Future Screening – A Framework for Advancing Strategic Corporate Foresight

Submission for the Award of Doctor of Business Administration

by

Marc K Peter

E-Bus Eng FH (UASBern), MMktg (UBasel), EMBA (UASBern/Babson/PKU)

Charles Sturt University
July 2011
I Table of Contents

I Table of Contents.................................................................2
II Statement of Original Authorship...........................................5
III Acknowledgments.................................................................6
IV Abstract.................................................................................7
V List of Tables and Figures......................................................10
VI List of Abbreviations...............................................................15
VII List of Definitions....................................................................16

1 Introduction ...........................................................................19
  1.1 Overview and Structure of Introduction Chapter ......................19
  1.2 Background to the Research ..................................................19
  1.3 Strategic Corporate Foresight in a Management Theory Framework ....20
  1.4 Research Problem and Question .............................................24
  1.5 Research Propositions.............................................................28
  1.6 Research Objective and Methodology .....................................32
  1.7 Justification for the Research ................................................34
  1.8 Limitations of the Study .........................................................36

2 Literature Review ....................................................................38
  2.1 Overview and Structure of the Literature Review Chapter ..........38
  2.2 Strategic Planning and Uncertainty .........................................39
  2.3 Foresight .............................................................................44
  2.4 Methods in Foresight .............................................................50
  2.5 Foresight Frameworks in Literature .......................................53
  2.6 Forecasting...........................................................................55
  2.7 Environmental Scanning........................................................56
  2.8 Sourcing of Weak and Strong Signals .....................................59
  2.9 Weak and Strong Signals........................................................62
  2.10 Processing of Signals.............................................................68
  2.11 Working with Scenarios ........................................................71
  2.12 Scenario Building.................................................................77
  2.13 Scenario Presentation.............................................................81
  2.14 Implementation of Scenario Insights and Scenario Monitoring ....84
  2.15 Innovation and Risk Management .........................................87
  2.16 Conclusion – Linking the Findings of the Literature Review ..........90
3 Research Methodology ........................................................................................................ 96
  3.1 Overview and Structure of Research Methodology Chapter ........................................ 96
  3.2 Research Methodologies in Strategy and Foresight Research ..................................... 96
  3.3 Research Method and Justification .............................................................................. 103
  3.4 Selection of Literature, Cases and Foresight Experts ..................................................... 106
  3.5 Data Collection and Analysis (Case Organisations and Experts) .............................. 110
  3.6 Scientific Criteria ........................................................................................................ 115
  3.7 Conclusion .................................................................................................................. 117

4 Research Findings ............................................................................................................ 119
  4.1 Overview and Structure of Research Findings Chapter ............................................. 119
  4.2 Introduction and Profiles of Case Organisations .......................................................... 120
  4.3 Analysis of Approaches to Foresight and Strategy Development ............................... 122
  4.4 Research Proposition 1 .............................................................................................. 127
    4.4.1 Research Findings for RP\(_1\) ................................................................................ 127
    4.4.2 Conclusion Regarding Support for RP\(_1\) ............................................................. 136
  4.5 Research Proposition 2 .............................................................................................. 138
    4.5.1 Research Findings for RP\(_2\) ................................................................................ 138
    4.5.2 Conclusion Regarding Support for RP\(_2\) ............................................................. 142
  4.6 Research Proposition 3 .............................................................................................. 145
    4.6.1 Research Findings for RP\(_3\) ................................................................................ 145
    4.6.2 Conclusion Regarding Support for RP\(_3\) ............................................................. 148
  4.7 Research Proposition 4 .............................................................................................. 150
    4.7.1 Research Findings for RP\(_4\) ................................................................................ 150
    4.7.2 Conclusion Regarding Support for RP\(_4\) ............................................................. 154
  4.8 Research Proposition 5 .............................................................................................. 156
    4.8.1 Research Findings for RP\(_5\) ................................................................................ 156
    4.8.2 Conclusion Regarding Support for RP\(_5\) ............................................................. 161
  4.9 Research Proposition 6 .............................................................................................. 163
    4.9.1 Research Findings for RP\(_6\) ................................................................................ 163
    4.9.2 Conclusion Regarding Support for RP\(_6\) ............................................................. 167
  4.10 The Foresight Framework Emerging from Case Study Research ............................... 169
    4.10.1 Foresight in CO-A and CO-B .......................................................................... 169
    4.10.2 Framework Derived from Research of Case Organisations ............................... 171
  4.11 The Foresight Framework Emerging from Interviews with Experts ......................... 176

5 Conclusion and Recommendations ................................................................................. 185
  5.1 Overview and Structure of Conclusion & Recommendations Chapter ..................... 185
  5.2 Framework for Advancing Strategic Corporate Foresight Emerging from the Research .................................................................................................................. 185
    5.2.1 Comparison of Practice Frameworks Emerging from the Research .................... 185
    5.2.2 The Best Practice Framework and Overarching Considerations ....................... 187
    5.2.3 The Uncertain Environment ............................................................................... 193
    5.2.4 Environmental Scanning, Databases and Signals Analysis ............................... 196
5.2.5 Scenario Building (Images of the Future) ........................................ 199
5.2.6 Scenario/Future Workshops ...................................................... 203
5.2.7 Strategic Programme Management and Scenario Transfer ............. 207
5.2.8 Scanning Strategy and Monitoring System ..................................... 210
5.2.9 Future Agents & Think Tanks ................................................... 213
5.2.10 Performance Reviews and the Foresight Continuum ...................... 216
5.2.11 Support for Best Practice Model from Foresight Experts ............... 219

5.3 Research Contributions and Implications ................................. 221
5.4 Limitations of the Research and Directions for Future Research ........ 228
5.5 Conclusion ................................................................................. 231

6 List of References ....................................................................... 234

7 Appendices .................................................................................... 267
7.1 Appendix A: Documentation of Environmental Information ............ 267
7.2 Appendix B: Assessing Industry Scenarios ...................................... 268
7.3 Appendix C: Strategic Issue Management ....................................... 269
7.4 Appendix D: The External Environment Council ............................. 270
7.5 Appendix E: Questionnaire for Case Organisations and Foresight Experts ... 271
7.6 Appendix F: Profiles of Interviewees and Experts .............................. 276
7.7 Appendix G: Nodes and Interviews from Qualitative Analysis with NVivo® 278
7.8 Appendix H: Organisational Structures of Case Organisations ......... 281
7.9 Appendix I: Profiles and Financial Performance of Case Organisations .... 285
7.10 Appendix J: Strategy Process of CO-A .......................................... 290
7.11 Appendix K: Strategy Process of CO-B .......................................... 293
7.12 Appendix L: Method to Combine Signals into Scenarios ................... 296
7.13 Appendix M: Techniques in Foresight Studies ................................... 299
7.14 Appendix N: Method Families for Foresight Studies ....................... 301
7.15 Appendix O: Example of CO-B Weak Signals Database .................. 303
7.16 Appendix P: Best Practice Foresight Framework with Insights .......... 304
II Statement of Original Authorship

I Marc K Peter

Hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Charles Sturt University or any other educational institution, except where due acknowledgment is made in the thesis. Any contribution made to the research by colleagues with whom I have worked at Charles Sturt University or elsewhere during my candidature is fully acknowledged.

I agree that the thesis be accessible for the purpose of study and research in accordance with the normal conditions established by the University Librarian for the care, loan and reproduction of the thesis.*

12 July 2011

Signature

Date

* Subject to confidentiality provisions as approved by the University
III Acknowledgments

I would like to thank the group of dedicated, experienced and professional individuals who have supported me over the past years as I have worked on this dissertation.

Without the direction setting, workshops and feedback sessions from my two supervisors, this work would not have been completed: Prof Dr Denise G Jarratt, Associate Dean of Research at Charles Sturt University (Australia) and Prof Dr Alexander Jungmeister, Head of Competence Centre Entrepreneurial Management at the University of St Gallen (Switzerland) and Adjunct Professor at Charles Sturt University (Australia). These two professionals have continually been my strong supporters and I am very grateful for everything they have done for me.

For their specific and invaluable assistance,¹ I thank Stephan Burkhalter for his support with scanning the web for relevant articles and websites on the topic of foresight and strategy development, Sophie Leahy for her support summarising field research data from case organisations, Dr Patricia Bazeley and Dr Robyn Maddern for their NVivo® and qualitative data analysis workshops, and Shan Mukerjee for professional editing.

I extend my appreciation to the group of academics and practitioners involved in the Strathclyde International Conference on Organisational Foresight who inspired me in 2004 to invest time in the topic of foresight, as well as companies such as Royal Mail who introduced me to their sophisticated ways of anticipating future development and innovating (Innovation Lab in Rugby, UK).

Furthermore, I thank all participants in the research from the two case organisations and the group of foresight experts for their time and open feedback, and the group of examiners who review this dissertation. And finally, a warm thank you to my family who accepted my absence from family life for many weekends.

Marc K Peter, 12 July 2011

¹ The five individuals listed in this paragraph provided their assistance for a fee (disclosure requirements as per University regulations, section 4.3.5.1 of “H1 Progress, Supervision and Assessment Regulations: theses and other examinable research works”, issued 31 December 2003).
IV Abstract

Foresight, that is the ability to foresee how the future will unfold, is a desirable management capability which can be developed through engaging with strong and weak signals in the emerging environment. The foresight process provides strategic guidance through identifying critical turning points in the evolution of the environment. The importance of foresight in strategy development will increase as the likelihood of market pressure and dynamics remains the same or even increases, which will lead to stronger competition and a need for long-term innovative planning capabilities.

The literature does not provide an overall best practice foresight framework, as the investigations that have been completed are specifically focussed on weak signals management, environmental scanning, strategy adaptation or scenario management, or a combination of the above. Having examined existing literature on strategic planning, strategic thinking, envisioning and innovation, it is evident that an integrated strategic foresight framework from signals collection to scenario building and strategy implementation has not been built and the impact of this approach on business practice is yet to be articulated. The development and empirical investigation of a contemporary, foresight driven approach to strategy development is the core of this research project. Based on the conclusion from the literature review, the research question can be formulated as “how and why can strategic foresight, based on the integration of strong and weak signals methodologies, enrich the strategy process in a dynamic and changing environment?” Or in other words, how does a contemporary best practice framework for advancing strategic corporate foresight need to be designed so it is applicable and value generating in a real business environment?

The synthesis of literature informed the development of a theoretical framework. This framework was augmented by the research, as guided by six hypotheses addressing weak and strong signals, the qualitative methods required to build scenarios capturing weak and strong signals and the application of scenarios in strategy planning. From this work, the basis of an overall framework for advancing corporate foresight was developed. Based on additional insights and results of case study research with two organisations (one of which has a new approach to foresight) and a survey with independent foresight experts to enrich and validate the theoretical model, a new
A contemporary framework for foresight and long-term strategic planning was constructed.

The foresight process that emerged from the research involved engaging with relevant stakeholders (e.g. strategy, corporate development, marketing and product managers) in workshops, and challenging current assumptions with regard to long-term opportunities and threats for their strategy and/or products. The outcomes flowing into the strategy development and implementation process lead to the development of an innovation portfolio designed to meet immediate, medium and long-term organisational objectives. While literature describes methods for interrogating the environment and building econometric scenarios, there is a paucity of research that utilises methods for integrating qualitative foresight signals into scenarios. This research has addressed this practice challenge.

The development and comparison of the frameworks informed by the literature and the enrichment through foresight experts and case study research led to a number of research contributions, including the above mentioned best practice model. Research has highlighted the need for a scanning strategy and articulated the importance of the utilisation of weak signals early in the process, and strong signals and wildcards later in the process. In addition, the necessity for qualitative methods across multiple process steps was identified, as well as a need for methods for presenting scenarios and challenging an organisation with the outcomes from scenarios. While the implementation of information systems in a foresight framework is not required at sophisticated levels, the utilisation of a foresight network (or future agents) was identified as a major component of a contemporary foresight framework. Finally, an emerging concept of a “foresight continuum” was identified and described; a set of intrinsic but informal values or benefits generated through foresight.

The research will enrich discussion of the immature field of weak signals management and help to understand the benefits and implications for corporate foresight. The outcome of the project is to encourage companies to shift from a traditional approach to strategy development to an integrated framework that improves strategy decisions in corporate planning and innovation management. It will foster strategic conversations and the building of foresight knowledge which will help companies to stay flexible in terms of their strategies and future initiatives based on a future oriented culture, and
ultimately lead to more flexible decision-making in relation to forthcoming opportunities and threats.

