UNIVERSITY OF KWAZULU-NATAL

Scenario Planning: The Future of Bosch Projects as Seen Through the Sugar Industry Lens

By:
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2025 1477 2

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DECLARATION

I, Mhlengi A Madiba, declare that

(i) The research reported in this dissertation/thesis, except where otherwise indicated, is my original research.

(ii) This dissertation/thesis has not been submitted for any degree or examination at any other university.

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a) their words have been re-written but the general information attributed to them has been referenced:
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Signature:

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Mhlengi Arthur Madiba

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- My gorgeous wife “Mouth”, isithandwa sami!
- My children Akhanya “Ben 10”, my first born, and his yet unborn siblings Khanya and/or Culo!
- Sithokozile, my mother, awekho ok’chaza what I think of you.
- Themb’nkosi, umalume, for being a positive role model for me no malumekazi ugogo ka Sa. My grandparents (MaMkhize no Macashisa), my other mother uThembaphi for the positive influence. My cousins (Ndu maka Geli, Pre, Gugu isdludla, Njebs unkosikazi ka Lebo, Sindi yebo mam, S’bu, Mesuli uyise kaJoji, JB, Mpume maka Shay’zandla, Mpume maka Zwi, Bonge, Nok’lunga and Bheki). The rest of the Madiba family for “making me right”.
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ABSTRACT

This research explores the application of scenario planning to an engineering and project management consulting company based in Durban, South Africa. Scenario planning is used to formulate possible scenarios that this company's main client industry/ market may face in the next ten years. This application provides an opportunity for the consultancy to test if it is necessary for it to start pursuing other markets in order to minimize risk associated with its core market and mostly it prepares the consultancy for opportunities and threats that may exist but is currently not aware of.

The research takes the following approach and sequence:

- **Introduction:** The section gives a background into Bosch projects and the sugar industry. It also places me in the context of the research.

- **Literature Survey:** In this section I review general thinking around strategy formulation, organizational learning, metaphors and system thinking. I also draw a link amongst these areas of learning.

- **Research Methodology:** This section presents the methodology I followed in conducting the research. The research started with conversations with research participants followed up with questionnaires. The questionnaires were supplemented with one- on- one interviews with the participants in order gain more clarity on their responses. Scenario planning exercises were conducted with Bosch Projects' management team and the sugar industry participants. Three scenarios were developed with BP and another three with the sugar industry. I developed two additional scenarios for each group for my own interest.

- **Results Analysis:** In this section I present the results of the research process. I start off by discussing the environmental scan analysis which describes the external environment within which the sugar industry operates. This discussion is informed by the results of the interviews with the participants. The general consensus was that the industry is faced with many positive possibilities. It also became clear that the industry is not taking full advantage of opportunities already available to them. In the same section I present the scenarios developed which highlight the challenges faced by the country and how they could affect the industry in the long term.

- **Conclusion:** I then close off the research by making a conclusion that Bosch Projects has a positive future when viewed through the sugar industry lens irrespective of which uncertainties materialize but there are key issues which the company must address in order to be prepared for any of the eventualities.

- **Value:** This research eventually revealed itself to be about learning to effectively lead a scenario planning session and what pitfalls to look out for when creating storylines. There is great value for people interested in finding progressive and well informed ways for strategy formulation.

This scenario planning research is grounded on the concepts of a learning organization and systems thinking as the core drivers

Table of Contents

TABLE OF ACRONYMS

B&A	Bosch and Associates
BAG	Bosch and Associates Group
BEE	Black Economic Empowerment
BMS	Bosch Management Services
BP	Bosch Projects
BPE	Bosch Projects Equipment
EE	Employment Equity
ISL	Illovo Sugar Limited
THS	Tongaat-Hulett Sugar
TSB	TSB Company
UCL	UCL Company Limited
UMC	UShukela Milling Company
SA	South Africa
SADC	Southern African Developing Community
SARS	South African Revenue Service
SASA	South African Sugar Association
SASTA	South African Sugar Technologists Association
SBA	Stemele Bosch Africa
SP	Scenario Planning

DEFINITION OF TERMS

The following terms and definitions are important to understanding the paradigm from which the research is being undertaken. Some definitions here are not complete but are sufficient for the purpose of meaningfully engaging this research:

Bagasse: The dry pulp residue left after the extraction of juice from sugar cane.
Source: http://oxforddictionaries.com
[Accessed: 15 October 2010]

By-Products: A by-product is a secondary or incidental product deriving from a manufacturing process, a chemical reaction or a biochemical pathway, and is not the primary product or service being produced. A by-product can be useful and marketable, or it can be considered waste.
Source: http://www.animalfarmers.com
[Accessed: 6 November 2009]

Co-generation: The process of producing electricity with the primary aim of self usage and selling of excess power to the national grid.

Ethanol: An alcoholic product produced from sugar cane, and other vegetation, which may be used for similar purposes as petroleum based fuels. Ethanol is a volatile, colorless liquid that has a strong characteristic odor. It burns with a smokeless blue flame that is not always visible in normal light. The physical properties of ethanol stem primarily from the presence of its hydroxyl group and the shortness of its carbon chain. Ethanol's hydroxyl group is able to participate in hydrogen bonding, rendering it more viscous and less volatile than less polar organic compounds of similar molecular weight.

Source: http://wiki.trytop.com/ethanol.html
[Accessed: November 2009]

Scenario Planning: The art of developing multiple plausible futures for an organization in order to be better prepared to take advantage or minimize risks should any of the critical uncertainties from the scenarios come to fruition.

Strategy: One perspective is that a strategy is a plan of action designed to achieve a particular goal. Strategy deals with the how part rather than the what. The word strategy has military connotations, because it derives from the Greek word for general.

Source: http://www.cwanswers.com/8921/strategy
[Accessed: November 2009]

System: A set of things working together as parts of a mechanism or an interconnecting network; a complex whole.
Source : http://oxforddictionaries.com
Accessed : 15 October 2010

CONFIDENTIALITY CLAUSE

October 2010

To Whom It May Concern:

RE: CONFIDENTIALITY CLAUSE

Due to the strategic importance of this research it would be appreciated if the contents remain confidential and not be circulated for a period of five years.

Sincerely

……..
MA Madiba

“Searching for the secrets of success reveals little about the world of business but speaks volumes about the searchers – their aspirations and their desire for certainty”

Rosenzweig (2008:173)

1. CHAPTER 1: INTRODUCTION

"Knowledge is a weapon, so I constantly keep reloading my tool"

Rapper Big Pooh
Delightful Bars Album

Research Goals Summary

In this research I propose to study how a client's future can have both a positive and negative impact on the future of a service provider, especially the so-called preferred service providers. I then propose that service providers should regularly perform long term view/ reviews of their clients in order to make sure that they are not hedging all their bets on a failing industry or declining market. I propose that scenario planning is a suitable methodology for this review process as it can provide a multi-perspective of one's future through engaging storylines. During the research I will also how critical it is for the facilitator to be fully conversant in the methodology in order to maximize value for the participants.

I focused my research lens on Bosch Projects (BP) and its relationship with the sugar milling industry especially the KwaZulu Natal based sugar millers.

In conjunction with the sugar industry participants and BP an environmental scan was performed with the aim of unearthing issues that directly and indirectly affect the sugar industry. As a guide to the external environmental scan; a strengths, weaknesses, opportunities and threats (SWOT) and a social, political, economic, competitive, regulatory and environmental (SPECTRE) guided environmental scan were performed. This process was separate for each participating organization in order to develop a multi layer perspective of the sugar industry as seen by the different participants. Scenarios were then developed by BP participants followed by the sugar industry participants. I proceeded to develop two additional scenarios on my own.

It was not the aim of this research to develop new strategies for BP and or the sugar industry but I hoped that the information developed would help them; especially BP; in questioning the assumptions that inform current strategies and help in developing well informed strategies for the future.

Problem Statement

With this research I aimed to apply the scenario planning (SP) approach to identify and generate several plausible future(s) of BP and the South African sugar industry in order to compare the impact of SP versus traditional strategy making methodologies.

I was aiming to find out whether the sugar industry will still be a profitable market for BP in the next ten years and if there were any opportunities or threats that BP is not aware of that the sugar industry was faced with. In order to answer this question we had to develop different plausible futures and then identify if BP's current abilities could take advantage of the opportunities presented by the future. The first three sets of scenarios were developed with the sugar industry participants even though it was not part of my original plan and another set of three was developed with the BP participants.

Research Questions

After unearthing the current status of the participating organizations and their operating environment, together with participants we applied SP in a real work context within BP in order to flesh out the following issues:

1. How does the future of the sugar industry look in the next ten years, when viewed through S.P?
2. How does the future of BP look in the next ten years, when viewed through S.P?
3. After the research SP sessions, would any of these organizations apply SP for future strategy making?
4. Relative to traditional strategy making methodologies how do these organizations view SP?

Questions four, and five below, were jointly answered with the sugar industry participants because BP could not accuartely answer it for the all the participating organizations. To get the responses for this question I had to conduct post research interviews with the participants.

At the end of the research there was an unplanned question that emerged in one of the many reflective stages that came up, which was:

5. Whether Bosch Projects, and therefore any service provider, was qualified enough to develop meaningful scenarios for the sugar industry, taking into consideration that it is their biggest market and that a number of employees are former sugar industry people?

The first four questions made up the core of this research but the fifth question which came towards the end of the research, made me query the validity of my assumption about service providers conducting scenarios for their core markets.

Background

The South African Sugar Industry

The South African sugar industry is one of the most competitive in the world; see Figure **1**, in terms of quality and cost of producing sugar per tonne. It is consistently ranked within the top 15 globally (South African Sugar Industry Directory; 2008/2009:8).

The SA sugar industry is largely based in the KwaZulu- Natal (KZN) province with only two sugar mills based in the Mpumalanga province which are owned and operated by the TSB Company Ltd (TSB).

The big industry players based in KZN are Illovo Sugar Limited (ISL), Tongaat-Huletts Sugar (THS) and then there are two farmer owned co-operatives which are UCL Company Limited (UCL) and UShukela Milling Company (UMC). UMC was previously a BEE owned company which was formed by buying two Illovo Sugar mills; Gledhow in Stanger and uMfolozi in Mtubatuba.

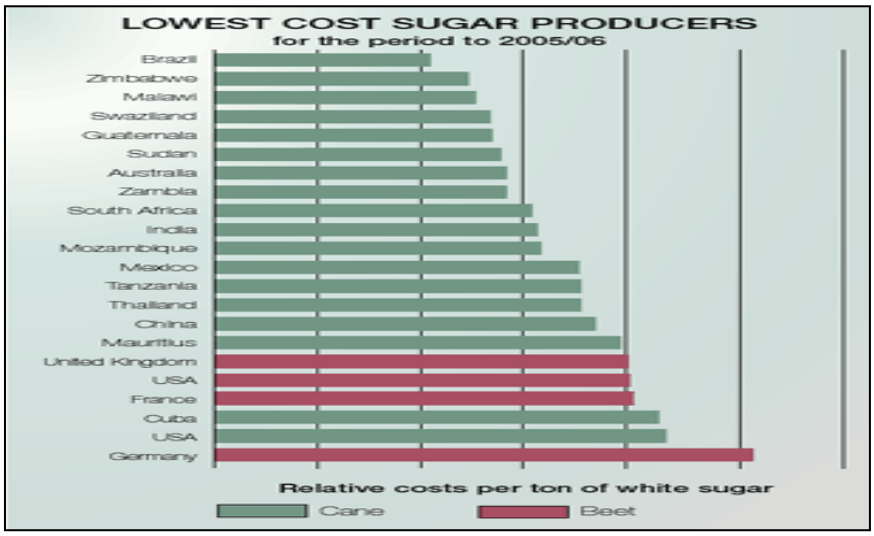


Figure 1: Relative Cost Graph of Producing White Sugar
SOURCE: http://www.illovosugar.com/worldofsugar/internationalSugarStats.htm

Figure 2 represents the ownership structure of the existing operational mills in South Africa as adapted from the South African Sugar Industry Directory (2008/2009:15). These mills are owned by:

- **Illovo Sugar Limited:** ISL owns and operates six sugar mills within SA, two of which have refineries and three of which have packaging plants (South African Sugar Industry Directory; 2008/2009:15).

- **Tongaat-Hulett Sugar:** THS owns and operates four sugar mills and a central refinery in Durban (South African Sugar Industry Directory; 2008/2009:15).

- **UCL Company Limited:** UCL owns and operates one sugar mill on a same site where it also operates a wattle bark extract and adhesive factory (South African Sugar Industry Directory; 2008/2009:15). UCL is primarily owned by Midlands based farmers.

- **TSB Sugar Limited:** TSB owns and operates two sugar mills and a refinery and packaging plant (South African Sugar Industry Directory; 2008/2009:15).

- **UShukela Milling (Pty) Ltd:** This company once owned both uMfolozi and Gledhow mills however at the beginning of this research there were changes in the ownership structure. UMfolozi mill is now jointly owned by a farmers co-operative and NCP Alcohols.

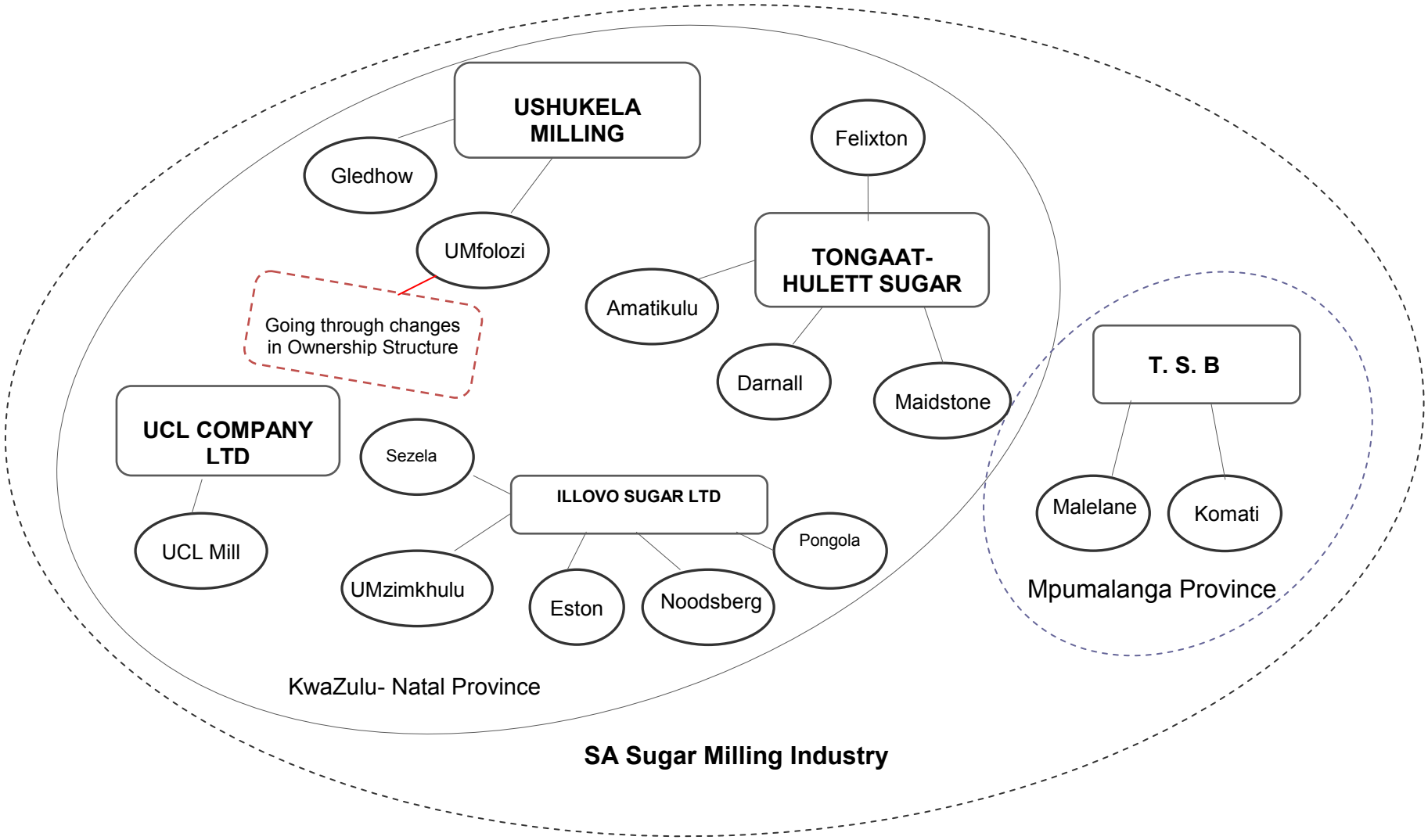
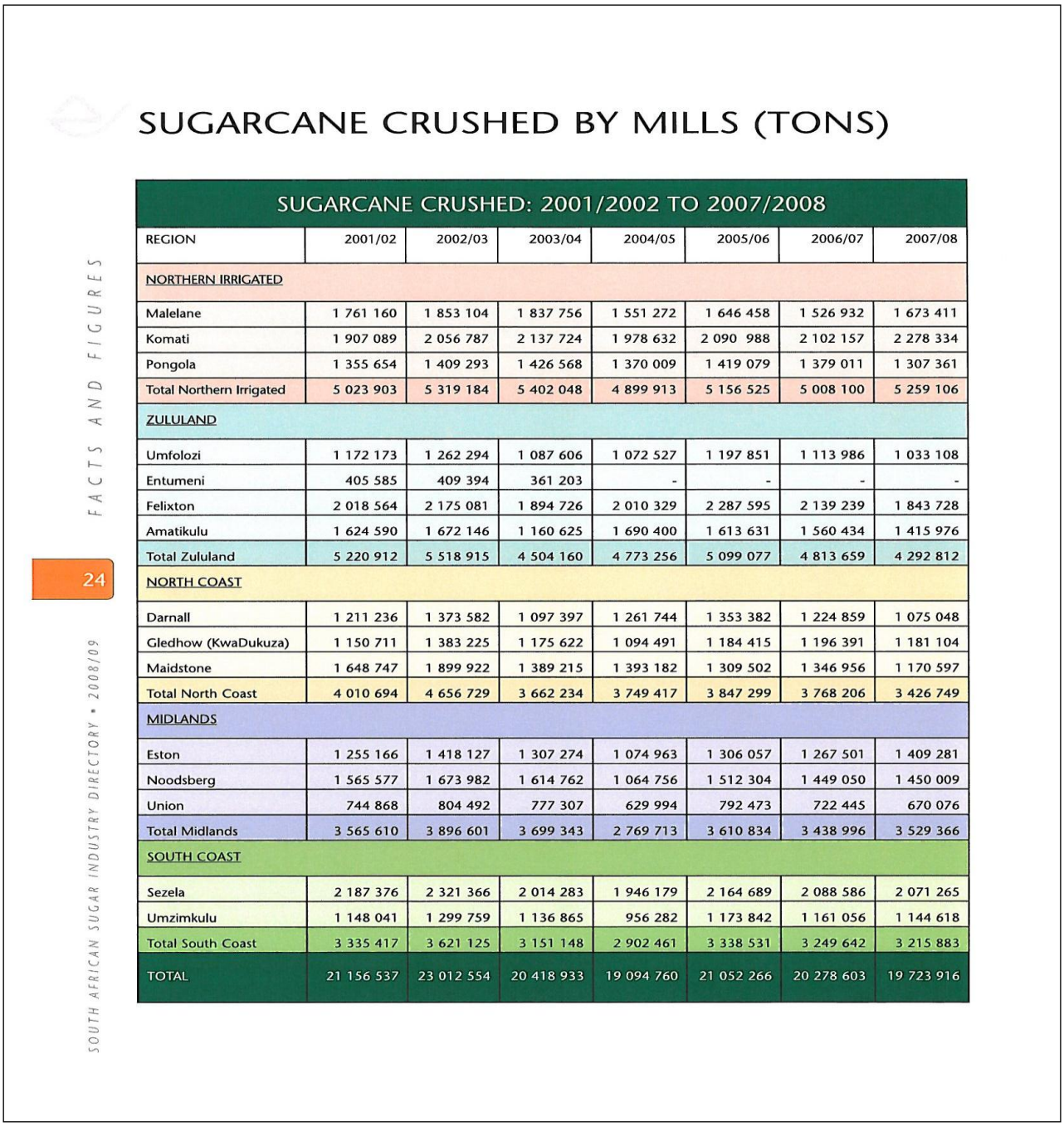


Figure 2: The SA Sugar Industry Mill Ownership

The following table shows the amount of cane crushed by each mill in the SA market.



SUGARCANE CRUSHED BY MILLS (TONS)

FACTS AND FIGURES

24

SOUTH AFRICAN SUGAR INDUSTRY DIRECTORY • 2008/09

SUGARCANE CRUSHED: 2001/2002 TO 2007/2008							
REGION	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
NORTHERN IRRIGATED							
Malelane	1 761 160	1 853 104	1 837 756	1 551 272	1 646 458	1 526 932	1 673 411
Komati	1 907 089	2 056 787	2 137 724	1 978 632	2 090 988	2 102 157	2 278 334
Pongola	1 355 654	1 409 293	1 426 568	1 370 009	1 419 079	1 379 011	1 307 361
Total Northern Irrigated	5 023 903	5 319 184	5 402 048	4 899 913	5 156 525	5 008 100	5 259 106
ZULULAND							
Umfolozi	1 172 173	1 262 294	1 087 606	1 072 527	1 197 851	1 113 986	1 033 108
Entumeni	405 585	409 394	361 203	-	-	-	-
Felixton	2 018 564	2 175 081	1 894 726	2 010 329	2 287 595	2 139 239	1 843 728
Amatikulu	1 624 590	1 672 146	1 160 625	1 690 400	1 613 631	1 560 434	1 415 976
Total Zululand	5 220 912	5 518 915	4 504 160	4 773 256	5 099 077	4 813 659	4 292 812
NORTH COAST							
Darnall	1 211 236	1 373 582	1 097 397	1 261 744	1 353 382	1 224 859	1 075 048
Gledhow (KwaDukuza)	1 150 711	1 383 225	1 175 622	1 094 491	1 184 415	1 196 391	1 181 104
Maidstone	1 648 747	1 899 922	1 389 215	1 393 182	1 309 502	1 346 956	1 170 597
Total North Coast	4 010 694	4 656 729	3 662 234	3 749 417	3 847 299	3 768 206	3 426 749
MIDLANDS							
Eston	1 255 166	1 418 127	1 307 274	1 074 963	1 306 057	1 267 501	1 409 281
Noodsberg	1 565 577	1 673 982	1 614 762	1 064 756	1 512 304	1 449 050	1 450 009
Union	744 868	804 492	777 307	629 994	792 473	722 445	670 076
Total Midlands	3 565 610	3 896 601	3 699 343	2 769 713	3 610 834	3 438 996	3 529 366
SOUTH COAST							
Sezela	2 187 376	2 321 366	2 014 283	1 946 179	2 164 689	2 088 586	2 071 265
Umzimkulu	1 148 041	1 299 759	1 136 865	956 282	1 173 842	1 161 056	1 144 618
Total South Coast	3 335 417	3 621 125	3 151 148	2 902 461	3 338 531	3 249 642	3 215 883
TOTAL	21 156 537	23 012 554	20 418 933	19 094 760	21 052 266	20 278 603	19 723 916

Table 1: Sugarcane Crushed by Mills (Tons)
SOURCE: South African Sugar Industry Directory (2008/2009:24)

Based on the 2007 and 2008 production figures one can tell that Sezela, which is owned by ISL; crushed the most tons of sugarcane and UCL crushed the least in the rest of the country. The UCL crushed tonnage is smaller than that of ISL's and THS's smallest mills. This low crush for UCL is attributable to their bark chipper plant being the most profitable and therefore their primary focus for the past three years.

