords (Schmidt, 2001). Neither dataset contained negative value orientation words. Finally, CATPAC II™ has an exclusion file made up of words that do not contribute to the analysis. These include prepositions, articles, conjunctions and adverbs. When the software program reads the data, the words or concepts in this exclusion file do not form part of the analysis.

The number of unique concepts required for the analysis of both datasets was set at 40 as this was considered appropriate for optimal interpretability (Samkin and Schneider, 2008). Additionally, as the five datasets were going to be subject to a comparative analysis, the greater the number of unique concepts the more likelihood there was of concepts being common to both datasets. The window size[3] was set at five and the slide size[4] at one.

Results

The analysis of the five sustainability reports is structured as follows. Portions of the 2007 annual report that included sections that formed parts of subsequent sustainability reports are discussed first to provide an initial frame of reference. The results of the analysis of the 2008-2011 sustainability reports are then considered. An alphabetically sorted list of key words from the sustainability sections of the 2007-2011 annual reports is provided in Table III.

The descriptive statistics are detailed in Table III. Total words are the number of unique words in the text. Total episode is the total number of windows used in the analysis, while total lines refer to the total number of lines in the text analysed. The terms "threshold", "restoring force", "cycles", "function", and "clamping" provide a record of the network parameters used in the analysis. Threshold refers to the level at which a neuron is activated. The lower the threshold the more likely it is for neurons to become active, while the higher the threshold the less likely it is that neurons will be activated. After the inputs to any neuron have been transformed by the transfer function they are summed and, if they exceed a given threshold, that neuron is activated; otherwise it remains inactive. The default threshold level of 0.000 was used in the analysis.

	2007				2008				2009				2010				2011			
Total words	700				1279				3234				4687				3050			
Total episodes	696				1275				3230				4683				3046			
Total lines	254				677				1661				1863				1366			
Threshold	0.000				0.000				0.000				0.000				0.000			
Restoring force	0.100				0.100				0.100				0.100				0.100			
Cycles	1				1				1				1				1			
Function	Sigmoid (−1- + 1)				Sigmoid (−1- + 1)				Sigmoid (−1- + 1)				Sigmoid (−1- + 1)				Sigmoid (−1 − + 1)			
Clamping	Yes				Yes				Yes				Yes				Yes			
Word	FREQ	PCNT	CASE FREQ	CASE PCNT	FREQ	PCNT	CASE FREQ	CASE PCNT	FREQ	PCNT	CASE FREQ	CASE PCNT	FREQ	PCNT	CASE FREQ	CASE PCNT	FREQ	PCNT	CASE FREQ	CASE PCNT
Apprentice	9	1.3	41	5.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Arc	14	2.0	60	8.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Audit	–	–	–	–	15	1.2	59	4.6	–	–	–	–	–	–	–	–	–	–	–	–
BBBEE	–	–	–	–	–	–	–	–	46	1.4	183	5.7	–	–	–	–	–	–	–	–
Board	29	4.1	108	15.6	48	3.8	173	13.6	64	2.0	224	6.9	111	2.4	380	8.1	105	3.4	362	11.9
Business	25	3.6	101	14.5	57	4.5	269	21.1	196	6.1	864	26.7	153	3.3	706	15.1	155	5.1	694	22.8
Committees	21	3.0	77	11.1	37	2.9	126	9.9	55	1.7	212	6.6	84	1.8	323	6.9	55	1.8	204	6.7
Company	20	2.9	94	13.5	21	1.7	98	7.8	–	–	–	–	110	2.4	475	10.2	67	2.2	313	10.4
Compliance	10	1.4	50	7.2	35	2.7	147	11.5	68	2.1	289	8.9	–	–	–	–	–	–	–	–
Controls	9	1.3	45	6.5	–	–	–	–	–	–	–	–					43	1.4	201	6.6
Contract	–	–	–	–	24	1.9	87	6.8	73	2.3	276	8.5	–	–	–	–	–	–	–	–
Customer	–	–	–	–	–	–	–	–	64	2.0	243	7.5	–	–	–	–	–	–	–	–
DCLD	16	2.3	70	10.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Defence	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	1.3	169	5.5
Denel	50	7.1	204	29.3	39	3.0	169	13.3	287	8.9	1213	37.6	353	7.5	1465	31.3	241	7.9	971	31.9
Details	–	–	–	–	–	–	–	–	–	–	–	–	67	1.4	322	6.9	–	–	–	–
Develop	11	1.6	55	7.9	53	4.1	218	17.1	105	3.2	469	14.5	187	4.0	811	17.3	135	4.4	573	18.8
Directors	15	2.1	59	8.5	26	2.0	108	8.5	–	–	–	–	–	–	–	–	53	1.7	205	6.7
Effective	12	1.7	60	8.6	22	1.7	100	7.8	–	–	–	–	–	–	–	–	–	–	–	–
Employees	14	2.0	46	6.6	31	2.4	145	11.4	124	3.8	493	15.3	139	3.0	538	11.5	82	2.7	328	10.8
Engagement	–	–	–	–	–	–	–	–	–	–	–	–	67	1.4	303	6.5	–	–	–	–
Ensure	14	2.0	66	9.5	37	2.9	170	13.3	93	2.9	430	13.3	129	2.8	622	13.3	78	2.6	369	12.1
Entities	14	2.0	56	8.0	64	5.0	258	20.2	151	4.7	676	20.9	174	3.7	783	16.7	98	3.2	461	15.1
Environment	–	–	–	–	–	–	–	–	51	1.6	239	7.4	–	–	–	–	–	–	–	–
Environmental	–	–	–	–	–	–	–	–	41	1.3	172	5.3	121	2.6	472	10.1	83	2.7	346	11.4
Executives	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	41	1.3	189	6.2
Financial	16	2.3	73	10.5	23	1.8	105	8.2	–	–	–	–	–	–	–	–	49	1.6	233	7.6
Group	38	5.4	153	22.0	82	6.4	345	27.1	212	6.6	919	28.5	291	6.2	1276	27.2	167	5.5	716	23.5
Health	12	1.7	41	5.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Impacts	–	–	–	–	–	–	–	–	43	1.3	196	6.1	68	1.5	315	6.7	66	2.2	276	9.1
Implemented	9	1.3	38	5.5	29	2.3	137	10.7	63	2.0	298	9.2	100	2.1	473	10.1	47	1.5	226	7.4

(*continued*)

Table III.
Descriptive statistics and alphabetical sorted frequency word list from the five sustainability reports

Table III.