*Keywords:* foresight, long-term planning, future screening, weak signals, scenario planning, scenario development, strategy development, innovation, organisational development, future planning.
V List of Tables and Figures

Tables

Table 1: The Impact-Urgency Matrix (own illustration, based on Ansoff 1980, p. 140)

Table 2: Scenario Building in a Corporate Foresight Framework Generated from the Literature (developed from Abplanalp & Lombriser 2010; Bell 1997; Fahey & Randall 1998a; Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Godet 1987; Ringland 1998; Schwartz & Ogilvy 1998; Wack 1985b; Wilson 1998a)

Table 3: Scenario Presentation in a Corporate Foresight Framework Generated from the Literature (developed from Burkhard, Spescha & Meier 2005; D'Aveni 2004; Fink, Schlake & Siebe 2001; Giget 1988; Godet 1997; Igartua et al. 2010; Rollwagen et al. 2008; Thatcher 2006)

Table 4: Implications from Scenario Insights in a Corporate Foresight Framework Generated from the Literature (developed from Amara & Lipinski 1983; Ansoff 1988; Courtney, Kirkland & Viguerie 1997; Day & Schoemaker 2007; Fahey 1998; Fahey & Randall 1998; Fahey & Randall 1998b; Georgantzas & Acar 1995; Micic 2010; Ringland 1998; Stoffels 1994; Wilson 1998b)

Table 5: Key Factors of a Framework for Advancing Strategic Corporate Foresight (own illustration)

Table 6: Research Schools in Corporate Foresight and Scenario Planning (own illustration)

Table 7: Comparison of Strategy Processes from CO-A and CO-B (own illustration)

Table 8: Recommended Methods to Combine Signals into Scenarios (own illustration from Fuller 2005)

Table 9: Extract of CO-B Weak Signals Categories (CO-B Foresight Process, internal document, 20 December 2005)

Table 10: Key Differences and Similarities from Input from Foresight Experts (own illustration)

Table 11: Key Differences and Similarities between Practice Frameworks (own illustration)
Table 12: Recommended Methods for Scenario Building (own illustration following Fuller 2005)
Table 13: Corporate Foresight Tasks and Roles (own illustration)
Table 14: Contributions to Practice (own illustration)
Table 15: Documentation of Environmental Information (based on Stoffels 1994, pp. 112-114)
Table 16: Interviewees CO-A as of 2007
Table 17: Interviewees CO-B as of 2007
Table 18: Foresight Experts as of 2007
Table 22: Techniques in Foresight Studies (Koniclja–da Mata et al. 2004)
Table 23: Collection of Weak and Strong Signals (Future Screening project report CO-B, 30 December 2004)

Figures

Figure 1: Interactions of Major Topics with regard to Foresight (own illustration, developed from Ansoff 1965; Huber, Jungmeister & Zahld 2007; Ringland 1998; Stoffels 1994)
Figure 2: Elements of Corporate Foresight (own illustration)
Figure 3: A Traditional Strategy Planning Approach (Huber, Jungmeister & Zahld 2007; NetMBA 2011; Pearce II 1981, p. 40; Preble 1997, p. 771; Thomas 1984, p. 142)
Figure 4: A Contemporary Strategy Planning Approach using Corporate Foresight (own illustration, developed from Huber, Jungmeister & Zahld 2007; Ofek & Wathieu 2010; Rohrbeck & Gemünden 2011; Van der Duin & Den Hartigh 2009)
Figure 5: Companies and Products with Roots in Disruption (Christensen & Raynor 2003, p. 48)
Figure 6: The Danger of Forecasting: Forecasts vs. Scenario Planning (Ringland 1998, p. 47)
Figure 7: Organisations and the Future (Tsoukas & Shepherd 2004, p. 4)
Figure 8: Forecast Approaches over Time (following Graf 1999, p. 82)
Figure 9: Strategic Foresight: from Mental Model A to Mental Model B (Marsh, McAllum & Purcell 2002, p. 7)
Figure 10: Applied Methods in Corporate Foresight (Burmeister, Neef & Beyers 2004, p. 37) (Source, date and sample size of survey have not been provided)
Figure 11: The Use of Methods in Foresight (according to Armstrong 2001, p. 677; Stoffels 1994, pp. 139-181)
Figure 12: Analysis of Strategic Implications based on SRI (following Ringland 1998, p. 250)
Figure 13: Framework for Environmental Scanning (Stoffels 1994, p. 95)
Figure 14: Framework for Environmental Knowledge and Scanning Strategy Determination (Stoffels 1994, p. 22)
Figure 15: Collecting and Processing Signals (own illustration)
Figure 16: Impact of Threat/Opportunity (with enough attention, an organisation should be able to avert the threat and/or seize the opportunity) (Ansoff 1975, p. 22)
Figure 17: Weak Signals and Graduated Response (Ansoff 1982; Ansoff 1984, p. 23)
Figure 18: Environmental Dimensions and Perceived Uncertainty (Duncan 1972, p. 230)
Figure 19: Tools of Trend Analysis (Fink, Schlake & Siebe 2001, p. 188)
Figure 20: The Trend based Scenario Process (Burmeister, Neef & Beyers 2004, p. 48)
Figure 21: Scenario Development (own illustration according to Albers & Broux 1999, p. 59)
Figure 22: Scenario Development at Shell (Gilad 2004, p. 222)
Figure 23: The Impact of Sustaining and Disruptive Technological Change (Christensen 1997, p. xvi)
Figure 24: Early Warning Model of Citigroup (Gilad 2004, p. 174)
Figure 25: Foresight Framework Derived from the Literature Review (own illustration)
Figure 26: Model Development Emerging through Different Methods of Research (own illustration)

Figure 27: Screenshot of folders and number of articles with academic literature from own research (over 1,600 articles as of September 2004)

Figure 28: Case Study Research Steps (Noor 2008, p. 1603)

Figure 29: Example of Environmental Impact for CO-A (File Note, 2 December 2005)

Figure 30: CO-B Foresight Process (Internal documents, 20 December 2004; 20 December 2005)

Figure 31: Drivers of Swiss Banking for CO-B, Based on Different Foresight Reports (Future Screening project report CO-B, 30 December 2004)

Figure 32: Foresight Framework Derived from Case Study Research (own illustration)

Figure 33: Foresight Framework Enriched and Validated by Foresight Experts (own illustration)

Figure 34: Best Practice Foresight Framework Emerging from Research (own illustration)

Figure 35: The Uncertain Environment (own illustration)

Figure 36: Environmental Scanning, Databases and Signals Analysis (own illustration)

Figure 37: Scenario Building (Images of the Future) (own illustration)

Figure 38: Scenario/Future Workshops (own illustration)

Figure 39: Strategic Programme Management and Scenario Transfer (own illustration)

Figure 40: Scanning Strategy and Monitoring System (own illustration)

Figure 41: Future Agents and Think Tanks (own illustration)

Figure 42: Performance Reviews and Foresight Continuum (own illustration)

Figure 43: Assessing Industry Scenarios: Key Steps and Questions (Fahey 1998, p. 212)

Figure 44: Strategic Issue Management (Ansoff 1975, p. 31)

Figure 45: The External Environmental Council as Part of the Environmental Scanning Structure (Stoffels 1994, p. 76)

Figure 46: CO-A Organisational Chart (Vademecum 2007)

Figure 47: CO-B Organisational Chart (10 April 2007)
Figure 48: Operating Revenue Growth Rates 2003 to 2009 (Annual Report of Holding Organisation 2009, 24 March 2010)

Figure 49: Operating Profit Growth Rates 2003 to 2009 (Annual Report of Holding Organisation 2009, 24 March 2010)

Figure 50: Combination of Signals with Trends (Fuller 2005)

Figure 51: Elaboration of Patterns of Logical Consequences (Fuller 2005)

Figure 52: Experiment with Cross-Overs (Fuller 2005)

Figure 53: Entrepreneurial Creation of Futures (Word® Clip Art collection)

Figure 54: Best Practice Foresight Framework with Insights One to Twelve (own illustration)
VI List of Abbreviations

BSC Balanced Score Card
CEO Chief Executive Officer
CO-A Case Organisation A
CO-B Case Organisation B
CSM Comprehensive Situation Mapping
EPFL École Polytechnique Fédérale de Lausanne
FSEx Foresight Expert Number x (from field research)
GE General Electrics
HR Human Resources
ICT Information and Communication Technology
INTx Interviewee Number x (from field research)
IT Information Technology
NA Not Applicable (or Not Available)
PEST Political, Economic/Ecological, Social and Technological Influences
P&L Profit and Loss
R&D Research and Development
RFID Radio Frequency Identification
ROI Return on Investment
RP Research Proposition
SWOT Strengths, Weaknesses, Opportunities and Threats
TV Television
WOR Window on Risk
VII List of Definitions

*Environmental Scanning*
Assessing an organisation’s external, dynamic and sometimes complex environment in terms of its competitive and entrepreneurial (or strategic) behaviour, combined with its political, economic and ecological, social and technological influences (see also *PEST Analysis*). The external environment consists of all conditions and forces which affect the strategic options and operational activities of the organisation (Ansoff, Declerck & Hayes 1976; Burmeister, Neef & Beyers 2004; Christensen 1997; Day & Schoemaker 2005, 2007; Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Gilad 2004; Hamel & Prahalad 1994; Ringland 1998; Stoffels 1994; Van der Heijden 1996).

*Forecasting*
A quantitative approach to generating knowledge about the future (e.g. projections). Past developments are extended into the future using certain assumptions regarding the extrapolation of trends (in contrast to *Foresight*) (Godet 1987; Ringland 1998; Tsoukas & Shepherd 2004).

*Foresight*
Research undertaken as part of an organisation’s medium to long-term (five to twenty years) strategy development to better get to know the future, with the goal of transforming the challenges of the future into opportunities and therefore increasing the overall learning and innovation capacities of the organisation. Foresight reflects a qualitative approach to capturing the future (in contrast to *Forecasting*) (Albers & Broux 1999; Burmeister, Neef & Beyers 2004; Chia 2004; Hamel & Prahalad 1994; Marsh, McAllum & Purcell 2002).

*Future*
The future (or multiple futures to acknowledge multiple potential outcomes) lies ahead of us and contains environmental uncertainty which organisations try to understand and plan for (Lindgren & Bandhold 2003; Ringland 1998).
**Future Screening**

A sub-process in a contemporary approach to business strategy development during which strategic conversations would be held, based on long-term scenarios built by combining strong and weak signals. It is seen as a prerequisite for the situation analysis and strategy formulation steps. This sub-process fosters strategic thinking and makes companies aware of discontinuities. It should stimulate companies to look beyond a three or five year planning horizon in strategy development, to strengthen innovation capabilities, take better advantage of opportunities and defend against threats in the long-run (author’s definition).

**Futurism**

A science which tries to develop an understanding of the future and learn what causes change in the PEST environment (Bell 1997; Schwartz 1996).

**Innovation Management**

The management of new ideas and the creation of something new that has significant value to the organisation or industry. It requires certain processes and techniques, and an organisational culture which supports innovation (Afuah 1998; Bryan 2002; Christensen & Raynor 2003; De Geus 1999; Fagerberg et al. 2006; Igartua, Garrigós & Hervas-Oliver 2010; Pohl 2009).

**PEST Analysis**

A classification scheme in order to analyse the political (P), economic and ecological (E), social (S) and technological (T) influences of an organisation’s external environment (see also Environmental Scanning) (Ansoff 1976; Burt et al. 2006; Cady 2006; Day & Schoemaker 2006; Farjoun 2002; Frost 2003; Kotler et al. 2004; Smits, van der Poel & Ribbers 1999; Stoffels 1994).

**Risk Management**

The discipline of assessing strategic and operational risk and developing strategies to manage these external (and internal) risk factors (Aven & Renn 2009; Caragata 1999; Gilad 2004; MacCrimmon & Wehrung 1986).
**Scenarios**
A story or model of an expected or supposed image of the future, including assumed drivers and events, built through the application of a number of methodologies. Scenarios are based on findings from *environmental scanning* activities designed to gather data about future developments (Bell 1997; Porter 1985; Ringland 1998, 2010; Schoemaker 2002; Van der Heijden 1996; Van der Merve 2007).

**Strategic Surprise**
An event of great strategic relevance that suddenly and unexpectedly arrives and creates new issues for which the organisation has no immediate response strategy. As immediate action is required, the issue cannot always be handled by normal systems and processes (also know as wildcards or critical events) (Ansoff 1984; Day & Schoemaker 2007; Glassey 2009).

**Strong Signals**
Generally recognised trends or assumptions (e.g. demographic changes or the growing influence of e-business), which can be connected with an industry or market. These issues are visible and relatively concrete, allowing an organisation to estimate their impact and create response plans. Most planning approaches/techniques focus on strong signals (see also *Weak Signals*) (Ansoff 1975, 1982, 1984; Bell 2003; Collis 2008; Fink, Schlake & Siebe 2001; Harris & Zeisler 2002; Marsh, McAllum & Purcell 2002; Ofek 2010; Wack 1985a).

**Weak Signals**
The smallest accessible data elements in environmental scanning which may be seen a source of disruption in strategic planning. Weak signals are poorly understood drivers of change and/or signals which are currently unconnected with a trend, industry or market. They include opportunities and threats and will develop over time. Consequently, their identification and correct interpretation can be vital to the success or survival of an organisation (see also *Strong Signals*) (Ansoff 1975, 1982, 1984; Day & Schoemaker 2005; Huber, Jungmeister & Zahld 2007; Liebl 1996; Marsh, McAllum & Purcell 2002; Martinet 2010).
1 Introduction

1.1 Overview and Structure of Introduction Chapter

An introduction to the research around long-term strategic planning, foresight and signals management will be provided in section 1.2, followed by a summary of the literature based on a management theory framework around the discipline of foresight (section 1.3).

The challenges for foresight planning with traditional planning approaches and methodologies in strategy development and the research question are discussed in section 1.4, followed by the research propositions informed by the literature (section 1.5). The need for a contemporary approach to strategic planning and foresight is described in section 1.6, together with an overview of the research methodology which includes literature review, case study research and a survey with independent foresight experts. Finally, the research will be justified (section 1.7) and limitations of the study described (section 1.8).

1.2 Background to the Research

At the time of publishing, no best practice method exists to support an organisation’s ability to foresee the future with a high degree of certainty. The future is not stable and trends (strong signals) evidenced in past and current behaviour are not necessarily good descriptors or predictors of future environments (Bell 2003; Fink, Schlake & Siebe 2001; Ofek & Wathieu 2010; Ringland 2010; Wack 1985a). The objective of foresight is to build a bridge from the present to the future while simultaneously re-educating and re-engineering organisations that are culturally programmed to focus on the present and therefore ignore to some extent the dynamic, uncertain or discontinuous environment (Chia 2004, p. 36; Hamel & Prahalad 1994, p. 16; Magnusson et al. 2009; Maguire et al. 2009; Marsh, McAllum & Purcell 2002, pp. 7-15).

Here, weak signals play a crucial role (Roberto, Bohmer & Edmondson 2006; Glassey 2009). Weak signals contain poorly understood market information. They indicate
opportunities and threats that may emerge over time and, as such, correct identification and interpretation of weak signals can be vital to the success or survival of an organisation. Despite this, there are very few empirical studies that have examined the use of weak signals (Clemons & Hann 1999, p. 19; Martinez & Perez 2004), and most planning approaches fail to generate and/or manage weak signals. Today’s techniques focus mainly on strong signals or trends (Collis & Montgomery 2008; Harris & Zeisler 2002, p. 22; Huber, Jungmeister & Zahld 2007; Ofek & Wathieu 2010).

Existing literature does not provide a comprehensive foresight framework from signals collection to strategy implementation, as the investigations that have been completed are specifically focussed on either weak signals management (Ansoff 1975, 1982, 1984; Day & Schoemaker 2005, 2007; Gilad 2004; Glassey 2009; Liebl 1996; Martinet 2010) or broad environmental scanning and strategy adaptation (Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Gilad 2004; Ringland 1998; Stoffels 1994; Van der Heijden 1996). Having examined the existing literature on strategic planning, strategic thinking, envisioning and innovation, it is evident that an integrated strategic planning framework from signals collection to scenario building and strategy implementation does not exist, and the impact of this approach on business practice is yet to be articulated. The development and empirical investigation of such a contemporary, foresight driven approach to strategy development is at the core of this research project.