A downward trend is notable in the crushed tonnage for each mill which is attributable to the shortage of available cane. This is due to reduced farmed cane land.

The World of Sugar

Despite with its high efficiencies of sugar production, the South African sugar industry has difficulty exporting sugar profitably because some countries heavily subsidize their sugar milling operations. This subsidization also tends to contribute towards overproduction in some major sugar producing countries (South African Sugar Industry Directory; 2008/2009:8). The industry is faced with shrinking margins and increased international competition aggravated by the rising input costs for growing sugar cane (Rossetenstein; 2008:15). Rossetenstein (2008:15) quotes (Chiadamrong and Kawtummachai; 2008:1) and says that they agree that the international sugar market is now in crisis because of the low price of sugar and this is serious concern to main sugar producing countries such as Brazil, Australia, Thailand and South Africa. He further quotes Thornburn, Archer & Jakku (2008:611) where they say the:

> *"…long term sugar price trend has been downwards with a 50% decrease over a 35 year period to 1999 despite the costs of production generally increasing…"*

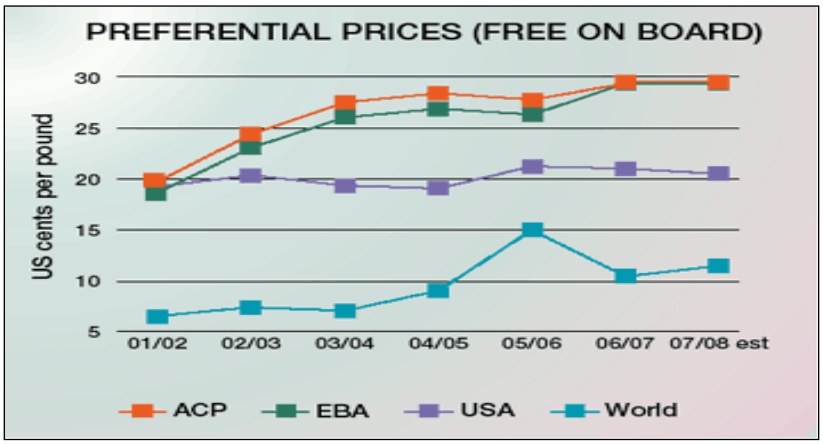


Figure 3: Preferential Sugar Price Trend
SOURCE: http://www.illovosugar.com/worldofsugar/internationalSugarStats.htm

The SA sugar industry is a major employer in rural communities, especially of unskilled labor, which impacts positively to sustainable development of these communities and the overall South African economy (South African Sugar Industry Directory; 2008/2009:15). The SA sugar industry is responsible for generating an annual estimated direct income of R6 billion when compared to other SACU sugar miller and the world export markets, (Rossetenstein; 2008:20).

Sugar is traded as a commodity on the different stock exchanges and this makes the price of sugar very volatile and unpredictable. Due to the high consumption of sugar, both directly and indirectly in America and the European Union, their own millers cannot satisfy the demand in their local markets and hence sugar is imported from other producing countries.

There is an agreement from the European Union that former colonies [African, Caribbean, Pacific (ACP)] of the member states should be paid a preferential price for their sugar supplies which can be thirteen times more than the World Sugar price (see Figure 3). This agreement encourages investment and development in the ACP regions. South Africa is excluded from the ACP agreement because of its leading edge technology in sugar milling. While protecting the market from imports, the SA government does not subsidize SA farmers like the EU states. It is for this reason that SA companies are investing heavily in other African states by building new sugar mills or de-mothballing existing but non operational ones or by increasing capacity in already operational ones. The preferential price incentive makes business sense as the margin are too big to resist and it allows them to utilize their world class milling technologies and produce high quality sugar at low cost but charge a premium.

ISL was the first SA milling company to recognize and take advantage of this opportunity and it is yielding exceptional financial benefits for them.

Due to BP's history as a leading and high performing consultancy for the sugar industry it has become a preferred service provider for ISL in its expansion projects in Africa. This has been noted by other sugar millers in Africa and around the world as more millers are now seeking the services of BP for their own expansion projects.

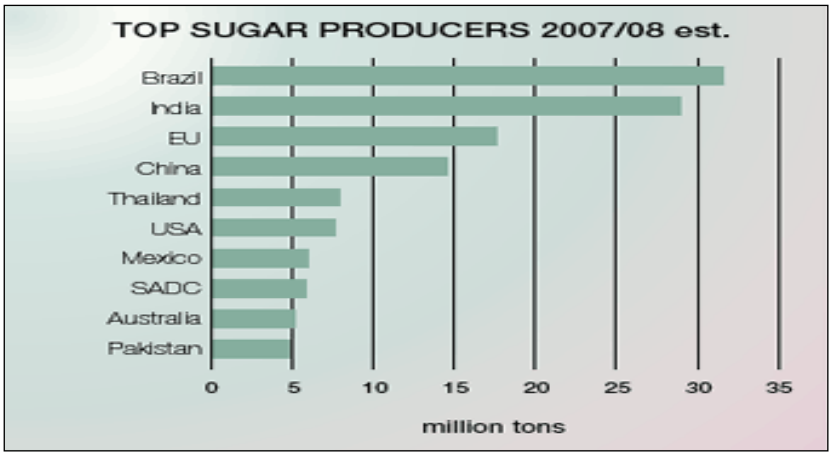


Figure 4: Top 10 Sugar Production Rankings
SOURCE: http://www.illovosugar.com/worldofsugar/internationalSugarStats.htm
International sugar statistics (Source: ED & F Man - 2007/08, Oct/Sep basis.)

Figure 4 shows the ranking of the ten biggest sugar producers in the world. As notable from the graph, South Africa is not in the top ten and yet the sugar engineering skills are highly regarded worldwide.

The SADC Sugar Producing Region

ISL (2 May 2009) says that:

> *"The Southern African sugar production region benefits from ideal growing conditions, full scale irrigation from secure water sources and efficient milling operations, to make it one of the lowest cost producing areas in the world."*

http://www.illovosugar.com/worldofsugar/SADC.htm

Figure 5 shows the biggest producers for the South African Developing Community region. In this graph South Africa is shown to be the biggest producer by the biggest margin to the next big producer. The main SADC sugar producing countries are:

- Malawi
- Mauritius
- Mozambique
- Swaziland
- South Africa
- Tanzania
- Zambia
- Zimbabwe

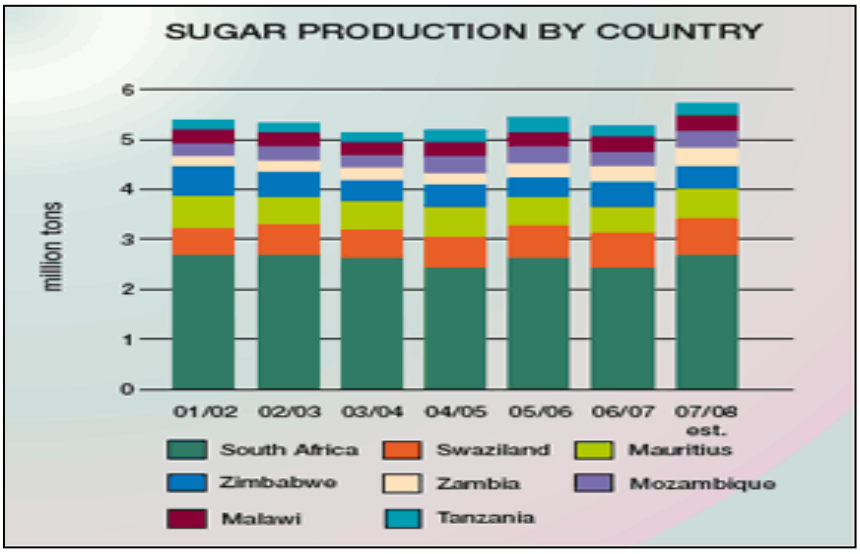


Figure 5: SADC Production Statistics
SOURCE: http://www.illovosugar.com/worldofsugar/internationalSugarStats.htm

With the exception of Mauritius, SA companies have milling operations in all these countries.

The Bosch Projects System

BP was founded in the late 1960s as the technical services division of Tongaat-Hullet Sugar but at the time it also consulted to the rest of the sugar industry.

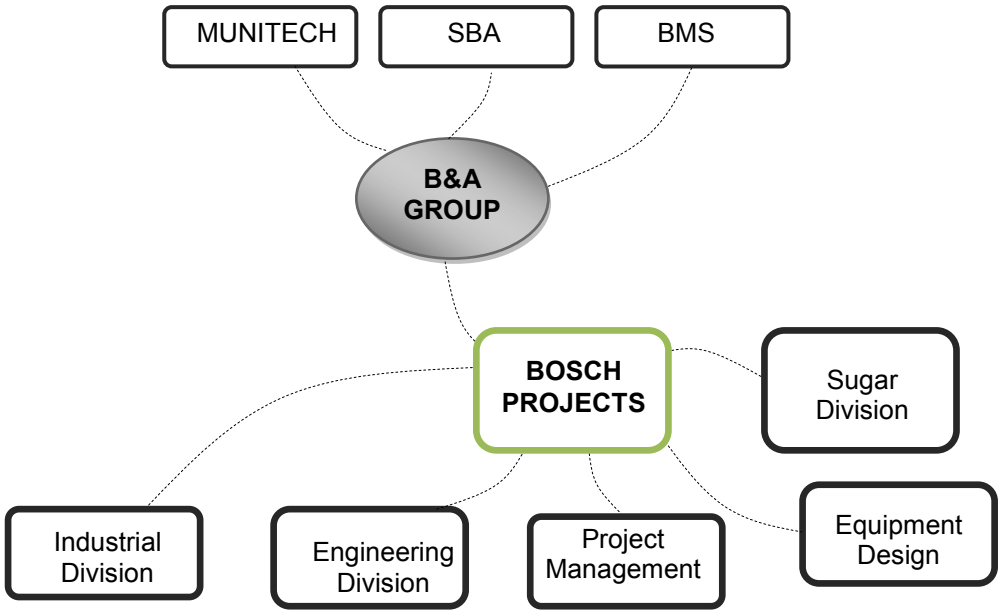


Figure 6: B&A Group Structure

With regulatory changes to the sugar and the consulting engineering industries, BP was registered as a n ind ependent company f irst primarily f ocusing o n th e su gar industry a nd lat er other engineering industries. To this day the sugar industry is BP's primary market

Today BP is part of the Bosch and Associates Group (BAG) of companies. BAG is the biggest engineering consultancy in KZN and the eight biggest in South Africa. The other companies within the group are:

- **Stemele Bosch Africa:** Stemele Bosch Africa (SBA) is a 51% owned BEE company within the group. It specializes in civil engineering infrastructure projects.

- **Munitech:** Munitech specializes in the provision of engineering and project contract management services to municipalities. It also provides a leak detection service for water conservation which has been shown to be a major source of unaccounted water loss in South Africa.

- **Bosch Management Services:** Bosch Management Services (BMS) provides the human resource and financial management services for the whole group. The company does not generate any profit but is a support component for all the group companies.

BP is one of the biggest and most respected sugar engineering consultancies in South Africa. It is the preferred engineering consultancy for Illovo Sugar Limited, which is Africa's biggest sugar milling company. The company, BP, is currently riding the growth wave being experienced by most sugar milling companies invested in Africa, especially outside of South Africa. These companies are investing billions of Rands in order to grow the milling capacities of these African mills. This is done because of the premium that the market allows them to charge for the commodity when manufactured in the ACP economies.

For the financial years 2006-2008, sugar milling companies contributed more than 40% to BP's earnings; making it the most profitable industry for the company. This was not a new trend but something that has been since the founding of the business.

My study is partly motivated by BP's need to diversify its basket of clients so as to be better able to spread and minimize the risk associated with business cycles of different industries.

The Personal System of the Researcher

At commencement of the research I was employed by BP as a Project Manager in Training. This was an accelerated middle management trainee position that is designed to help the incumbent manage world-class projects using best practices as developed by the Project Management Institute (PMI) and systems developed from within BP. My training was completed in the last quarter of 2009 and I am now a fully fledged project manager registered with Project Management Institute of South Africa (PMISA). I am registered under the Full Member category.

I have been with the company since October 2007 and have been managing relatively smaller projects compared to the other project managers. My responsibilities and the size have been growing since commencement of the programme. I have found that the desirable complexity of the projects can be found in any project no matter the size. I hold qualifications in mechanical engineering, business management, project management and I am in my final year of study towards a Master of Commerce degree in Strategy and Project Leadership.

Having studied the Strategy and Organizational Dynamics module for the Master of Commerce degree at the University of KwaZulu-Natal, I became in interested in strategy related topics especially scenario planning and hence I wanted to research the subject further to see how it can add value to the operations of BP.

I have previously worked for Illovo Sugar for three years in their middle management engineer in training (EIT) programme; and therefore I have an intimate knowledge of the sugar milling industry and I believe that this was be a reasonably solid base from which to build my research.

The Sugar System Relative to Bosch Projects

There are factors in the sugar industry systems that have influence over Bosch Projects.

Figure **7**, the bounded influence diagram, shows the many influences of the factors on each other in the BP system. Some of the factors have a negligible influence presently but may have tremendous impact in the long term. Factors such as people's view of the impact of sugar on their health may in the long term decrease the demand for sugar-containing products.

Government regulations, designed to protect the sugar industry, make it financially unfeasible to legally import sugar into SA. This is achieved through high import taxes being levied on sugar. The major reasons for providing protection are:

- Job protection as the industry is a major employer in KZN
- The European Union and American governments are also offering protection to their unprofitable and inefficient farming and milling operations by way of subsidies

Illovo Sugar has a very competent Technical Services (TS) department which can manage expansion projects for the group. TS is used to manage services providers such as BP in these expansion projects. This may be due to the fact TS's primary role is to provide technical support to sugar mills and to manage relatively minor projects. This TS department can be a threat to BP and other services providers should a decision be made to run projects in-house.

Due to the volatility of the oil price, some governments have felt the need to minimize the dependency on crude oil and find environmentally friendly alternate energy sources. Biofuels are amongst the most preferred sources of renewable energy and the crop of choice is sugarcane because of its many alternate uses and high energy content. The first-half of the biofuels manufacturing process is totally identical to that of sugar milling and hence companies with know-how in the sugar industry are important to this market. BP was recently awarded a major contract to design and manage the building of an ethanol plant in Mozambique. Upon completion this will be the biggest ethanol plant in the southern hemisphere; and therefore further entrenching BP's reputation as a leader in the field with an intimate knowledge of the African continent.

Eskom's inability to immediately satisfy the load demands of the country has presented an opportunity for co-generation from independent companies. Sugar mills are generally energy self-sufficient as they develop enough energy to able to export to a national grid. This has presented ISL and THS with an opportunity to sell electricity to Eskom and therefore create a new revenue stream. BP is at the forefront of the co-generation consulting boom for the sugar industry as it has a deep understanding of the statutory requirements of tying up into the Eskom grid.

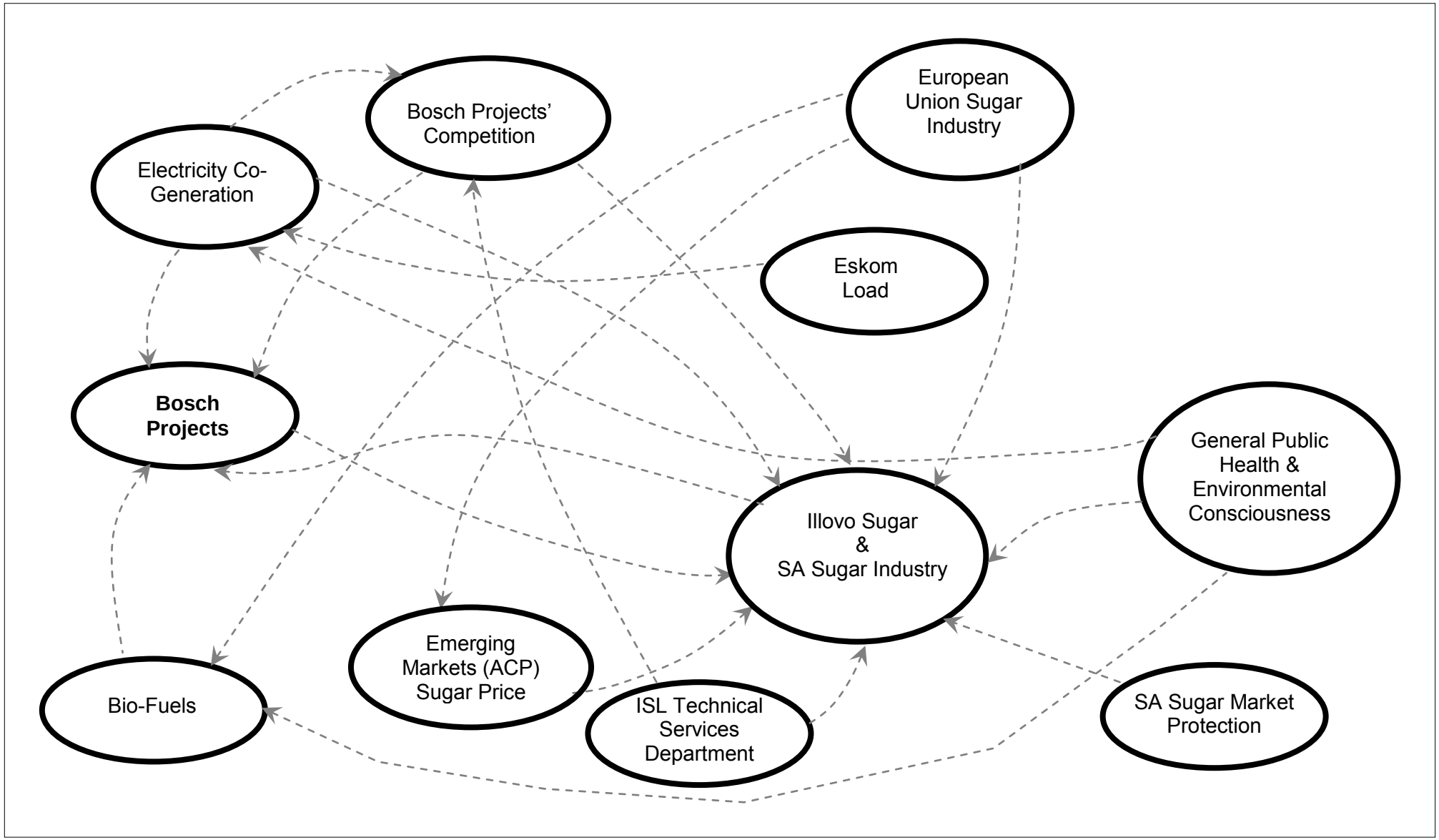


Figure 7: The Sugar Industry Influence Diagram

Significance of the Study

My preliminary observations suggested that the sugar industry is set for bigger growth, especially in Africa, excluding South Africa. The sugar milling companies are investing billions of Rands in other African states in order to enjoy the premium at which sugar from these countries is bought and sold in the market.

The sugar manufacturing companies also have an opportunity to diversify from sugar and include biofuels as a major product to take advantage of opportunities that are almost guaranteed from this product. Brazil is the world leader in these two markets, ethanol and sugar and so there is opportunity for greater cooperation between SA and them as both are considered developing regions.

Health conscious people generally believe that sugar is not good for one's health, with particular concern to their weight. I wanted to see how this would impact on the growth of the industry as more people become affluent.

I believed that the organizations involved in the study used traditional strategy making methodologies. These methodologies have been proven to be too linear and inflexible in turbulent times, (Henderson; 2007:132).
It was my expectation that the results of the study will help BP and the other participants in formulating more informed long term growth strategies. The results of the study could also help other consulting organizations who want to enter into the sugar industry.

The results were made available to the participant organizations in order to help them to verify the robustness of their current strategies and their long term beliefs of their industry's future.

Delimitations

The research respondents were limited to senior management personnel within the organizations of interest as they are the ones who do organizational planning, year-end strategy sessions, on an annual basis. The usual planning techniques used are not complexity sciences based and hence they are generally rigid and unsuitable for the times we live in which are characterized by uncertainty, ambiguity and imperfection. I expected that people at this level in their organizations are comfortable and confident enough to express their views and they would understand and appreciate the importance of the research for both BP and themselves.

Within Bosch Projects, the research was limited at director level personnel, who also play a major role in the day to day running of the company.

As already mentioned I did not aim to provide future strategies for either BP or the sugar industry participants but I was seeking to trigger introspection from them.

Limitations

The face to face time required for a meaningful SP conversation was a limiting factor and hence I tried to maximize the impact and value from the amount time allocated to me by the participants. Pre-packs were sent to participants in order to prime them about the SP technique and its application to real world situations. This allowed for a more productive engagement between me and the participants.

Context of the Study

With the sugar industry being the most profitable and biggest market for Bosch Projects, I was interested in seeing how long could BP rely on this market before it flattens out? I was also interested in developing stories about the future of the sugar industry in the next ten years and then from these stories BP could place itself in that context and see how it would fit and what it could do to derive the most benefit from the future lying ahead.

Therefore the context of the study was the analysis of the mutually beneficial relationship between BP and the sugar industry and the many possible scenarios that could be generated from this relationship.

I wanted to see if there are any long term benefits that could be derived from this relationship.

Report Sequence

This research report takes the following sequence and logic:

- In this first chapter I have given the background about the research goals, the organization of interest and its main market. I have also briefly shown how I fit into the mess.
- In the second chapter I shall review literature on scenario planning and partly on strategic management. I shall supplement it with a review of the literature on the learning organization, metaphors and complexity sciences. I shall create a link between these research fields and argue that for effective strategic management they must be explicitly dealt with together.
- In the third chapter I shall discuss the design and logic of the research methodology followed and give a brief but sufficient profile of the research participants.
- In the fourth chapter I shall discuss the results of the research and present the scenarios developed during the research. In this chapter I shall also respond to the research questions.
- In the fifth chapter I shall reflect on the whole research journey and conclude the research.

2. CHAPTER 2: LITERATURE REVIEW

"At exactly which point do you start to realize, that life without knowledge is death in disguise"

Talib Kweli
K.O.S Determination
Black Star Album

Introduction

Hwang (1998:338) states that:

> *"As market needs change at a rapid speed in the world's increasingly complex and competitive business climate, so our capabilities to meet these needs require learning. The only resource capable of learning in an organization is the people".*

This is the primary reason I chose a scenario planning based research case study over other strategy methods. I wanted to see what the future holds for the sugar industry so that BP could acquire the capabilities to meet those needs. Scenario planning explicitly appreciates that businesses operate in a complex world. This statement ties in with Lichtenstein's (2000:526) thinking where he asserts that thinking that informs dynamic models is essentially different to that of mechanistic models. He further recognizes the important role that this thinking based on non-linear assumptions is playing in changing how we view organizations.