	2007				2008				2009				2010				2011			
Improvement	–	–	–	–	–	–	–	–	49	1.5	228	7.1	77	1.6	365	7.8	56	1.9	259	8.5
Includes	–	–	–	–	–	–	–	–	63	1.9	307	9.5	155	3.3	733	15.7	85	2.8	414	13.6
Industry	10	1.4	46	6.6	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–
Initiatives	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	61	2.0	274	9.0
Internal	16	2.3	70	10.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Key	–	–	–	–	–	–	–	–	42	1.3	186	5.8	94	2.0	443	9.5	–	–	–	–
Learners	21	3.0	50	7.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Level	13	1.9	65	9.3	17	1.3	80	6.3	–	–	–	–	73	1.6	341	7.3	–	–	–	–
Management	36	5.1	157	22.6	59	4.6	264	20.7	117	3.6	534	16.5	181	3.9	781	16.7	109	3.6	484	15.9
Managers	–	–	–	–	15	1.2	75	5.9	–	–	–	–	65	1.4	304	6.5	43	1.4	203	6.7
Part	9	1.3	43	6.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Performance	13	1.9	62	8.9	29	2.3	135	10.6	85	2.6	386	12.0	143	3.1	647	13.8	93	3.0	400	13.1
Place	–	–	–	–	–	–	–	–	–	–	–	–	74	1.6	350	7.5	–	–	–	–
Plans	–	–	–	–	–	–	–	–	–	–	–	–	78	1.7	357	7.6	47	1.5	209	6.9
Policy	–	–	–	–	20	1.6	91	7.1	57	1.8	252	7.8	93	2.0	422	9.0	41	1.3	187	6.1
Processes	13	1.9	65	9.3	37	2.9	179	14.0	60	1.9	280	8.7	69	1.5	329	7.0	49	1.6	230	7.6
Product	–	–	–	–	23	1.8	79	6.3	45	1.4	177	5.5	–	–	–	–	–	–	–	–
Programme	20	2.9	87	12.5	44	3.4	184	14.4	82	2.5	347	10.7	99	2.1	428	9.1	97	3.2	399	13.1
Progress	–	–	–	–	16	1.3	76	6.0	–	–	–	–	–	–	–	–	–	–	–	–
Provided	–	–	–	–	–	–	–	–	46	1.4	225	7.0	156	3.3	734	15.7	44	1.4	217	7.1
Report	13	1.9	59	8.5	58	4.5	218	17.1	136	4.2	531	16.4	170	3.6	755	16.1	94	3.1	395	13.0
Requirements	–	–	–	–	–	–	–	–	52	1.6	240	7.4	–	–	–	–	43	1.4	194	6.4
Responsibilities	9	1.3	43	6.2	20	1.6	98	7.7	45	1.4	202	6.3	96	2.0	452	9.7	69	2.3	322	10.6
Review	18	2.6	90	12.9	32	2.5	152	11.9	63	1.9	300	9.3	93	2.0	430	9.2	–	–	–	–
Risk	29	4.1	120	17.2	54	4.2	212	16.6	97	3.0	400	12.4	101	2.2	407	8.7	87	2.9	352	11.6
Safety	14	2.0	53	7.6	15	1.2	63	4.9	57	1.8	250	7.7	–	–	–	–	–	–	–	–
Schools	9	1.3	41	5.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Shareholder	–	–	–	–	17	1.3	68	5.3	–	–	–	–	–	–	–	–	–	–	–	–
Significant					16	1.3	69	5.4	–	–	–	–	–	–	–	–	–	–	–	–
Skills	–	–	–	–	18	1.4	78	6.1	46	1.4	207	6.4	82	1.7	344	7.3	50	1.6	212	7.0
Stakeholders	–	–	–	–	–	–	–	–	–	–	–	–	91	1.9	402	8.6	–	–	–	–
Strategy	18	2.6	85	12.2	31	2.4	147	11.5	84	2.6	395	12.2	119	2.5	551	11.8	72	2.4	310	10.2
Suppliers	10	1.4	37	5.3	–	–	–	–	45	1.4	172	5.3	–	–	–	–	–	–	–	–
Support	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	44	1.4	175	5.7
Sustainability	–	–	–	–	16	1.3	67	5.3	71	2.2	324	10.0	86	1.8	381	8.1	63	2.1	263	8.6
Systems	20	2.9	95	13.6	29	2.3	137	10.7	43	1.3	199	6.2	72	1.5	318	6.8	49	1.6	220	7.2
Targets	–	–	–	–	–	–	–	–	–	–	–	–	92	2.0	429	9.2	–	–	–	–
Training	22	3.1	84	12.1	–	–	–	–	46	1.4	185	5.7	–	–	–	–	56	1.8	229	7.5
Transformation	–	–	–	–	19	1.5	71	5.6	–	–	–	–	71	1.5	292	6.2	–	–	–	–
Various	–	–	–	–	19	1.5	93	7.3	–	–	–	–	–	–	–	–	–	–	–	–
Year	29	4.1	127	18.2	32	2.5	138	10.8	67	2.1	306	9.5	103	2.2	468	10.0	93	3.0	404	13.3
Wards method																				

Table III shows that for the 2007 sustainability report dataset there was a total of 700 words. There were 696 windows in the analysis, and 254 lines of text. The individual words are sorted alphabetically. The column FREQ details the number of times the particular word occurred in the text. The word PCNT is the percentage of time that particular word was used in the text. For example, in the 2007 sustainability dataset, the word "Denel" occurred 50 times and was used in 7.1 per cent of the text. The term CASE FREQ indicates the total number of windows in which a word was used. Table III shows that in the 2007 sustainability dataset the word "Denel" appeared in 204 or 29.3 per cent of the scanned windows.

Two-dimensional concept maps generated by the ThoughtView™ software package[5] together with the CATPAC II™ analysis were used to visualise the relationships between concepts. In a two-dimensional concept map, concepts that cluster in a space are read together as they represent "emergent meaning in the text" (Doerfel and Marsh, 2003, p. 221). Centrally located words represent dominant themes. A label that, in the opinion of the researcher, best represents the cluster theme was allocated to each cluster.

2007 annual report

Although no formal sustainability report was prepared in 2007, the annual report included sections that were incorporated in subsequent reports, as well as being covered by the King (2002) report on corporate governance. These included sections covering human resources; socio-economic development; supply chain and corporate governance. The two-dimensional representation of the unique concepts from the 2007 sustainability report is shown in Figure 1.

The training cluster is closely associated with Denel's training of "learners". This cluster focuses on Denel's contribution to socio-economic development and in particular

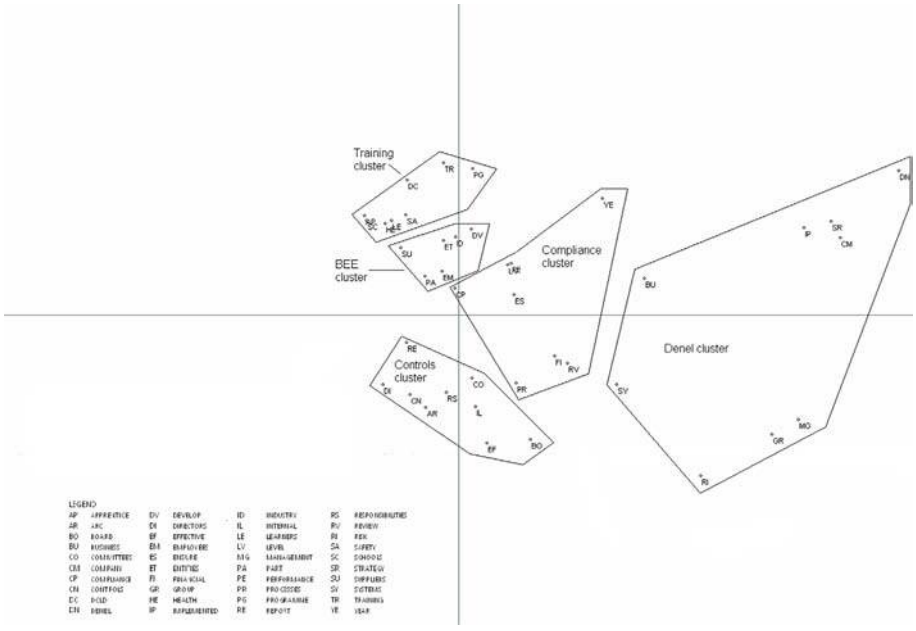

Figure 1.
Two-dimensional representation of unique concepts from 2007 sustainability report

its training initiatives. Details of the company's contribution to the Government's joint initiative for priority skills acquisition project, its accreditation as a training provider by the South African Civil Aviation Authority and the Transport Education Training Authority, the Denel Youth Foundation Training Programme (DYFTP), its apprentice and artisan training school, and schools outreach programme were provided. Additionally, as part of its enterprise risk management, Denel committed itself to promoting health and safety through various initiatives "including continuous education and awareness training" (Denel (Pty) Limited, 2007, p. 37). The following extract is illustrative of the health and safety concepts found in this cluster:

> Formal management systems are maintained throughout the Group to promote industrial safety and to mitigate health risks inherent to the workplace. Denel has established statutory health and safety committees at its operations where health and safety matters are discussed. With regard to occupational health hazards, the various entities have occupational health centres to conduct medical surveillances (Denel (Pty) Limited, 2007, p. 36).