1.3 Strategic Corporate Foresight in a Management Theory Framework

The management disciplines around strategic corporate foresight can be summarised and are presented in Fig. 1. For strategic planning purposes, uncertainty needs to be lowered and disruptive forces identified in order to defend against threats and take advantage of opportunities (Ansoff 1965; Caragata 1999; Courtney, Kirkland & Viguerie 1997; Cravens et al. 2009; Dibrell et al. 2007; Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Gilad 2004; Hamel & Prahalad 1994; Hartley 2000; Jaeger et al. 2001; Kochikar & Ravindra 2007; Magnusson et al. 2009; Maguire et al. 2009; Ofek & Wathieu 2010). This element of the theoretical framework is described in section 2.2.

(1) Foresight (see sections 2.3 to 2.5), a qualitative technique focusing on weak and strong signals management (Ansoff 1975, 1984; Day & Schoemaker 2005, 2007; Glassey 2009; Jaeger et al. 2001; Marsh, McAllum & Purcell 2002; Mintzberg 1987; Schwartz 1996); and

(2) Forecasting (see section 2.6), a quantitative projective technique aimed at extending developments into the future (Godet 1987; Ringland 1998; Tsoukas & Shepherd 2004).

Weak signals can be a source of disruption and changes in the uncertain environment (Ansoff 1975, 1984; Day & Schoemaker 2005, 2007; Glassey 2009; Jaeger et al. 2001; MacKay & McKiernan 2010b; Mintzberg 1987; Schwartz 1996). On the other hand, strong signals (or trends) are clearly observable changes (already happening today) which are expected to continue (Ansoff 1975; Marsh, McAllum & Purcell 2002). Both weak and strong signals (section 2.9) can be found through scanning and analysis of the environment (Ansoff, Declerck & Hayes 1976; Burmeister, Neef & Beyers 2004; Georgantas & Acar 1995; Stoffels 1994; Whipp, Rosenfeld & Pettigrew 1998). Therefore, scanning the landscape (sections 2.7 to 2.8) is essential, since an organisation
is inherently and unavoidably linked to its external environment (Ansoff, Declerck & Hayes 1976; Burmeister, Neef & Beyers 2004; Christensen 1997; Day & Schoemaker 2005, 2007; Hamel & Prahalad 1994; Hitt, Ireland & Duane 2001; Stoffels 1994). It is argued (but subject to validation) that identifying weak and strong signals through environmental scanning and using them for innovation and strategy development lowers uncertainty, identifies opportunities and decreases the level of risk for an organisation.

The signals that the organisation manages to identify and collect need to be analysed and consolidated (Aguilar 1967; Ansoff 1980; Duncan 1972; Fink, Schlake & Siebe 2001; Fuld 2003; Georgantzaz & Acar 1995; Haeckel 1999; Huber, Jungmeister & Zahld 2007). This may include filtering and rating in terms of impact, probability and relevancy. Once identified and analysed, the scenario management process (sections 2.10 to 2.14) will utilise and connect signals and trends to create, utilising various techniques, scenarios (or stories) about potential futures (Albers & Broux 1999; Bell 1997; Brown & Eisenhardt 1998; Burmeister, Neef & Beyers 2004; Fahey & Randall 1998; Fahey & Randall 1998a; Fink, Schlake & Siebe 2001; Georgantzaz & Acar 1995; Godet 1987; Graf & Klein 2003; MacKay & McKiernan 2010a, p. 279; Ogilvy 2002; Ringland 1998; Schoemaker 2002; Schwartz 1991; Van der Heijden 1996; Wilson 1998a).

Scenarios play an important role as they decrease the complexity in an unknown or poorly understood future environment and enhance strategy development (Gilad 2004; Porter 1985; MacKay & McKiernan 2004, 2010b; Ringland 1998, 2010). It is argued and subject to validation, that envisaging multiple futures, in the form of scenarios based on signals whose possible courses have been plotted in time, is the appropriate method for reducing and understanding the complexity of the future environment. Based on the insights gained from scenario development, necessary actions should be defined in order for the organisation to survive and grow in the long-run (Ansoff 1965, 1980, 1988; Ansoff, Declerck & Hayes 1976; Fahey & Randall 1998b; Godet 2001; Huber, Jungmeister & Zahld 2007; Johnson 1983; Kunze 2000; Liebl 1994; Mietzner & Reger 2009; Stoffels 1994; Teece 2007). Actions are described as corporate initiatives or response strategies, summarised as strategic programme management, and will require business strategy adaptation in all main areas of an organisation. The outcomes flow back into the strategy development process via a “scenario transfer” (Burmeister, Neef & Beyers 2004; Fahey & Randall 1998; Fink, Schlake & Siebe 2001; Gilad 2004;
Graf & Klein 2003; Hamel & Prahalad 1994; Havas et al. 2010; Hitt, Ireland & Duane 2001; Lindgren & Bandhold 2003; Marsh, McAllum and Purcell 2002; Micic 2010; Ofek & Wathieu 2010; Porter 1985; Schoemaker 2002). It is argued and subject to validation that this helps to prepare an organisation for the future. Once the organisation has been challenged with the outcomes of scenario development, for strategy input and in order to build a successful organisation, stakeholders define all necessary projects/actions in order to prepare for the future, either through active modification of the current processes, structure and/or products, or simply by keeping the organisation fit for future change (Abadie et al. 2010; Aguilar 1967; Amara & Lipinski 1983; Ansoff 1980, 1988; Chia 2004; Courtney, Kirkland & Vuguerie 1997; Daheim & Uerz 2008; Fahey 1998; Fahey & Randall 1998a, 1998b; Fuld 2003; García-Arca & Prado-Prado 2007; Georgantzas & Acar 1995; Godet 2001; Lichtenthaler 2009; Marsh, McAllum and Purcell 2002; Rahman & De Feis 2009; Ringland 1998, 2010; Schoemaker 2002; Stoffels 1994; Van der Merwe et al. 2007; Wilson 1998b).

Change from the environment not only impacts strategy development, but also its innovation and risk management sub-processes; change and uncertainty are the underlying driver for both innovation and risk management. Therefore, environmental scanning, signals management and scenario building will provide valuable input to these two additional management disciplines (Afuah 1998; Aven & Renn 2009; Caragata 1999; Christensen 1997, 2003; Gilad 2004; Higgins 1994; Igartua et al. 2010; Shen et al. 2009; Van der Duin & Den Hartigh 2009), described in section 2.15.

Finally, as part of the scenario management process, performance reviews support the learning capabilities of the organisation through the analysis of the efficiency and effectiveness of corporate foresight activities (Eschenbach, Eschenbach & Kunesch 2003, p. 74; Halme 2002, p. 1101). As scenarios change over time, it is important to implement a monitoring system (Day & Schoemaker 2007; Fink, Schlake & Siebe 2001; Higgins 1994; Huber, Jungmeister & Zahld 2007; Krystek & Müller-Stewens 1990; Schwartz 1996) that constantly observes the identified underlying signals and drivers and tracks them on their path to either becoming strong signals or fading into insignificance. At each phase in the development (lifecycle) of the signals, an organisation needs to decide whether to act on the signal or continue with pure observation.
To summarise, foreseeing the future is one of the key tasks in strategic management. The future is not stable and past performance is not necessarily a basis for future planning assumptions (Bell 1997, p. 1; Maguire et al. 2009; Wack 1985a, p. 73). Uncertainty needs to be decreased in order to defend against threats and take advantage of opportunities. Scenario based learning, informed by signals management, is a way forward for organisations to enrich their strategy development process. Research is needed to validate that working with signals and scenarios not only increases the chances of survival and competitive advantage, but also initiates a learning process in an organisation. This will ultimately help the organisation to grow and stay dynamic, increase its appetite for innovation and risk, and support its decision-making process.

1.4 Research Problem and Question

The discipline of strategy development has re-invented itself over the last few decades and has been adapted to address special functional tasks, such as Human Resources (Wright et al. 1998) and Information Technology (Coombs & Richards 1991; Das & Van De Ven 2000; Kostoff & Geisler 1999; Kultilaka & Venkatraman 2001; Reger 2001).

In a traditional approach to strategy, the focus is on structured analytical processes, including situation analysis and strategy formulation, generally without the use of weak signals management and scenario planning (Kaplan & Norton 2000; Navarro, Hayward & Voros 2008; Pearce II 1981; Porter 1985; Preble 1997; Thomas 1984). This traditional planning approach is not designed to cope with uncertainties driven by the fast changing environment, nor to capture unrealised future impacts (Clemens 2009; Frost 2003; Karami 2005; Maguire et al. 2009; Mietzner & Reger 2009; Ofek & Wathieu 2010; Ringland 2010; White, Conant & Echambadi 2003). Unveiling market challenges and opportunities in long-term corporate planning is a demanding and resource intensive task. In a number of companies, the strategic view is limited to a specific industry and a set of generally recognised assumptions (strong signals such as demographic changes and the growing influence of e-business), the likely impacts of which are widely accepted and understood (Ansoff 1984; Courtney, Kirkland & Viguerie 1997).
Most recently, the focus of strategy development has been on emphasising strategic thinking, envisioning, innovation management, communication, intuition and creativity as opposed to the mechanics of the process (ASQ 2005, p. 13; Carr, Durant & Downs 2004; Choi 2006, p. 27; Cravens 1998; Dwyer & Mellor 1993, p. 160; Hamel 1998, p. 9; Harari 1995; Jarratt & Fayed 2001; Jarratt & Stiles 2010; Kemelgor 2002, p. 67; Kouzes & Posner 1996, p. 14; Micic 2010; Mintzberg 1994, p. 107; O'Shannassy 2003, p. 59; Rahman & De Feis 2009; Shen et al. 2009; Teece 2007; Voros 2006). However, there seems to be little practical guidance and validation through field research of how such envisioning and creativity might be supported within the process of strategy development (strategising), strategy articulation and implementation to better prepare an organisation for the dynamics and uncertainties of the future. This leads to the research problem, which is located in the domain of corporate foresight and long-term strategic thinking.

Long-term thinking and weak signals management are not generally regarded as traditional business practices (Day & Schoemaker 2007; Fuld 2003; Hollings 2000; Mietzner & Reger 2009; Navarro, Hayward & Voros 2008; O’Regan & Ghobadian 2007; Ofek & Wathieu 2010), and in current business planning, cycles have become shorter and strategy and organisations more flexible in order to address dynamic environments and facilitate fast responses. Where long-term planning activities using strong signals are being implemented, managers adapt standard methods, such as the PEST or SWOT analysis. Comprehensive methodologies and dynamic adaptive models are not generally employed, and some researchers believe that sometimes strategies must be left as broad visions, not precisely articulated, to adapt to the evolving environment (Cady 2006, p. 40; Farjoun 2002, p. 561; Frost 2003, p. 59; Smits, van der Poel & Ribbers 1999, p. 77). This emphasis on recognised opportunities and threats in planning hinders an organisation’s innovation management capabilities, because the traditional PEST and SWOT methods, even in combination with scenario planning, do not provide a platform to support future oriented thinking, and rely on managers’ current and biased thinking, filters, mindsets and mental models (Cheung et al. 2009; Clemens 2009; Gunn & Williams 2007; Smith 2007; Van der Duin & Den Hartigh 2009; Voros 2001).

Where there has been an attempt to combine qualitative (descriptive and non-quantifiable) weak and strong signals from a dynamic market environment, many of the
methods contained in literature are of a quantitative character, such as various forms of cross-impact analysis and mathematical models. These methods are more suitable for the analysis and combination of strong signals only. It is concluded, and to some degree supported by literature, that these methods fail to address the complexity of weak signals generated by turbulent and complex environments (Ansoff 1965; Bell 2003; Caragata 1999; Fink, Schlake & Siebe 2001; Georgantas & Acar 1995; Godet 1987; Graf 1999; Hitt, Ireland & Duane 2001; Lindgren & Bandhold 2003; Huber, Jungmeister & Zahld 2007; Ogilvy 2002; Ringland 1998; Schoemaker 2002; Tsoukas & Shepherd 2004; Wack 1985a, 1985b). These signals, if not identified, can impact and potentially destroy an organisation and/or an entire market. Scenarios built with quantitative models and based only on strong signals are a continuous description from the past into the future. They do not necessarily help to describe discontinuous futures.

While it has been argued that discontinuous scenarios should be integrated at the beginning of the strategy development process (Ansoff 1975, 1984; Day & Schoemaker 2005; Jaeger et al. 2001; Marsh, McAllum & Purcell 2002; Mintzberg 1987; Schwartz 1996), the literature does not provide an integrated framework for strategic corporate foresight. Therefore, in modern, foresight-centric strategy planning approaches – in contrast to traditional analytical approaches utilising only PEST and SWOT, and predominantly strong signals – the challenge is to determine:

- The nature of weak signals, and how can they be identified;
- The methods outlined in the literature to collect weak and strong signals;
- How weak and strong signals methodologies are being processed and integrated within scenario planning;
- The impact of integrating weak and strong signal methodologies on the quality of the strategy development process; and
- The support these methodologies provide during the strategising and decision-making process and the extent to which they should be implemented during strategy planning.

The research question to be addressed is therefore “how and why can strategic foresight, based on the integration of strong and weak signals methodologies, enrich the strategy process in a dynamic and changing environment?” The objective is to develop a contemporary, future oriented approach to strategy development, where a future screening process supports strategy formulation. Research suggests that an organisation
which implements this process is likely to anticipate discontinuities and ensure innovation is a central activity of the organisation. The emphasis on innovation will be reflected in the strategy development process, in special methods and techniques, and in a corporate culture which allows change and strategic conversations.

This concept, based on the integration of weak and strong signals in the strategy process, can be broken down into three categories:

![Diagram of Corporate Foresight process]

**Figure 2:** Elements of Corporate Foresight (own illustration)

*Strategising* includes strategy development, its underlying structure and the human element, interaction and debates. This can be extended to culture, mental models and potentially politics within an organisation. An important element of strategising is seen in scenario building. It is argued that foresight-centric approaches will result in a collaborative preparation of anticipated future outcomes, and therefore better prepare the organisation for a dynamic and uncertain future. In turn, this can deliver more future oriented strategic projects and an innovation driven culture.

*Strategy articulation* includes the process of discussing, arguing and elaborating on potential strategy with regards to the future environment, including descriptions of alternative strategies (or scenarios), goals, actions and outcomes. It is argued that there is a difference in terms of scope and range of future strategies or scenarios developed based on the choice of methods. Traditional structured analytical frameworks will generate convergent perspectives on the future and adopt strategies that support incremental change. By contrast, an approach that integrates both strong and weak signals foresight methodologies will generate strategic imperatives that both address current challenges and prepare the organisation to address anticipated industry and market reconfigurations.
*Operationalising strategy* involves the integration of weak signals into an organisation’s strategic planning process. This includes foresight methodologies, the collection of weak and strong signals, signals analysis and scenario building. This requires top-level management support and techniques which can be applied throughout the organisation. It is argued that companies utilising a foresight-centric approach will exhibit flexible decision-making later in the process as strategies are being implemented.