It is common cause that the primary reason for pursuing a business venture is to make sustainable profit in the long term. With the advent of businesses having investors who are not family members and who require a certain level of confidence that the entrepreneur knows what he wants and has a plan to achieve it, the investor would require some kind of plan that shows the desired direction of the business prior to investing any funds in the venture.

Most business plans carry with them certain assumptions and hopes of certain things holding constant into the future in order for the plan to come to fruition. With the progression of time it has become apparent that the world is dynamic and the rate of change is becoming faster than before and therefore assumptions on which some plans were made and businesses were founded are no longer valid. This change in the environment and the way the business responds can mean the difference between success and bankruptcy. Investors and entrepreneurs do not adjust their profit expectations down in the long term; they want to see sustained growth. A healthy and profitable business is seen to be a failure if it maintains flat levels of profitability in the long term as this is not what investors want. Managers therefore have to constantly find ways to grow companies and productivity.

It is common practice for departmental heads to project or forecast certain percentage growths in sales even when there is no solid basis or plan to achieve this. The projections are used to formulate business strategies and thereby making them the official future of the organization. It is even worse when directors lack the ability or tools to evaluate the feasibility of these projected growths.

There is a never-ending search by scholars and practitioners to find better ways to develop strategies that are responsive to the environment in which businesses operate. Feurer & Chaharbaghi (1995:15) say that:

> *"The main problem is that there is no common perspective, vocabulary and conceptual base between different studies as issues are viewed differently, emphasizing isolated elements, and different approaches are taken to study the problems"*

In this chapter I will discuss thinking around strategy, complexity theory, organizational learning, and metaphors and I will attempt to show that there is a direct link between these concepts and scenario planning.

Contemporary Thinking on Strategic Management

Businesses have moved from having a basic business plan to having more detailed action plans which are commonly referred to as the business strategy. This strategy is aimed to be a plan of where the business wants to be within a given timeframe and how it plans to get there. It is a mind map drawn up by business managers/ owners in order to help them identify their goals at the beginning and then to work towards achieving those goals within a given the time frame. Formulation of a business strategy typically involves scanning of the external environment and then aligning the company's capabilities with the environment. It is important to acknowledge that because businesses do not operate in a vacuum they may also influence the external environment depending on the services and products offered by the company. This in essence means that powerful corporations may change the external landscape and therefore the business strategy may not be to adapt to the external environment but to mould the external environment to suit its long term plans. This would be more applicable to high tech business environments where a non-existent product maybe launched only to become a game changer.

A number of scholars, including Henderson (2007:132), Hwang (1998:338), Panagiotou (2008:554) and Feurer & Chaharbaghi (1995:67), have acknowledged the constantly and rapidly evolving landscape in which businesses operate. This evidence shows that current business thinking and methods are ill-equipped to deal with the flux and rapid change and therefore new methods are required to assists business managers and executives to deal with the uncertainty. This is negative judgment on current and popular strategy making techniques as they are obviously no longer sufficient to sustain a business in these times. In Porter's generic strategy model, being all things to all people is a recipe for disaster, (Mintzberg et al; 1998:103). He says that firms must make a choice and then pursue it with vigour. In summary, the thinking in Porter's generic strategies is that you can't please everyone and still be happy yourself; this is in sharp contrast to those organizations, such as General Electric, that actively pursue diversification and succeed. When Porter made this assertion in developing the four generic strategies of his school, he was well aware that humans have limited cognitive abilities and that by spreading the organizations focus you then run the risk of being overwhelmed with data especially in times of turmoil. Quantitative based forecasting techniques are based on past events which are then extrapolated into the future which explicitly carries an assumption of a relatively stable environment.

There is a tendency to group strategies into two core groups (Mintzberg et al.; 1998:15), prescriptive and descriptive groups. From the prescriptive perspective, the methodologies, prescribe how strategies should be formulated. The schools provide a sequence of steps that must be followed in order to formulate a strategy. Scientific management thinking is at the core of prescriptive schools as it is built on an expectation that managers will be rational at all times. Formal action plans are an expected outcome for this strand. The major component of scientific thinking is that if something is understood then a rule and a control procedure can be developed. These schools argue that strategy should be explicit in order to be effective and be specific

enough in order to require some actions and exclude others. According to the Management Thinking (1998:18) article, this involves knowing and identifying what a company might do (opportunities), what it can do (internal abilities, competencies and deficiencies), what the people in the company want to do (personal aspirations and values) and what it should do (external obligations). This part about aligning organizational vision with personal vision will also be highlighted in the section in this chapter that deals with the learning organization concept.

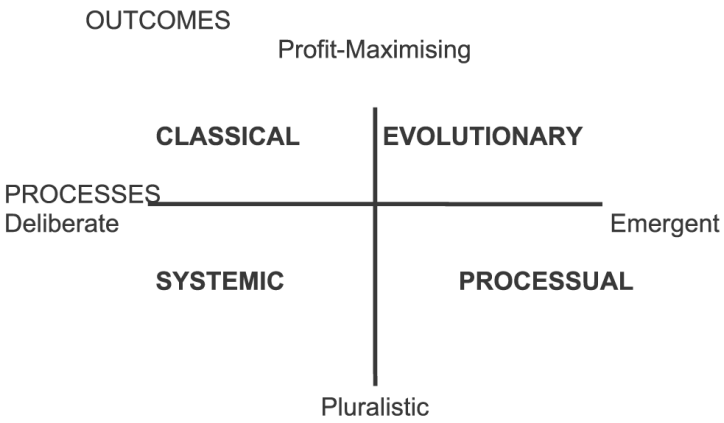
The other perspective is that of descriptive strategies. In this perspective, the methodologies describe what really happens when creating a strategy. Due to the complexity of the environment within which organizations operate it becomes imperative for managers to be able to supplement the lacking information and make judgments based on limited data. This has gained more recognition as an important branch of strategic management, where and how the human mind takes over and processes complex information to arrive at crucial decisions. Human creativity and intuition are important and gaining acknowledgment in strategic management.

This mentality of grouping has resulted in many strategy formulation techniques and schools, (Mintzberg et al.; 1998:15); this has lead to the promotion of some schools to the detriment of others. This is usually attributable to business school practices especially at undergraduate level where people are taught just enough to survive in the business environment. People should also take responsibility for only learning what is taught to them and not expanding their horizons by doing independent research. Academic institutions tend to offer or adopt a position that is most common to industry thereby reinforcing that thinking even if it's insufficient. Individuals are also to blame for only taking from the schools that which fits with their mental models and abilities and discarding that which they find challenging and label it as unnecessary.

At the core of the strategy formulation is the desire to be able to predict the future so that the organization may better be able to respond to that future environment. Most schools of thought will tend to lead the applicant to one or two possible futures and thereby leading the applicant to only formulate strategies that deal with those two futures. This thinking is weak and insufficient as they tend to be worst and best case futures and assume that anything in-between will be easy to deal with. The best case future is only filled with positive outcomes and ignores that even good environments still have negatives that must be dealt with and so that the worst scenario also suffers a similar fate. This failure is primarily due to the inability for strategies; especially long term ones, to accurately predict the environments a business will be operating under in the future. Forecasting methods while helpful in the past tend to fail in rapidly changing environments as the data to predict future is based on past performance.

Henderson (2007) through Whittington (1996) and also Feurer & Chaharbaghi (1995) present different thinking strands on how strategic management thinking can be grouped and they explicitly shed more light on the learning school, which I will cover under the learning organization section, and implicitly on the cognitive school, which is covered in the metaphors section.

Unlike most scholars who choose to favor a particular school over others as identified by Mintzberg et al. (1998), Whittington developed his own framework of identifying and grouping strategic management thinking into four core schools. He further argues that writers have shown bias to their preferred schools, exaggerating some while suppressing others (Henderson; 2007:132). Whittington's argument for this grid is simply that actions are either deliberate or emergent and can either be pluralistic or profit maximizing and hence these factors form the axis of the grid.



Source: Whittington (1996)

Figure 8: Whittington (1996) Strategy Schools
Source: Henderson (2007:133)

This grouping technique results in a two by two grid which culminates in the following schools, one per quadrant:

- **Classical School:** People and strategists who subscribe to this school believe that profit maximization is the ultimate goal of the organization and all decisions made are rational. This school ignores that by the nature of humanity, no manager would maximize profit if it conflicted with their aspirations. It further ignores the concept of bounded rationality which recognizes that people can never be fully rational as there are too many variables to be considered, especially when making business decisions.

- **Evolutionary School:** This school argues that because environmental changes are so rapid and often, planning is a waste of time and company resources. It says that a company should aim for efficiency and plans be made on a day to day basis. This school ignores that even though environments are generally turbulent, the pace of change is not so turbulent so as to make planning totally obsolete. The other problem lies with the level and detail to which planning may be done. It is also unwise to tie up resources on planning daily sessions when they should be executing the previous days plan.

- **Processual School:** The thinking in this school is that stakeholder satisfaction is more important than profit maximization. The motto is satisficing, not maximization! This school recognizes that organizations are faced with balancing multiple outcomes and some actions and results come and emerge over time.

- **System School:** This school explicitly embraces the concepts of systems thinking and complex adaptive systems that will be later discussed in this chapter. This school highlights and emphasizes that managers do not operate in purely economic environments, there are other sub-systems influencing their decisions which should not be ignored.

- Further thinking around this school which is also supported by Henderson (2007:136) says that:

  "It is not necessary for each institution and stakeholder in society to articulate and enforce its expectations on individuals and business firms. Rather individuals will not necessarily be mindful of conformance on the wider scale"

It is therefore evident that classical and evolutionary schools require managers to be arrational in exercising strategic actions. Systemic and processual schools embody the thinking and

appreciation that businesses do not operate in a vacuum and that for a business to truly prosper it cannot be purely driven by profit maximization; there are other subsystems in the mix.

My thinking is that the best strategy methodology should encompass all that is good about all the thinking strands and their schools and that is why I call the next section the “hybrid strand”.

The Hybrid Strand

I imagine that strategy formulation in this strand would involve a process of formally drawing up strategies so that organizational members can have a shared vision and understanding of the goals and the course of action to achieve such goals. This methodology would also acknowledge the fluidity of today’s business environment and therefore advocate for strategies that are not rigid and allow for quick change in the face of approaching danger and uncertainty. The quick change process would be allowed for by planning ahead for various plausible futures. This would be intended to minimize the paralysis that most people go through when caught off guard by life changing circumstances.

I would also expect that in this strand, decision makers would meet on a regular basis and ask “how are we looking” and not wait for the following year’s strategy session to address this. This question would not only be asked in formal setting but would be a recurring question to the business executives.

In the next section I will argue that scenario planning is the hybrid strand that allows for this quick shifting and adapting to be less painful a process.

Scenario Planning

Scenario planning has its roots in the US Army in the 1940s during World War II, (Mietzner & Reger; 1995:221). The RAND group and Royal Dutch Shell are acknowledged as being amongst the pioneers of adapting scenario planning for application in a business context, (Mietzner & Reger; 1995:221, Schoemaker; 1995:25 and Foresight; 2009:5).
The tremendous competitive advantage gained by Shell over major competitors during the 1970s when the oil price shock occurred is quoted as a milestone for advocating the effectiveness of the methodology. Through Shell’s preparedness for multiple futures through scenario planning, they were able to move from being one of the top seven oil producers to the top two when compared to volumes of crude produced, (Mietzner & Reger; 1995:222). They also became the most profitable company in their industry, (Mietzner & Reger; 1995:222).

The description of scenario planning is fuzzy as different people use the term to describe different things as attested to by Mietzner & Reger (2005:223) and French (2009:6), but for me scenario planning is about developing a number of plausible futures in which the business may operate in within a given time frame. Schoemaker (1995:25) describes it as a disciplined method of imagining the future. The farther into the future you go the less accurate your futures may become, some have recommended that a five year window period is the longest one should look at. The essence of scenario planning is that multiple scenarios and strategies are formulated and then one is immediately pursued while armed with well developed and understood alternates.

Mietzner & Reger (1995:223) say that the main aim for this construct is:

> *“… to establish future planning which can minimise surprises and broaden the span of managers’ thinking about different possibilities…”*

Scenarios are therefore designed to obtain different end-states. This is achieved by challenging the assumptions about the official future and reframing existing decisions. Scenarios can be explorative (past or present trends and leading to a realizable future) or normative (built on the basis of different visions of the future), (Mietzner & Reger; 1995:225).

Kenny (2006:359) summarizes his thoughts as:

> *"…it must be emphasized that when dealing with „wicked' strategic problems, much is unknown and unpredictable at the outset and has to be learned."*

He thus advocates that strategies in an uncertain and turbulent world must embody the concepts of the learning organization. Scenario planning has been shown to be a tool of major importance for businesses that want to deal with uncertain environments by preparing now. By its very nature scenario planning is built on systems thinking tools and it explicitly appreciates that no business operates in a vacuum and therefore changes in a seemingly unrelated business sector can trigger both negative and positive changes in a different sector. The ability to respond to these triggers is what can turn market leaders to followers. The understanding, appreciation and acceptance of systems thinking concepts are vital to being able to effectively deal with dynamic environments.

Scenario planning has been seen to be the broadest and most thorough methodology for imagining the future. There are many versions of scenario planning methodologies in existence but they all generally stem and are built around similar steps. In the implementation of the one strategy based on a scenario; the external environmental is constantly watched to see if the assumptions in which it is built are still valid and if not then the organization reflects on what has happened and adjusts the strategy for the prevailing conditions. The adjustment process is based on the assumption that the changes are in line with one of the other futures. This is a hands-on execution of strategy where there is constant interaction, reflection and learning between the organization and its environment. By fully immersing oneself in scenario development, one appreciates that no scenario will materialize on its own but that factors from the various scenarios may occur at the same time. The advantage of embracing all the scenarios is that one's organization then becomes prepared for almost all occurrences developed in any of the various scenarios.

Some techniques like those presented by O'Brien and Dyson (2007:217) go further than just developing plausible storylines but they also address how the organization may respond to each of those futures; this is generally done at a broad stroke level as too much detail assumes that you know a lot about the future, which has already been shown to be untrue. These broad stroke responses are mini-strategies which may be used as a basis to develop more detailed strategies. An important skill required in scenario planning is the ability to create storylines that command the reader's attention and grab the participants and etch themselves into their minds for a long time. To assist in achieving this some researchers and practitioners recommend the use of metaphors and giving each scenario a short and yet catchy name that will be remembered long into the future.

The Three-Building Blocks

In this sub-section I will present three concepts; metaphors, complexity theory and the learning organization; which I believe are important to better understanding scenario planning and strategic management in general. I will attempt to show how these three concepts; that I call the Three-Building Blocks; are linked to scenario planning. It is my opinion that scenario planning already; but implicitly embodies; these concepts. I further argue that in order to make better use of scenario storylines, the participants and especially the facilitator should be aware of their existence and their value to the whole scenario planning scheme.

My thinking, but excluding metaphors, is affirmed by Kenny (2006: 353 – 368) where he argues that for effective strategy formulation and implementation, organizational learning and complexity sciences must be explicitly acknowledged and consciously built into the strategy processes, structures and roles.

The Learning Organization

It is important to get a basic understanding of the learning organization concept in order to fully appreciate the significance of scenario planning. In this section I will argue that there is a strong link between scenario planning and the concept of a learning organization.

A learning organization; also known as a knowledge-based business; is described as being an organization that is able to achieve its objectives because its employees have an aligned vision. Organizational learning is described as the transfer of knowledge and values within the organization in the form of mental models and shared visions, (Feurer & Chaharbaghi; 1995:43). Hosley et al. (1994: 5) describe it as:

> *"A competitive learning organization is said to be a continuously adaptive enterprise that promotes focused individual, team and organizational learning."*

The argument is that learning is vital for organizational survival but learning alone will not guarantee survival.

(Kenny; 2009:354) says that:

> *"A leap of faith is required as the outcomes are unknown and there may be discomfort and struggle as values, ideals and beliefs are questioned."*

There are many thoughts and vantage points of what a learning organization is, from various scholars such as (Feurer & Chaharbaghi; 1995), (Hosley et al.; 1994), (Kenny; 2006) and (Senge; 2006), just to name a few.

Senge's (2006) model of a learning organization is built on five pillars which are:

- **Systems Thinking:** Harrington et al (1999:54) define a system as an:

  "...aggregation of interconnected elements which provide something that is not available with the parts alone"

  In organizational learning context, systems thinking says that the future is not only a continuation of past relationships and dynamics but can also be shaped by human choice and action. Systems thinking prevents a narrow focus among firms and fosters a holistic view of the world in terms of seeing wholes, interrelationships and processes of change, (Hosley et al.; 1994:6).

Kenny (2009:355) believes that:

"There needs to be a holistic approach to the strategic process to address the structural flexibility and learning aspects of change".

This belief reaffirms my argument that systems thinking is a must for effective strategy formulation and for learning.

- **Mental Models:** Mental models are mental pictures that people carry around in their minds. They define what people think is possible and impossible. Stereotypes are rooted in people's mental models. As will be shown in the next sub-section, metaphors are vital for shaping and challenging mental models.

- **Team Learning:** This is the ability of a team to achieve a synergy amongst its members. Where team learning is occurring, the effectiveness of the team is higher than the sum of its members. This highlights an important point that in a learning organization, learning should not only happen at an individual level but also at a group/ team level. To foster this team learning, people have to be comfortable with sharing their experiences regardless of whether good or bad.

- **Personal Mastery:** Personal mastery is a level of self understanding that allows one to be able to define and identify things that really matter to them. This ability helps one to be able to prioritize and not get bogged down by unproductive information and people. It promotes objectivity in dealing with information.

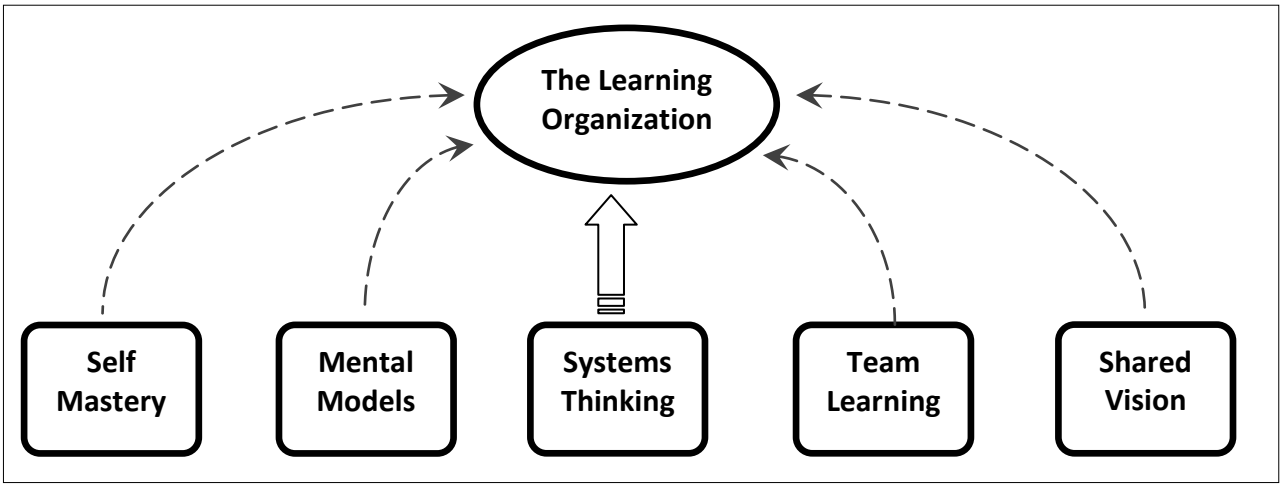


Figure 9: Building Blocks of a Learning Organization

- **Shared Vision:** A shared vision is one where the team members fully identify with the goals of the team and are willingly contributing towards achieving those goals.

It is important to highlight that Senge's (2006) work is not the complete truth as there are other scholars who are continuously adding value to existing body of knowledge. This means that while most of them agree that the five pillars are important, others may think that it takes more than just these pillars.

Metaphors

Gold & Watson (2001:508) claim that:

> *"Language provides an important means by which individuals come to interpret their world and construct practice with other participants which can be accepted local versions of a "reality" or "truth""*

In a learning organization context, metaphors can help build a shared vision and allow mental models to be constructed and changed. Metaphors are the language and a figure of speech through which people create meaning by using one element of experience to understand another. Wood, Jr. (2002:11) says that metaphors function like a series of connections that lead one to create deeper link between issues. He further explains this and says metaphors interact and come to describe the world in the production of reality.
Metaphors give us the opportunity to stretch our thinking and deepen our understanding, therefore allowing us to see things in new ways and ultimately act in new ways (Oztel & Hinz; 2001:153).

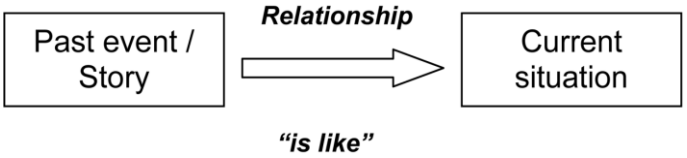


Figure 10: Metaphor Flow: Making Sense of the Present by Linking to a Past Event
SOURCE: Oztel & Hinz (2001:157)

People are better able to solve problems that they have dealt with before because they have a better idea of what works and what does not. Scenario planning primes people to what the future may hold for the organization by forcing them to live the future today. In scenario planning, the use of metaphors can help people visualize the desired outcomes in an organization and therefore trigger attitude change that is required to achieve the goals.

To effectively use and to understand a metaphor, Wood (2002:11), says the process:

> *"…involves discovering a system of common points which are associated with the metaphor and its object..."*

From these assertions it becomes clear that metaphors are an excellent tool for managing change, and strategy by its nature is a process of continuous change.

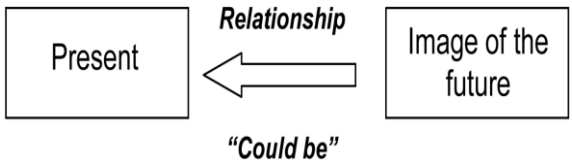


Figure 11: Metaphor Flow: Making Sense of the Future by linking it to a Present Story
SOURCE: Oztel & Hinz (2001:158)

Priming is a process of subliminally presenting issues to people. There are ethical issues around priming as at times people can be influenced into doing things they would not normally want to do. People's preferences have been shown to unconsciously lean towards issues that have been subliminally presented to them before. Metaphors are a great way to prime people and therefore increase the probability that later decisions will favor the desired outcome which has already been presented to them without them even knowing it at times. A scenario planning facilitator has to be ethical and avoid unethical priming of scenario planning participants and users of the scenarios.