The BEE cluster focuses on Denel's supply chain and in particular the difficulties facing BEE suppliers wishing to enter the high technology industry. Since the promulgation of the codes of good practice on broad-based black economic empowerment (B-BBEE), Denel has collaborated with the department of public enterprises (DPE) to produce a competitive supplier development policy. The policy sought to address B-BBEE challenges, increase local manufacturing, as well as the competitiveness of local industry (Denel (Pty) Limited, 2007). The cluster is associated with employee participation and empowerment. As Denel explains: "The Group believes that economically viable and self-sustaining employment equity is an essential part of good corporate governance and promotes the empowerment of its employees through participative structures" (Denel (Pty) Limited, 2007, p. 34).

The controls cluster is associated with corporate governance. The cluster emphasises the purpose of board committees, the composition of the audit and risk committee, as well as the role this committee plays in the financial reporting process. The cluster confirms that the responsibility of the audit and risk committee is to safeguard group assets, and maintain adequate accounting records and effective systems of internal control.

The compliance cluster focuses on the responsibility that Denel as a state-owned enterprise has to ensure that adequate processes were in place to ensure conformity with PFMA as well as other legal and regulatory requirements, which includes the different business entity levels within Denel. Consistent with compliance this cluster is also associated with the performance of management during the year under review. As an example "Management is held accountable through quarterly reviews of their performance against the targets" (Denel (Pty) Limited, 2007, p. 32).

The final cluster is the Denel cluster. This cluster comprises four of the five most frequently occurring words in the dataset. The concepts in this cluster are associated with the systems Denel has in place for the management of risk within the company and group. As Denel explains:

> As a global player operating in a highly competitive commercial business environment, Denel has developed and implemented a formal and effective process of risk management. The company's primary risk management objective is to protect the interests of stakeholders and to ensure sustainability of the business and compliance with legal and regulatory requirements.

> In keeping with its macro strategy, notably the unbundling of the business, Denel reviewed its risk management strategy, which outlines accountability and various roles for risk management throughout the Group (Denel (Pty) Limited, 2007, p. 36).

Denel's implementation of various strategies including the creation of stand-alone businesses and the building of a skills base for engineering and high technology industries also forms part of this cluster.

2008: the first formal sustainability report

The 2008 annual report was the first to include a formal sustainability report aimed at its broader stakeholder community. Although this report was the first step towards fully complying with the GRI requirements (Denel (Pty) Limited, 2008, pp. 4 and 23), it was not subject to formal audit or independent verification. Denel acknowledged that as the first sustainability report, the processes necessary to improve firm objectives and targets against which business entities and subsidiaries will be measured will be improved. Denel saw the information contained in this report as showing a commitment to communicating with its "broader stakeholder community" (Denel (Pty) Limited, 2008, p. 23). The rationale for the report can be determined from the "profile" section of the annual report. Here Denel explains that the sustainability report "considers the economic, environmental, social and technical performance of the Group for the financial year under review, and is the first step towards fully complying with the GRI requirements" (Denel (Pty) Limited, 2008, p. 4). The two-dimensional representation of the unique concepts from the 2008 sustainability report is shown in Figure 2.

The regulatory cluster emphasises that senior managers are responsible for complying with all regulatory requirements, as well as the overall functioning of the organisation. This was achieved through an effective internal audit process under the auspices

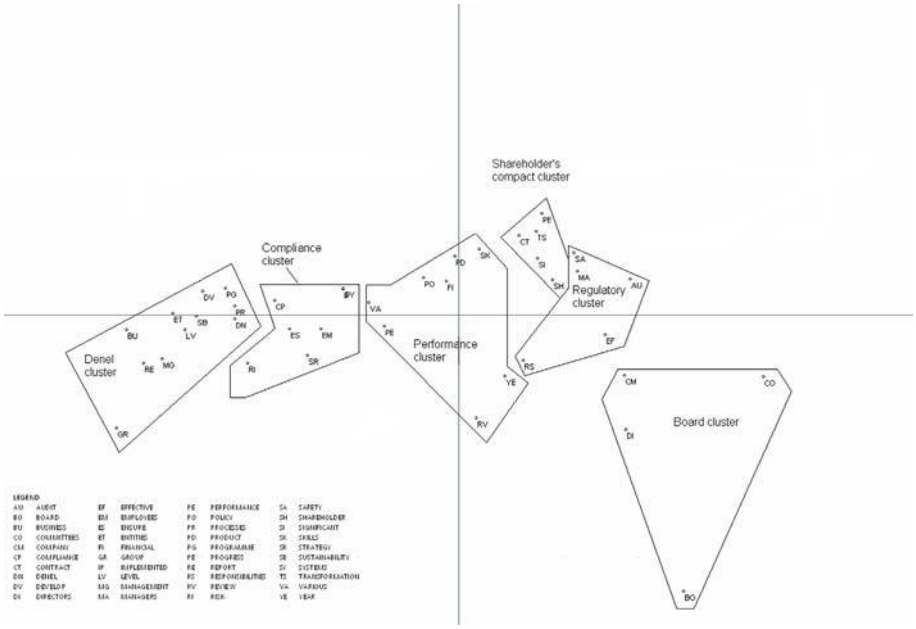

Figure 2.
Two-dimensional representation of unique concepts from 2008 sustainability report

of the group audit and risk committee that ensures compliance with the PFMA and treasury regulations. The cluster also focuses on safety, health and environmental audits undertaken by companies within the group so as to comply with ISO 14001 certification.

The shareholder's compact cluster refers to the compact between the sole Shareholder represented by the Minister of Public Enterprises and Denel. The compact defines, confirms and strengthens the company's objective, strategic objectives and key performance areas and indicators used to measure the company's performance. The compact also requires the company to report to the Shareholder on progress made with transformation. In the content of this sustainability report, transformation involves the creation of a new culture where performance and delivery are viewed as drivers of success. This success includes progress being made with signing of significant new contracts with overseas clients as well as improvement in contracting and contract management. Further, the Shareholder's compact requires Denel to report to the Shareholder that the company is complying with all relevant legislation as well as confirming that the B-BBEE CoGP has commenced as part of the transformation programme.

The concepts in the board cluster are associated with the Board of Directors as well as the different committees such as the group audit and risk and transformation committees in place to assist the board in discharging their duties. This point is clarified in the sustainability section of the annual report as follows:

> Board committees assist the Directors to discharge their duties. The composition of the Board committees and their terms of reference are reviewed from time to time with a view to keeping them current. The committees have due regard to their roles as advisory bodies, except in instances where the Board has delegated specific decision-making powers to them. The Board is regularly informed of the activities of the various committees and of the proceedings of committee meetings (Denel (Pty) Limited, 2008, p. 69).

The performance cluster focuses on the financial and operational sustainability of the company. From a financial sustainability perspective the concepts refer to the performance of the company for the financial year under, as well as including, the ten-year review. The concepts are also associated with the operational sustainability of the company as they are associated with the role played by the company in advancing the government's socio-economic development objective. This includes developing policies and strategies to retain the appropriate skills for the required for the business as well as the development of high technology products to ensure the sustainability of the industry.