These three elements of future screening, or what is described as a foresight-centric approach to strategy planning, led to the building of the six research propositions outlined below.

### 1.5 Research Propositions

The research propositions which will guide the research in answering the research question were generated from a synthesis of the literature, discussed below (see also section 1.3 and chapter 2).

The topic of strategic corporate foresight is a young field and only a small number of companies apply the foresight-centric concept of long range planning based on weak and strong signals (Fuld 2003; Hollings 2000; Kochikar & Ravindra 2007; Maguire et al. 2009; McKinsey Company 2006; Mietzner & Reger 2009; Ofek & Wathieu 2010). Many companies have adapted to shorter cycles, but traditional strategy approaches do not cope with this fast changing world or foresee discontinuous change. At the same time, a large number of companies do not have a strategic plan, and strategies sometimes only focus on direct financial benefits or simply do not significantly influence the organisation’s performance (Clemens 2009; Frost 2003, p. 55; Karami 2005, p. 65; White, Conant & Echambadi 2003). Since traditional planning approaches cannot cope with today’s uncertainties driven by the fast changing environment (Bhide 2010; Cravens et al. 2009; Jarratt & Stiles 2010; Jennings 2001, p. 397; Karami 2005; Marshall & McKay 2002; Oosthuizen 2000, p.10; Reger 2001; Schindehutte, & Morris 2009; Spence 2003; Smith 2007; Wilson 1999), a new contemporary approach to strategy development, capturing unpredictable futures, is needed in business practice.
In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process (i.e. employing envisioning and scenario building) will reflect more open strategic debate, revealing more divergent scenarios for consideration.

Envisioning, which can be seen as the creation of an overall picture of a desired and/or assumed future, is rarely highlighted as a process step in strategy development, or identified as an important leadership capability (Choi 2006, p. 27; Kochikar & Ravindra 2007; Kouzes & Posner 1996, p. 14; Van der Merwe et al. 2007). Other challenges arise from the uncertainties driven by the fast changing environment (Igartua et al. 2010; Jennings 2001, p. 397; Karami 2005; Marshall & McKay 2002; Oosthuizen 2000, p.10; Reger 2001; Ringland 2010; Spence 2003; Teece 2007; Wilson 1999). In order to reduce uncertainty, companies create knowledge about the future using a variety of qualitative methods suggested by the literature (e.g. Ansoff 1975; Bell 2003; Burmeister, Neef & Beyers 2004; Day & Schoemaker 2006; Fahey 1998; Fahey & Randall 1998a, 1998b; Georgantzas & Acar 1995; Godet 1987, 2001; Huss & Honton 1987; Lindgren & Bandhold 2003; Porter 1985; Ringland 1998; Schoemaker 2002; Schwartz 1996; Schwartz & Ogilvy 1998).

Adoption of a foresight-centric toolset leads to more discontinuous innovations. Innovation management is a key driver for today’s business, as companies need to shift their strategic priorities from purely focusing on base business growth to managing innovations (Dwyer & Mellor 1993, p. 160; Hamel 1998, p. 9; Kemelgor 2002, p. 67; Magnusson et al. 2009; Shen et al. 2009; Wright 2007).

In comparison to organisations exhibiting traditional structured analytical approaches, those adopting a foresight-centric strategic planning process will have more future oriented strategic projects and an innovation driven culture.

Most companies use techniques which focus on strong signals or trends only (Cheung et al. 2009; Chia 2004, p. 36; Hamel & Prahalad 1994, p. 16f; Harris & Zeisler 2002, p. 22; Marsh, McAllum & Purcell 2002, pp. 7-15). PEST or SWOT analysis remain the common methods for environmental scanning in order to learn about the future (Ansoff 1976; Burt et al. 2006; Day & Schoemaker 2006; Frost 2003, p. 60; Gunn & Williams 2007; Jarratt & Stiles 2010; Kotler et al. 2004; Stoffels 1994; Van der Duin & Den
Modern dynamic, foresight-centric models are rarely used (Clemens 2009; Smith 2007; Smits, Van der Poel & Ribbers 1999). A focus on traditional or quantitative methods will fail to capture the complexity of weak signals, and therefore deliver only average or incremental growth (Ansoff 1965; Bell 2003; Bhide 2010; Clemens 2009; Caragata 1999; Dibrell et al. 2007; Fink, Schlake & Siebe 2001; García-Arca & Prado-Prado 2007; Georgantzas & Acar 1995; Godet 1987; Graf 1999; Hitt, Ireland & Duane 2001; Huber, Jungmeister & Zahrld 2007; Lindgren & Bandhold 2003; Ogilvy 2002; Ringland 1998; Schoemaker 2002; Tsoukas & Shepherd 2004; Wack 1985a, 1985b).

**RP3:** Conversations around the future environment of organisations generated as a consequence of using traditional structured analytical frameworks in strategic planning such as SWOT and PEST will generate a convergent perspective about the future and lead to the adoption of strategies that support incremental change.

The use of discontinuous scenarios at the very beginning of the strategy development process is posited to support strategic thinking in organisations (Ansoff 1975, 1984; Day & Schoemaker 2005; Jaeger et al. 2001; Marsh, McAllum & Purcell 2002; Mintzberg 1987; Schwartz 1996). Traditional approaches to corporate strategic planning include several challenges for organisations. For instance, traditional approaches to strategic planning hinder strategic thinking and envisioning, especially when quantitative approaches manipulate the strategic visions (ASQ 2005, p. 13; Bhide 2010; Carr, Durant & Downs 2004; Cheung et al. 2009; Harari 1995; Mintzberg 1994, p. 107; Smith 2007; Teece 2007; Van der Duin & Den Hartigh 2009). Overall, the limited research on applied methods in corporate foresight (Bhide 2010; Burmeister, Neef & Beyers 2004; Schwarz 2006) fail to consider the application of the weak signals theory.

**RP4:** Strategising in organisations that integrate both strong and weak signals foresight methodologies will generate strategic imperatives that both address current challenges and prepare the organisation to address anticipated industry and market reconfigurations.

Effective strategy formulation and decision-making arrive from a communicative interaction between relevant organisational stakeholders (Carr, Durant & Downs 2004; Choi 2006, p. 27; Cravens 1998; Dwyer & Mellor 1993, p. 160; Hamel 1998, p. 9;
Integrating weak signals into foresight methodology requires specific research and development that must be supported by top-level management, to ensure that managers at all organisational levels can address potential complexity and instability (Ansoff 1965, p. 98; Armstrong 2001, p. 676). Research suggests that top-level management must guide the integration process. Stoffels (1994, pp. 139-181) and Armstrong (2001, p. 676) reinforce the importance of user-friendly methods in integrating environmental instability and other required knowledge. Further, Burkhard, Spescha & Meier (2005) have noted that it is the role of top-level management to create a vision for the organisation. If an organisation has a “big picture” to visualise, any data collected (weak signals or strong signals) can be interpreted and used in a much more meaningful way for the benefit of that organisation (Igartua et al. 2010; Rollwagen et al. 2008; Stoffels 1994, p.3).

**RP5**: Operationalising the integration of weak and strong signals foresight methodologies in an organisation’s strategic planning process will require top-level management support and user friendly methodologies that can be readily interrogated by strategists at all levels of the organisation.

The literature encourages a refocussing of strategy development around strategic thinking, envisioning and innovation management. Research presents the benefits of a foresight system that helps managers to think strategically, and develop their vision. This includes supporting synthesis, intuition and creativity at all levels. Effective strategic decisions have been assigned to a communicative interaction among relevant organisational members (Carr, Durant & Downs 2004; Choi 2006, p. 27; Cravens 1998; Dwyer & Mellor 1993, p. 160; Hamel 1998, p. 9; Harari 1995; Kemelgor 2002, p. 67; Kouzes & Posner 1996, p. 14; Maguire et al. 2009; Mintzberg 1994, p. 107f; O'Shannassy 2003, p. 59; Rahman & De Feis 2009; Rohrbeck & Gemünden 2011).

**RP6**: In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process will exhibit flexible decision-making later in the process as strategies are being implemented.
To summarise, literature does not offer guidance on an iterative, overarching strategy framework from signals collection to strategy implementation. Liebl (1996, p. 11) and Stoffels (1994, pp. 87-96), for example, fail to incorporate scenario techniques in their model for corporate foresight; Amara & Lipinski (1983), Georgantzaz & Acar (1995, pp. 147-151) and Ringland (1998, pp. 222-250) do not include weak signals theory, and Fink, Schlake & Siebe (2001, p. 202f) fail to include a direct link to strategy development. An explicit integrated advanced framework from signals collection (environmental scanning) and management to scenario building and strategy implementation is critical for business practice, particularly with respect to guiding innovation. With a call for greater emphasis on strategic thinking, envisioning and innovation, and given the uncertainties from the fast changing market environment, the need for a new contemporary planning approach, where weak signals management and foresight conversations are in the centre of the activities, is paramount.

1.6 Research Objective and Methodology

Many companies do not have a formal strategy process or document (Frost 2003, p. 55; Karami 2005, p. 65; White, Conant & Echambadi 2003). In addition, traditional planning approaches (Fig. 3) are not designed to cope with uncertainties driven by the fast changing environment (Clemens 2009; Jennings 2001, p. 397; Karami 2005; Maguire et al. 2009; Marshall & McKay 2002; Ofek & Wathieu 2010; Oosthuizen 2000, p.10; Reger 2001; Spence 2003; Wilson 1999).

In general, a traditional strategy planning approach includes the following elements (Huber, Jungmeister & Zahnd 2007; NetMBA 2011; Pearce II 1981, p. 40; Preble 1997, p. 771; Thomas 1984, p. 142):

Vision/Objectives → Situation Analysis → Strategy Formulation → Strategic Projects → Implementation → Control

Figure 3: A Traditional Strategy Planning Approach (Huber, Jungmeister & Zahnd 2007; NetMBA 2011; Pearce II 1981, p. 40; Preble 1997, p. 771; Thomas 1984, p. 142)
There is general agreement on the need for a contemporary approach to strategic planning, one which can cope with the fast changing dynamic environment and shorter planning cycles in organisations, yet ensures that long-term considerations are part of strategy conversations (Day & Schoemaker 2007; Magnusson et al. 2009; Mietzner & Reger 2009; O’Regan & Ghobadian 2007; Igartua et al. 2010; Smith 2007; Jarratt & Stiles 2010). The goal of this research is to develop a more contemporary, future oriented approach to strategy development. In such an advanced, contemporary strategy planning approach, a future screening process is a prerequisite for strategy formulation:

![Diagram of a Contemporary Strategy Planning Approach using Corporate Foresight](own illustration, developed from Huber, Jungmeister & Zahld 2007; Ofek & Wathieu 2010; Rohrbeck & Gemünden 2011; Van der Duin & Den Hartigh 2009)

Three elements of future screening, namely environmental scanning, situation analysis and strategic conversations based on strategic scenarios, built by combining strong and weak signals, are part of this model to build strategy and an innovation market leadership role (Ofek & Wathieu 2010; Rohrbeck & Gemünden 2011; Van der Duin & Den Hartigh 2009). These researchers argue that an organisation adopting a process containing these elements will become aware of discontinuities and innovation. The emphasis on innovation in the framework is reflected in the strategy development process, in special methods, techniques and tools in strategy development, in the way strategy documents are built, and in a corporate culture which allows change and
strategic conversations. The framework embracing these three elements defines a foresight system (framework) that incorporates both weak and strong signals (as well as the interaction between them) and which will support the formation of scenarios. The value of such a foresight framework was tested by studying two case organisations, one of which had implemented a foresight system as part of their contemporary approach to strategy development. The other organisation operates with a more traditional strategic planning approach and does not scan the environment for weak signals or utilise scenarios. Both case organisations are part of a Swiss group of companies, owned by the Swiss government. The analysis of the two case organisations includes document research and qualitative interviews with the strategy teams of the two organisations and led to the development of a practice framework for foresight. To maximise the applicable scope for the framework, foresight experts participated in a survey to enrich and validate the theoretical model derived from the literature review, which in turn allowed the author to further advance and confirm findings from case study research.

1.7 Justification for the Research

Major practice gaps and support for further research are apparent in three areas. First, PEST analysis is the most widely accepted method for environmental scanning in order to gather weak and strong signals (Ansoff 1976; Collis & Montgomery 2008; Day & Schoemaker 2006; Gunn & Williams 2007; Kotler et al. 2004; Schindehutte, & Morris 2009; Smith 2007; Stoffels 1994; Van der Duin & Den Hartigh 2009). However, PEST seems better suited to use as a classification system than a method for actively accessing and interpreting the environment. In addition, the value of PEST analysis is limited by its focus on the current (static) environment, rather than how the environment has changed and how and why it may develop in the future. PEST factors are also analysed as standalone elements with little regard for understanding the interdependencies between those elements (Burt et al. 2006). Research is necessary to analyse whether these weaknesses are evident in business practice, or if a toolkit for qualitative environmental scanning activities is necessary in order to close this gap in foresight processes.
Second, there is a practice gap with regard to qualitative methods for combining non-econometric signals into scenarios. How can signals with multiple meanings of a complex (not quantifiable) environment be combined? Major literature about foresight and scenario development suggests a variety of 2x2 matrices, crosslink analysis and mathematical models, all of which are of a static nature (e.g. Ansoff 1975; Bell 2003; Burmeister, Neef & Beyers 2004; Day & Schoemaker 2006; Fahey 1998; Fahey & Randall 1998; Georganantas & Acar 1995; Godet 1987, 2001; Huss & Honton 1987; Lindgren & Bandhold 2003; Porter 1985; Ringland 1998; Schoemaker 2002; Schwartz 1996; Schwartz & Ogilvy 1998). So what is the most successful way of combining non-quantifiable signals into scenarios? There is a need for a tool-set for combining qualitative signals in a qualitative way to create scenarios. In most of the cases, scenarios are formulated upon econometric models. However, quantitative techniques are not capable of modelling with the complexity of signals: for example, forecasting does not consider that trend lines can be broken, and is therefore not adequate for scenario planning (Ansoff 1965; Bell 2003; Caragata 1999; Fink, Schlake & Siebe 2001; Georganantas & Acar 1995; Godet 1987; Graf 1999; Hitt, Ireland & Duane 2001; Lindgren & Bandhold 2003; Ogilvy 2002; Ringland 1998; Schoemaker 2002; Tsoukas & Shepherd 2004; Wack 1985a, 1985b). This link between non-quantifiable signals and scenarios is one of the most critical elements, if not the most critical, within an overall framework for strategic corporate foresight.