Oztel & Hinz (2001:167) suggest that metaphors can be clustered by three important functions:

- **Process 1:** Bridging between realms, fields and activating mainly left and right parts of neo-cortex as a tool for conscious creative analysis.

- **Process 2:** Transfer from stimulus to the emotional parts of the brain in order to change attitudes towards the issue at hand.

- **Process 3:** Transfer from stimulus to the unconscious mind resulting in changes in action patterns.

Oztel & Hinz (2001:157) further argue that we must bear in mind that metaphors are stories and therefore present the views of the narrator. This is why it is imperative for a scenario planning team to be multi-disciplinary in order to prevent one-sided thinking. One must obviously draw and emphasize the points that connect the story to the desired outcome. They further remind us to remember that metaphors are just stories, they can be limiting.

Proponents of scenario planning such as Roxburgh (2009:9), stress the importance of using short catchy names for each scenario. This naming process fosters buy-in and solidifies the scenarios in the minds of employees which are important for creating a shared organizational vision. They also highlight the importance of continuously learning from experience in order to enhance future scenario planning exercises.

Complexity Theory

One of the important features of effective scenario building is that one must embrace systems thinking and complexity theory principles as explained earlier in this chapter. Letiche (2000:545) describes complexity theory as a collective of new anti mechanistic metaphors stressing process and emergence.

Another important skill and appreciation that people in management and strategists need to develop is the ability to be comfortable with uncertainty and understand that this cannot be totally eliminated in fast changing environments.

Harrington et al. (1999: 55) assert that:

> *"Most managers today are ill-equipped to deal with complex systems, whether that system is their organization or the products it produces. The root of the problem is the way we were trained to think about problems. Our basis for solving problems is by breaking the system down into smaller elements that can easily be analyzed, rather than the larger entity that cannot."*

I will argue that knowledge and understanding of complexity sciences would be an ideal way to help people attain a certain level of comfort in uncertain environments. Fitzgerald (2002:339) says:

> *"…chaos is the science of complex, dynamical, non-linear, co-creative, far from equilibrium systems."*

He extends this and says that since organizations in their very essence are complex, dynamical non-linear and far- from- equilibrium systems, chaos theory is then a science of organizations. By taking this thought thread further I argue that due to the complexity linked to implementing strategy it then becomes obvious that it is imperative for those involved in the organization to be comfortable with uncertainty and not dread turbulence. This would involve understanding that the

business world is an ecological system, where seemingly unrelated parts have an influence on each other. Important features of any system are:

- **Holism:** Understanding the whole cannot be achieved by analyzing system part individually. The system is more than the sum of its parts.

- **Interrelatedness:** Each component in the system has influence over another component which results in emergent behaviour not predictable by reducing the system to its parts.

Systems thinking is a major building block of complexity theory, chaos theory and complex adaptive systems. CAS describes a complex environment as one composed of a set of interrelated parts, each of which is capable of acting autonomously. Maintaining synergy in this system requires feedback processes. The interrelationship between the parts makes them a system. The system is said to be complex because of the nature of the interrelationship of the parts that results in breaking routines, and the feedback process required to manage the shifting routines. The system is adaptive because the subsystems work collectively to cope with ever changing challenges.

Macbeth (2002:728), references Glass (1996) where he summarizes the argument that:

> *"…traditional management is based on linear thinking and assumptions whereas the reality of business is different..."*

He goes on further to say that if:

> *"...we are subject to non-linear influences then actions will have unforeseeable and unforecastable outcomes that can work for or against our intended changes".*

South African engineering consultancies are generally owned by people with an engineering background with one or two who may have postgraduate management studies typically in the form of an MBA. These people will generally be conversant in contemporary business management techniques as taught by business schools at postgraduate level. If we accept my previous argument about business schools not teaching systems thinking based management techniques and that we are faced with a rapidly changing and complex landscape, this means that a typical engineering consultancy is not equipped with cutting management thinking which directly translates to the inability to form cutting edge strategies for the organization. Some consultancies will stay within their niche and barely break the mould into other spheres. This I fear is the same fate in which Bosch Projects is headed as since its inception it has been focused on the sugar industry and even its diversification actions have been built around the sugar industry.

The Three-Building Blocks and Scenario Planning

Vision driven scenarios, as defined by Courtney (2003:14), help:

> *"…facilitate learning and dialogue throughout the organization and help develop a shared commitment."*

This assertion creates an immediate link between scenario planning and three of the five disciplines. Dialogue is crucial for shaping mental models while shared commitment and learning address team learning and shared vision.

I have already shown that some scholars acknowledge the complexity of today's business environment which is aggravated by the rate with which variables change therefore making long term planning near impossible. Feurer & Chaharbaghi (1995:38) concur with other strategy

scholars that strategy formulation is driven by the need to secure a favorable position for the organization. The core argument is that for effective adaptation, strategy formulation should become a cognitive process and less about conception. They argue that for this to happen strategy formulation should become a continuous learning process. The learning should be at both the organizational and individual levels. They proceed to establish a relationship that exists between strategy and learning. It is their argument that to determine the relationship that exists, the definition of learning has to be extended to include three dimensions:

- **Identification of Goals:** In order to determine that the organization wants to be in the future.

- **Acquisition of Knowledge:** Regarding the relationship between actions and their effect towards goals.
- **Learning:** How to implement these actions.

Feurer & Chaharbaghi (1995:43) also assert that the concept of a value system to learning, the difference between knowing "how to do" and knowing "why to do it", must be expanded to include a third dimension of learning what wants and needs to satisfy. The process of learning is viewed as a continuous self-repeating cycle. It is a general belief that learning takes place as long as this cycle takes place.

Feurer & Chaharbaghi (1995:41) assert that:

> *"All learning models have at least one feature in common and that is that learning takes place by testing a hypothesis which is formulated to answer a question. Knowledge is then generated by reflecting on the outcome of the testing phase. The knowledge generated in turn develops a number of new questions thus making the learning cycle its next operation phase"*

It becomes evident that organizations have to continuously change their strategies because of the new knowledge that is constantly developed. This should not be done just for the sake of changing so strategy formulation and learning becomes a balancing act unique to each organization at any given time. From this statement then one can deduce that existing knowledge may become obsolete as soon as new knowledge is developed.

On the other hand, Feurer & Chaharbaghi (1995:47) further argue that constant change is not good because it denies the organization and individuals an opportunity to build what they call vertical knowledge, which is basically building on the previous learning experience. It then becomes obvious that there is constant balancing act that must be performed between consistency and change and alignment between value and primary learning cycles.

This thinking clearly falls into the learning school, which advocates that managers must learn over time, as described by Mintzberg et al. (1998:175) but it also carries elements of the cognitive school as these authors assert that:

> *"… Strategy formulation should become a cognitive process and less about conception…"*

Scenarios enable business leaders to lead organizations in conditions of false certainty generated by applying forecasting methods and the paralysis that arises from the forecast not materializing, (Roxburgh; 2009:2).

There are three features that make scenarios exceptionally powerful:

- **Scenarios expand your thinking:** Building scenarios compels one to think broadly because each outcome has to be backed by a series of possible events that can lead to it.

This process exposes one to underlying assumptions that were not obvious or questioned, (Roxburgh; 2009:2).

- **Scenarios uncover inevitable futures:** The process of constructing scenarios helps unlock some underlying drivers of change which may not be immediately apparent. The drivers most usually result from events that already have happened or are happening during the time of analysis. To highlight this point Roxburgh (2009:3) says:

  "It has rained in the mountains, so it will flood in the plains"

- **Scenarios protect against group think:** The application of SP necessitates that people challenge generally accepted thinking and business assumptions. Generally people are less inclined to openly challenge thinking from their senior managers even if they do not agree with it. Investigation of alternative scenarios limits the negative effects of power and politics in strategy formulation, Roxburgh (2009:4).

Roxburgh (2009:10) further says:

> *"Scenarios will not provide all the answers, but they help executives ask better questions and prepare for the unexpected. And that's makes them a very valuable tool indeed"*

In all the schools, the common thread is that there is a certain level of looking at the environment, both internally and externally to the organization; that must be done. Alternative futures have to be developed either by statistical methods or qualitative methods, with a hint of intuition and gut-feel. SP is a suitable method for developing alternative futures as it acknowledges the complexities of life and the futures generated are not purely based on past trends. Therefore SP can reinforce forecasting techniques while forecasting trends cannot paint a picture of the future which is not repeating past events. SP encourages managers to look at plausible futures which may go against previous trends, which are used to forecast.

While SP is closely related to the planning school, as per Mintzberg et al. (1998:63) inference, the school does not hold exclusive rights to it. I do not view SP as purely a strategy formulation technique but I see it a major building block for developing robust strategies, whether they be prescriptive or descriptive strategies. It is an important building-block that can help an organization to formulate strategies for various possible futures. Scenario planning process goes through stages:

- **Multiple plausible futures are created:** During this stage a series of sequential steps are taken in order to get to the end point where the organization is sitting with a number of different plausible futures.

- **Relevant strategies are formulated in order to address the identified futures:** During this stage the company follows a more cognitive approach; based on individuals experiences; in order to make sense of the plausible futures and to develop strategies to take advantage of opportunities identified or to minimize risks identified.

Summary and Conclusion of the Literature Review

In this section I have argued that components of strategy definition have something to do with looking externally to the environment and internally to the organization in order to take advantage of existing opportunities. At a superficial level strategy is the art of matching an organization's resources to the current environment in order to achieve the overall goals of the organization. This can either take a pre-planned approach or a decide-as-you-go approach. It is also evident that strategic management is in its developmental stage as there is no clear definition of what it is and how it should be used. Well respected scholars cannot even agree on the number of strategic schools, assuming that there are schools. The terminology in the discourse is not entirely consistent and can be confusing for someone looking for a one-size-fits-all type of solution. The one size notion does not exist and what might have worked today is almost guaranteed not to work tomorrow as organizations are faced with quickly changing landscapes.

A number of scholars have chosen a school of thinking; which is essentially a model; that fits in with their mental models and have tried to expand it while ignoring the value added by the other models. It is unfortunate that there is little visible interaction between the researchers and the practitioners which is normal for well developed fields of study and practice.

I have also shown that current times are turbulent which makes purely rational decision making impossible for humans. The competitive business landscape does not provide time for analysis of different variables for rational decision making. The root of the problem is the way we were trained to think about problems. Our basis for solving problems is by breaking the system down into smaller elements that can easily be analyzed, rather than the larger entity that cannot, (Harrington et al.; 1999:55).

Mintzberg et al. (1998:223), reference Stacey (1992:99-100):

> *"… has discussed the assumptions of conventional management that are undermined by chaos theory, for example, that „long-term futures are knowable,' that „the environment is a given' to which „the successful business adapts' by understanding the „clear cause and effect relationships'..."*

In the review process I showed that strategy formulation, for all the schools, was at a minimum a two-pronged process. Each school has a planning component to it, whether it is formal and explicit or informal and implicit. Then there is an implementation component which tends to be complex and difficult for most organizations. The planning takes some form of prescriptive approach with a number of given steps to be followed resulting in a strategy document. The implementation theoretically should be the easy part because the plan already exists on paper, but it is always the most challenging part because the variables are always so varied and complex and they never stand still.

Prescriptive schools provide a sequence of steps that are meant to be followed to assist managers in deciding how best to approach the task at hand while the descriptive schools describe what has happened to achieve the current state. The descriptive schools argue for the recognition that managers operate within limited cognitive states and hence decisions cannot always be rational in hindsight even though they were meant to be. This is an observation that in the current world of ambiguity and turbulence, it is rare and almost impossible for managers to have all the required information about variables at hand, and hence experience and calculated "luck" come into play.

Managers have to learn from past decisions in order to avoid similar pitfalls in the future. This learning can be achieved by identifying emergent properties in previous actions. Panagiotou (2008:559) argues that in complex situations different managers may choose the same solution but driven by totally different reasons and motives. He further asserts that for strategic thinking to grow, scholars must consolidate all the thinking strands on the subject. Due to the complexity in

implementing strategy it then becomes obvious that it is imperative for those involved in the organization to be comfortable with uncertainty and not dread turbulence.

The constant theme in this chapter has been that strategic management thinking is held back and compromised by uncertainty in the business environment and mindsets of participants. I have argued that a thorough scenario planning session and well developed robust scenarios can go a long way in addressing these challenges and issues.

A scenario planning template used for this research is attached in appendix 1.

There are many schools of thought on how strategies should be formed and presented and their success is dependent on the type of industries they are applied in. One constant theme emerging through all business spheres is that all industries are faced with dynamic environments with some being more turbulent than others. Therefore this means businesses require strategy formulation techniques that are adaptive and receptive to constantly changing environments.

Like Courtney (2003:14); I cannot help but wonder why:

> *"Scenario planning would seem to be the perfect tool for managers making strategic decisions in today's highly uncertain, turbulent business environment… a declining number of business executives use scenario planning tools. Why have so many companies abandoned scenario planning at a time one might expect it to be most useful?"*

As stated at the beginning of this chapter, the initial reason for choosing the application of SP as a basis for my research was that it fitted well with my mental models and it seemed to be flexible and malleable to accommodate the turbulence presented by today's business life, I have now shown that scenario planning encompasses a little of every school as identified by both Mintzberg et al. (1998) and Whittington (1996). In all the schools, the common thread is that there is a certain level of looking at the environment, both internally and externally to the organization that must be done. Futures have to be imagined and or developed either by statistical methods or qualitative methods, with a hint of intuition and gut-feel. SP is a suitable method for developing alternative futures as it acknowledges the complexities of life and futures generated are not purely based on past trends. Therefore SP can reinforce forecasting techniques while forecasting. Scenario planning encourages managers to look at plausible unpleasant futures which may go against previous trends and expectations, which are used to forecast.

My conclusion is that scenario planning is one of the better and more all encompassing techniques for strategy formulation which can be used as a testing ground for strategies developed using any of the other schools.

3. CHAPTER 3: RESEARCH METHODOLOGY

"If you keep sleepin', then your dreams won't come true"

Common
The Show
As featured on the Rising Down Album by The Roots

Introduction

In this section I will present the methodology that I followed in executing this practitioner type research. The aim was to use scenario planning to inform strategy formulation and also to prime the participants to the existence of the methodology either as a strategy formulation technique or as a technique to inform, verify the feasibility and robustness of whatever strategy that may be in existence for their organizations.

The aim of the adopted research approach was to ensure that reasonably accurate evidence could be obtained from the respondents. This could then be analyzed and be interpreted to determine if the research goals and questions could be answered. Strategy formulation is a group effort and scenario planning builds on factors that affect various systems and sub-systems in a social context, therefore for this reason, a mainly qualitative research approach was employed as is generally the case with social science research work. I agree with Chew-Graham et al. (2002:285) and Braud & Anderson (1998:257) that the principal advantage of qualitative research is that it offers a means of understanding the authentic perceptions, sentiments and understanding of subjects. I found myself facilitating and leading the scenario planning exercise at BP, which reaffirmed the notion that this type of research allows the researcher to be immersed in the processes and the relationships of the respondents.

I chose not to confine my research within some theoretical framework. My research was mainly placed within the action research paradigm, what Braun & Anderson (1998:273) describe as studying what I was doing while doing what I was studying. The approach I employed was to describe what I was aiming to find out, how the data were collected and analyzed and what was found, without locating or locking this in any particular paradigm which is in line with the thinking of Burnard (2004:178). In hindsight my research also carried elements of integral inquiry, intuitive inquiry, heuristic research and organic research as identified by Braud and Anderson (1998:256). Ghauri & Grohaug (1995:85) argue that the important point of any research is not the paradigm within which it is placed but it is the systematic, focused and orderly collection of data for analysis in order to solve the research problem.

The overall aim of this chapter is to provide an overview of the methodology followed in executing the research, the research design and the profile of the participants.

Research Aim

As I have already discussed in chapter 1, the aim of the research was to answer four overlapping questions which are:

- How does the future of the sugar industry look in the next ten years when viewed through scenario planning?
- How does the future of Bosch Projects look in the next ten years when viewed through scenario planning relative to the sugar industry?

- After the application of scenario planning would any of these organizations use the methodology for future strategy making?
- Relative to traditional strategy making methodologies, how do these organizations view scenario planning?

A fifth question which was not part of the research design was how able is BP to develop scenarios for its main market industry?

Inherent in these questions were some of my own assumptions which I was unconscious of (at the beginning) but surfaced themselves during the many varied reflective stages that I went through during the research process. Some of these assumptions were that these organizations do not use any structured scenario planning methodology as a strategy informing tool. The other assumption was that the sugar industry would continue to be Bosch Projects' main market. The final assumption was that the industry participants were very conversant in strategic thinking and its many existing strategy making methodologies. This last assumption was contradictory to my second assumption of the participants not being familiar with scenario planning.

Research Design

The research design was originally three pronged; firstly the research questionnaires were distributed to the sugar industry participants in order to obtain their views on the state of the industry within the next ten years and also to build an issues data pack reflecting the issues that they felt mattered most to them. This issues data pack would be used as a wind tunnel for the second stage results. Secondly the research questionnaires were forwarded to Bosch Projects' participants. This was followed by a scenario planning exercise held with Bosch Projects' participants, in order to generate multiple plausible scenarios for the sugar industry which would have a direct impact on the future of BP. The third phase was the process of validating the BP perceptions against the sugar industry perceptions, in terms of factors that really matter.

In essence the scenario planning exercise was planned to be placed within the sugar engineering consulting context. Then the robustness of the scenarios developed during the scenario planning exercise would be tested by applying a questionnaire technique to draw perceptions from the sugar industry and see if they corresponded with issues raised by Bosch Projects. The further I went on with the research the more the plan transformed and adjusted to reflect what I was learning and experiencing during the process, things such as:

- **BP Scenario planning process:** the scenario planning session conducted within Bosch Projects was flawed and did not provide meaningful scenarios that could add value to the organization. This flaw was primarily based on my lack of appreciation and grasp of the preparedness required for effective facilitation of the process. In my head I had expected the process to be organic and self organizing but this was not the case. In order to rectify the results of this ill-informed expectation I re-used the external environmental factors highlighted within Bosch Projects and developed new scenarios which are presented in the next section. This experience reaffirmed Roxburgh (2009:9) where he said that scenario development is an art rather than a science and requires experience. He further said that it is useful to look back at old scenarios and ask what they missed. I had missed a lot in my first session.

- **The Sugar industry processes:** the sugar industry was only meant to be used as a provider of external issues that I could use to test the accuracy of the Bosch Projects' issues. Deeper into the research I found myself dealing with enthusiastic research participants who wanted to get to the point of developing scenarios for the sugar industry. I was happy to do this but this was primarily driven my appreciation that the Bosch Projects'

scenarios were flawed and I needed to find replacement scenarios for the industry and the sugar industry participants were the best people to help me achieve this. This stage brought in additional and originally unplanned question of whether Bosch Projects was qualified enough to develop meaningful scenarios for the sugar industry, taking into consideration that it is their biggest market and that a number of employees are former sugar industry people. This question had a deeper meaning for other companies who may want to develop scenarios for their external environments.

This whole process allowed me the opportunity to listen and then interrogate the respondents' worldviews.

Data Collection and Analysis Sequence

The data collection process had three explicit stages which were supplemented by other implicit actions where data may have been collected unconsciously based on the fact that a number of my work related projects immersed me within the sugar industry environment on a regular basis.

- **Phase 1**

The first step in the research process after having identified the organizations and the mills that I wanted to participate in the process was to start engaging them and consciously priming them of what I was planning to do so that they could consciously starting thinking about the process.

A questionnaire, which I called a primer questionnaire, was sent to the participants in the organizations that had approved my request to conduct research at their premises. This questionnaire covered the generic strategy areas where I wanted the participants to start putting on paper the SWOT (their employing organization and the industry) and the SPECTRE factors that they perceived to be of concern to them, their organizations and industry. The questionnaire also aimed to:

- Highlight the factors that each participant saw as being important to the industry. This was achieved by asking them to rank each factor raised on a scale of 1 – 5 whenever possible. This factor ranking process did not work well as a number of participants did not allocate importance to the factors they highlighted even though I could tell that they had taken time and applied their minds to responding to the questionnaire which one participant had told me was badly designed for people wanting to give quick responses but engaging for people genuinely interested in engaging with scenario planning. For better and for worse scenario is a time consuming process and hence I chose not to re-design the questionnaire as I did not want to compromise the depth of the responses from the participants.

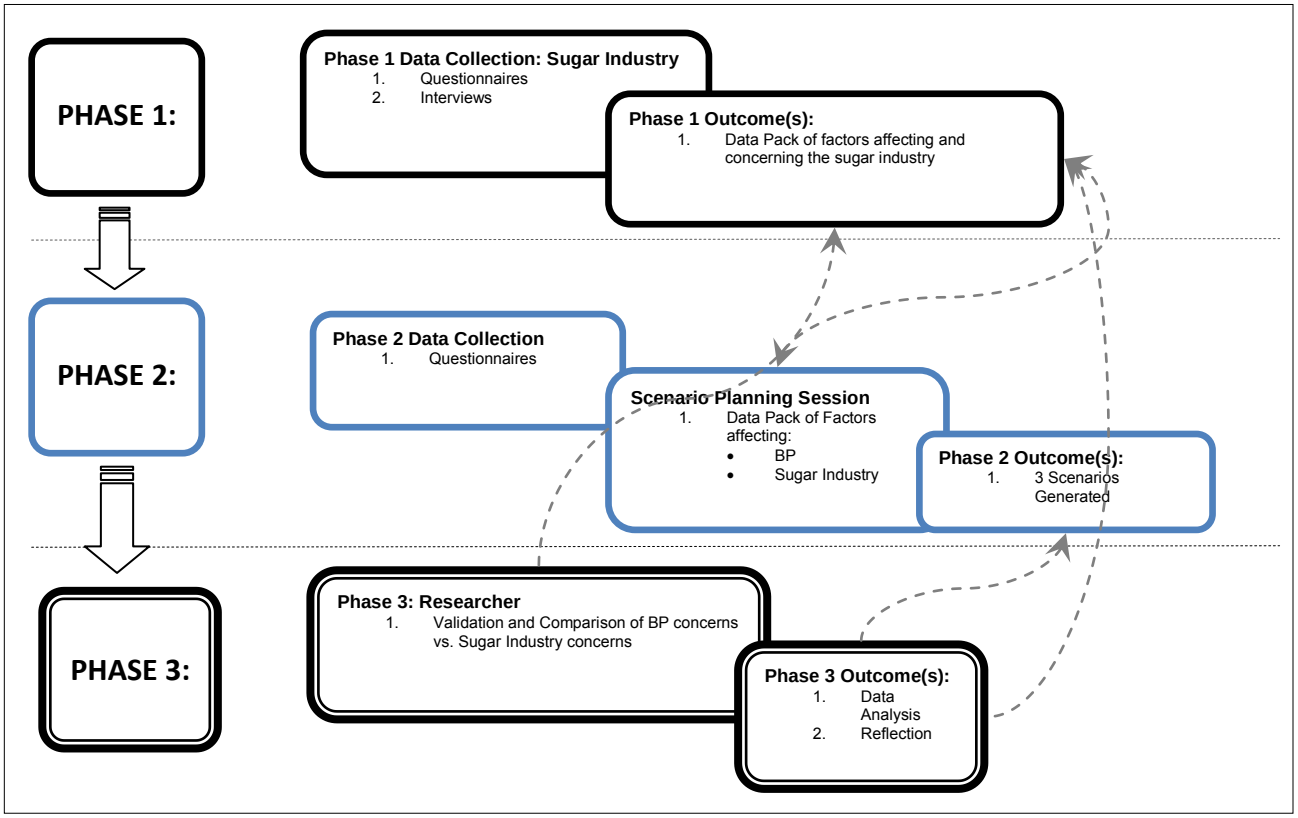


Figure 12: Research Process Flow

- Create a mental model or crude scenarios in the participant's head by asking them to justify why or how they viewed the impact of the factors they raised.