The Denel cluster is the largest of the clusters in that it comprises 11 concepts as well as eight of the top ten. This cluster provides the framework for the sustainability report including what the company terms "high level issues" (Denel (Pty) Limited, 2008, p. 23). The sustainability report also provides the broader stakeholder community with information on the activities of each business unit. This cluster focuses on Denel's role as a "major global player" (Denel (Pty) Limited, 2008, p. 23), as well as its contribution to the development of the country. As a group, the company acknowledges:

> [. . .] its responsibility regarding the sustainability of the economic, environmental, and social conditions. To this end, it has embarked on a process of developing a policy and aligning structures to incorporate performance at various levels in line with the elements of sustainability reporting (Denel (Pty) Limited, 2008, p. 23).

This cluster also focuses on the sustainability vision and the role the group plays in the advancement of the Government's socio-economic developmental objectives.

These include the "introduction and distribution of new technologies, business processes and standards to the manufacturing sector and in the development of small- and medium-sized business enterprises" (Denel (Pty) Limited, 2008, p. 23), as well as the management of significant risks to the group.

The compliance cluster emphasises the ethics and legislations section of the sustainability report including details of Denel's compliance with laws and regulations including the PFMA, B-BBEE codes, the Employment Equity Act, the Labour Relations Act and the National Conventional Arms Control Committee (2002). These require the company to implement effective compliance systems. Additionally this cluster emphasises the importance of Denel's ethics policy. These systems ensure that each business entity within the group identifies high-risk areas such as fraud and corruption and implements a policy to counter them. The fraud prevention policy, which identifies high-risk areas, is made available to employees when joining the company. Additionally, the implementation of a whistle-blowing system for the reporting of fraudulent activities and cases of unethical behaviour in a secure and confidential manner is detailed.

2009 sustainability report

Denel saw its second sustainability report as:

> [. . .] providing a balanced, transparent and understandable view of Denel's sustainability activities, during the year. It includes the group's contributions to the economic, social and natural environments in which it conducts its business (Denel (Pty) Limited, 2009, p. 55).

The report, which followed a similar structure to that of the previous year, was not subject to formal audit or independent verification. The company acknowledged that as its sustainability strategy had not yet been formalised and all data measurement techniques were not in place, the report might contain limitations. The two-dimensional representation of the unique concepts from the 2009 sustainability report is shown in Figure 3.

The B-BBEE cluster focuses on the role that customer and supplier relationships have with sustainability. The company sees care for its customers as being reflected in group values. From a customer perspective, sustainability of the group will be enhanced through product and business system innovations which build long-term relationships. Although Denel required all supplier entities to be fully compliant with the requirement of the CoGP as set out in the B-BBEE legislation, the company acknowledges the difficulties associated with this requirement. As the company explains:

> Although the business entity makes an earnest effort to identify and develop B-BBEE suppliers, the complexity of the products required, together with the small quantities, makes it impossible to sustain a budding B-BBEE supplier base (Denel (Pty) Limited, 2009, p. 96).

The environmental theme in the sustainability report and the way the company deals with the impact that its operations have on the environment are associated with the environmental cluster. The nature of Denel's activities which includes explosives and chemical-related activities means that there is significant risk of environmental contamination. To overcome this, the company takes environmental considerations into account during the design phase of the group's products. Denel explains that its commitment to the environment extends beyond legislative compliance and is a core focus of sustainability efforts. A commitment, or improving transparency, on environmental performance was made. Each business entity developed a climate improvement plan

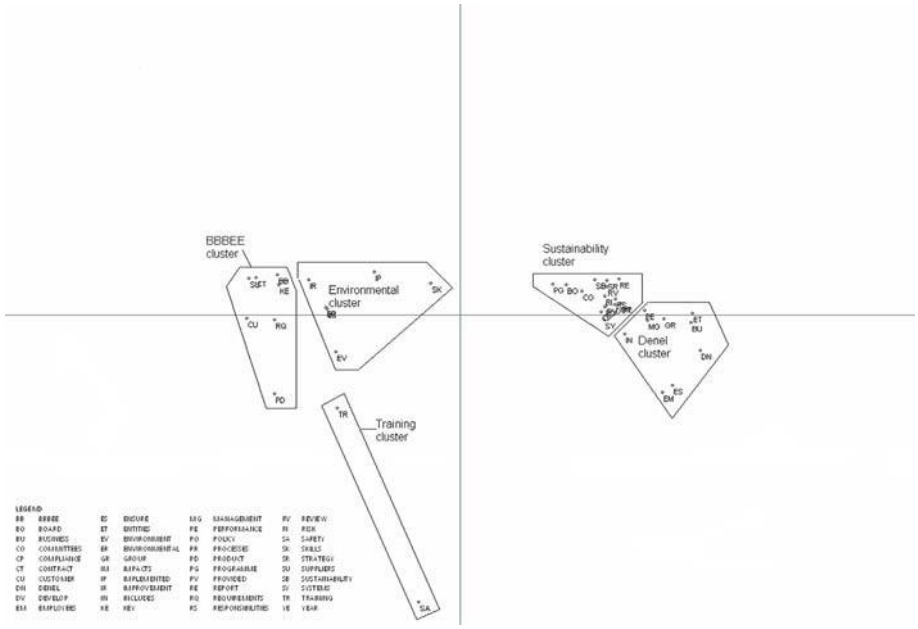

Figure 3.
Two-dimensional representation of unique concepts from 2009 sustainability report

which includes the implementation of programmes to reduce energy consumption, as well as effective disposal of hazardous waste (Denel (Pty) Limited, 2009). This area is summarised as part of Denel's environmental responsibilities policy as follows:

> Denel has an environmental management policy (EMP) which establishes the minimum principles and guidelines for which each business entity within the group has to base its own standards, systems and procedures. Its policy, therefore, is to ensure the health and safety of its employees in the workplace on all related aspects in the environment (Denel (Pty) Limited, 2009, p. 110).

The training cluster focuses on training and in particular the occupational health and safety training available to Denel employees. This cluster also focuses on the safety standards and requirements as well as the training facilities and venues Denel has available to its employees.

The sustainability cluster is the largest with 16 concepts. Two sub-clusters contribute to how sustainability can be understood in the 2009 sustainability report. The first sub-cluster emphasises corporate governance. It focuses on the roles of the various board committees including the group audit and risk committees that are in place to assist the directors' discharge their duties. This sub-cluster includes an evaluation of their compliance with legislation including the PFMA, B-BBEE CoGP, the Employment Equity Act, the Labour Relations Act and the National Conventional Arms Control Act. The second sub-cluster emphasises Denel's sustainability vision contained in the sustainability report. As the company explains:

> Denel's values, risk management, and business processes underpin its strategic approach to sustainability and reflect the desire of the group to preserve its future for all its stakeholders (Denel (Pty) Limited, 2009, p. 70).

Monitoring and reporting of sustainability issues is seen by Denel as an evolving discipline, meaning that, although the company's strategy, governance structures, policies and reporting processes including the Shareholder's compact had yet to be formalised, a number of processes and practices did exist to ensure that sustainability requirements were addressed (Denel (Pty) Limited, 2009). These include risk management processes including the controls and initiatives put in place to respond to the key risks as well an EMP.