Finally, as discussed previously, the literature does not provide an overall framework from signals collection to strategy implementation (Micic 2010), since frameworks either cover weak signals theory, with or without the application of scenario development (Ansoff 1975, 1982, 1984; Day & Schoemaker 2005; Fink, Schlake & Siebe 2001; Liebl 1996, p. 11; Stoffels 1994, pp. 87-96), or environmental scanning and strategy adaptation (Amara & Lipinski 1983; Georganantas & Acar 1995, pp. 147-151; Gilad 2004; Ringland 1998, pp. 222-250; Stoffels 1994; Van der Heijden 1996). An explicit integrated advanced framework from signals collection (environmental scanning) and management to scenario building and strategy implementation does not exist in the broad literature, and its relevance in business practice needs to be confirmed.

Addressing these three topics in the research, reflected through the research propositions, will validate the importance and constitution of an integrated framework
for advancing strategic corporate foresight and its application in current business practice.

1.8 Limitations of the Study

Any independent study on a foresight framework for advancing strategic corporate planning will be limited by its scope and generalisability across industries, and potentially also due to existing cultural and mental models within organisations.

First of all, the intention of this research project is not to describe and create a new way of scenario building or development, although scenario management is seen as an important step in the foresight framework. In addition, the scenario methodologies described will focus on qualitative models which can manage non-quantifiable environmental drivers. The discussion will not address methodologies for developing scenarios based on econometric models (see for example Behravesh 1998, pp. 296-307; Godet 1987, 2001). Therefore, no specific model or guidelines have been created to demonstrate how scenarios can be built and integrated in detail.

Second, the foresight or future workshops that have been recommended as part of the foresight process are not the focus of this study. There are no basic workshop guidelines that can be readily simulated, validated and described. A variety of techniques exist, such as war gaming workshops (Abadie et al. 2010; Oriesek & Schwarz 2008; Rollwagen et al. 2008), but these will not be discussed in detail.

Probably the most significant limitation of this research is the unreliability of human nature. The way in which this framework has been established assumes an objective approach to the collection and interpretation of weak and strong signals. In this framework, signals are collected through environmental scanning, market research, open conversation and debate, using foresight experts and workshops. However, as each of these steps involves people, and as people also interpret the signals, it is not possible for the information to be unaffected. This human factor eliminates the possibility of pure objectivity, as humans are subjective beings by nature. Therefore, the human factor and social interactions within an organisation, for example, complex adaptive systems.

The framework also heavily relies upon a certain level of trust and support from the executive management of organisations. For strategic corporate foresight to have any success, an organisation must invest both time and money in its own foresight and innovation programmes. These organisations must trust that weak signals will eventually provide their companies with significant financial returns, despite the uncertainty with which they are linked. This leads to the last limitation to be found within this research: it is not intended to prove that there is a definitive link between financial performance and the type of foresight or strategy process utilised. This may vary case to case, according to unique cultural, structural or market specifics. In order to strengthen this link, more comprehensive research must be undertaken with a larger sample size, and case organisations must be observed over a longer (10+ years) period of time.
2 Literature Review

2.1 Overview and Structure of the Literature Review Chapter

The goal of the literature review is to build the foundation of a theoretical framework to address the research question through exploration of the field of weak and strong signal management and with regards to scenario building within the context of strategic planning.

All major dimensions of capturing weak and strong signals, scenario building and strategic management that support the research question will be described, based on the foresight management theory framework described in section 1.3. Specifically, this includes the notion of strategic planning and uncertainty (section 2.2), supported by the management discipline of foresight (sections 2.3 to 2.5) and to a small degree, forecasting (section 2.6).

In order to drive foresight and reduce uncertainty, an organisation’s environmental scanning possibilities are described (section 2.7), including the sources of weak and strong signals and a definition of the two terms (sections 2.8 to 2.9). Identified signals will need to be processed (section 2.10) in order to build and take advantage of scenarios (sections 2.11 to 2.13). Finally, the utilisation of insights from scenarios to create strategies and action plans (section 2.14), and the connection to innovation and risk management (section 2.15), will be discussed.

Through engagement with this literature, a series of propositions are developed which form the research framework for the investigation. A conclusion with an overview of literature supporting the elements of a proposed framework (section 2.16) will form the final part of the literature review.
2.2 Strategic Planning and Uncertainty

The role of management in organisations is to undertake a large and complex set of activities such as analysis, decision-making, communication, leadership and motivation, measurement and control. These tasks are not only performed in the context of operational business, but also in the process of strategic planning to create new value for customers and drive profits (Kotler et al. 2004; Porter 1996; Shen et al. 2009).

Value creation is a central concept in management. It is defined as a process of innovation, production and the delivery of products to the market (Lepak, Smith & Taylor 2007, p. 180; Mizik & Jacobson 2003, p. 63). It is argued that organisations which engage in value creation strategies deliver high innovation capabilities, but require information-based strategies to create value. These value focused strategies must be positioned around unique organisational activities to remain competitive in the long-run (Dobni 2010, p. 337; Porter 1996, p. 64).

The literature identifies the following reasons for organisational failure to create value: uncertainty, driven by the use of poor quality or inadequate information about the changing environment; underestimating the need to be prepared for operational disruption; the level of preparedness for challenges; and the use of outdated problem-solving approaches and planning methodologies (Caragata 1999, p. 6; Collis & Montgomery 2008; Dibrell et al. 2007; Maguire et al. 2009; Mietzner & Reger 2009; Negrila 2010; Ofek & Wathieu 2010; Ogilvy 2002, pp. 6-14; Sandström et al. 2009). These managerial limitations lead to failure to support the development of clear priorities for action and a tendency to ignore early warning signs. For instance, according to one study, 97% of 140 corporate strategists admitted that their organisation has no foresight or early warning system in place (Fuld 2003).

Underestimating the uncertainty of the future environment can lead to strategies that neither defend against threats nor take advantage of opportunities (Courtney, Kirkland & Viguerie 1997; Magnusson et al. 2009; Maguire et al. 2009). On the other hand (Day & Schoemaker 2007; Hamel & Prahalad 1994, p. 61, 177), there are substantial potential rewards for anticipating the future, provided that the risks of new ventures are recognised and managed. Anticipating the future before others may allow an organisation to innovate and establish a first mover competitive advantage in a new
market or product category. According to Fink, Schlake & Siebe (2001, p. 8), people do not have the ability to progress into and face the future without encountering problems. The authors point to one example where a German company created future scenarios in 1984 in which one described a world where the Eastern bloc would not exist anymore and the two German countries were reunited. “Too radical”, stated the management, and discarded this scenario. Thomas J. Watson of IBM predicted a need for only five personal computers on the global market in 1943, and Ken Olfsen from DEC did not see any market at all for computers in households in 1977/1978. Western Union regarded the telephone as an unsophisticated way of communicating in 1876 and Decca Recording Co. rejected the Beatles in 1962 because guitar music is “on the way out” (Fink, Schlake & Siebe 2001).

Taking advantage of new opportunities, managing threats and creating value may be the core of strategy, but strategising and the strategy process depend on an organisation’s ability to identify weak signals and emerging patterns in the environment and to develop response strategies. The role of management support here is crucial, as “the process of perceiving and then assessing environmental change and its implications for new strategies, structures, technologies, and cultures in the organisation is an immensely complex human and organisational process” (Whipp, Rosenfeld & Pettigrew 1998, p. 15). Effective scanning of the environment is a precondition for identifying environmental change which will subsequently impact the current strategic direction of the organisation (Auster & Choo 1994; Day 2003; Day & Schoemaker 2007; Georgantzas & Acar 1995, p. 4; Hamel & Prahalad 1994; Van der Duin & Den Hartigh 2009).

Prior research provides an overview of companies (Fig. 5) whose expertise lie in identifying emerging patterns (disruptions) and transforming them into new business ventures (Christensen & Raynor 2003, pp. 46-49). For instance, Sony pioneered the use of transistors in consumer electronics by producing their portable radios and televisions, thus disrupting established market participants by producing large TVs using vacuum tube technology.

Not understanding the potential of current developments can also be interpreted as a threat in terms of the possible consequences of missing long-term market opportunities. The way organisations take advantage of opportunities and manage threats depends on:
(a) to what extent there is a knowledge base upon which to draw to anticipate important changes in the environment; and (b) to what extent there is a base of knowledge and insights on which to draw for developing response strategies (Georgantzas & Acar 1995, p. 6; Havas et al. 2010; Lichtenthaler 2009; Tsoukas & Shephard 2004, pp. 3-6).

In today’s environment, the techniques used for business planning over the past decades are no longer sufficient. Planning in the current environment requires a view of the future that captures the dynamics of the emerging market environment. Forecasts based on current trends, or estimates of growth based on history, are dangerous to organisations operating in a dynamic environment. In addition, forecasts only point towards an end state, but future developments can be more dynamic (Fig. 6) and require the creation of multiple potential outcomes (Bhide 2010; Cheung et al. 2009; Lindgren & Bandhold 2003, pp. 21-28; Ringland 1998, pp. 46-47; Smith 2007). Early literature discussed how forecasting, “could be made more rigorous, reliable and valid” (Voros 2008, p. 196).
These future outcomes can be described and visualised in scenarios. Scenarios allow an organisation to move away from dangerous, single point forecasts, especially when the future cannot be predicted with certainty (Porter 1985, p. 447; Ringland 1998, 2010).

There are four different ways in which organisations attempt to deal with the future (Fig. 7). When important events are anticipated and there is a pool of knowledge as to how to deal with them, organisations use forecasting methods (e.g. for forecasting seasonal demand). If the knowledge base for anticipating important events is sizeable, the organisation may use analogical reasoning; if it is small, but the knowledge base for undertaking action is great, it will resort to contingency planning (Tsoukas & Shepherd 2004). In cases where both knowledge about the extent to which certain events and processes may be anticipated and knowledge from which to draw for undertaking actions is limited, scenarios are typically employed.
Through scenarios, futurists and managers can try to develop an understanding of the future (Bell 1997, p. 111; MacKay & McKiernan 2004, p. 162; Ringland 2010; Van der Duin & Den Hartigh 2009). They seek to know what causes change, be it the dynamic processes underlying technological developments, or changes in the political, economic, social, and cultural orders. They also look for theories to explain such changes in order to help others recognise and understand them. Schwartz (1999, p. 61) explains that foresight experts sometimes talk about having a “radar”. A radar device sends out a high-frequency signal and waits for objects to bounce the signal back. When something unusual shows up on the display screen, an organisation pays closer attention.

In a critical analysis of environmental scanning, Stoffels (1994, pp. 11-16) provides both reasons for adopting scanning activities and criticism of the various approaches. The post-industrial society has seen accelerated change and increased complexity necessitating a corresponding evolution in planning methodologies and the implementation of scanning activities that read signals about the future environment.

Criticism, on the other hand, is targeted at the interpretation of results, since interpreting the results of environmental analysis to predict specific impacts on the organisation’s businesses and determine specific appropriate responses is a challenging task. The concept of the adaptive enterprise is offered, representing large, complex organisations that adapt systematically and successfully to disruptions from environmental change.
(Haeckel 1999; Huber, Jungmeister & Zahld 2007; Sandström et al. 2009). In adaptive enterprises, change is unpredictable and based on external signals. A company will adapt its structure, systems and culture immediately to the new environment. These organisations can respond quickly to signals from the external environments, based on an effective mobilisation of the organisation's internal resources and configuration (Gehani 1992, p. 46).

To summarise, the essence of strategy is to take advantage of new opportunities, minimise threats and/or reshape the organisation around the emerging environment to create value for its stakeholders. Therefore, one key success factor is a company’s ability to identify emerging signals and patterns through continuously scanning the economic, business, technological and political environment, and to actively respond. It is important to consider multiple futures (scenarios) and not only to forecast one (single point) future. Accepting change and acting upon it is not only a matter of organisational and human capabilities, but also visionary leadership skills. It requires an organisation to interpret and process the outcomes of environmental scanning, and to utilise this information in strategy development.

2.3  Foresight

Foresight is a medium to long-term strategy development task which aims to build knowledge about the future in order to foster strategic conversations and assist organisations to plan ahead (Albers & Broux 1999; Burmeister, Neef & Beyers 2004; Chia 2004; Hamel & Prahalad 1994; Marsh, McAllum & Purcell 2002). It has also been posited to be part of a manager’s duty to create connections between present actions and future possible outcomes (Kochikar & Ravindra 2007; Maguire et al. 2009; Ofek & Wathieu 2010). Due to the long-term range of planning and the relatively low level of detail and accuracy, foresight is dependent on a qualitative approach to envisioning the future. Pressures from competitors, major shifts in science and technology, and fluctuations in consumer demand and governance provide a foundation for foresight projects in companies (Burmeister, Neef & Beyers 2004, p. 12; Kochikar & Ravindra 2007; Marsh, McAllum & Purcell 2002, p. 63; Mietzner & Reger 2009; Ofek &
In order to motivate an organisation to support the development of foresight, it must build a basic future knowledge base.

The approach of focusing on long-term market issues in business was not developed until the 1960s. Prior to that point, market research had been seen as a task for the research and development department of a company (e.g. Ansoff 1965, p. 92), not as a source for strategic planning. Although Ansoff’s decision flow in product market strategy formulation (1965, p. 202f) already included a number of elements, namely terms like “current forecast”, “industry potential”, “diversification gap” and “expansion gap”, “scope and growth vector” and “competitive advantage”, all of which point to the emergence of an approach to corporate foresight, the scientific discipline of foresight did not yet exist in Ansoff’s world (Martinet 2010). The long-term aspect of market research (i.e. the connection with scenario building) was later defined as a key element in corporate planning. Only in the 1970s were the first approaches to corporate foresight presented, by combining the two techniques of environmental surveillance and forecasting, in order to reduce uncertainty (Ansoff, Declerck & Hayes 1976).