Almost all the questionnaires; except two; were followed-up with telephonic conversations and personal interviews with each respondent in order to draw and get clarity on how they perceived some issues. Most of the participants kept engaging me on a regular basis as they felt my questions were too broad and they wanted me to guide them into giving useful responses. The broadness of the questions was good for the research as it did not impose any limitations to the minds of the participants but it was risky as there was an ever present danger of losing the few participants who were willing to engage in the process if they felt that I was unfocused and wasting their time.

The end result from this data collection and clarification exercise was no longer only a bouquet of factors that would be later used as a basis for comparing the sugar industry factors to BP factors. This phase now culminated in its own scenarios formed by the sugar industry participants. These factors were no longer used as a test bed for BP perceptions of their main client industry but I was now faced with the opportunity to compare BP scenarios with sugar industry scenarios. Effectively I now could compare apples with apples.

While the scenarios were sufficiently thorough, due to time constraints I felt they had not been fully built up and explored. I later added more flesh to the scenarios by using the environmental factors that had not been incorporated into the storylines. The aim here was not to change the scenarios but it was to reinforce them further and crystallize them for the benefit of those interested in using them at a later stage.

- **Phase 2**

In the second phase of this research I aimed to get the BP participants to start thinking early on about my research. This was achieved by giving them a questionnaire similar to the one given to sugar industry participants. This was supplement by getting them to actively start thinking about BPs SWOT in addition to those of the sugar industry.

A scenario planning session, which we referred to as The Think Tank, was held with four BP directors which followed the Dyson and O'Brien template as shown in the latter part of the previous chapter. I took the role of facilitator where I would lead the process and ask questions which I hoped would trigger deeper appreciation of what we were trying to achieve at the session.

One of the outcomes was that we were able to come up with a well detailed bouquet of BP and sugar industry SWOT and SPECTRE factors. From these we were then able to start drawing up scenarios. I went into this session with some reservations because I did not know whether the participants were there to really add and gain value or were they there just to be courteous to me but I was positively surprised by the engaging attitude of the participants in this session as I could see that they came clearly prepared. My plan was to have two scenarios in order to minimize time spent with the directors but the participants suggested that we go for three scenarios. To me this meant that they were not only doing this help me get through my studies but they also wanted to get value out of the exercise, which made the exercise meaningful and reaffirming for me.

A three scenarios strategy document was the outcome of this exercise, with one strategy being optimistic the other being pessimistic and the third being a middle ground. In retrospect the scenario planning process had been flawed and we had fallen for the most common pitfall of developing extreme end scenarios and a middle ground scenario. I had failed to gain the most out of this facilitation process. While reflecting on the scenarios, I felt they were not useful and meaningful to the BP participants and they were not asking hard questions or challenging their mindsets and worldviews in any meaningful way. I therefore chose to revisit the scenario development process on my own but using the environmental factors created during the Bosch projects' session. To help reframe the sugar industry system, I decided to draw a Rich Picture that I would use to create a narrative about the status of the sugar industry.

The scenarios were once again presented to the research participants of BP for their comment and they all agreed that they were more meaningful than the previous ones. The revisited scenarios are outlined in the next chapter where I will discuss the research results from my perspective.

- **Phase 3**

The third phase of this research was for me to then go and assimilate the results of the first phase of data collection and then follow this with the assimilation of the bouquet stage of the second phase. This was achieved by comparing the sugar industry scenarios to those of Bosch Projects. This was important to me because the scenarios raised by BP would be useless if found to be substantially different to those of the sugar industry or if built on misguided or ill-informed factors.
The research did not explicitly follow these three phases as my mind kept switching from each phase depending on what I was thinking. Phase 3 was constantly present throughout the research as reflection and self-questioning was ever present.

Scenario Planning Process Flow

The scenarios development phase had two explicit stages with regards to the creation of the storylines. As already stated there was the Bosch Projects sessions, stage one, and the sugar industry sessions which made up the second stage.

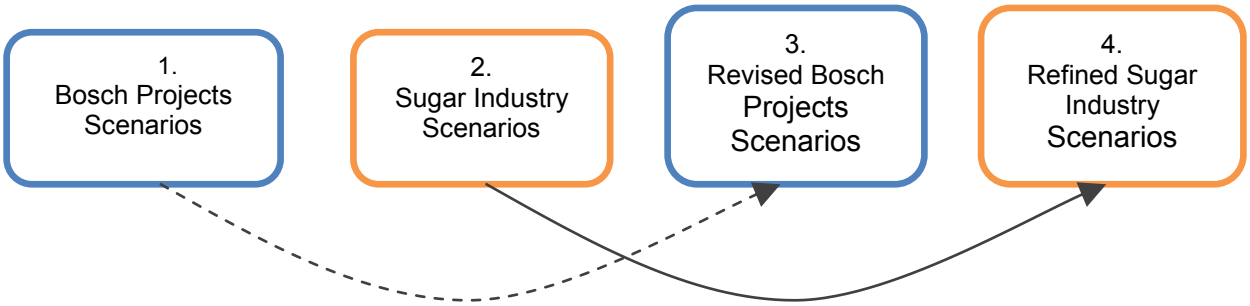


Figure 13: Scenario Planning Storylines Process Flow

As will be shown in the next sub-section, in retrospect the first stage was found to be flawed as it had not resulted in scenarios that could be of any strategic value to the end-user. My analysis and review of the Bosch Projects scenarios revealed that these would not be engaging enough and therefore unlikely to question people's mental models about the sugar industry and its future. This necessitated that I review the scenarios and ultimately led me to recreate them using the factors as identified by the original participants.

Stage two had yielded more detailed and much more engaging storylines but it had not incorporated most of the external factors into the storylines. I then revised the storylines and added more of the factors but without changing the theme of the original stories that had been developed with the participants.

This experience reinforced in my head how important it is to have a "reiterative mindset" when dealing with dynamic environments.

	Bosch Projects		Sugar Industry	
	Original Scenario Session	**Revised Scenarios Session**	**Original Scenarios Session**	**Better Detailed Scenarios Session**
Scenario Names	The initial scenarios were not engaging and not worthy of the level of research being conducted. While the names were simple as recommended, the stories were not interesting or value adding. The original names were as follows: • Sweet Dreams • Nightmares • Optional Scenario – where the status quo remains Even the themed factors had been given names. • Human Resources • History Channel • Grand Prix • Finance This judgment reflected my misunderstanding of the scenario planning session.	The initial scenario names were cluttered and were incorrectly used. The judgments and decisions made during the first session reflected my misunderstanding of the scenario planning session. As I was revising the scenarios I gave them new names which resonated more with the storylines. The revised titles were as follows: • The Incredibles • The Apprentice • Afro Samurai • Sleepwalkers	The original storyline titles were inspired by movie names with a sub-title describing what the scenario was about. The original titles were as follows: • MATRIX - United Tree Huggers • QUANTUM OF SOLACE - United Now Consumers • DAY AFTER TOMORROW - Segregated Now Consumers • BOURNE IDENTITY - Segregated Tree Huggers In retrospect this was found to be too much and against the recommended “short and catchy names” thinking.	The storylines did not change much because this session was carried out after the Bosch Projects sessions from which I had learnt a lot of valuable facilitation lessons. In retrospect it was decided that the movie names be removed and only the descriptive sub-titles were retained resulting in the following scenario names: • United Tree Huggers • United Now Consumers • Segregated Now Consumers • Segregated Tree Huggers
Data	The data collected with the questionnaires, interviews and at the sessions was thorough. It was reflective of the information that I later obtained from the sugar industry participants. The scenario storylines developed at the sessions was however found to be weak and non-engaging to the intended end-users. This inappropriate end-state was totally attributable to me as the facilitator.		The sugar industry scenarios had been more productive and much smoother to run as I had learnt from the Bosch Projects sessions. The only weak point about the results of these sessions is that the stories did not incorporate all the factors as had been identified in the sessions. This had been done because of the limited time we had in creating the stories.	
Contingencies	After having revisited the storylines and found them to be unsatisfactory I created new storylines using the same factors as had been previously identified. I reused some of the names that had been developed from the original sessions as titles for the revised storylines but I left out others. The resultant stories were sent to the BP participants, who agreed that they were much more meaningful, engaging and usable.		I revisited the stories and included more factors to the storylines. This was done with caution as I did not want to change the essence and the theme of the stories that had been developed with the participants	

Table 2: Heuristic Device Reflecting Contingencies

Sampling Method

I was not strict in choosing the number of respondents and the employing company's of the research participants except that ISL and UCL would have to take a bigger share as they were BPs main customers from this industry. Having worked in the sugar industry for the biggest sugar milling company in Africa I knew I could get a reasonable response or participation from ISL. My current work at Bosch Projects had also helped me build a close relationship with the UCL senior management team and I was confident that they would gladly assist my research as can be seen by the number of respondents from that mill. While each mill within each group is a system on its own with a culture unique to it, there was agreement between me and the research participants that each group had an overarching culture that shadowed the individual mill culture. This overarching culture gave me enough confidence to believe that results obtained from one sugar mill would effectively reflect the general feeling from the other mills. While I had this belief at the back of my mind I chose not to approach one mill per group but to approach people from each of the various mills and then see if my assumption was valid.

On average I wanted to have at least one respondent per sugar mill within the ISL group as most of these people would have also worked at another mill within the group.

Profile of Research Participants

In this sub-section I will present the profile of the research participants. While this may not be significant, I strongly believe that it is important to highlight the age, race and the positions held by these participants, as this may affect their worldviews in terms of factors like social issues, the stability of the country and the rest of the continent. I have divided the participants into two broad groups, namely:

- **Sugar Industry Group**

The age range of the eleven sugar industry participants that responded to the questionnaires was between 35 and 50 years. Five were white males from the UCL mill, four were black males and had worked extensively for both ISL and THS and the last two were both black, one having worked only for ISL and the other only for THS.

Participants from all companies occupied senior management positions, all of them having been developed through the Engineer-in-Training programs offered by the various companies. Only one UCL participant had come from Eskom.

An interesting observation was that almost all these participants have only worked in the sugar industry in their lives, albeit in various capacities. I thought it would be interesting to see how this could possibly obscure their view of the world within which their industry operated but also thought it would present me with a chance to obtain in-depth information about the industry as these people knew it inside out. ISL also ran an annual course which educated its employees, from the most junior grade to the most senior director grade, about the sugar industry and how each operating division fits into the bigger scheme of things. It was compulsory for everyone to attend this course which was run at mill and head office levels in small groups. I believe this tied in well with Senge's point of building team vision and shared goals in a learning organization environment as has been covered in the previous chapter.

- **Bosch Projects Group**

The age range of the four participant BP directors was between 45 and 50. Two were university mechanical engineering graduates with professional engineer status'; one was an electrical technologist with a master of technology degree coupled with a professional construction project manager status and the fourth holds both mechanical and electrical engineering diplomas plus a government certificate of competency. They all had a heavy engineering working background primarily in the sugar and mining industries.

BP participants were all white males. None of them hold any formal commercial/ managerial qualifications but they have gone for numerous management training short courses.

Summary

The process followed in this research was fluid and adaptive as a number of important milestones did not yield expected results and I had to continually adapt my expectations as more information came to the fore. This adaptation process kept reminding me of the importance of scenario planning in helping organizations prepare and adapt for the unexpected. This process was excellent for my learning and became very informative for both me and the participants. Some participants highlighted that while they try and build scenarios during the annual strategy sessions, they have never followed any set methodology and hence they missed some very important nuances that come with applying a structured scenario planning methodology. What most organizations call scenario planning, is more akin to contingency planning as they usually evaluate the impact of one variable not behaving as expected in an adopted strategy and then deciding how they would respond to that situation.

With this research I learnt and came to know a lot from doing. In the next section I will discuss the results of the research.

4. CHAPTER 4: RESEARCH ANALYSIS AND FINDINGS

"The engine to my comprehension is just too complex, much too complex"

De La Soul
The Bizness
Stakes is High Album

Introduction

The primary aim for this research was to answer one question; which is how the sugar industry would look within a ten year period and how this may affect Bosch Projects. This question had other sub-questions embedded in it; which are:

- How does the future of BP look in the next ten years; when viewed through scenario planning relative to the sugar industry?

- After application of SP would any of these organizations apply SP for future strategy making?

- Relative to traditional strategy making methodologies how do these organizations view SP?

The last two questions could only be answered post the scenario planning exercise and therefore necessitated that I re-engage the participants to get post research feedback. Another unplanned question that emerged in the research, as I highlighted in the previous chapter is whether Bosch Projects was qualified enough to develop meaningful scenarios for the sugar industry, taking into consideration that it is their biggest market and that a number of employees are former sugar industry people.

During the actual research phase it quickly became evident that we had to look at how SA would look in ten years. We then had to imagine how that state of SA would impact on the sugar industry and ultimately on BP. The data collected came in clusters from the different organizations engaged during the research and these were all grouped to form the basis for formulating the scenarios. As previously stated the data was collected and grouped into two clusters, one for the sugar industry respondents and the other for BP respondents.

Figure 13 shows the processes followed for the data collection and analysis stages.

Seidel (1998:2) simplifies qualitative data analysis and describes it as a symphony of three notes "Noticing, Collecting and Thinking". He further asserts that in the symphony one should make some type of sense out each collection; look for patterns and relationships within and across the collections and make general discoveries about phenomena one is researching.

Answers to the questions asked and analytical insights that emerged during the data collection are the two points which he says one must draw conclusions from.

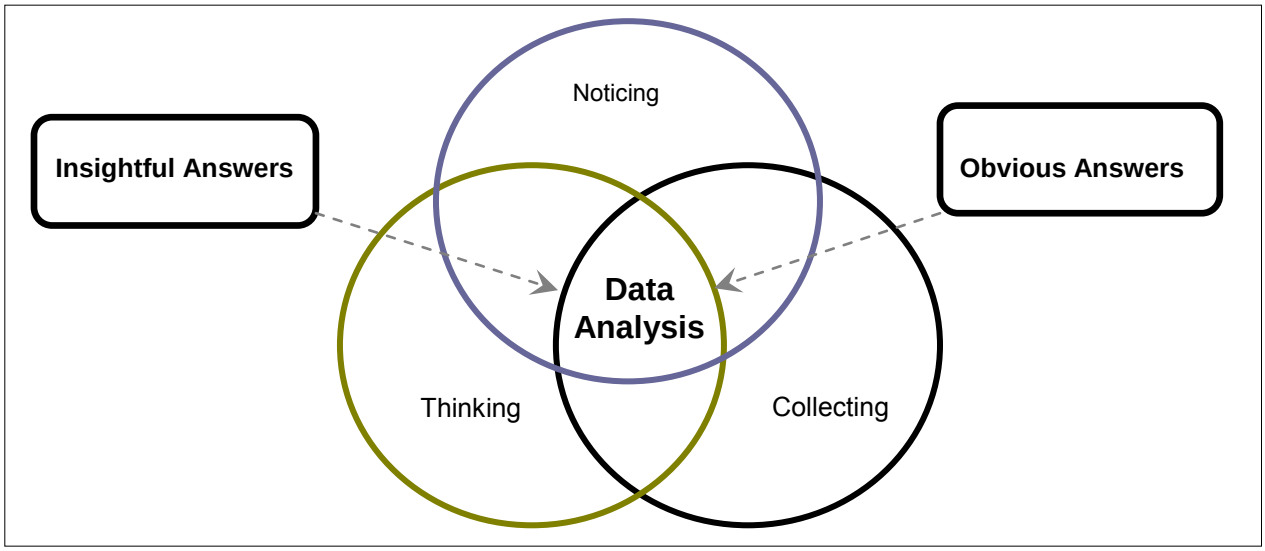


Figure 14: Data Analysis Approach
Inspired by: Patton (2002)

In this chapter I will present the scenarios developed from the sugar industry scenario planning sessions and then follow it up with the scenarios developed from the revised Bosch Projects scenario planning session. From these scenarios I will then answer the first two and the last, of the five research questions and their implications for the research participants. From post research engagement I will then answer the remaining two questions.

In the succeeding sections I will also analyse the data, draw the obvious conclusions and then highlight hidden conclusions which can only be seen through insightful analysis of the data obtained during the research as recommended.

Current State of Sugar Industry

In this sub-section I will discuss the current state of the sugar industry which is mostly informed by:

- The Rich Picture which I had developed post the flawed BP scenario planning session as stated in the previous chapter.
- The results of the SWOT analysis

This analysis is also informed by the multiple discussions I had with the sugar industry participants during the interrogation and analysis of the primer questionnaires. The rich picture was not used with any of the research participants but was a tool I used for myself in order to distil and summarize the issues affecting the sugar industry for my own understanding. I also could refer to it on a regular basis as I analysed the various bundles of data collected and also when I revisited and reviewed the scenarios developed at the different stages of the research. I will start off this section by providing the rich picture and then proceed to the discussion by providing the results of the SWOT factors in tabular format. These factors are grouped as presented to me by the industry participants. No factors were moved or shifted to a different column even though some had been misallocated. On analysis of the factors it became clear that there was some misunderstanding with some participants as to how SWOT factors should be grouped. Some individuals had difficulty with understanding how to differentiate the external factors from internal factors.

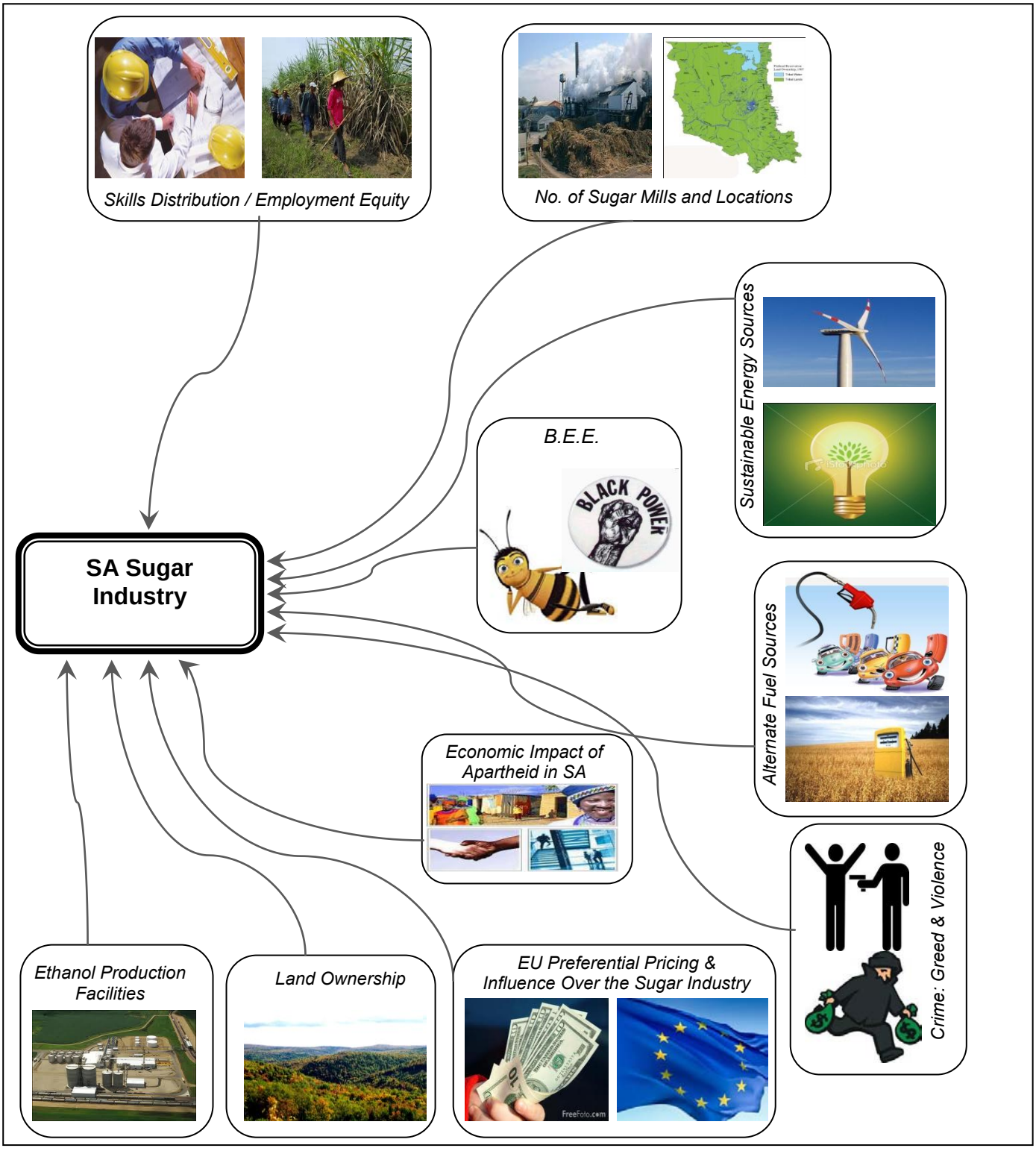


Figure 15: Rich Picture for Environmental Analysis

The Rich Picture shows the main components/ agents of the sugar industry system. These agents vary across the SPECTRE spectrum and include crime, skills availability and EE, sustainable energy sources, biofuels, land ownership etc. As previously stated, the picture was for my own use as it helped me easily identify the major agents of my system of interest.
The following table is an assembly of the factors as submitted and without re-allocating factors I have drawn up the current state of the industry.

SWOT Analysis: SA Sugar Industry

A SWOT database was drawn up with the sugar industry participants and this informs part of the discussions that follows:

SWOT Analysis	
Strengths	• World-class leaders in sugar technology • Many sugar engineering patents originate from South Africa • Tongaat-Hulett Sugar is internationally renowned in equipment design • SA companies can compete with the best in process technology and equipment design and manufacture • Bosch Projects and Techserve are internationally renowned sugar engineering and project management companies • Ease of access to vast tracks of land for production • Large employer for both skilled and unskilled labour in Africa • ISL is one of the biggest milling companies in the World. It is the biggest in Africa • SA companies have a footprint all over Africa • Access to cheap labour in other African states except in South Africa • African governments have a "sweet spot" for South African business • SA government is loved by it African peers • SA is a regional superpower in terms of sugar production and the economy in general
Weaknesses	• Cost of labour in SA is a prohibitive factor • Local consumption demand is almost stagnant • Indecisiveness of the sugar industry with regards to production of ethanol • The industry does not speak with one voice on issues of development e.g. THS was against the use of sugar cane for ethanol production.
Opportunities	• Ethanol production • Electricity co-generation • Land development • Access to preferential market prices for sugar production in Africa (excluding South Africa) • To partner with Brazilian companies who are already enjoying the benefits of ethanol and sugar co-production • Partnering with African governments in order to secure land for cane plantation in return for job creation and local investment • Partnering with companies that supply ethanol production technology • Securing ethanol supply contracts with EU companies and governments who have bought into and are now driving the renewable energy hype
Threats	• Political and economic stability in countries of operation • Risk of land invasions in countries where land reform has not implemented effectively • Corruption by government officials • Inability for government to enforce the rule of law • Lack of further investment in local communities where the companies operate

Table 3: Sugar Industry SWOT Analysis

In discussing the operating environment I have chosen to implicitly mix the themes that came from the SWOT and SPECTRE elements and then present the general description of the environment.