The Denel cluster comprises eight of the ten most frequently used words in the 2009 sustainability report including the top six. This cluster focuses on the Denel group as a business entity. From a corporate governance perspective, the cluster provides a focus on how the group is managed. From a sustainability perspective, the cluster provides a focus on the framework for the report including the importance of economic performance of the group, the role of employees and the management of their performance. The following example found in the sustainability report section of the annual report is consistent with this position:

> Denel's vision and values form the basis of the culture that the group wishes to achieve, namely a culture of operational excellence, integrity, innovation, caring and accountability. Ethical business conduct is fundamental to expanding the group's global presence and increasing shareholder value. A performance management system was introduced during the previous financial year. All managers were trained and consultation took place with organised labour. Employees receive feedback on performance at least bi-annually and personal development plans are drawn to ensure that employees' career development objectives are met. The performance management system has been adequately embedded in the group to ensure a culture of performance and achievement of goals (Denel (Pty) Limited, 2009, p. 110).

2010 sustainability report

Denel explains that the 2010 sustainability report is based on GRI guidelines and leading practice within the defence and aerospace industry (Denel (Pty) Limited, 2010, p. 51). The report leads with what can be viewed as Denel's rationale for sustainability reporting, that it cares about the "sustainability of our planet" (Denel (Pty) Limited, 2010, p. 50). It continues by stating that its sustainability vision is "aligned to the group's objective of being a respected world-class partner in aerospace, landward, as well as specific maritime defence technologies and associated manufacturing capacity" (Denel (Pty) Limited, 2010, p. 50). As with the 2009 sustainability report, the company claims that the 2010 report sets out to provide a balanced, transparent and understandable view of the sustainability activities during the year under review. As the first annual reports prepared under the King (2009) requirement, Denel took cognisance of the integrated reporting requirements expected of "a responsible organisation committed to good governance and accountability" (Denel (Pty) Limited, 2010, p. ii). Drawing on King (2009), Denel acknowledged "that sustainable business practices are a moral imperative that require innovation, fairness and collaboration, as well as an economic imperative" (Denel (Pty) Limited, 2010, p. 50). Values and an ethics policy were identified as influences and guides to business practices and behaviours in respect of sustainability objectives and performance. As in previous years the report had not been independently assured. The two-dimensional representation of the unique concepts from the 2010 sustainability report is shown in Figure 4.

The smallest cluster comprising just three concepts is the sustainability cluster. This cluster links sustainability and corporate governance including the role played by

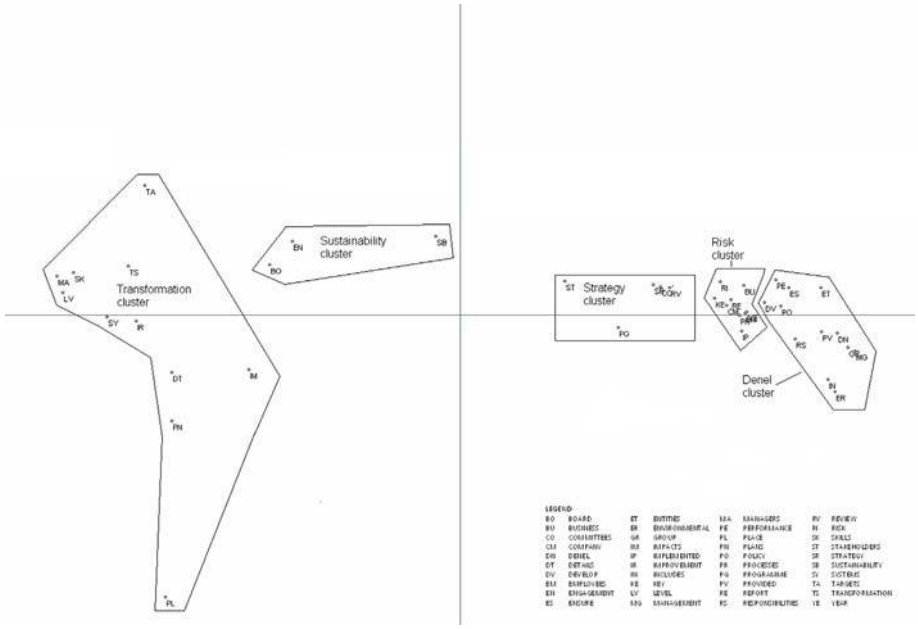

Figure 4.
Two-dimensional representation of 2010 unique concepts

the board, in particular evaluating how the board has performed in respect to governance which includes stakeholder engagements, communications and the formalised sustainability reporting processes.

The transformation cluster provides an overview of the process and how it is managed. The commitment to the transformation process is demonstrated through a description of programmes including B-BBEE objectives across the group. The management of the transformation process including the policies and systems and the role of managers is described. These include focusing on a representative workforce through diversity at senior and middle management level as well as describing the accelerated training and development of previously disadvantaged employees to achieve business and social transformation, and skills development. Transformation of supplier management is also emphasised in this cluster with Denel stating its commitment to supporting and developing local suppliers, thereby contributing to the country's national development and transformation goals.

The third cluster focuses on risk and in particular the group audit and risk committee and risk governance. From a corporate governance perspective, the group audit and risk committee reviews and reports on the effectiveness of the company's internal control systems, safeguards company assets, and implements new systems. A risk assessment process, the management strategy for managing risks as well as an annual risk review, are the responsibilities of the group audit and risk committee. The risk governance section of the sustainability report deals with the plans in place to address key strategic risks identified during the year under review. These plans include implementing succession planning and mentoring, skills development, talent management and skills retention programmes for employees to address the loss of critical skills.

The Denel cluster comprises eight of the top ten concepts including the top five. This cluster has as its primary focus the environmental responsibility section of the sustainability report. In this section Denel acknowledges its responsibility to "protect, manage and rehabilitate the environment in which it operates and the role it has to play as a corporate citizen in achieving ecological sustainability" (Denel (Pty) Limited, 2010, p. 113). The way the group is responding to the global environmental crisis is detailed. As Denel explains:

> Denel strives to be a good corporate citizen committed to responsible environmental practices. Identified environmental risks are managed as part of the group's risk management processes, with management systems implemented across the group to address and mitigate any risks and environmental priorities (Denel (Pty) Limited, 2010, p. 113).

The environmental policies and management systems, including the group EMP used to manage the environmental impacts at entity level, are detailed. They include group performance against key related policies, plans and directives in place across the group, as well as the rationale/purpose of the policies.

The strategy cluster focuses on the stakeholders' engagement section of the sustainability report. The company recognises that effective stakeholder engagement is vital as the company continues to implement its turnaround strategy. To achieve this end, it is necessary to engage with key stakeholders in a meaningful and coordinated manner. Doing so includes communicating the awareness, conservation, wellness, savings and transformation programmes to various stakeholders. The strategies and reviews put in place by Denel during the year under review to achieve them are also detailed.

2011 sustainability report

In its 2011 sustainability report, Denel explained its conviction that long-term sustainability was integrally linked to caring for community, employees and the environment. In supporting this position Denel explained that it aims to conduct its business in a sustainable manner by making positive contributions to its economic, social and natural environments, and ensuring the responsible use of scarce natural resources (Denel (Pty) Limited, 2011, p. 56). Business process would take into account all aspects of sustainability including safety, health, environment, quality and social issues. As in previous years the report was not independently assured. Denel explains the importance with which it views sustainability reporting as follows:

> The monitoring and reporting of sustainability demonstrates a serious commitment to sustainable development, whilst maintaining and strengthening trust with internal and external stakeholders. Complying with sustainability development requirements including reporting is 'the right thing to do' and is in line with Denel's values (Denel (Pty) Limited, 2011, p. 56).

The two-dimensional representation of the unique concepts from the 2011 sustainability report is shown in Figure 5.

The board cluster is associated with the corporate governance process and in particular focuses on the role that the board of directors has in ensuring that an adequate and effective governance process is established and maintained. This cluster also deals with the board composition comprising executive and non-executive directors. Additionally, it deals with the role and responsibilities of the committees of the board including the policies and processes in place to ensure the board complies with legal requirements as well as their relationships with managers charged with running the company.