Environmental surveillance involved scanning the organisation's internal and external environments to identify emerging issues and trends which might eventually influence the direction and effectiveness of existing strategies. The process tried to anticipate the need to change strategy, so that action could be taken before the window of opportunity for effective response closed. The quality of this process lay in the organisation’s ability to capture weak signals, to identify impulses that would break trend lines in foreseeing the probable future (Day & Schoemaker 2007; Fiegener 1994, p. 28; Massé 1965, p. 193; Rubin & Kaivo-Oja 1999, p. 354; Wilenius 1999). In Ansoff’s decision schema of strategy formulation (1965, pp. 27-58), the appraisal of outside opportunities was an integral and important element in the strategy development process, as it was seen as the foundation for long-term growth and ROI. In order to achieve and maintain a high ROI, researchers have argued that an organisation needs the ability to respond to external challenges flexibly through contingencies (Glassey 2009; Huber, Jungmeister & Zahld 2007; Mueller & Smith 1984, p. 88; Ofek & Wathieu 2010; Wilenius 1999, p. 375). To identify and analyse past and present trends, and to extrapolate future developments, weak signals were identified to be important; risk and uncertainty were influencing elements on the final decisions in strategy planning. However, it is recognised that the past is connected with the future via cognitive linkages. The “foresight bias” influences
managers’ thinking about futures when analysing historical data (their causes and consequences) and linking them to foresight (MacKay & McKiernan 2004, p. 163, p.176).

Possible outcomes of uncertainties from the environment are rarely neutral, instead usually carrying with them benefits or penalties. Prior research has suggested that organisations may need to employ more flexible structures so they can cope with the new situation (or a number of new “futures”) and invest more time in information seeking, because uncertainty is seen as an information deficit and new processes become necessary in order to enable an organisation to deal with the environment and amount of available information (Fink, Schlake & Siebe 2001, p. 20; Hartley 2000, p. 112; Jaeger et al. 2001, p. 16f; Kochikar & Ravindra 2007; Rahman & De Feis 2009; Shen et al. 2009; Teece 2007).

Trends and strategic events, once identified as weak and strong signals, are seen as major drivers for uncertainty. Still, they do not necessarily mean change (for example, rendering existing products obsolete or requiring the development of new solutions). Alternatively, identified signals may indicate potential long-term future changes (Jaeger et al. 2001; Marsh, McAllum & Purcell 2002; Kahn 2006). Following the literature covering signals theory (e.g. Ansoff 1975, 1982, 1984; Marsh, McAllum & Purcell 2002; Voros 2006), signals can be broken down into three categories:

- **Weak Signals:** Information about the future development is vague and its future course unclear (e.g. new technologies for designing services).
- **Trends or Strong Signals:** Clearly observable changes happening today and expected to continue into the future (e.g. the mobility of individuals becomes more important).
- **Wildcards, Critical Events or Strategic Surprises:** Something that could happen that is completely outside existing mental models and ways of managing (e.g. a new virus breaks out at a major international airport).

Graf (1999, pp. 81-82) sees quantification, availability of details, degree of objectiveness, and probability in relation to the time horizon as a way of differentiating between the several approaches for looking into the future:
Foresight, not described in Graf (1999), provides a mechanism for building a bridge from the present (mental model A, Fig. 9) to the future (mental model B). Mental model A reflects perceptions of current customers, competitors, products and services, and company goals. Foresight tries to build knowledge about mental model B (i.e. about the future business, future competitors, future goals and future customers in five to twenty years), and at the same time re-educate the organisation, as companies are culturally predisposed to focus on visible elements and to somewhat ignore the dynamic, uncertain and interactive environment (Chia 2004, p. 36; Day & Schoemaker 2007; Hamel & Prahalad 1994, p. 16f; Magnusson et al. 2009; Marsh, McAllum & Purcell 2002, pp. 7-15; Ofek & Wathieu 2010).
Today, approaches to reducing uncertainty are covered to some degree in academic literature, but practice oriented methods are mainly based on unsophisticated approaches. Some (e.g. Day & Schoemaker 2006, p. 53; Kotler et al. 2004) still suggest PEST analysis or the application of Porter’s (1985, p. 451) analysis of the five competitive forces (rivalry among existing organisations, threat of new entrants, bargaining power of buyers, threat of substitute products or services, and bargaining power of suppliers). They are the preferred methods of environmental analysis and thus remain the best means for reducing uncertainty through actions tied to the outcomes of the analysis. The main critique of the PEST approach is that it is not a method per se; rather it is a classification system for application to the collected signals. In addition, PEST analysis as a stand-alone approach is not capable of working with environmental dynamics which require a more sophisticated method (Jarratt & Stiles 2010; Kotler et al. 2004; Van der Duin & Den Hartigh 2009). Other authors (e.g. Jagpal 1999) offer analytical, data driven models for managing an organisation’s uncertainty. At the other end of the scale, Futurists offer very unconventional and scientifically unproven methods for foreseeing future events.

The need for shorter strategy planning cycles in a dynamic and discontinuous environment and the application of traditional (outdated) methodologies puts organisations under considerable pressure (Fink, Schlake & Siebe 2001; Hartley 2000; Jaeger et al. 2001; Jarratt & Stiles 2010; Kochikar & Ravindra 2007; Kotler et al. 2004; Rahman & De Feis 2009; Shen et al. 2009). This is especially true when combined with the urgency of fulfilling customer needs, and the imperatives to survive in a competitive landscape and create shareholder value. A foresight-centric strategy planning process has been posited to allow an organisation to reflect the changes in the environment, in order to prepare for future change. The foundation of such a foresight-centric approach is the integration of both strong and weak signals (Day & Schoemarker 2007; Fiegner 1994; Huber, Jungmeister & Zahld 2007; Massé 1965; Rubin & Kaivo-Oja 1999; Wilenius 1999) in the scenario building and strategy process, to reduce the levels of uncertainty and prepare an organisation for the future (Anoff, Declerck & Hayes 1976; Jaeger et al. 2001; Marsh, McAllum & Purcell 2002; Kahn 2006). Therefore,
RP4: Strategising in organisations that integrate both strong and weak signals foresight methodologies will generate strategic imperatives that both address current challenges and prepare the organisation to address anticipated industry and market reconfigurations.

There is a consensus view that even the best foresight efforts cannot foresee all of the important events and consequences: uncertainty about the future cannot be reduced to certainty (for instance, because of strategic surprises). To summarise, foresight is a medium to long-term (five to twenty years) strategy development task with the objective of building knowledge about the future. Foresight provides the opportunity to transform the challenges of the future into innovations and is consistent with a company’s efforts to increase its learning and innovation capacities. It can be run as a standalone project to develop a new view of the future, as an ongoing function with fulltime staffing, or as a refreshing project to upgrade current knowledge (and assumptions) about the future (Marsh, McAllum & Purcell 2002, p. 25), but it must link to strategy (Micic 2010; Mietzner & Reger 2009). A generic project model could include the processing of trend information (signals), attempting to identify the influence of these signals on the company's industry and products/services, and the generation of a business infrastructure that can flexibly respond to changes in the future.
2.4 Methods in Foresight

Burmeister, Neef & Beyers (2004) present the following overview from their research of the methods that are being applied in foresight:

![Figure 10: Applied Methods in Corporate Foresight (Burmeister, Neef & Beyers 2004, p. 37)](source)

(Source, date and sample size of survey have not been provided)

The literature covers a broad range of techniques, which range from predominantly descriptive accounts of the current and immediate term as in industry analysis (Porter 1980, 1985), to broad projections of alternative futures (e.g. through future workshops, gaming and conferences), as exemplified in scenarios crafted by the “World Future Society” and many other consulting corporations (Bell 1997, p. 241; Collis & Montgomery 2008; Cravens et al. 2009; Glenn & Gordon 2009; Gunn & Williams 2007; Koncilja–da Mata et al. 2004; Narayanan & Fahey 2004, p. 38; Scholz & Tietje 2002, p. 65; Stoffels 1994, Weisbord & Janoff 2000, p. 4).

2 The most detailed reports on techniques in foresight are presented by Glenn & Gordon (Futures Research Methodology, 2009) with over thirty described methodologies, and a report from EPFL for a Swiss Bank (Konicilja–da Mata et al. 2004, Methods to find Weak Signals for Foresight and Scenario Planning) with over forty described methods.
There is general agreement that quantitative techniques are not capable of revealing the complexity of weak (and strong) signals, especially because some signals cannot be quantified with regard to impact or probability (Bhide 2010; Cheung et al. 2009; Georgantzias & Acar 1995, p. 153; Koncilja–da Mata et al. 2004). In addition, conventional quantitative forecasting techniques cannot explain the effects of changes that will occur in the future. An interesting qualitative approach to dealing with the future is the use of Innovation Laboratories (iLabs), such as those run by the British Royal Mail Group. An iLab is a special physical space in which organisations can explore and extend their thinking beyond the “normal” boundaries of assumptions and mental models, as a way of including new and potentially disturbing drivers in strategy development. The key components of the iLab process are a dedicated space with a distinctive layout, design and visualisation aids, an emphasis on collaboration and creativity and the use of facilitation techniques including games and software tools. Results from Royal Mail’s iLab include the electronic “smart stamp”, e-billing solutions, new direct mail concepts, value chain solutions and others. Early in the 1900s, Ansoff (1965, p. 98) pointed out that special lab equipment is needed to run research and development, demonstrating that corporate foresight also relies on effective infrastructure and support.

However, a number of authors (Bell 1997, pp. 246-315; Georgantzias & Acar 1995, p. 153; Stoffels 1994) present quantitative methods for foreseeing the future, like the pragmatic prediction of one variable by another variable, time series analysis, extrapolation of trends/time series and simulation and computer modelling. The use of quantitative techniques is recommended for low-intensity environments, a mixture of quantitative and qualitative techniques (e.g. cross impact analysis) for moderate intensity environments and the application of qualitative techniques in high intensity environments, where conditions are least stable, most complex and risky (Ansoff 1965; Stoffels 1994). Therefore, for strategic corporate foresight in complex environments or markets where disruptive technologies emerge, techniques for high intensity environments should be used. They include interviews with experts and/or workshops based on intuition and conjecture. Voros (2008, p. 198) suggests that a mix of methods should be applied as part of an integral framework, depending on the form of inquiry and domains of interest. It is important to “take the broadest possible view of the human knowledge quest” (p. 199) in order to develop insights into potential futures.

3 Royal Mail company visit 2004, pers. comm., 12 July, Rugby/UK.
Combining the work of Armstrong (2001, p. 676) with Stoffels’ criteria for the evaluation of the appropriate methods, namely the ability to deal with environmental complexity and to reduce uncertainty and instability, and the level of required knowledge, resources and skills to use the technique (Stoffels 1994, pp. 139-181) offers a guiding process for the selection of the appropriate methods for dealing with uncertainty (Fig. 11).

![Figure 11: The Use of Methods in Foresight (according to Armstrong 2001, p. 677; Stoffels 1994, pp. 139-181)](image)

Formulating the problem includes objective setting and problem structuring; obtaining information is concerned with the identification of data (signals) sources, and the collection and preparation of the data. At the point where methods need to be selected, selection criteria first need to be defined. For the implementation stage, simpler methods are recommended, as complex methods are linked to errors that propagate through the system or mistakes that are difficult to detect. Finally, Armstrong (2001) and Stoffels (1994) recommend that methods should be evaluated in terms of their accuracy and other criteria, and note that experience will aid the selection of methods for further analysis and increase the quality of outcomes.

Today, over fifty methods for foresight are described in literature, of which approximately thirty methods have a qualitative basis. Sometimes, a clear categorisation of sources, techniques, methods and tools is not possible because they fall into multiple categories, but it is argued that qualitative methods are required to manage the challenges of weak signals.
2.5  Foresight Frameworks in Literature

Summarising all stages from environmental scanning, signals management and scenario building to strategic programme management, a foresight framework should offer companies a comprehensive process for advancing strategic corporate foresight.

In literature, a number of ideas for structuring corporate foresight exist, for example the scenario-driven planning loop from Georgantzas and Acar (1995, pp. 147-151) designed to reduce strategic uncertainty (scenario construction, model construction and tactical planning), or the model from Fink, Schlake and Siebe (2001, p. 202) in which observers collect relevant items (signals), a small team interprets the signals, and senior management will define whether or not the signals need to be monitored or implemented in the scenario development. The model from Amara and Lipinski (1983) contrasts the world as it exists (or is assumed to exist) with the models the company has built in order to understand the world. The environment is seen as a source of data on which to draw to identify trends and events, based on which decisions are taken. In order to analyse gaps between the assumed environment, the organisation’s value model and management’s expectations, decision scenarios can support a company in deciding on the next steps to be taken.

More practice-oriented models were developed by Liebl (1996, p. 11) with the key elements of: (a) scanning and monitoring; (b) generation of trend landscapes; (c) diagnosis/analysis of strategic relevance; and (d) definition of response strategies.

Ringland (1998, pp. 222-250) developed, on the basis of alternative business environments, the following strategy for a future organisation:

![Diagram](Figure 12: Analysis of Strategic Implications based on SRI (following Ringland 1998, p. 250))
A similar, but probably more complete framework (Fig. 13) is presented by Stoffels (1994, pp. 87-96). He identified three overall tasks, namely: (a) gathering inputs and processing information; (b) synthesising and evaluating emerging issues; and (c) communicating environmental insights to prepare the organisation for the future (action plans). This is aligned with Voros’ (2003, p. 15) generic 6 step foresight model of input (strategic intelligence), analysis, interpretation, prospection (i.e. scenario building), outputs (reports, presentation, workshops) and strategy (strategy development and planning).

The visualised top tasks, based on the framework for environmental knowledge and scanning strategy determination, gather, input and process the information. The activities within the dashed line box represent the synthesising and evaluation of emerging issues. This is the core component for generating knowledge of future environmental developments. Finally, the bottom part communicates the environmental insights within the organisation.
However, the literature (e.g. Ansoff 1965, 1975, 1980; Georgantzas & Acar 1995; Liebl 1996; Ringland 1998; Stoffels 1994) does not offer an integrated process for strategic corporate foresight where the focus is not only scenario building and strategy development, but where the whole process chain is explained, starting with the individual weak signal that becomes part of an image of the future with a link to strategy development. Consideration of the strengths and weaknesses of each approach encourages the development of a more comprehensive model with a logical sequence, incorporating all the elements of foresight.

2.6 Forecasting

In contrast to the qualitative approach of foresight, forecasting is a quantitative approach to generating knowledge about the future. Attempts to forecast future developments are frequently inaccurate as they are based substantially on historical data (e.g. trend lines). The petroleum crisis of the 1970s marks an important point in forecasting, as it highlighted the vulnerability of basing predictions on data from the past. Foresight-based models have the ability to include or comprehend disruption and strategic surprises: successful foresight requires that the future be studied “with a view to illuminating the present” (Godet 1987, p. 3).