(Respondent 1, 2009, personal communication), whose opinion was backed by all the others, said:

> *"I personally think that one of the strengths is that the sugar industry is here to stay. No matter what we do, sugar forms a huge part of our lives. Be it food, medicines, refreshments like cold drinks and alcohol"*

The SA sugar industry's main advantage and strength is the high degree of technical expertise and competence. This provides millers with a chance to make money even under difficult circumstances. SA leads the world in terms of maximising sugar recovery from every stick of cane. Most sugar mills have managed to survive the world economic down turn and therefore instead of shedding jobs they have created employment for the jobless during a world recession. With the recent slump in the world economy, the sugar industry was not as badly affected as some of the industries as evidenced by the following statement from (Respondent 1, 2009, personal communication):

> *"In short we did not lose as many jobs as other people did. Sugar sales slowed down a bit but people still bought sugar"*

The sugar industry has also managed to engage in training of artisans, engineers and other skills in South Africa, which is a positive contribution to the sustainability of the country's economy. Staying competitive demands high production standards.

The weaknesses are a concern and most of them actually pose a threat to the sustainability of the sugar industry. They differ from mill to mill and organization to organization but the consistent theme was that the high operational costs are a result of a unionised labour force. I do not totally agree with view as adopting this mentality tells me that one would condone the exploitation of unskilled labour if the law allowed it.

Spatial planning and location of the sugar mills was also seen as a weakness because they are generally built too close to each other which can cause fights over the available cane. This is a result of takeovers and buy-outs as these have changed ownership a number of times.

The industry is in a comfort zone because SA has better extraction results than most markets and therefore has little incentive to actively seek performance improvements.

The main opportunity currently which does not need major capital investment is power cogeneration. However, there is a perception that the prevailing political climate does not make it conducive to pursue this option.
Downstream beneficiation of sugar is another opportunity, but this would need detailed market information to arrive at the range of viable downstream products. While the participants know possible products, not much time and money is being spent on R&D. Although not in a big scale, the sugar by-products are so valuable that it is expensive and financially unattractive to try and import them. Some of these by-products are alcohol from molasses as used by SAB, NCP and other spirits manufacturers, papers manufactured from bagasse as used by SAPPI and MONDI and methylated alcohols etc.

(Respondent 1, 2009, personal communication) said:

> *"Some of these industries caught a wakeup call when Gledhow Mill was about to shut its doors and they realized how much they relied on the sugar mill. They are now share holders and are very much involved in one way or the other".*

This sentiment was shared by all the research participants.

Although some have argued that it is cheaper to import sugar from India, Brazil and the likes, the import tariffs make it financially unattractive to do so. This is a protective mechanism afforded by government to the industry.

The abundant availability of cane and land to farm presents the industry with endless opportunities. A number of people are interested in farming sugar cane as a result of its perceived profitability. The job opportunities created through cane farming are great for the economy as cane farming is labour intensive and requires both skilled and unskilled labour. The industry needs to invest more on agricultural activities like R&D in order to find more cane varieties that can withstand changing climatic conditions and also present better yields per hectare. More cane must be made available to sustain the industry growth to meet demand. The SA government support to small scale growers makes it worthwhile for sugar millers to sell previously owned land to emerging farmers, but the millers must be actively involved in order to maximize the benefits to all stakeholders.

New or improved manufacturing methods and products are an underexplored section of this market. The existing production methods have been in existence for a long period and therefore present an opportunity to gradually change and improve technology. The industry must develop new techniques of making sugar and do that cost effectively.

Similar to Brazil, SA must be a major participant and not just a "victim" of market conditions and prices. When Brazil chooses to focus on making ethanol instead of sugar, the global sugar price increases and vice versa.

Input costs of farming, milling, advertising and also distribution are increasing on a regular basis yet the sugar price in the world markets is basically remaining unchanged. The instability of the coal price to R900 per ton is another challenge mentioned. Coal usage has to be minimized at all costs in order to minimize its negative impact. I see this as being difficult as most mills burn a mixture of bagasse and coal in order to lower fuel cost. It is difficult to run a mill purely on bagasse especially during start-ups as there is almost no bagasse available for this purpose.
These factors keep straining the profit margins and making it less attractive to invest in growing the SA production capacity.

Land redistribution is seen as a possible threat in the sustainability of cane supply to millers. When cane land is distributed to people with little or no cane farming experience, little yields or no yields may be received from the farm. There were differing views on how land claims would impact on the industry, some people highlighted that they felt settled claims may result in reduced land for plantation of sugar cane while others felt that unresolved could have a bigger impact in that its increases the risk of land grabs similar to Zimbabwe. Also under political factors, government's trade laws, depending what they favour, may impact the imports or exports of sugar. There is persistent concern during the change of government (elections) in that it may result in some changes that can directly negatively affect the whole sugar industry.

All the research respondents agree with (Respondent 4; 2009; personal communication) highlights the insecurity faced by millers in cane supply and says:

> *"… that most of the time the miller has no say on how the farmer or grower has to use his/ her land. This sometimes results to the farmer selling the land to developers for quick and sometimes greater profit than farming at the end of his/her contract with the miller…"*

Skills shortage and a perceived shortage of trainable people is another threat. Like all industries in South Africa, the shortage of experienced sugar personnel is on the rise and slowly causing

unease in the minds of sugar millers. Although there are levies to continuously train and skill people, some companies do not have the capacity to train and choose to “poach” in the already diminishing pool of the sugar industry. The geographical location of many mills also makes it difficult to attract skilled personnel as some people do not like “farm” life. The thorny affirmative action (AA) issue came up a number of times. It is agreed that in necessary but if welcomed with some resistance from the senior management it may be detrimental to the progress of the industry. AA appointees also have to compete with and try to dispel the perceptions carried by their colleagues about them being less capable then their white counterparts.

Black Economic Empowerment (BEE) can change the procurement landscape and bring along a new cluster of challenges and opportunities to the industry. Companies need to get actively involved in mentoring BEE companies that have a potential to meet their needs. There was an agreement that BEE and AA are necessary but that it is not well handled by most companies.

The national lottery and cell phones industries are also blamed for the slump in sugar demand. (Respondent 5, 2009, personal communication) said:

> *“I blame the lotto and cell phones. People used to buy sweets and drinks with their leftover change. Now they either but airtime or save some for the lotto. This means less sugar consumed/sold for us.”*

Availability of cane supply is probably the biggest threat in the industry as this is the core raw material for sugar production. The issues around cane supply vary from land issues to the availability of people in terms of skills and labour. Former cane land in the north coast, which is where most of the cane is grown, has been used for developing luxury estates. The development from north of Durban to Richards Bay has meant that some of the cane farming land is utilized for developing luxury housing and other infrastructure including the new airport which will come with warehousing developments. This is forcing milling organizations to look at rationalizing their mills and compete for whatever land under cane available.

Residential developments do not only diminish the land but also put pressure on labour availability in the north coast of KwaZulu- Natal. Former cane cutters for an example are now seeking employment in the building sector. All the farmers who still have land under cane are finding it very hard to get people to cut cane. As a result they have to rely on mechanical harvesting which is cost prohibitive and not well developed for South African conditions. Richards Bay is also responsible for consuming all available skilled labour and artisans. The sugar industry is finding it increasingly hard to catch up with the rate of pay some developed industries are giving to the skilled labour.

Another respondent highlighted poor education results and linked that to a poorly skilled labour pool which would affect productivity at mill level. There was also a constant theme of concern for safety and security, from all respondents of all races, in that this causes problems ranging from insecurity of staff when coming or going to work, especially people who work late and early morning shifts. Crime causes unnecessary cost increases because companies and people have pay for enforcing security measures. Crime was also accredited with the flight of skilled labour to other countries.

Economic factors such as fuel prices affect transport costs, thus impacting on the supply of raw material as well as transportation of the final product. Unemployment; an Economic factor; reduces the demand for the product and causes further unemployment to other industries. Exchange rates affect exporting of sugar as it is sold on a US$ basis. This can also have an impact on infrastructure upgrades and other costs of exported items which may have direct or indirect impact on the sugar business.

Competitive factors have an impact in the sense that if the price of sugar is high, then people have an option to purchase it from elsewhere, or even import it from other countries like Brazil. The levies and taxes paid on importing sugar make it unattractive to do this though. By adopting manufacturing best practices and implementing them effectively, they can reduce the cost of manufacture thus reducing the price of the product and increasing competitiveness of SA millers. The local millers do not actively compete with each other as it seems that they have an unspoken agreement that ISL will focus more in the industrial market while THS focuses on the household market.

Technology, Regulatory and Environmental factors also have direct impact in the sugar industry because of the nature of the business which relies heavily on all these factors. Technological advancements that allow each company to improve extraction by 1% are highly valued in the industry as these directly translate to millions of Rands in revenue increase. BP has been investing in sugar equipment design and has been successful in improving on old industry technology, such as the BP Chainless Diffuser which is approximately 20% cheaper to build and yet presents similar production results. Interestingly enough, someone has to first try out the new product before the industry "jumps on board".

There was a common thread regarding climate change being amongst one of the biggest threats as it affects crop production patterns and making it difficult to plan production targets. This is because sugar cane plantation relies heavily on weather patterns as well as the location of the plantation. With the climate changing more drastically than ever, more risks are posed to the productivity of sugar and its by-products. This may cause increased capital investment requirements to try and counter the effects of climate change possibilities. In some areas floods and droughts are a concern but there is an appreciation that there is not much that can be done about this.

The SA sugar industry is not proactive in fully exploiting the current possibilities that exist in South Africa such as power generation and biofuels production. The industry is waiting for government to drive the processes which we all know is too much to expect in a developmental state. The government might have more pressing issues to deal with currently. The industry knows of many existing opportunities that are either under exploited on not at all. I suspect that this "not now" attitude stems from knowing that the government will protect the sugar industry at any cost.

Brazil is the world leader in co-production of ethanol and sugar and the companies only produce the product that's more profitable for them and the country at any given time. I was surprised to hear (Respondent 1, 2009, personal communication) classify ethanol as a threat to the sugar industry, by saying:

> *"Production of Ethanol using sugar cane is another threat because it has a potential of reducing raw material supply for sugar manufacturing."*

This is only a threat if the sugar industry chooses not include an ethanol production capability in existing mills, therefore this threat is also an opportunity. The Brazilian government had a long term vision and made a conscious decision to subsidize production of ethanol long before it was profitable to do so. I learnt that only when the price of crude oil is around $50 does it become profitable to manufacture ethanol. OPEC is well aware of this fact and does everything to maximize the price of crude oil and then reduces the price before it becomes attractive for companies and governments to actually invest in bio-fuels. The Brazilian government chose to invest in ethanol production in order to provide themselves with a safety cushion against the volatile crude oil market. The SA sugar industry needs to lobby government and sell the case for local production of bio-fuels. The current regime is wary of biofuels as they are concerned about the effects it may have on food security. This is obviously a political power decision, but there is no

reason why SA sugar mills cannot maintain two production lines and thereby making sugar a "by-product" of bio-fuel production.

Eskom is still driving the co-generation dialogue which in my opinion is an error on the SA government's side and the sugar industry. Eskom leadership has no incentive to get other players on board in the electrical generation business. I believe that an independent body such as NERSA should be driving the talks about co-generation as it is difficult for any company to build its own competitors even if it's a state owned organization.

SA companies lead the world sugar market in re-investing in African states which are beneficiaries of the preferential rate offered by the EU. Many of these countries were ravaged by civil wars and so SA companies are able to get valuable land cheaply or at no upfront cost; with the assistance of governments with little infrastructure. British Foods has bought a majority stake in ISL in order to take advantage of its infrastructure in Africa and the accompanying incentive of selling African sugar to the EU market. I think what British Foods has done will soon be done by other EU companies. I cannot help but ask myself though whether EU companies lobbied the EU bodies to offer this incentive in order for them to get access to cheap labour and raw materials while being socially responsible.

I picked up a trend in thinking, that at production level, managers are only concerned with the local data that has a direct bearing on their lives and them being able to fulfil their production mandate. (Respondent 1, 2009, personal communication) said:

> *"Unseen threats may be a possible takeover by different shareholders who may change business objectives."*

This implies that the respondent is in a comfort zone and does not want to see change in his work environment. This of course encourages them to exclude or ignore issues that they suspect will not have an immediate impact in their planning. I am not surprised by this thinking because on a weekly basis there is an industry report, compiled by SASA, which benchmarks each sugar mill across all companies purely comparing production targets with a large number of variables. I believe that this forces mill managers to focus almost exclusively on inputs that will help them achieve acceptable standing in the weekly report.

Either strategy formulation is not very important to managers in the sugar industry or they have missed the point of formulating strategies, as informed by this comment:

> *"Unconsciously yes we do use Scenario Planning!"*

Strategic thinking and strategy formulation should not be an unconscious process. Managers have to be alive and conscious at all time to what is happening around them. Managers have adopted a notion that each year's strategy is to increase some industry benchmark; usually based on the previous year's results, by 10%.

It is a prevalent trend across a number of industries that managers also go on "two- day" strategy sessions and come back with thick documents for their department's plan which are only reviewed closer to the next strategy session which is usually a year later.

Sugar Industry Results

The sugar industry scenario planning session was the most thorough and most engaging. It was held over five days over a three weeks period. Even though the initial plan had been to only obtain the critical drivers of change so as to use them as the testing bed for the BP scenarios it emerged that the participants were interested in learning more about the methodology and were therefore willing to engage me to the point where we developed scenarios for the industry. The scenarios developed looked over a ten year window period. The sugar industry scenarios were still usable as a testing bed and yielded very interesting results for me as a researcher learning the pros and cons and weakness and strengths of facilitating a scenario planning session.

The following narrative reflects in detail the major steps followed in building the sugar industry scenarios.

Drivers of Change

Drivers of change are factors that have a direct and perceptible influence over the system of interest. These factors vary widely as some are in the immediate vicinity of the system while others are away. Some have immediate effect on the system of interest while others may be outside of the time window of interest. The change drivers may be grouped into two:

- **Predetermined Elements:** These are elements that we can predict with a reasonable degree of certainty. They may fall outside of our window if interest but we know that they will eventually occur.

- **Critical Uncertainties:** These are elements that cause unease as we do not know whether they will happen and when. It is hard to immediately predict how they will play out in the system and their long term impact. These elements usually are the reason for divergence in the scenario directions. Ideally one should be able to narrow down the critical uncertainties to just two items but this is rarely the case and hence it is recommended that you narrow them down as much as possible and then try out combinations of the few that are left.

SPECTRE Analysis

In this section I provide the drivers of change as identified by the sugar industry participants. The elements in grey, bold and italic font are those that were identified as critical uncertainties; they were used to develop the skeletal scenarios presented in the four quadrant grid which was the basis for the four scenarios developed.

SPECTRE Analysis: Factors Raised	
Social	• Increase gap between the rich and the poor, • Increase in middle class, • ***Latent racism,*** • ***Latent resentment for uncorrected injustices of the past,*** • Over-indebtedness of the middle and lower classes, • High rate of unemployment, • Tertiary education dropouts, • Quality of high school graduates, • ***Lack of willingness to work hard in order to succeed,*** • ***Public indifference to corruption,*** • ***Xenophobia,*** • Get rich quick desires, • Materialism promotion, • Respect for the rule of law, • ***Food security,*** • ***People's awareness of the pro and cons of fossil fuels against ethanol based fuels,*** • Skewed land ownership in SA, • ***HIV and AIDS,*** • Transfer of agricultural land from milling companies, • Creation of jobs, • Perception of shortage of skilled workforce, • ***Drugs and their effect on society,*** • Crime
Political	• ***Lack of will to act against corruption,*** • Need to secure more jobs for voting public, • Political stability, • ***Inability to quickly address land redistribution issues,*** • ***Ability and willingness to enforce the rule of law,*** • Buy-in of governments to the popular notion that global warming is caused by carbon emissions even though there is a different school of thought, • Agricultural land ownership, • Boom of "golfing estates" in former cane farms, • Urban creep as people from rural areas,
Economic	• Labour intensive industry especially farming and harvesting, • Demand of sugar/ sweet products, • ***Interest rate variation,*** • ***Exchange rate variations,*** • High interest rates, • ***Farmers uncertainty with renewal of existing cane supply contracts,*** • ***Unwillingness of business to invest in training graduates and artisans,*** • ***Attractiveness of SA Labour to international investors,***

	• ***Access to cheap electricity,*** • ***Food production and security***
Competitive	• Artificial sweeteners, • ***Golf estates competing with cane for land,*** • Petroleum industry against the new ethanol industry, • ***Carbon footprint as a source of competitive advantage for companies operating in "green" conscious countries***
Technological	• Cane production techniques not changing much, • Cane harvesting still labour based, • Automated plants but progress on the instrumentation side, not the mechanical side, • No new equipment being introduced in sugar processes, • Equipment progress is incremental, no leaps in technology
Regulatory	• ***Ban on use of foods as ethanol raw materials,*** • ***Opening electricity generation market to other players,*** • ***Land and water use management by government,*** • Taxing of large capacity petroleum engines/ vehicles, • Government control of imported sugar products, • ***Protection/ guarantees provided to companies willing to venture into ethanol and power generation sectors,*** • ***Land claims, tax incentives,*** • EU preferential price for 3rd world sugar production
Environmental	• ***Shortage of fossil fuels,*** • Damage caused by fossil fuels to the environment, • Availability of suitable land for farming, • SAs chronic water shortage, • ***Choosing the best raw materials for use in ethanol production,*** • ***Carbon emissions controls,*** • Reduction in emissions, • ***Renewable energy sources,*** • Green police, • General pollution (effluent, burning of cane etc)

Table 4: SPECTRE Factors

The Four-Grid Scenario Framework

It was challenging to the research team to reduce critical drivers to only two as participants had varying opinions about which two uncertainties were most critical. Post research reading showed that we could have used the method recommended by Means III et al (2010:26) to help us narrow down the critical uncertainties. They say:

> *"The driving forces and their associated critical uncertainties are ranked based upon their relative importance and their relative certainty of occurring with respect to the central question(s). Those of greatest interest in the process are both very important and highly uncertain (critical uncertainties)"*

Roxburgh (2009:18) recommends that different combinations be tried out and to see the varying storylines that come up. This was a luxury that we did not have for this exercise.

After much discussion and engagement it was agreed to accept two major issues of uncertainty as the following and they were used to draw up the two- axis of the scenarios grid:

- **Legacy of apartheid:** The legacy of apartheid showed itself to be an important factor to South African companies because it is yielding unexpected and unintended results in our society. On the one end of the spectrum we are faced with the possibility of a united country with people who appreciate and understand the negative impact of a racially divided society. On the other end of the spectrum we are looking at a society segregated along the class and affluence lines and possibly racial lines.

- **Energy sources and security:** Eskom is unable to meet the power demands of our developing society and power is not as cheap as it once was. Government is dragging its feet in finalizing take-up agreements with independent suppliers. On this axis we are faced with a society totally dependent on fossil fuels; including petroleum; whose long term availability is unsecure and has been shown to have negative impact on the environment. On the other end of the spectrum we are faced with endless possibilities of using renewable energies for all human needs.

These major uncertainties were used to develop the following four-grid diagram. The two variables in the grid should not be dependent on each other as this leads to creation of worst and best case scenarios, (Roxburgh; 2009:8).

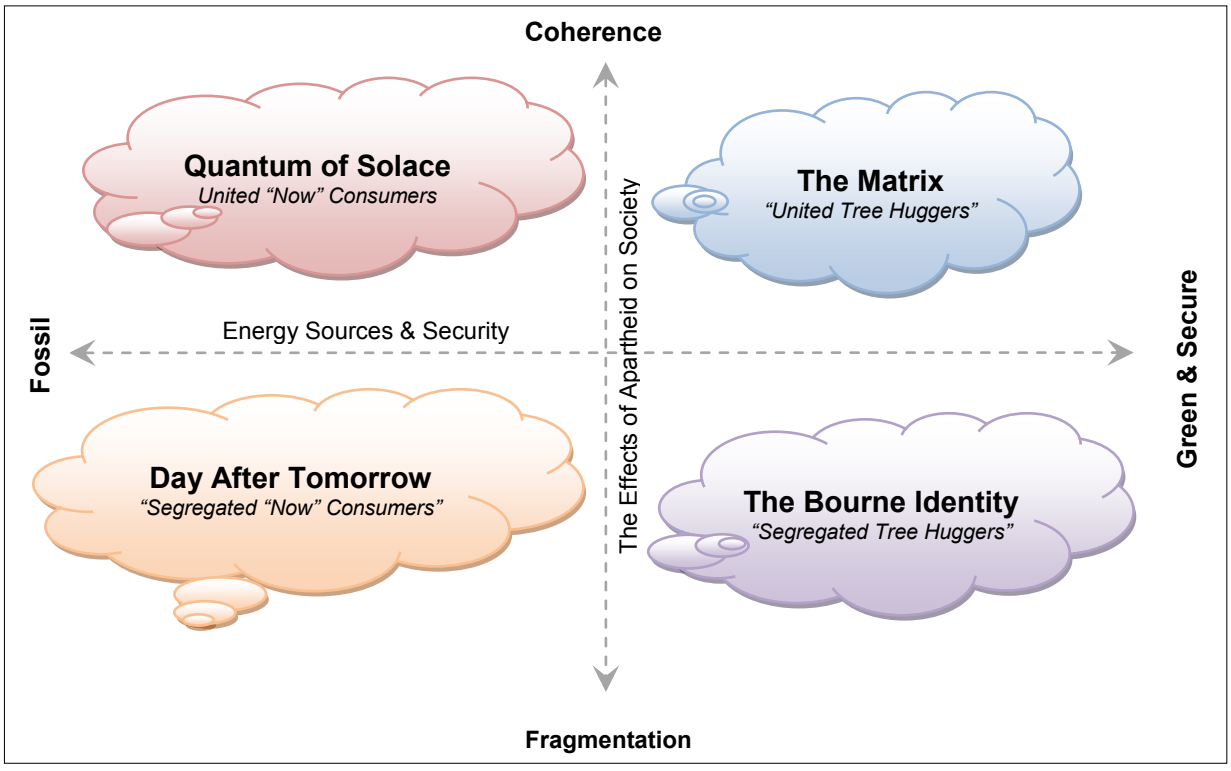


Figure 16: Four-Grid Scenario Frameworks Diagram

The Scenarios

The sugar industry sessions resulted in the following four scenarios which are presented in the next section:

Scenario 1: "United Tree Huggers"

This scenario is based in 2019 and is presented as an extract from an examination question paper and an answer provided by a postgraduate student for a module which forms part of the Advanced Leadership programme offered by the University of KwaZulu- Natal in Zimbabwe. The module is called Concerted Development.