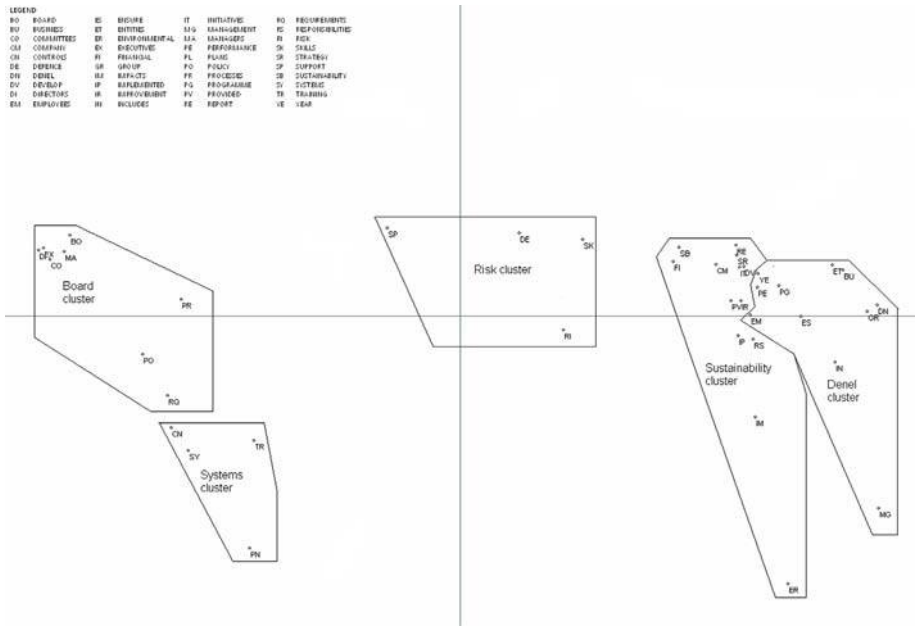

Figure 5.
Two-dimensional representation of unique concepts from 2011 sustainability report

The systems cluster focuses on the system of internal controls to assist the board in managing the significant group risks. This cluster is also associated with the various training programmes run by the company including the requirement that key personnel complete training on system audits including legal compliance and incident investigation.

The Denel cluster comprises seven of the top ten concepts. This cluster is primarily associated with the human resources and transformation section of the sustainability report. This section focuses on the human resource strategies developed by Denel and the business entities comprising the group to ensure that the business objectives and plans for the year are achieved. The cluster also focuses on the company leadership and management development programme as well as other programmes put in place to ensure that employees realise their full potential. The performance management and reward system payable to employees of the group, programmes in place to support HIV/AIDS, employee skills development initiatives, as well as leadership and management development undertaken during the year, are detailed in this cluster.

The sustainability cluster is the largest of the clusters. Three sub-clusters contribute to the understanding of sustainability. The first sub-cluster refers to the development and implementation of various strategies by the company to ensure that the business objectives and plans are achieved. These strategies include key socio-economic development and enterprise development initiatives, including climate improvement objectives. Details of these are provided in the various sections of the sustainability and annual report. The second sub-cluster focuses on the environmental issues Denel considers important. These include implementing training programmes to ensure that employees are aware of what the company terms "environmental liability" and that they understand their responsibilities to minimise the liability that may arise from

their conduct. Employees are also made aware of the importance of conforming to the environmental management system, the related impacts associated with their work, as well as the roles and responsibilities each one has in respect of the environment (Denel (Pty) Limited, 2011, p. 105). The final sub-cluster confirms Denel's view that financial success is central to long-term sustainability. This view is illustrated in the sustainability report as follows:

> Denel is convinced that long-term sustainability is integrally linked to our caring for community, employees and the environment. This conviction is reflected in every financial and economic decision that is made by the group (Denel (Pty) Limited, 2011, p. 56).

The risk cluster focuses on risk management and in particular the risks associated with shortages of engineering, science and technical skills necessary to support the defence industry. To facilitate skills development a number of initiatives, including training and development interventions as well as financial support provided to learners, are reported. The link between skills development and sustainability is explained by Denel as follows:

Denel understands the intrinsic link between skills development and long term business sustainability. This industry requires, to a large extent, unique technical skills that are largely not available in the market. Denel has developed a comprehensive skills attraction, development and retention strategy to support the growth strategy of the group. The challenge remains that of implementing such strategies whilst the group continues to post losses (Denel (Pty) Limited, 2011, p. 69).

Denel sustainability reports – measuring the differences

Although the two-dimensional perceptual maps of the sustainability reports provide useful information, the arbitrary orientation spaces cannot be compared as they do not have their own coordinates or share a common orientation. An accurate comparison can be made only if the two coordinate files share a common orientation through the rotation of the datasets (Woelfel, 1998; Woelfel and Barnett, 1992).

The rotation requires a reference frame to be established to serve as the standard against which the datasets are measured. The datasets are the five sustainability reports. As the data in these datasets sets was prepared annually, a straight comparison of them is inappropriate. The reason explains Chen (2004) and Woelfel and Fink (1980) is that reference frames change through time. In this paper, the 2007 Denel sustainability report is taken as the reference frame as it was the first sustainability report analysed in this study.

Rotating the data

Before rotation the list of concepts in the five sustainability reports coordinate files (CRD) are compared to identify those common to all datasets. To ensure that rotation takes place on the matched concepts only, those common to both datasets are "manually massaged" and placed in the same order in all files. A text editor program, Notepad™ was used to open each of the files and copy the data into a single Excel™ spreadsheet. As the information from the 2007 sustainability dataset was used as the reference frame, the concepts common to all datasets were rearranged so as to appear in the same order as the 2007 data. One example of manual adjustments made was moving the concepts "board", "business" and "committees" in the 2008-2011 data sets to rows three to five (the row numbers of the 2007 dataset). The 2007 dataset and the reordered 2008-2011 datasets were then saved in a single ASCII text file.

With the common concepts appearing in the same rows for all datasets, the matched concepts can be rotated. A rotator program, MicroRot™, was used to undertake the rotation. This program rotates data files so that common concepts created under two or more reference frames can be compared (Samkin and Schneider, 2008). The series of coordinates is taken as inputs and they are rotated until a common orientation is shared (Hsieh, 2004, p. 64). The 2008-2011 coordinates were rotated until the concepts were as close as possible to the location of the concepts in the 2007 sustainability reference frame without the distances being changed (Hsieh, 2004; Woelfel and Murero, 2005). After rotation, any differences remaining between the concepts common to both standards are real differences, not differences due to different reference frames (Chen, 2004).

An additional coordinate file is produced for the rotated data. The variances or the distances between the matched concepts in the datasets, as well as information on the correlations among the concepts (row) position vectors, are generated.

Comparing the datasets

After rotation, the coordinates in the five datasets have the same reference frame. Although the five sustainability reports' datasets each contain 40 concepts, the rotation is based on the 20 concepts common to all datasets. When reviewing the concepts, only the distances between the concepts common to all datasets are measured. The Riemannian (a mathematical framework used to describe curved shapes of any dimension) distances the 20 common concepts moved between the five sustainability reports datasets is detailed in Table IV.

The stability of the locations of each of the common concepts between the five datasets is detailed in Table IV. It shows the shortest path distance between each concept in a dataset and its counterpart in an adjacent dataset (Woelfel *et al.*, 1979; Woelfel and Fink, 1980). The mean distance of 0.62 units between all points in the 2007 sustainability report and the 2008 sustainability report represents the sum of the distances between the common concepts in the 2007 and 2008 sustainability report, while the mean distance of 0.73 units between all points in the 2008 sustainability report and the 2009 sustainability report represents the sum of the distances between the common concepts in the 2008 and 2009 sustainability report. For individual concepts the smaller the distance between the datasets, the more stable they are. "Ensure", with a distance of 0.17 units from the 2007 to 2008 sustainability report, is the most stable of the concepts. Additionally this concept is the most stable over the five datasets. With a distance of 1.08 units from the 2010 to 2011 reports the concept "committees" is the least stable.