Forecasting is a projective technique, aimed at extending the present and current developments into the future, based on past and current facts and using certain assumptions for the extrapolation or variation of trends. Foresight, on the other hand, allows multiple possible futures (scenarios) which are not necessarily driven by past experience, existing knowledge or recognised relationships between drivers of change. Systems dynamics and the management of complex systems are important issues in foresight and strategy development, and scenarios which only forecast alternative outcomes from past developments do not support strategy development in today’s competitive and changing environment (Bhide 2010; Cheung et al. 2009; Fink, Schlake & Siebe 2001, p. 20; Hitt, Ireland & Duane 2001, pp. 52-53; Ogilvy 2002, p. 5; Schoemaker 2002, p. 50f; Smith 2007; Wack 1985a, p. 74; Wack 1985b, p. 2).
In order to dispel uncertainty driven by the changing environment, more qualitative based methods should be applied; future projections of a number of environmental influences that are hard to quantify cannot be reduced to basic regression models. In addition, forecasting does not take into consideration the fact that trends can be broken.

Academic literature frequently interchanges the terms “forecasting”, “foresight” and “foreseeing the future”. Also in our daily use of the English language, “forecasting” refers to the broad range of techniques for planning into the future, and is not limited to quantitative (econometric) methods. In this instance, however, the term foresight is limited to qualitative techniques for foreseeing the future.

2.7 Environmental Scanning

An organisation relates to its external, turbulent, complex and global environment in two distinct ways, namely through either competitive or entrepreneurial behaviour, combined with social, economic and technical influences (Ansoff, Declerck & Hayes 1976, p. 42; Awazu et al. 2009; Elenkov 1997; Hitt, Ireland & Duane 2001, p. 52; Stoffels 1994, p. 1). With competitive behaviour, a company attempts to “produce as efficiently as possible and to secure the highest possible price and market share”; entrepreneurial behaviour is when a company seeks to replace “obsolete products/markets with new ones which offer higher potential for future profits” by “identifying areas of new demand, developing responsive products, developing appropriate manufacturing and marketing capabilities, market testing and introducing new products to the markets” (Ansoff, Declerck & Hayes 1976, p. 42). For both aspects, with an ever changing environment, scanning is seen as an important process for reducing uncertainty to aid decision-making (Clemens 2009; McEwen 2008; Nadkarni & Barr 2008).

Environmental scanning (or “peripheral vision” according to Day & Schoemaker 2006, 2007) is seen as an important process for companies that operate in dynamic environments. However, “old traditional” industries that have not faced many changes over the last decades will also increasingly need to look for changes in the environment (Navarro, Hayward & Voros 2008). Overall, scanning supports the organisation in
adapting its behaviour to the changing reality of the external world by providing early warning signals from within emerging environmental issues, threats and opportunities. By helping organisations to develop, adjust and modify, scanning has been proposed to support the development of internal structures and processes of the organisation and sensitise managers to the needs and benefits of new or modified strategies (Burmeister, Neef & Beyers 2004, p. 72; Day & Schoemaker 2005; Hitt, Ireland & Duane 2001, p. 52; Huber, Jungmeister & Zahld 2007; Jarratt & Fayed 2001; Kochikar & Ravindra 2007; Nadkarni & Barr 2008; Stoffels 1994, p. 3).

The right scope for environmental scanning cannot be determined easily, and there is a danger of “seeing too little or too much” (Day & Schoemaker 2006, p. 28). The environment of an industry is seen as a driver for the width of environmental scanning. This raises questions, such as; does a passenger transportation business have to look as far ahead as a financial institution which covers all areas from political, economic, social, and technological dimensions? With regard to a methodological scanning framework, Stoffels (1994, pp. 18-25) presents a model for scanning and signal processing activities. Between a company and its environment lie dependencies that are mainly under the “control” of the company, as the managers are regularly confronted with the issues arising from this environment. Stoffels describes this as the task (or operational) environment. On the other hand, the remote environment influences the organisation through indirect consequences of its impact on the intervening task environment.

Stoffels’ (1994) framework for undertaking this task is presented in figure 14. The forces and signalling indicators of this environment run through two filters. The reception filter passes only the inputs that are observed, whether by chance or by search. The perception filter decreases the signalling power of the input, based on evaluation and interpretation, and depending on individual acuity, processes, biases and interactions among people. Only once these filters are applied, will synthesis and presentation of the knowledge gained from scanning activities be possible.
Figure 14: Framework for Environmental Knowledge and Scanning Strategy Determination (Stoffels 1994, p. 22)

The outcomes of scanning activities are seen as valuable input for strategy formulation and can result in additional or modified scanning tasks (environmental scan strategy determination). The work from Stoffels (1994) provides excellent input to the development of a best practice framework. In one of the most comprehensive sources on environmental scanning, the author links the outcomes of environmental scanning with strategy formulation and addresses strategic programme management as both a process for challenging managers with the outcomes of environmental analysis and a means for defining the necessary projects/tasks to keep the company aligned with future developments. However, in this framework, Stoffels does not consider the possibility of applying the scenario technique, which links the outcomes of environmental scanning to scenarios as an approach to combining and understanding the gained signals.

The combination of environmental scanning (Day & Schoemaker 2006, 2007; McEwen 2008; Nadkarni & Barr 2008; Stoffels 1994), signal analysis and scenario development will form the basis of a foresight-centric planning approach. Signals need to be processed and understood within a company and outcomes of this process should flow into strategy development in order to prepare the company for the future landscape (Burmeister, Neef & Beyers 2004; Day & Schoemaker 2005; Hitt, Ireland & Duane 2001; Jarratt & Fayed 2001; Kochikar & Ravindra 2007; Stoffels 1994). It is argued that the strategy of incorporating all aspects of foresight methodology will enhance the
effectiveness of strategy development for short and long-term survival of an organisation.

2.8 Sourcing of Weak and Strong Signals

Through different techniques, organisations scan the environment for the collection of weak and strong signals. In a strategy workshop for a Swiss bank\(^4\), the following visualisation of sources, techniques and tools was created in order to achieve a common understanding of project terms:

![Visualisation of sources, techniques and tools](image)

The company’s foresight framework, described above, accesses a number of sources (first column), such as existing trend reports or market reports (Daheim & Uerz 2008). Trend reports are available through multiple sources, for example Popcorn (2002) presents seventeen trends from female thinking to the demographics tendency to live longer and younger; Horx (2002) outlines eight spheres of the future, from “TechnoSphere”, “BodySphere” to “ConsumerSphere”; and Laermer (2008) discusses

\(^4\) Workshop on 13 July 2004.
cultural and technological environments in 2011. However, trend reports provide insights into strong signals and focus on trend setting, rather than describe trends and reveal information about industry specific weak signals (Boon et al. 2005, p. 210).

Extracting information from reports and forums occurs through the application of a broad range of methods (second column), from facilitation techniques like brainstorming to future workshops, trend scouting and expert panels. Finally, tools (third column) enable the processing of signals and building of scenarios. Tools can be of a physical character (e.g. Innovation Laboratories) or can be software tools (e.g. FountainPark®). The result of accessing sources through techniques is a list of weak and strong signals. Perhaps these signals have been pre-processed by using tools.

The academic literature has generally supported more traditional approaches for extracting and synthesising trend data (Ansoff 1976, p. 183; Hahn 1979, pp. 34-36; Jarratt & Stiles 2010; Schindehutte, & Morris 2009; Stoffels 1994, pp. 57-59). PEST, and similar tools, will support the classification of information about the environment, but it is not a technique that will reveal weak signals (Burt et al. 2006). Prior research has established the narrow application for methods in strategic planning and the limited nature of PEST and other traditional techniques (Burt et al. 2006; Cheung et al. 2009; Clemens 2009; Day & Schoemaker 2006; Frost 2003, p. 60; Gunn & Williams 2007; Jarratt & Stiles 2010; Smith 2007; Van der Duin & Den Hartigh 2009), demonstrating how such structured approaches to foresight strategy cannot effectively understand or integrate more qualitative parts of foresight, such as weak signals. Traditional or quantitative methods fail to capture the complexity of weak signals and uncertain environments and therefore will only deliver average growth and support incremental change (Ansoff 1965; Bell 2003; Bhide 2010; Caragata 1999; Dibrell et al. 2007; Fink, Schlake & Siebe 2001; Garcia-Arca & Prado-Prado 2007; Georgantzas & Acar 1995; Godet 1987; Graf 1999; Hitt, Ireland & Duane 2001; Lindgren & Bandhold 2003; Ogilvy 2002; Ringland 1998; Schoemaker 2002; Tsoukas & Shepherd 2004; Wack 1985a, 1985b). Therefore,

**RP3:** Conversations around the future environment of organisations generated as a consequence of using traditional structured analytical frameworks in strategic planning such as SWOT and PEST will generate a convergent perspective about the future and lead to the adoption of strategies that support incremental change.
In order to collect signals and trends from the environment, the literature (for example Fahey & Randall 1998b, p. 34; Godet 1997, p. 18; Hitt, Ireland & Duane 2001, p. 53; Lachnit 1986, p. 9; Stoffels 1994, pp. 67-70 and 106-109) suggests considering the following issues:

- It is impossible to predict what information will be needed to run a successful environmental scan;
- Qualitative weak signals are more important than quantitative, global and strong drivers (or signals);
- The organisation may only focus on areas which are already known, or limit the scope because of the volume of information, as it is difficult to understand new/unknown concepts or identify the strategic value of a signal;
- The number of sources for collecting information should be broad and the most insightful drivers of change are those outside of the organisation; and
- All signals have to be analysed and classified around plausibility (improbable events vs. probable events), time and geographic range in order to further work with the outcomes of scanning activities.

To conclude, a foresight system includes sources (internal, external) which companies access through the application of methods and techniques. PEST analysis is identified as a widely used starting point for scanning activities, but it is seen more as a classification system than a scanning method which delivers weak signals for foresight activities. Optionally, tools (infrastructure, software) can be utilised to process the signals. The result of these activities is a list of weak and strong signals which will be further analysed and processed. It is suggested that less information may be collected because of the limited ability to process information into meaningful forms (e.g. scenarios and images of the future), but this includes the risk of missing potentially fruitful market opportunities.
2.9 Weak and Strong Signals

Following Mintzberg’s strategy concept (1987), weak signals could be seen as the source of disruptive elements that influence the intended strategy. Signals stand at the very beginning of every strategic analysis, and can be described as the “smallest accessible data elements” (Hansen 1992, p. 111). These signals, which can include both opportunities and threats, arrive from the external (and internal) environment and will develop over time. They are difficult to capture and understand or the connection to the environment might be weak, but they are a critical component in strategy development (Ansoff 1984, p. 22; Day & Schoemaker 2005, 2007; Ofek & Wathieu 2010; Tsoukas & Shepherd 2004).

Strong signals are issues that are visible and relatively concrete and allow an organisation to understand their impact and identify specific actions for response (Ansoff 1984; Courtney, Kirkland & Viguierie 1997). On the other hand, weak signals can help to feed R&D pools and therefore increase the long-term chance of survival for organisations (Jungmeister 2006). Case organisations would be more or less foresightful depending on their ability to deal with the weakness (Seidl 2004).

A discontinuity or strategic surprise is a significant deviation from the trend line, where extrapolation may or may not lie in historical data (Ansoff 1976, p. 131; Ansoff 1981, p. 234). Signals monitoring can identify emerging opportunities and threats (Fig. 16) within the assumed business environment, if information from foresight flows into strategic planning (Day & Schoemaker 2007; Glassey 2009; Mietzner & Reger 2009).
There is an inherent challenge related to the availability of signals: if the organisation waits until market information is adequate for strategic planning, it might miss out on opportunities and will be increasingly surprised by crises; if it acts on vague information, the organisation takes a high risk and the content will not be specific enough for thorough strategic planning (Ansoff 1975; Maguire et al. 2009; Ofek & Wathieu 2010). Ansoff (1975)\(^5\) suggests that in an early phase of a threat, when the information is weak and unclear, a company will not be able to formulate a clear response strategy. As the information becomes less ambiguous, the organisation will be able to develop a focused response strategy. However, just as in a radar surveillance system, in spite of the best efforts of the operator, some issues will slip by the environmental surveyors and become strategic surprises (Ansoff 1984, p. 24f; Glassey 2009). Here, Ansoff employs the term “weak signals”\(^6\) for the first time in the literature. He explains the organisation’s action as a response strategy to weak signals, in contrast to conventional strategic planning that depends on strong signals. This implies that the first task in strategic planning must be to explore the environment for weak signals that can be typically expected from a strategic discontinuity.

---

\(^5\) Ansoff has been described as a “brilliant man” and his work on signals theory as “fundamental and applicable today”. Conversation with a Stanford University Professor (who knew I. Ansoff), 2 November 2010.

\(^6\) Ansoff (1975, p. 23) makes reference to a personal communication with W. W. Bryant (Manager, TEO Central, Phillips, Eindhoven, Holland) while stating the term “weak signals” for the first time.
In the early life of an environmental or competitive threat towards a company, when its information is vague and future course unclear, the responses will be correspondingly unfocused, thus increasing the need for strategic flexibility in the organisation (Ansoff 1975, p. 23; Martinet 2010).

The sense of turbulence (phase I) is the earliest identification of the signal. At this stage, it is impossible to say from where the important event will originate. In the next phase, the source of the challenge becomes known (phase II) and later the challenge becomes concrete (phase III). When the signals become strong, a response strategy needs to be developed immediately (phase IV), however, the response should not be implemented before the outcome of the response becomes forecastable (phase V). Issues which are sufficiently visible and concrete to permit the organisation to compute their impact and devise specific plans for response are described as strong signals (Ansoff 1982; Ansoff 1984, p. 22). Detecting weak signals is efficient only if a company responds to them with low costs and a graduated response plan until the signal becomes strong. Ansoff lists six stages of graduated response, starting with (A) environmental surveillance and (B) identification of the organisation’s relative strengths and weaknesses in response to the challenge. When the source of the challenge is identified (phase II) a company can (C) reduce its external vulnerability, for example by reducing the dependence of certain business areas which may be effected by the challenge, and strengthen the

Figure 17: Weak Signals and Graduated Response (Ansoff 1982; Ansoff 1984, p. 23)
organisation’s internal flexibility (D). When the shape of the challenge is concrete (phase III), the organisation has enough information to start planning its response to the signal (E). When the plan has proven to be feasible, the company can finally react (F) (Ansoff 1982).

Recent research shows that the identification of weak signals and consistent scanning of the external environment is still key to effective management, identifying the drivers of potential change, sustaining innovation and building value for an organisation through engaging with strategy (Braganza, Awazu & Desouza 2009; Davis 2008; Sirmon, Hitt & Ireland 2007, p. 287). For example, a recent study focused on the creation of insights through the analysis of descriptive language (a “map of folksonomic items”) from environmental sources (in this case a description of 250 start up companies) to understand the drivers for change (Glassey 2009). This allows organisations to identify key future evolutions and thus opportunities for innovation and entrepreneurship.