Institution **:** University of KwaZulu- Natal – Harare Campus
Department **:** Leadership Centre
Degree **:** Postgraduate Diploma in Advanced Leadership
Module **:** Concerted Development
Module Code **:** LEAD CD 705
Year **:** November 2019
Question 2:

2.1 South Africa is now considered to be one of the best countries in the world and a number of case studies have been developed to highlight the concepts of concerted development and social upliftment of societies. Explain in concise bulleted points how and why the country is where it is today.

Solution:

General Concerted Development principles show that South Africa is where it is today because:

- **Land Ownership Distribution:** Because the concept of *"willing seller, willing buyer"* was not working, the SA government took a firm stance that land would be distributed back to black people and the owner would be compensated financially at a fair price even if they felt the price was unfair. Over time it had been shown that land owners were holding back to get higher prices not because what they were being offered was unfair. On financial settlement some of this land went to ruin as the new owners either had no skill to farm the land or they were just no interested, but this was an important step for settling the land issue in the eyes of the black community. Some black land owners started selling back the land to white farmers and this land carried no burdens of apartheid and forced removals.

- **BEE 2.0:** During the first decade of democracy only a handful of politically connected individuals were reaping the benefits of BEE. Business were only willing to engage BEE participants if it bought them political points. After President Zwelinzima Vavi was pushed by the masses to lead the ANC, all this multiple BEE dealing came to a halt as people who had already been empowered through some BEE deal worth more than R50m could not earn BEE equity points for their new partners.

- **EE 2.0:** The introduction of EE tax by government via SARS was a quick yet permanent fix for companies that did not want to train black individuals and promote them into senior management positions. EE tax was 20% of profits after the deduction of normal income tax and only applied to companies that were demographically representative of the SA population. Within four years of introducing this tax the professional landscape and SA boardrooms had changed drastically as companies suddenly started investing in fast

tracking the training and recruiting of unemployment graduates which had been a problem on persistent within the black race. For some reason white graduates never faced unemployment while this was very persistent with other races.

- **Education:** After many years of experimenting with improving the education system the country settled on a system; which while not amongst the best is now stable and well resourced. Everyone had always agreed that even during apartheid, the problem was not in the education taught at schools but was the unfair distribution of teaching resources based on racial grounds. The ANC should have concentrated on equipping the previously disadvantaged schools and fostering community ownership in order to minimize vandalism. Around 2012 people started showed a sign of losing patience with the educations system as it was perceived to have gotten worse under the ANC leadership. It was no longer justifiable that people in former townships still had to send their children to former model "c" schools to receive education that should be available at the schools right next to them.

- **Skills and Training:** The SETA system which had long been in existence finally started to show positive signs around the year 2014. Some SETAs had been performing earlier than that but some were constantly failing to provide the required skills training. The problem mostly lay with the leadership of these organization and greed driven corruption.

- **Research and Development:** SA academic institutions have always been highly regarded internationally due to the high quality of their research output.

- **Water Shortage:** SA has always known that it had a chronic water shortage but this problem crystallized in government's mind around 2015 when the country experienced severe drought due to climatic changes. Desalination technology has stabilized the country's water supply thereby removing the economic pressure that came with this scarce resource.

- **Protection of Local Industries:** Many industries which employ a large number of the population now enjoy government protection. Many developed countries have been doing this. China, which for a long time had an upper hand on labour costs compared to most countries, has started to lose its competitive edge as people are becoming unionised.

- **HIV & AIDS:** The country is still faced with the HIV & AIDS problem but the growth rate has been declining for almost a decade now. The decline is said to have started after President Mbeki's era; whose government was seen to be out of touch with contemporary thinking on managing the disease. SA is winning this battle but will only eradicate this problem once the men of the country start behaving responsibly as it is said they are the cause of the problem.

- **Exchange and Interest Rates:** The prime interest rate has been stable at around 8% since 2011. This has had a positive bearing on many sectors of the economy especially the property market. This second wave of the property boom since 1994 was better managed as government already had land management rules in order to prevent a number of farm lands being used for the development of luxury estates, golf and equestrian.

- **The Greening Rainbow Nation Initiative:** After having faced Eskom power shortage during the latter 1990s which were commonly called "Load Shedding" the government invested more in new power stations. Independent power producers were encouraged to sell electricity to the national grid. They were paid a fixed rate for power exported into the Eskom grid. The sugar industry was the major beneficiary as South Africa already had a number of sugar mills which could generate vast amounts of excess power. SA had always been considered one of the leading sugar producing countries with world class engineering

expertise. Their government; taking a leaf from Brazil; also took a stance that 80% of cars sold in SA should be able to run on ethanol, petroleum based fuels or a combination thereof. The state offered incentives to the automotive industry to introduce flex fuel vehicles in order to improve public uptake of ethanol usage. The South African citizens soon realized that ethanol behaved like diesel as they could run longer on tank of ethanol than possible with a tank of petrol. All these renewable initiatives were part of the Greening the Rainbow Nation Campaign which has been emulated by many other countries.

- **World Cup 2010:** The 2010 World Cup, which was the first on the African continent, is acknowledged as having forced the world to take note of SA's engineering and project management capabilities. The Moses Mabhida stadium is still considered the best looking stadium in the world and has become an icon and landmark for Durban, the country's new economic hub.

- **Keep Flying the Flag:** Many sectors of business and the SA community noted the unity felt by the country during the 2010 World Cup and they chose to maximize benefit from this euphoria. It is interesting to note that the euphoria never really subsided as SA sports support stopped being race based and any sporting event there is now racially representative of the country's demographics.

- **Olympics 2016:** Durban was awarded the opportunity to host the Olympics and this entrenched SA and KZN in people's minds. The Moses Mabhida stadium, the lush cane field stretching for kilometres along the east coast and generally sunny weather of the province attracted a lot of foreign interest into KZN. Three sugar mills were bought by EU companies and upgraded to crush twice of their previous capacities. These mills are now both sugar and ethanol focused. This also went a long way in ensuring that South Africa was included in the preferential pricing strategy. This inclusion was mainly due to the EU wanting to reward SA for adopting the 2025 Green Charter developed by EU states.

- **Corruption Anonymous:** President Vavi was also loved by the masses for taking a decisive stance against corruption. His government rooted out all civil servants who were corrupt and people who went into politics for self enrichment. People convicted of fraud and corruption received similar sentences as murderers because they were shown to be taking away from the poor to whom a government grant meant the difference between life and death.

Scenario2: "United ‚Now' Consumers"

This scenario is presented as a pre-discussion article published by the South African Sugar and Associated Industries Journal. It is written by the chairman of a newly formed lobby movement that wants to influence political and economic direction of the country with special focus on sectors and activities that affect the sugar industry and related industries. The name of the organization is Green Sugar Milling South Africa (GreSuMSA). The published article is about first highlighting what has gone wrong in the country and then devising plans to help and or gently nudge government to start adopting green initiatives that make economic sense for the sugar industry and therefore the vast electorate employed by the industry. The second, but equally important aim is to mend relations with the EU so as to resuscitate the old preferential pricing structures and to win new favours for adopting the 2020 Green Charter.

Article Title : Going Up: An Overview of How the SA Sugar Industry has gone Down
Author : Dr Sandile Mthiyane
Year : April 2020
Publication : SASAIJ Vol. 1 Issue 2

In 2020 South Africa has developed very well as a country and the negative impacts of apartheid have mostly been removed on a social and superficial level. The country's development and growth have been driven by consumption of fossil fuels for energy generation; coal for power stations and petroleum for transportation.

The country has outlawed the use of food products for the production of ethanol and other biofuels. The sugar industry is heavily subsidized to keep it profitable and to maintain its employment levels. Sugar companies have now invested in foreign ethanol production operations albeit they were slow on taking up this opportunity until they were forced by the EU sanctions. Crime and corruption are seen to be under control and within acceptable international norms. Mozambique is the biggest producer of ethanol in the SADC region and has the biggest ethanol plant in the southern hemisphere which was designed and built by Bosch Projects.

SA is shunned by the "green brigade" countries, which are mostly EU based because of its environmentally unfriendly viewpoints. These countries no longer offer financial assistance, in any form, to African states that have not adopted and shown a positive attitude towards the 2020 Green Charter which prohibits the use of non-renewable energy sources. These countries are further threatening to cut ties with states that house operations for companies headquartered in non-green countries. This threat weighs heavily for sugar companies that are heavily invested in Africa in order to obtain preferential EU prices for sugar products including ethanol. This means that SA companies face a real threat of either selling their foreign operations or not being based in SA to avoid the repercussions for these non SA operations.

SASA has been very reactive in all its actions and hence it is seen by the sugar industry to have failed to serve its interests. A new body is being formed behind the scenes to lobby the South African government in protecting the industry's interests both in SA and the rest of Africa. It is also tasked with mending the relationship with the EU and being proactive with the "greening" of African states in order to earn brownie points with the EU.

Because the growth of the country came at a cost of not adopting "green" trends, the country is battling to convince the population that going "green" is for the good of the country. There is a heavy argument that as much as SA has grown it is still burdened with improving the lifestyles levels of all people to that of first world countries and this would be difficult to achieve if the country had adopted EU green policies. GreSuMSA is aiming and reaching negotiated milestone with the EU in order to phase in the adoption of the 2020 Charter. The country cannot compete with first

world states on “green” benchmarks. People are still unwilling to invest in green products due to the required upfront cost:

- Changing to solar water heaters
- Modification to vehicle engines to run on ethanol
- Negative perception of diesel/ ethanol vehicles by the “performance car crazy crowds”

Government is subsidizing the adoption of the green strategy by providing rebates for home use of solar panels and similar products. This started around 2009, but at that time it was purely driven by the shortage of energy. This subsidization was meant to reduce the burden on the Eskom grid thereby ensuring temporary energy security until new power plants came online. SA citizens are too used to living for “now” and have difficulty compromising and changing lifestyles for a future that might never come to fruition. An alternate school of thought has taken hold regarding global warming. This alternate school of thought that has gained ground says that global warming has nothing to do with carbon emissions and that the earth is going through a normal cycle of cooling or warming. This belief is solidified by the perception that the first world countries are pushing the green agenda in order to *“keep the third world on foot while the first world stays on the driving seat”*. America’s unwillingness to sign the Kyoto Protocol and similar initiatives makes the third world even more suspicious of the real agenda as EU states and the new UN have shown themselves over a number of times to be unwilling to punish USA for breaking agreed rules.

Most developing countries have taken a stance that if western countries will not do business with them then they will do business with China. For a long time China was seen as the answer to the arrogant west as it was perceived to at least respect other countries and did not take a superior-than-thou stance when dealing with developing nations. Africa and the rest of the developing world has seen that while China does not impose strict conditions it is not sufficient to maintain long term growth desired by all these nations and hence they need to nurture the relationship with the EU.

The world is a community and while we may not always like our neighbours we sometimes have to deal with them. The EU is the neighbour we don’t like but who can greatly improve our neighbourhood.

Scenario 3: "Segregated "Now" Consumers"

This scenario is presented as a pre-cursor to the AU Summit which is considering removing South Africa as a member state because of EU's threats to cut all financial aid and economic ties with Africa if they continue to be led by South Africa which is seen as the new Zimbabwe. The article is written by Prof Akhanya Madiba who is the Head of Economic Development unit.

Economic Development Office
African Union
Lesotho

To : AU heads of state and representatives

Date : 2 May 2018
Status : Confidential

African Union www.au.org
An Alliance of African countries united by a common vision for the greater good of mother Africa and her children

***The primary aim of this article is to prime the heads of states**; ahead of the **uMlazi Summit**; of the negative impact one of our sister states is having on the rest of the continent because of its toxic relationship with European Union. Considering the losses mother Africa faces if we do not cut ties with our sister, the Economic Development Office has produced this briefing with key points that need to be considered when deciding the fate of our sibling state.*

It is with a heavy heart that that I draft this letter but, the year is now 2018 and South Africa is a country divided both along racial and class lines. Black people harbour resentment against whites who they feel have made zero sacrifice in order to balance the injustices of apartheid. On the other end of the scale white people carry resentment against policies that were meant to correct apartheid's injustices such as Black Economic Empowerment and Employment Equity. They feel that these initiatives have put them at a disadvantage so many years post 1994. Within both race groups there is also class segregation as poor blacks resent everyone including successful blacks as they see them as being part of the problem, doing minimal to change the economic dilemma they are faced with.

The South African government has failed to make a visible difference in promoting and enabling green energy development and usage as people have failed to accept that they should make economic compromises when they are faced with an uphill battle to earn decent wages. The country is heavily dependent on fossil fuels including coal for power generation. Eskom is finding it difficult to secure further funding from international funders who fear retribution from the EU in order to meet the energy requirements to grow the economy further. The public is against nuclear generation due to associated safety concerns. This inability to generate additional power and to secure additional funding has resulted in sporadic civil unrest as people are tired of being faced with +20% annual increases in electricity price for the past number of years. This has had a knock-on effect in other spheres of the economy. Parties that are highlighting what government should have done a while ago, show that the government could have introduced green strategies much earlier and could have secured energy availability had they allowed independent electricity producers to get on board much earlier.

Government has failed on a number of spheres including:

- To address land ownership. This has resulted in angry mobs invading farms and forcefully taking land which has not been redistributed back to them through the legal process. These raids however have negatively impacted on food availability in the country.
- To encourage the use of cane for ethanol production. Farmers have become tired of the sugar industry paying them based on sucrose content in their cane when ethanol is not cane quality dependent. Some farmers have moved to neighbouring African states where they plant cane and other food stuffs and get paid a premium for it. These farmers generally prefer to sell their cane to ethanol plants which are not concerned with sucrose content and hence they find that doing business with them more profitable then sugar mills.
- To allow sugar mills to import excess power to the Eskom grid. Most farmers have converted their farms into golf estates as they felt it presented them with immediate profitability. But this is an anomaly as these estates are now holiday homes for most people who no longer call South Africa their first home.
- To decisively tackle employment equity. Black people felt that they were continuously expected to compromise in order to maintain the peace and this eventually resulted in looting and large scale riots. Some companies then chose to take a "window dress" approach where people were appointed into positions they were not appropriately skilled for. There was no effort to train them in their fields of interest. This affected the sugar industry, its efficiency levels and hence its competitiveness even though it had always been training people for technical positions. Foreign companies presented skilled sugar engineers and artisans with offers that were hard to resist.
- To decisively manage BEE deals. The issue of the same people who kept getting lucrative BEE deals through their political connections, even though they were already empowered was another aggravating factor of the 2015 riots that brought South Africa to a standstill and made the country almost ungovernable.

The world has lost the romance it felt for South Africa and the halo effect that went with the Nelson Mandela brand has faded since his passing away 2014. South African companies are no longer receiving the darling status they once enjoyed because their country is no longer as loved in the continent due to government's racial denials and the inability to deal with xenophobia attacks of 2011 that left a number of foreigners of African descent dead and with no justice. This resentment shows itself where all operations owned by South African companies are burdened with social investment not required of other companies in the rest of the continent. The EU and the "green brigade" are treating countries with non green operations with the same attitude George Bush once treated non-American allies during the War on Terror. SA is seen as a country condoning environmental "terrorism" which is now defined as being any activity of using non-renewable resources when there is a renewable resource already available. This stance has taken away the EU's preferential price benefit previously enjoyed by most African states. This stance has lowered the profitability and the attractiveness of further investing in most of these operations.

Former SA sugar companies are now getting bought off by foreign interests as being South African is an Achilles heel for any company wanting to business with the EU.

I trust that this sheds the light on how the rest of the continent is suffering due to one state. While we sympathise with our South African brothers we cannot justify punishing our people in the rest of the continent over a principle.

Yours faithfully,

Dr Akhanya Madiba
Head of the Economic Development Office

Layout Inspired by: Metals Mining Scenarios to 2030 (2010:16)

Scenario 4: "Segregated Tree Huggers"

This scenario was not explored because some of the participants were not available. We conducted a high level analysis of this scenario and it showed that it carried some major elements of the other three scenarios.

It was decided that if any sugar industry or BP strategy was robust against the three other scenarios then it would be robust against this scenario.

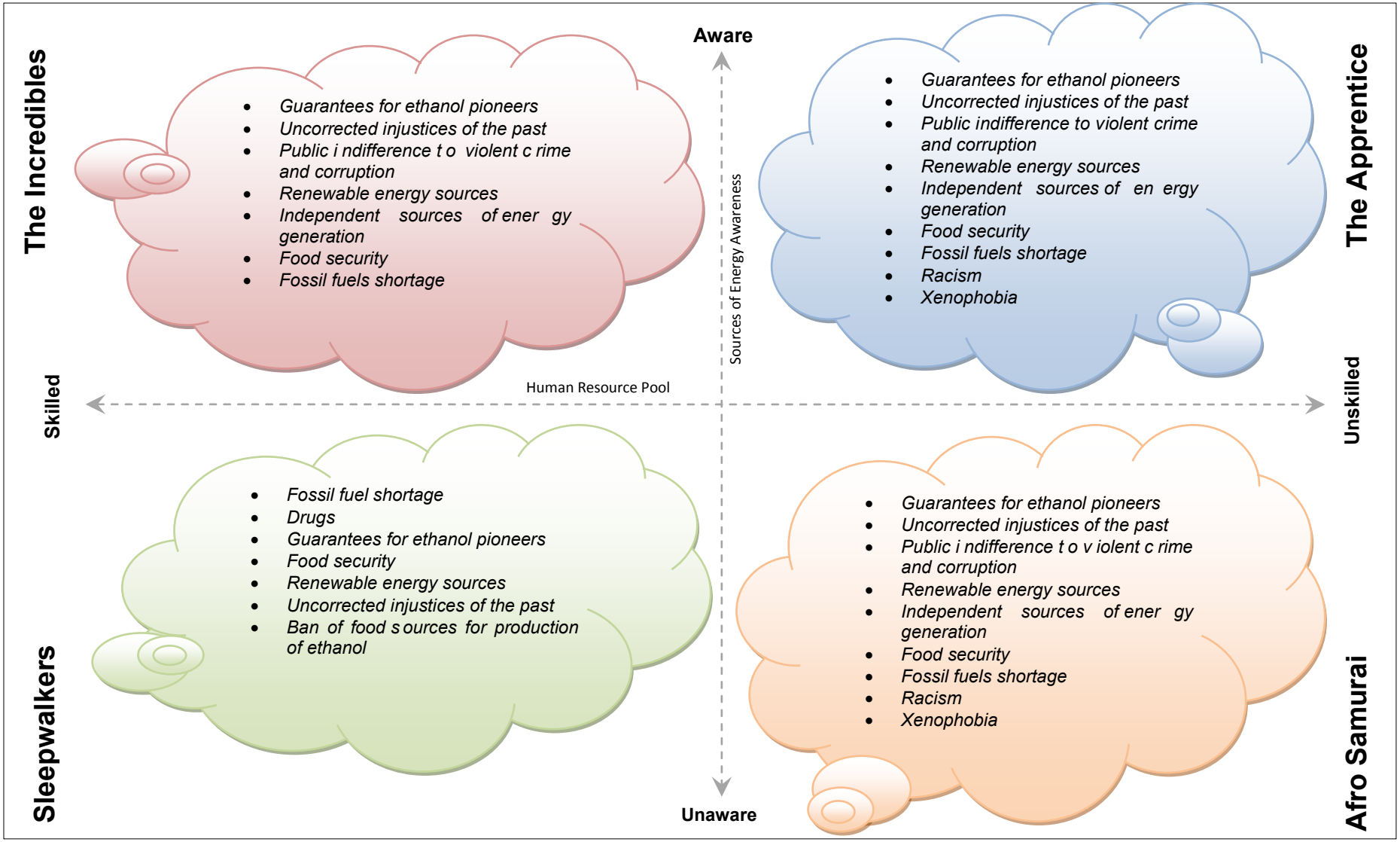


Table 5: BP SPECTRE Factors Regrouped by Scenario

The Bosch Projects Scenarios

As part of my own continuous learning process experienced during this research I found myself compelled to revisit the BP scenarios as reflection showed me that I had facilitated them in a flawed manner. I had fallen into a trap where the scenarios are not useful to the organization as risked turning people off from the usefulness of scenario planning.

With aid of the factors raised in the external environmental scan I re-imagined the BP scenarios and four storylines were created which were more relevant to the sugar industry than the previous ones, see Appendix 3 for the initial set of scenarios. I undertook the creation of the stories on an individual basis but using the factors developed with Bosch Projects participants. The first scenario created was used as the skeleton of the other three scenarios; this helped me to observe how the critical uncertainties can change the direction of the storylines. This partly one-man approach was flawed but I had to go through the process in order to correct the errors I had picked up in my original facilitation process plus to gauge how creation of scenarios with a minimal number of people can minimise the gravity of the scenario storylines:

Scenario 1 - The Incredibles

South Africa is a country which has done very well in addressing the issues of people development with the overall objective of correcting the imbalances created by apartheid. There is no longer a chronic shortage of skilled labour pool from which to choose resources and people are very much aware of the origin of the products that they use. There is a great concern for the wellbeing of the environment and for the labour that manufactures those goods. Usage of goods manufactured and independently certified to be from sustainable sources is a priority for a growing number of people.

Hybrid and electric vehicles now make up more than 30% of new vehicle sales for various reasons including the low cost of running and maintaining electric vehicles. This growth was spurred by the introduction of carbon tax to new vehicles sold in October of 2010.

Crime and corruption are still persistent but they have dropped to what most people consider acceptable levels when compared to countries of similar stature. Around 2012 the government stepped up its efforts to resolve the problems created by apartheid as people were quickly losing patience with the ANC government. Young people were frustrated with not getting services delivered while politicians were quickly getting rich instead of delivering on their mandate to uplift the lives of ordinary citizens. Compulsory free education positively changed literacy rate of the country's population. BEE, EE and land redistribution were finally resolved by taking a tough stance of people and companies non-compliant with these laws. Land owners were compensated at a fair price and there was no negotiation as previously done during the "willing seller, willing buyer "period. Unreasonable fines were imposed on companies not complying with the country's equity laws. People already directly empowered through BEE deals could not further accumulate more deals as companies could not earn more positive rating by empowering an already empowered individual.

The sugar industry has quickly taken up the opportunities presented by the green fuels drive worldwide and EU countries have into SA companies in order to obtain carbon credits as expected by their citizens. The advantages SA had over most countries were the abundance of cane lands, exceptional sugar milling skills and a large number of already operational sugar mills. Most mills now produce ethanol as their main product and sugar has become a downstream product of the process. This has ensured employment for both educated and uneducated masses. Eskom having had failed to ensure a secure supply of cheap electricity; the government finally issued licences to independent power producers but the prices were fixed in order to ensure market stability. The

sugar industry was once again amongst the earliest adopters and takers of this opportunity as they have always had excess capacity which they could now sell to the national grid.