The measure of agreement between the common concepts in the five datasets is provided in Table V. Correlations measuring the agreement between the rows corresponding to common concepts of the matrices representing the spaces in the 2007 sustainability to 2011 sustainability report datasets are detailed in Table V. A high correlation for any row with the equivalent row in another dataset indicates that the concepts corresponding to these rows lie in the same direction (Woelfel *et al.*, 1979). For example, the values in the columns "Correlation" and "Angle" are the variances between the same concepts in the 2007 sustainability report when compared to the 2008 sustainability report. The size of the correlations and angles illustrates the extent of the differences in the common concepts between the two sustainability reports. The higher the correlation, that is the nearer to one, the closer the concepts are (Woelfel *et al.*, 1979; Woelfel and Fink, 1980). Additionally, the smaller the angle, the closer two

	Units			
	2008 sustainability data set	2009 sustainability data set	2010 sustainability data set	2011 sustainability data set
Board	0.61	0.95	0.84	0.30
Business	0.35	0.31	0.27	0.37
Committees	0.72	1.04	0.09	1.08
Denel	0.49	0.19	0.18	0.17
Develop	0.41	0.34	0.21	0.12
Employees	0.25	0.21	0.27	0.15
Ensure	0.17	0.19	0.16	0.12
Entities	0.45	0.23	0.22	0.15
Group	0.42	0.36	0.22	0.12
Implemented	0.51	0.62	0.74	0.14
Management	0.34	0.36	0.30	0.30
Performance	0.16	0.27	0.15	0.12
Processes	0.32	0.30	0.13	1.01
Programme	0.37	0.45	0.19	0.44
Report	0.65	0.48	0.16	0.18
Responsibilities	0.37	0.52	0.25	0.11
Risk	0.19	0.39	0.14	0.27
Strategy	0.43	0.37	0.10	0.32
Systems	0.24	0.23	1.13	0.38
Year	0.37	0.54	0.15	0.21
The mean distance between all points in the	2007 sustainability and 2008 sustainability report 0.62	2008 sustainability and 2009 sustainability report 0.73	2009 sustainability and 2010 sustainability report 0.75	2010 sustainability and 2011 sustainability report 0.67

Table IV.
Distances moved between the five data sets

concepts are. If a correlation of 0.70 or an angle of 30 is taken as a basis, the concept "employees" lies in the same direction over the five-year period. The concept "report" with a correlation of 0.377890 (angle 67.8) is the least stable concept when the 2007 and 2008 datasets are compared, while "strategy" with a correlation of 0.142928 (angle 81.8) is the least stable concept when the 2010 and 2011 datasets are compared.

After rotation the co-ordinates of the common concepts of all the sustainability reports have the same reference frame. A two-dimensional representation of the three concepts "Denel", "group", and "management" common to the Denel cluster over the five-year period is shown in Figure 6. After rotation none of the three common concepts overlaps. The concept "Denel" in the 2009-2011 datasets appears the closest on the two-dimensional map. It should be noted that the two-dimensional representation cannot be used to establish how close the concept in the 2008 data is to the 2009-2011 data. The reason is that Figure 6 is a two-dimensional rather than spherical representation. The units shown in Table IV (and projected in Figure 6) are Riemannian (a mathematical framework used to describe curved shapes of any dimension) distances. When using Figure 6 to compare distances between the concepts it should be noted that ThoughtView™ maps are graphs of the eigenvectors of the matrix of neural connections (synapses) and, as such, are linear functions of these connections. They are relative, not absolute measures, and are good to the ratio level. So, for example, if the concept

Table V.
Concept row vector correlations from 2007 sustainability report to 2011 sustainability report

Concept	[a]2007 Magnitude	2008 Magnitude	Correlation	Angle	2009 Magnitude	Correlation	Angle	2010 Magnitude	Correlation	Angle	2011 Magnitude	Correlation	Angle
Board	0.60	1.17	0.963165	15.6	0.25	0.907387	24.9	1.01	0.750522	41.4	1.18	0.973827	13.1
Business	0.55	0.55	0.800866	36.8	0.40	0.829270	34.0	0.22	0.769554	39.7	0.53	0.811849	35.7
Committees	0.59	1.24	0.940189	19.9	0.22	0.922508	22.7	0.19	0.927488	22.0	1.21	0.734325	42.7
Denel	0.79	0.51	0.795905	37.3	0.48	0.925412	22.3	0.43	0.930694	21.5	0.55	0.969081	14.3
Develop	0.43	0.45	0.577174	54.7	0.28	0.660998	48.6	0.29	0.722137	43.8	0.31	0.928561	21.8
Employees	0.50	0.49	0.872820	29.2	0.49	0.909447	24.6	0.26	0.919439	23.2	0.37	0.937931	20.3
Ensure	0.50	0.48	0.944018	19.3	0.49	0.924206	22.5	0.43	0.945353	19.0	0.48	0.971942	13.6
Entities	0.59	0.47	0.650533	49.4	0.38	0.874082	29.1	0.42	0.854126	31.3	0.47	0.949555	18.3
Group	0.67	0.69	0.809345	36.0	0.40	0.918753	23.3	0.47	0.881258	28.2	0.53	0.976631	12.4
Implemented	0.56	0.43	0.500940	59.9	0.97	0.894056	26.6	0.35	0.760687	40.5	0.47	0.981544	11.0
Management	0.72	0.61	0.880513	28.3	0.32	0.894063	26.6	0.48	0.785343	38.2	0.74	0.970530	13.9
Performance	0.46	0.50	0.946255	18.9	0.33	0.864575	30.2	0.37	0.917908	23.4	0.34	0.947408	18.7
Processes	0.56	0.42	0.818989	35.0	0.24	0.719196	44.0	0.28	0.895979	26.4	1.08	0.340614	70.1
Programme	0.53	0.44	0.722813	43.7	0.32	0.330815	70.7	0.39	0.883215	28.0	0.40	0.373113	68.1
Report	0.59	0.58	0.377890	67.8	0.24	0.572396	55.1	0.32	0.883458	27.9	0.29	0.827133	34.2
Responsibilities	0.52	0.70	0.850816	31.7	0.22	0.855827	31.1	0.37	0.748972	41.5	0.44	0.977827	12.1
Risk	0.68	0.58	0.968813	14.3	0.25	0.830021	33.9	0.32	0.903383	25.4	0.51	0.883082	28.0
Strategy	0.61	0.44	0.718014	44.1	0.16	0.592641	53.7	0.18	0.835278	33.4	0.29	0.142928	81.8
Systems	0.60	0.56	0.918788	23.3	0.37	0.962400	15.8	1.43	0.857112	31.0	1.13	0.983465	10.4
Year	0.55	0.72	0.918788	29.6	0.25	0.812277	35.7	0.22	0.806599	36.2	0.40	0.939595	20.0

Note: [a]2007 magnitude represents the length of the position vectors of the concepts of the 2007 sustainability report while 2008 magnitude represents the length of the position vectors of 2008 sustainability report that is the distance of the concepts from the origin

Figure 6.
Two-dimensional representation of the three common concepts in the Denel cluster over the five-year period

"Management" (MG09 and MG10) in the 2009 and 2010 sustainability report is considered to be three times as far apart as the concepts "Denel" (DN09 and DN10) in the same reports this result would mean they are three times as different.