Scenario 2 - The Sleepwalkers

South Africa is a country which has done very well in addressing the issues of people development with the overall objective of correcting the imbalances created by apartheid. There is no longer a chronic shortage of skilled labour pool from which to choose resources. The problem is that people are not aware of the origin of the products that they use and they do not care to know. There is no concern for the wellbeing of the environment and for the labour that manufactures those goods. Usage of goods manufactured independently certified to be from sustainable sources is not priority for a large number of people.

Hybrid and electric vehicles now make up more than 30% of new vehicle sales for various reasons with the low cost of running and maintaining electric vehicles as the primary driver. This growth was spurred by the introduction of carbon tax to new vehicles sold after October of 2010, but people still do not care about the environment.

Crime and corruption are still persistent but they have dropped to what most people consider acceptable levels when compared to countries of similar stature. Around the year 2012 the government stepped up its efforts to resolve the problems created by apartheid as people were quickly losing patience with the ANC government. There has been a discernable difference in balancing the economic imbalances created by apartheid. Young people were frustrated with not getting services delivered while politicians were quickly getting rich instead of delivering on their mandate to uplift the lives of ordinary citizens. Compulsory free education positively changed literacy rate of the country's population. BEE, EE and land redistribution were finally resolved by taking a tough stance of people and companies non-compliant with these laws. Land owners were compensated at a fair price and there was no negotiation as previously done during the "willing seller, willing buyer "period. Unreasonable fines were imposed on companies not complying with the country's equity laws. People already directly empowered through BEE deals could not further accumulate more deals as companies could not earn more positive rating by empowering an already empowered individual.

The sugar industry has not taken up the opportunities presented by the green fuels drive. The EU has decided to punish SA companies as they tend to show disregard for the environment in their business dealings. Sanctions have been imposed on SA owned companies even those operating outside SA. Most mills now produce ethanol as co-product to sugar. This is driven by the growth in the number of flex fuel vehicles on SA roads. This has ensured employment for both educated and uneducated masses. There is a growing realization that by the country going green, it is easier to access EU funding for economic development projects. This will also help SA owned operations regain the EU preferential pricing for sugar that SA companies once enjoyed via its third world operations. Eskom having failed to ensure a secure supply of cheap electricity; the government finally issued licences to independent power producers but the prices were fixed in order to ensure market stability. The sugar industry was amongst the earliest adopters and takers of this opportunity as they have always had excess capacity which they could now sell to the national grid.

Scenario 3 - The Afro Samurai

South Africa is a country which has done very badly in addressing the issues of people development with the overall objective of correcting the imbalances created by apartheid. There is a chronic shortage of skilled labour pool from which to choose resources and people do not care about the origins of the products they use. There is no concern for the wellbeing of the environment and for the labour that manufactures those goods. Usage of good manufactured and independently certified to be from sustainable sources is not a priority for a large number of people.

Hybrid and electric vehicles have failed to take off primarily due to the prohibitive upfront costs for such vehicles. The low cost of running and maintaining electric vehicles has not been incentive enough for most people who are poor.

Crime and corruption are still persistent. The government has failed in its efforts to resolve the problems created by apartheid as people have lost patience with the ANC government. Other political parties gave gained ground against the ANC as people are no longer voting according to colour. Young people were frustrated with not getting services delivered while politicians were quickly getting rich instead of delivering on their mandate to uplift the lives of ordinary citizens. Compulsory free education has not changed the literacy rate of the country's population due to the lack of resources for schools to implement their mandate. BEE, EE and land redistribution are still unresolved as government has not done anything to address the weakness of the processes which have been identified in the past ten years. Land ownership is still skewed due to the flawed „willing seller, willing buyer' system which was shown a decade ago not to be working but was never addressed. Companies non compliant on EE targets, have never been severely punished. People already directly empowered through BEE continue to accumulate more deals even though it has been shown to be benefiting only certain individuals with political connections.

The sugar industry has quickly taken up the opportunities presented by the green fuels drive primarily driven by the EU. EU based companies have bought controlling stakes in SA companies in order to obtain carbon credits. The advantages that SA had over most countries were the abundance of cane lands, exceptional sugar milling skills and a large number of already operational sugar mills. Most mills now produce ethanol as their main product and sugar has become a downstream product of the process. Skilled positions are filled by expatriates as there are insufficient skills within the SA labour market to fill these positions. At minimum this has ensured employment for the few educated and mostly uneducated masses. Eskom having had failed to ensure a secure supply of cheap electricity; the government finally issued licences to independent power producers but the prices were fixed in order to ensure market stability. The sugar industry was once again amongst the earliest adopters and takers of this opportunity as they have always had excess capacity which they could now sell to the national grid.

Scenario 4 - The Apprentice

In this scenario South Africa is faced with a growing pool of unskilled labour as most people's educational careers end at secondary school level. While these people do not hold any formal qualifications, they are highly aware of the latest technology trends and exhibit behaviour of materialism. The great issue is that most people feel they have been failed by the education system of the country and that government is doing little in ways of tangible actions to change their lives of ordinary people.

South Africa is a country which has done very badly in addressing the issues of people development with the overall objective of correcting the imbalances created by apartheid. There is a concern for the wellbeing of the environment and for the labour that manufactures the goods as South Africans are much unionised and believe that environmental awareness is good for themselves and their children. Usage of goods manufactured from sustainable sources is a priority for a growing number of people; independent certification is not a major concern though. There is a chronic shortage of skilled labour pool from which to choose resources. People do care about the origins of the products they use and Made in South Africa products are preferred as they create employment.

Hybrid and electric vehicles sales have started to take after years of minimal uptake. The primary driver of this growth is the government's subsidy scheme for these vehicles as their upfront costs are prohibitive. The low cost of running and maintaining electric vehicles has not been incentive enough for most people until the introduction of the schemer. The pleasant surprise has been the public uptake on electric motorcycles which have been well received.

Crime and government employee corruption are still persistent. The government has failed in its efforts to resolve the problems created by apartheid and people have lost patience with the ANC government. Other political parties gave gained ground against the ANC as people are no longer voting according to colour. Young people were frustrated with not getting basic services delivered while politicians were quickly getting rich instead of delivering on their mandate to uplift the lives of ordinary citizens. Compulsory free education has not changed the literacy rate of the country's population due to lack of resources for schools to implement their mandate. BEE, EE and land redistribution are still unresolved as government has not done anything to address the weakness of the processes which have been identified in the past ten years. Land ownership is still skewed due to the flawed "willing seller, willing buyer "system which was shown a decade ago not to be working but was never addressed. Companies non compliant on EE targets, have never been severely punished. People already directly empowered through BEE continue to accumulate more deals even though it has been shown to be benefiting only certain individuals with political connections.

These factors have maintained other socials ills such as:

- Xenophobia albeit at a small disguised level, as some people carry resentment of foreign nationals as they see them as taking their jobs.
- Racial and class polarisation. Poor black masses resent the black middle class as they feel they have no interest in uplifting them. There is a general resentment of the white race from the black community as they feel that they have never given or compromised on any economic and land issues and hence so many years after 1994, there has been no discernable change in economic profile of the country.

Because the country is environmentally friendly and is generally viewed to be politically stable by the EU; products manufactured from sustainable sources receive preferential pricing in the EU region. The biggest beneficiary of this scheme is ethanol. The country is now investing in ethanol production facilities.

The sugar industry has quickly taken up the opportunities presented by the green fuels drive primarily driven by the EU. EU based companies have been buying controlling stakes in SA companies in order to obtain carbon credits. The advantages that SA had over most countries were the abundance of cane lands, exceptional sugar milling skills and a large number of already operational sugar mills. Most mills now produce ethanol as their main product and sugar has become a downstream product of the process. Skilled positions are filled by expatriates as there are insufficient skills within the SA labour market to fill these positions. At minimum this has ensured employment for the few educated and mostly uneducated masses.

The sugar industry in conjunction with the ethanol industries is investing a lot on money into training artisans. The approach has been to lower entrance requirements for technical positions but put candidates through rigorous training programmes to make up for the disadvantage.

Due to Eskom having failed to ensure a secure supply of cheap electricity; the government finally issued licences to independent power producers but the prices were fixed in order to ensure market stability. The sugar industry was once again amongst the early adopters and takers of this opportunity as they always have had excess capacity which they could now sell to the national grid.

Strategy Concepts Misunderstood

In investigating how sugar companies formulate strategies and analysing the data that helped answer the research questions; I was not surprised to hear (Respondent 3, 2009, personal communication) say:

> *"We look at economic factors, political factors and the industry landscape as well as developments. Once these are analysed, then the current strategy is reviewed and changes on the current strategy are proposed and re-examined."*

This was in response to my question of how his organisation approaches strategy formulation and evaluation. This echoed general assumptions, as carried by the other participants, about strategy formulation. At a high level observation this statement says there is continuous re-evaluation of strategies as advocated for by the learning school but this review he was referring to; only happens once per annum closer to the period of the strategy weekend away. There was a general admission that even though scenarios are formed, there is no set or structured method used in achieving this. (Respondent 10, 2009, personal communication) said that they do try and build more than one scenario as noted from the statement below:

> *"Uncertainties are handled by having contingency plans in place. A "what if" analysis is done during the strategy formulation, this is an uninformed scenario development method."*

On interrogating this statement further, it became clear that only one strategy is thoroughly built for the most attractive scenario and a discussion is held for the "what if" scenario(s). This incomplete thinking leaves room for error due to a possible delayed reaction if the undesired scenario were to materialize. The notion of the scenario is also misunderstood as I have now shown that scenario planning is more about unearthing worldviews and challenging mindsets in order to prepare executives for a future they cannot imagine and less about predicting the future. Most importantly this delayed reaction related threat would likely come from the need for people to meet and re-strategize. All the participants misunderstood what scenario planning was about and loosely used the term scenario to describe a possibility and hence what they called scenario planning actually meant contingency planning.

A number of managers thought that scenario planning is about forecasting the future, which I have shown not to be true.

Answers to the Research Questions

1. **How does the future of the sugar industry look in the next ten years; when viewed through S.P?**

   The future of the industry looks full of possibilities. It is up to the participants to unearth and exploit the opportunities that exist. They need to be more proactive on issues such as ethanol, green fuels production and cogeneration. They have the opportunity to forge their environment to give them a future that suits them. The industry cannot base its business case on government protection and EU preferential prices only as these measures have an unknown lifespan.

   Some companies are short sighted and would rather sacrifice long term benefit for short term gains. Some respondents blamed one of the sugar milling companies for entrenching the doubt of using cane as a source for ethanol production. Their argument was that sugar production is dependent on sucrose content in the cane while ethanol is not cane quality sensitive. Hence one milling company which is not interested in ethanol production was concerned about the security of cane supply if the crop was allowed to be used for ethanol production. It is said that this organization is responsible for discouraging government into allowing sugar cane to be used as an ethanol production source. I believe that this is where organizations such as SASA and SASTA can play a major role and make a positive difference by presenting the truth to the relevant stakeholders to ensure that the sugar industry receives the best deal and opportunities available. In my opinion, whoever decides to lead the pack and take advantage of the current untapped opportunities, they will reap big rewards.

   Cane farmers must push for the use of cane for ethanol production as it is in their best interest.

2. **How does the future of BP look in the next ten years; when viewed through S.P?**

   BP seems to be caught in a win-win situation irrespective of whether things change or stay the same for the sugar industry as it has a worldwide footprint and has recently formed a new subsidiary in Brazil, the world's biggest sugar production market. It would be to the advantage of BP to prepare for whatever eventuality at the end. From the scenarios it is clear that there is a clear opportunity in energy generation and biofuels production and that in the long term the EU is mostly likely to adopt a "green approach" to all countries and companies the EU does business with. BP could start aligning itself with EU certification bodies to make it a recommended supplier of engineering services for future business growth.

   BP can also pre-empt some changes to the industry by lobbying government to pursue co-generation and ethanol production without worrying about food security. The company can achieve this via different means such as ECSA, SATA etc. The lobby body can influence government to only focus on cane based ethanol factories as these can also produce sugar and therefore have no negative impact on food security unlike maize based production facilities. BP already has ties with Dedini, a well reputed ethanol equipment supplier from Brazil, hence is well placed to take advantage of that eventuality.

   All participants agreed that technology used in the sugar industry is not cutting edge but South Africa is generally ahead of other countries in technology used in the industry e.g. diffuser technology. Brazil is only now becoming interested in diffuser technology, this happened after BP formed a relationship with Dedini who are now responsible for marketing the BP chainless diffuser technology. In 2008 ten of these diffusers were sold in Brazil and four have been sold in Asia as there is a general consensus that that the milling tandem method is outdated and maintenance intensive while the chainless diffuser gives better production efficiencies and requires less maintenance.

BP has formed an equipment design division named Bosch Projects Equipment (BPE). This division has a number of innovative, easy to maintain designs (vertical crystalliser, mixed juice heaters etc) and has started to roll them out to industry as the younger mill managers are more receptive to new designs.

3. After application of SP, would any of these organizations apply SP for future strategy making?

Based on the feedback from the directors at BP, after the Think Tank session, it is clear that scenario planning is an important tool that they will use going forward but the problem is that it is a time consuming exercise and hence would require more time dedication than previous strategy sessions. Even with the current strategy making methodology, they try to build scenarios, but like the sugar industry this is not done using any proven methodology or framework and hence presents a lost opportunity to maximize the opportunities presented by the formal methodologies.

Some of the comments that came across more than once were that there were opportunities for BP to:

- Review existing industry technologies and to patent any design improvements.
- Actively marketing biofuels technologies and removing the belief that the companies can either manufacture sugar or ethanol. BP already has strong relationship with Dedini in Brazil. This company is one of the leaders in design and construction of ethanol plants.
- To get ahead of the electricity co-generation business as BP has strong links with the sugar industry and is strong on sugar milling operations and power generation

After analysing the feedback from the industry respondents it is clear that they are of the impression that the two products, sugar and ethanol, cannot co-exist in the same manufacturing operation. This may be partly exacerbated by the prohibitive upfront costs of an ethanol plant. This is obviously an incorrect perception which must be actively addressed as it is hampering the local manufacturers and indirectly the local economy. BP can actively clear this up and start selling predesigned ethanol plants; jointly with Dedini; before the industry even knows that it needs them. They should consider putting together a business case for one sugar mill which can be used to market ethanol production to SA companies.

4. Relative to traditional strategy making methodologies; how do these organizations view SP?

Scenario planning and scenarios can mean different things to different people even though they may be within the same organization. Some scenarios can be “vision driven” while others can be “decision driven” as argued for by Courtney (2003:13). The scenarios developed in this research were “vision- driven” and hence they would be better suited for use by BP and to a certain extent UCL. Therefore these are the only two organizations that could better respond to this question. The BP directors choose the direction of the organization while the UCL managers have a direct influence on the trajectory of their company. The other managers have influence in the direction of ISL and THS but it is minimal and long range.

This research exercise did not go as far as building strategies for the scenarios for BP, but a discussion during and post the Think Tank session revealed that SP would be an excellent reinforcement of current strategy methodologies. It is my understanding that contemporary management thinking says that Heads of Departments should have plans that are measurable and as detailed as possible. The SP methodology tries to avoid going to the finest details as

people can get trapped in that thinking and be unwilling to adjust their vision when they have spent so much time building it.

SP was seen to be a participatory and democratic methodology which acknowledges that there is more than one possible future and we should be ready for more than one of them.

5. **Is Bosch Projects qualified enough to develop meaningful scenarios for the sugar industry, taking into consideration that it is their biggest market and that a number of employees are former sugar industry people?**

My answer to this question is that it is risky for a company to conduct or develop scenarios about or for its market industries. This is because there is always an ever present danger that they will not always have the latest information on the industry and can lose nuances that are only obtainable through engagement with personnel currently working in that industry. The BP storylines are not exactly similar to the sugar industry ones but there was important information that was common that came in all of the storylines. There is a common indication that environmentally friendly fuel technologies and green sources of energy are the future, the question is when the industry will stop being the follower of the debate and start leading it. Another key issue is that the legacy of apartheid manifests itself in many of the scenarios and therefore it is important for the industry to play its part in influencing the correction of the past in order for it to stay in positive light of the communities within which it operates. This involvement will also help it have a better pool of skilled labour to choose from.

I would recommend that all sugar industry stakeholders meet in order to develop long term scenarios for the industry which could be shared amongst all participants and their organizations for wind tunnelling their strategies and also to ensure that the industry has a future. Bosch Projects should be one of the stakeholders in this scenario planning session thereby removing the risk associated with lost nuances and insights from current industry employees.
If this industry-wide involvement is not possible then one could take Mercer's (1995:32) advice that managers must cultivate a deep curiosity about the external environment and maintain maximum exposure to the widest range of media.

Summary

In this chapter I have presented the thinking from within Bosch Projects and from the sugar industry. This has culminated in three major scenarios from the sugar industry and three mini scenarios from Bosch Projects. The BP scenarios were too high level and did not seem to add any value regardless of whether they were viewed as “decision driven” or “vision driven”. This flaw was a reflection of the time that was available in developing them and hence I revisited them individually and attempted to make them more meaningful.

The sugar industry scenarios were more thorough; this is a reflection of the time it took to put them together and the engagement between me and the research participants. It is apparent on closer inspection that BP scenarios carry elements which also come up in the sugar industry scenarios but this session was flawed as we chose to develop an optimistic, a pessimistic and status quo scenarios. Application of the four-grid method during the sugar industry session led to places none of the participants, me included, had imagined thereby resounding the importance of scenario planning as a tool to question and reframe mindsets and worldviews.
Comments from respondents revealed that their mental models were “holding them hostage”; as most of them knew that there is more than one possible future but because of what business schools taught them, in-line with the prescriptive schools, they only developed one strategy for what they thought was most probable future.

In the next chapter I will reflect on and discuss the research journey.

5. CHAPTER 5: CONCLUSION

"Droppin' more knowledge than litter, on the New York pave'"

De La Soul
The Bizness
Stakes is High Album

Introduction

This research has been a very revealing and enlightening journey for me. I have unearthed issues I did not expect and gained a profound appreciation for scenario planning and its facilitation. I was very surprised by the enthusiasm from the research participants especially from the sugar industry and their willingness to engage me outside of working hours. The journey revealed that people were not aware of the existence of scenario planning and how it could help make strategy formulation a more robust process.

In this section I will discuss the sugar industry by looking at its SWOT and how it may use this to take advantage of the possible future mix revealed during the scenario planning sessions. I will then reflect on how this may impact on BP and what BP can do to take advantage of the future positions regardless of which one materializes.

I will then close off this research by providing my conclusion and recommendations based on my observations.

Reflective Discussion

Business school teaching is informed by mechanistic scientific thinking which has reinforced some unspoken assumptions about change being foreseeable and predictable. This thinking has made people not to question the assumption that outcomes are more important than process. Scenario planning may be unpopular and unattractive to a number of people due to its time demanding nature.

During this research I learnt that:

- For any scenario planning activity to be meaningful people have to apply their minds to the process and constantly keep re-evaluating their thinking.

- When I started to revisit the Bosch Projects scenarios I also gained a deeper appreciation of how the two main factors used in designing the four-grid axis can change the direction of a storyline from positive to negative.

- I believe that to create really meaningful scenarios that explore many plausible futures, a scenario planning team should narrow down critical uncertainties to between four and six and then draw up grids trying out various combinations of the uncertainties. These combinations can then be used to create a number of story lines for a specific industry of interest. In this whole process the facilitator is a major component as people can easily lose interest if the feel their time is being wasted on unproductive processes.

- I had underestimated the magnitude of the work required in scenario development and especially the time commitment that I had to get from the research participants. I was fortunate in that most of them were interested in the work that was being done or else this study would have come to a standstill or become a victim of insufficient data to analyse.

- I had an expectation that the facilitation process would be easy but in retrospect when I was looking at the BP scenarios I quickly learnt that bad facilitation can mislead the scenario planning participants and the outcome would mostly likely be scenarios that do not trigger the right questions to the end user and therefore be meaningless.

- I regularly had to read and re-read articles even post the literature review phase as things kept revealing themselves to me during the research. Some things that did not make sense to me earlier in the literature review, later revealed themselves as I delved deeper into the research process.

- When looking at or creating longer term scenarios it is advisable to create sub-periods in the storylines in order to help the end-user bridge the gap from how we move from now to the scenario end state. This is especially critical for helping people accept and understand shocking or undesirable end states.

Conclusion

Scenario planning methodologies are an interactive approach to strategy development. The feedback processes during strategy formulation lead to results similar to those of a brainstorming session where obvious information crystallizes in the head of the participants resulting in surprisingly insightful outcomes.

(Respondent 10, 2009, personal communication) said:

> *"Long term planning helps in developing sustainability of the business, and also not to have a short term view of the business cycle. You are able to look further and see all potential opportunities and threats that the business may face and that enables one to enhance the strength and reduces the weaknesses of the business in time to benefit in future."*

This comment is interesting considering that there was a general admission from all participants, both within and external to BP, that there is no structured methodology used in formulating long terms scenarios and most were not even aware that there are methodologies available to them for this purpose. This leads me then to believe that contemporary management thinking based on systems thinking must filter into more education institutions; both formal and informal, and start to show up at undergraduate level. Scenario planning is one of the most simple yet extremely powerful strategy formulation techniques which can help businesses become more competitive in an unpredictable landscape.

People's mental models of how strategy formulation should take place have a potential to prevent them from obtaining the full benefits of scenario planning. The methodology is time consuming and requires constant reflection amongst the participants.

Based on the scenarios developed one cannot say what Bosch Projects' future looks like as it depends what the people with the power to make decisions do with the information developed.

After the Think Tank session (Respondent 2, 2009, personal communication) said:

> *"Scenario planning is better because it explores different scenarios based on future possibilities, rather than a traditional framework strategy based on certain industry standards or some case study benchmarks."*

At present, BP should continue to strive to exceed customer expectations so that it further cements its status and relationship with the sugar industry. BP must also focus on technology

improvement in order to secure future growth in the market because everybody acknowledges that the sugar production equipment and technologies are old. There is room for the sugar industry to branch into ethanol production and therefore BP can start aligning itself with companies that have a proven track record in the provision of ethanol production technologies.

Recommendations

This research has shown that there are many opportunities and threats that face the sugar industry. I would recommend that the sugar industry and its supporting industries should hold a scenario planning session in order to gain insight and an appreciation for the possible landscape they might be operating under in the long term. This would be a meaningful exercise for those companies that choose to maximize benefit from the results.

During the research process the old saying of “practice makes perfect” was reinforced many times. It is with this reason in mind that I also recommend that first time scenario planning facilitators should perform a few trial-run sessions in order to avoid delivering scenarios that do not add value to the end-user which could result in the prospective customer being averse to the scenario planning methodology.

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APPENDIX 1

Scenario Planning Template

APPENDIX 2

Sample of Uncompleted and Completed Sugar Industry Primer Questionnaire

APPENDIX 3

Initial Scenarios from the Think Tank Session

APPENDIX 4

Ethical Clearance