Findings and discussion

Companies operating in South Africa are in a unique position in that sustainability considerations are rooted in the South African constitution. It forms the basic social contract that South Africans have entered into (King, 2009, p. 11). It is this social contract or licence to operate that is central to King (2002, 2009). It forms the ethical foundation of the report on corporate governance as its licence to operate is earned "from those affected by and effecting its operations" (King, 2009, p. 21).

Coupled with this, South Africa's past means that a focus of CSR is how socio-economic issues are addressed. This includes disclosing how economic access and other opportunities are provided to previously disadvantaged and excluded communities and how social transformation is occurring. Concepts such as transformation, equity and ownership then are important aspects of South African CSR (Popp, 2009).

The paper found that over the period of the study Denel aligned itself with the principles and philosophical aspects embodied in King (2002, 2009). This finding is evident from the pervasive influence the documents had on the preparation of the sustainability reports that form the subject of this study. The study found that all the themes highlighted in the hierarchical cluster analyses were linked to individual chapters contained in the different sections of King (2002, 2009). For example, an examination of the 2007 hierarchical cluster analysis shows that the "training", "BEE", and "health" clusters were linked to the "human capital" chapter of the "integrated sustainability reporting" section of King (2002).

Although Denel followed the principles and philosophies of King (2002, 2009) when preparing the sustainability report, the study found that the emphasis of the reports changed each year. This finding is consistent with management having editorial control over the content and responding to what they believe is important.

Although the sustainability reports were the subject of the study, the paper found that the concept "sustainability" did not appear in the 2007 hierarchal cluster analysis. This result was not unexpected as a formal sustainability report was not prepared. The concept appeared only once in the 2007 sustainability report and was associated with risk management. In the 2008 reporting period the concept appeared 1.6 per cent of the time and was associated with the "Denel" theme. From 2009 to 2011 the increased use of the term by management when preparing the reports ensured a "sustainability" cluster or theme in each reporting period. However, the study found the concepts comprising the "sustainability" cluster or theme changed annually. This finding should not be unexpected as it is consistent with the difficulties Denel management appeared to have with reporting of sustainability issues. The comment by Denel in the 2009 sustainability report that "The monitoring and reporting of sustainability issues is an evolving discipline within the group, and actions are being taken to formalise the company's strategy, governance structures, policies and reporting processes" (Denel (Pty) Limited, 2009, p. 61) supports this position.

While King (2009) embodied the principle of responsible leadership that the "natural environment and the livelihood of future generations" should not be compromised, the chapter on safety, health and the environment in the integrated sustainability reporting section of King (2002) also required managers to consider environmental issues when preparing CSR reports. Over the period of the study, the paper found increasing emphasis being placed on environmental issues. Environmental disclosures ranged from a third of a page in 2007 to 16 pages in 2010, before reducing to 11 pages in 2011. This increasing page length was found to be mirrored in the hierarchical cluster analyses. While the concept "environmental" did not appear in the 2007 or 2008 hierarchal analyses it appeared 1.3 per cent of the time in the 2009 sustainability report with its use doubling in the 2010 and 2011 reports. A possible explanation for the mounting coverage of environmental issues is management appreciating that wider stakeholder groups are taking an increased notice of the impact that Denel's operations have on the environment.

A relatively large number of common concepts were found over the period of the study, suggesting that the five datasets are closely aligned. However, the study found that the number of times the common concepts were used in individual sustainability reports changed. Additionally, with some exceptions, the concepts did not appear in the same cluster or theme in consecutive reporting periods suggesting the focus associated with the concept changed. However, a year-on-year examination of the concept row vector correlations from the rotational analysis of the 20 concepts common to all datasets found the majority of the concept correlations to be above the threshold of 0.7 over the period of the study. With the adoption of King (2009) in the 2010 reporting period, it would have been reasonable to expect that some difference would be found in concept correlations between the 2009 and 2010 reports. However, all the concept correlations were greater than 0.70. This finding suggests that there is little difference in the meaning between the common concepts over the period of the study.

Finally, Byrne (2007) argued that companies in the defence or armaments industry see themselves as being outside the purview of CSR. For this reason Byrne argues,

they do not make extensive use of CSR disclosures. The findings of this study contradict those of Byrne. Extensive CSR or sustainability disclosures were provided by Denel. This eventuality can be explained by its status as a public sector entity governed by the PFMA which required it to comply with King (2002, 2009).

Conclusion

The primary objective of this paper was to ascertain the extent to which sustainability disclosures in a strategically important South African company have changed in light of King (2009). Sustainability reports contain qualitative and quantitative information detailing the ways in which the reporting entity has improved its economic, environmental and social effectiveness and efficiency in the reporting period and integrated these aspects in a sustainability management system (Daub, 2007). How prepares of CSR or sustainability reports communicate and emphasise information over a period of time is therefore of interest to stakeholders groups, prepares and researchers.

From the perspective of Denel, sustainability focuses on financial, governance and transformation issues. Transformation issues include the introduction of skills development programmes to create a sustainable skills base, as well as talent identification and management programmes necessary for the long-term survival of the company. Although environmental issues were addressed in each report, increasing emphasis was placed on this area in the last three years of the study and in particular the year immediately following the publication of King (2009). The 20 concepts that were common over the period of the study were rotated and the differences measured. The rotation illustrated that on the whole the meanings of the concepts did not change substantially over the period of the study.

While a reading of the 2007-2011 sustainability reports provided an intuitive indication of the changes in emphasis over time, the artificial neural network software programme, CATPAC II™, assisted in articulating the differences. This fuller exploration/probing of the reports is possible as the software is able to link key concepts. Two-dimensional concept maps were used to interpret the clusters or themes arising from the analysis. The analysis and rotation were useful to identify how the emphasis of Denel's sustainability reports changed over the period of the study. The use of computer assisted textual analysis software such as CATPAC II™ has implications for future research. In South Africa both public and private sector companies adhere to King (2002, 2009). Additionally these organisations are required under legislation to report on transformation issues including the Employment Equity Act, Skills Development Act and B-BBEE CoGP. It is reasonable to expect that because of these requirements, sustainability reports prepared by private and public sector entities may appear similar. However, how the key concepts are used in the reports means that the emphases may differ. Any differences and the extent of the differences will be of interest to stakeholders groups, prepares and researchers as it will indicate how organisations in the different sectors view sustainability.

Notes

1. Armscor (Armaments Corporation of South Africa) was set up by the apartheid government in South African in 1968 to overcome the military arms embargo by and sanctions put in place and implemented by the United Nations.

2. Examples of products developed and manufactured by Denel include the Umkhonto-IR missile, a vertically-launched, high-velocity, infrared homing missile, the Mokopa a long-range, precision-guided tandem warhead anti-tank missile, the G6 155 mm self-propelled howitzer and G5 155 mm towed howitzer, the longest ranged guns in their class worldwide, and fifth generation A-Darter air-to-air missiles (www.denel.co.za/products_services.html).
3. The software operated by passing a moving window of size n through a text file. With a window size of five CATPAC II™ reads the text five words at a time. With a window size of five, words 1 through 5 are read then 2 through 6, then 3 through 7, etc. Each time a word is in the window, the neuron representing this word becomes active. Connections among active neurons are strengthened, so words that occur close to each other in the text tend to become associated in CATPAC II™'s memory (Woelfel, 1998; Doerfel and Marsh, 2003).
4. Slide size refers to the number of words the window skips prior to reading the text. By selecting 1, words 1 through 5 are read then 2 through 6, then 3 through 7, etc. (Woelfel, 1998).
5. ThoughtView™ is bundled with the CATPAC II™ software package.

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