An even stronger disruptive force for discontinuities has emerged in literature and business practice because of events like 9/11 (the attack on the World Trade Center in New York on 9 September 2001), the Global Financial Crisis in 2009, and the effects of war and environmental disasters (such as the earthquake and tsunami impacting Japan in March 2011). Here, the term “wildcard” has become known. Wildcards are seen as events which are highly unlikely but would have a huge impact if they did occur. They are hardly perceptible at present, but will constitute a strong trend or consequence in the future. They are serious, destructive, catastrophic or anomalous and essentially unpredictable. A wildcard may be a chain of independent incidents that constitute turning points in the evolution of a certain trend, or a unique occurrence that is assumed to be improbable, but which would have significant and immediate consequences for an organisation if it were to take place (Godet 1997; Koncilja–da Mata et al. 2004, p. 128; Massé 1965, p. 188).

To summarise, early signals of change are, almost by definition, weak signals. Often weak signals are visible forerunner symptoms, foreshadowing a more significant impending shift in the uncertain environment. Until a crisis impacts current business, weak signals are not perceived as sufficiently important to attract managerial attention or provoke a response strategy. They usually become stronger and more specific over time (Day 1994, p. 48; Day & Schoemaker 2007; Glassey 2009; Kerfoot 2003, p. 293;

Early warnings, weak signals, symptoms, early indicators etc. are synonyms for the same concept, herein referred to by the umbrella term “weak signals”. There are very few empirical studies that have studied the use of weak signals, but it is certain that the ability to recognise and deal with weak signals is limited in organisations with traditional management approaches (Bhide 2010; Cheung et al. 2009; Clemens 2009; Clemons & Hann 1999, p. 19; Huber, Jungmeister & Zahld 2007; Kerfoot 2003, p. 293; Martinez & Perez 2004, p. 12; Smith 2007). To identify future challenges and scan the environment, foresight specialists or futurists (Higgins 1994, p. 30; Rohrbeck & Gemünden 2011; Schwartz 1996, p. 199) might be employed in order to not only identify but also to monitor weak signals and search for opportunities.

In order to analyse weak signals, an organisation needs to consider three factors according to its present state of knowledge (Ansoff 1984, p. 356f; Day & Schoemaker 2007; Fink, Schlake & Siebe 2001):

1. Whether the weak signal foreshadows a threat, an opportunity or both;
2. The time remaining and likelihood for the impact to occur, which is presented by a range from “high probability” to “low probability”; and
3. The probability of impact on profits presently derived from the strategic business area, again ranging from low probability to high probability.

Contemporary management approaches, which are based on foresight-centric decision-making, will put more emphasis on weak signals and, as a result, will prepare an organisation for discontinuous change and the future, in contrast to companies utilising traditional approaches. This includes envisioning or future search (Choi 2006; Kochikar & Ravindra 2007; Kouzes & Posner 1996; Van der Merwe et al. 2007; Voros 2006), mainly based around foresight-centric qualitative methods (Ansoff 1975; Bell 2003; Burmeister, Neef & Beyers 2004; Day & Schoemaker 2006; Fahey 1998; Fahey & Randall 1998a, 1998b; Huss & Honton 1987; Lindgren & Bandhold 2003; Ringland 1998, 2010; Schwartz & Ogilvy 1998). In turn, this will result in more future oriented strategic projects and lead to innovation (Dwyer & Mellor 1993; Hamel 1998; Kemelgor 2002; Magnusson et al. 2009; Shen et al. 2009). Thus,
In comparison to organisations exhibiting traditional structured analytical approaches, those adopting a foresight-centric strategic planning process will have more future oriented strategic projects and an innovation driven culture.

Flexibility in foresight strategic processes has been identified by prior research as critical for understanding and anticipating multiple potential future outcomes. Flexibility has been defined as the adaptation of organisational structures to cope with new situations arising from environmental changes (Fink, Schlake & Siebe 2001; Hartley 2000; Jaeger et al. 2001; Kochikar & Ravindra 2007; Rahman & De Feis 2009; Shen et al. 2009; Teece 2007).

It has been noted that traditional methods do not provide a platform for future oriented thinking and do not prepare an organisation for change, and therefore limit decision-making capabilities later in the process (Cheung et al. 2009; Gunn & Williams 2007; Smith 2007; Van der Duin & Den Hartigh 2009). By reducing environmental uncertainty via the identification of new and relevant trends, it is much more likely that an organisation will make successful strategic decisions, support the innovation process and develop new business markets (Neef & Daheim 2005, p. 228; Rahman & De Feis 2009; Ringland 2010; Teece 2007) on the basis of strategy debates and increased strategic thinking (Carr, Durant & Downs 2004; Choi 2006; Cravens 1998; Dwyer & Mellor 1993; Hamel 1998; Harari 1995; Kemelgor 2002; Kouzes & Posner 1996; Maguire et al. 2009; Mintzberg 1994; O'Shannassy 2003; Rahman & De Feis 2009; Rohrbeck & Gemünden 2011). Especially fast changing conditions created by wildcards require immediate decision-making on key strategic and tactical topics (Godet 1997; Koncilja–da Mata et al. 2004; Massé 1965). Therefore,

**RP6:** In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process will exhibit flexible decision-making later in the process as strategies are being implemented.

Sheaffer, Richardson & Rosenblatt (1998) and Kerfoot (2003) not only see a deficiency in planning processes and tools for dealing with strategic surprise, but also in management which does not accept and/or act on the weak signals that have been identified. It has been established that, on average, senior managers devote less than 3% of their time to building a corporate perspective of the future (Hamel & Prahalad 1994,
Prior research (Bhide 2010; Hamel & Prahalad 1994, p. 123-127; Mueller & Smith 1984; Smith 2007) has identified the importance of organisations addressing the following questions:

- What new core competencies will we need to build?
- What new product ideas should we pioneer?
- What alliances will we need to form?
- What potential development programmes should we protect?
- What long-term regulatory initiatives should we pursue?

Weak signals fundamentally change the current paradigm. They reflect aspects of the environment we do not know or understand, whereas current and present issues are aspects of the environment we are confident about. By definition, weak signals cannot be extensively documented (Prahalad 1995, p. iii; Prahalad & Ramaswamy 2003, p. 12; Schoemaker 1997, p. 61). Therefore, RP₂ and RP₆ provide a model that an organisation can use to safely navigate the uncertainty that is characteristic of weak signals. Flexible decision-making, a supportive culture and an effective combination of both strong and weak signals can all counter the inherent uncertainty of weak signals from a dynamic environment and thus benefit an organisation’s future.

2.10 Processing of Signals

After signals from the environment have been collected⁷, an organisation will need to analyse the signals with regard to emerging issues and measure and visualise the accumulation of references to high impact possibilities, then observe signs of acceleration and assess the proximity of the change to the organisation’s strategic response opportunities (for instance with symbols, such as flags/colours, as a simple visualisation aid). This process (Aguilar 1967; Ansoff 1980; Fuld 2003, p. 1; Rahman & De Feis 2009; Stoffels 1994, p. 122) will consolidate the collected signals from environmental analysis and classify them to support further work with the signals, for instance for scenario building purposes. The degree of influence of the signals may be analysed in the form of an impact-urgency matrix (Aguilar 1967; Ansoff 1980, p. 140):

---

⁷ Stoffels (1994, pp. 112-114) provides a framework for the documentation of environmental information (Appendix A).
<table>
<thead>
<tr>
<th>Impact</th>
<th>Low</th>
<th>Significant</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Drop the signal from the list of collected early warning signals</td>
<td>Review the signal on a periodical basis</td>
<td>Monitor the signal continuously</td>
</tr>
<tr>
<td>Significant</td>
<td>Drop the signal from the list or review it on a periodical basis</td>
<td>Review the signal on a periodical basis or monitor it constantly</td>
<td>Plan and define a delayed strategic response</td>
</tr>
<tr>
<td>High</td>
<td>Monitor the signal</td>
<td>Monitor the signal continuously</td>
<td>Create a strategic response immediately</td>
</tr>
</tbody>
</table>

Table 1: The Impact-Urgency Matrix (own illustration, based on Ansoff 1980, p. 140)

While Aguilar (1967) and Ansoff (1980) suggest using a matrix to help companies prioritise signals in order to formulate a strategic response based on the ranking, Georgantzas and Acar (1995, pp. 51-55, based on a work from Duncan 1972) propose the following classification of environmental conditions (signals) to support a company in understanding its environment (Fig. 18):

![Figure 18: Environmental Dimensions and Perceived Uncertainty (Duncan 1972, p. 230)](image-url)

C1: Low Perceived Uncertainty
- Small number of factors and components in the environment
- Factors and components are somewhat similar to one another
- Factors and components are basically the same and are not changing

C2: Moderately Low Perceived Uncertainty
- Large number of factors and components in the environment
- Factors and components are not similar to one another
- Factors and components remain basically the same

C3: Moderately High Perceived Uncertainty
- Small number of factors and components in the environment
- Factors and components are somewhat similar to one another
- Factors and components are in a continual process of change

C4: High Perceived Uncertainty
- Large number of factors and components in the environment
- Factors and components are not similar to one another
- Factors and components are in a continual process of change

Figure 18: Environmental Dimensions and Perceived Uncertainty (Duncan 1972, p. 230)
Fink, Schlake & Siebe (2001, p. 186) describe four additional, slightly modified, tools for interpreting, describing and prioritising early warning signals (Fig. 19). The trend analysis is a toolset of two presentation forms, namely the trend portfolio and the impact portfolio. Both support the interpretation of future developments (trends). The trend portfolio defines both the impact force of a trend on a company (how strong would a company be hit by the trend?) and the direction of the impact (how strong might the opportunity or the threat be?). The impact portfolio, on the other hand, defines the probability (what is the probability that the trend might become reality?) and the risk-opportunity profile (is the trend a potential threat or opportunity?).

The risk portfolio, the third tool, is a combination of the impact portfolio and the risk potential (supported by Burt et al. 2003). The illustration helps to identify those trends which recommend a strategic response. Finally, the trend-uncertainty portfolio helps to unveil key uncertainties, which are uncertain developments with a high impact to the company.

---

**Figure 19: Tools of Trend Analysis**

(Fink, Schlake & Siebe 2001, p. 188)
The impact-urgency matrix from Aguilar (1967) and Ansoff (1980) presents a relatively simple set of prioritisation criteria to determine whether a signal can be ignored, or whether monitoring and response strategies are required. On the other hand, Duncan (1972) and Georgantzazas and Acr (1995) present a classification system that allows an organisation to understand the signal’s potential behaviour in relation to the environment and identify whether signals are randomly distributed in the environment. This in turn enables the organisation to gauge if the signal will drive an environmental change, and assess whether the signal might be highly active because of the interdependence between the organisation and the environment. This approach seems to be more sophisticated than the two dimensional matrix for impact-urgency classifications (Aguilar 1967; Ansoff 1980). These simplified matrices are similar to the proposed methods from Burt et al. (2003) and Fink, Schlake and Siebe (2001). Based on the models described above and discussion of the different schools, it is evident that a classification or prioritisation system allows an organisation to process the collected signals and utilise them for further analysis, for instance to formulate a strategic response.

2.11 Working with Scenarios

The term scenario is broadly defined in literature, as it is used in many different ways and fields of management. Scenarios can be described as stories or models of expected images of the future which include certain assumed events and which are built through the application of a number of methodologies. Scenarios are generally based on outputs from scanning activities about future developments and should be value free; a state achieved by, for example, minimising personal emotional bias and by creating multiple futures (Bell 1997, p. 240; MacKay & McKiernan 2010a, p. 279; Ringland 2010; Schoemaker 2002, p. 220; Van der Heijden 1996; Van der Merwe et al. 2007; Wilson 1998a, p. 91).

Scenarios are primarily used in strategic planning to support the decision building process, since the alternative views within the multiple possibilities (scenarios) help management to better understand complex systems and make decisions accordingly. They are designed to “surprise readers by challenging their assumptions about how the
world works and altering their mental models” (MacKay & McKiernan 2004, p. 163). On the other hand, scenarios in early warning systems primarily support the process of environmental analysis (Fink, Schlake & Siebe 2001, p. 28; Gilad 2004). For an overall foresight process, it is argued that both types of scenarios (those for strategic planning and those for early warning detection) and numerous views about the future need to be considered.

This view on “multiple futures” (scenarios) is strongly supported by the literature (Brown & Eisenhardt 1998, p. 135; Burmeister, Neef & Beyers 2004, p. 72; Godet 1987, p. 21; Godet 2001, p. 63; Ogilvy 2002, p. 11). However, organisations are not used to considering multiple futures as part of their strategy development process, especially if they are radically different to the current course of the business (Daheim & Uerz 2008; Fahey & Randall 1998; Maguire et al. 2009; Ofek & Wathieu 2010; Teece 2007). Thinking in alternatives and multiple outcomes is essential, and econometric (mathematical) models are only reasonable when the scenario can be broken down into a set of variables, which allow for quantitative handling. Despite this, most corporations spend substantial effort forecasting and planning for one “likely” future. Scenarios are built on underlying trends and forces (as well as the underlying causal relationships) and lead to actions and response strategies (Bell 1997, p. 240; Burmeister, Neef & Beyers 2004, pp. 47-48). The created scenarios are always under the influence of further developments, for instance because signals change over time or through disruptions caused by unanticipated events and strategic surprises or wildcards (Fig. 20).

![Figure 20: The Trend based Scenario Process (Burmeister, Neef & Beyers 2004, p. 48)](image)
Some of the weaknesses of scenarios and scenario planning include (Lindgren & Bandhold 2003, pp. 30-31):

- Scenarios do not provide one single answer about the future (and therefore they do not provide the security that is often required in decision-making);
- Scenario planning is a much more demanding process than traditional planning (for instance, it requires time-consuming workshops);
- Scenarios are usually qualitative (based on reasoning and intuitive pattern recognition, rather than being based on quantitative facts); and
- The results are often presented in qualitative terms that fit poorly with traditional number oriented cultures.

Scenarios were first used in military strategy studies conducted by RAND Corporation in the 1950s (Gilad 2004). Much later, Royal Dutch Shell\(^8\) became one of the best known companies applying scenario planning in the 1970s and 1980s, using techniques for eliciting and aggregating group judgments, such as Delphi and cross-impact matrices. In the 1970s, scenario driven planning spread as strategic thinkers realised that effective changes in strategy require a clear perception of the business environment (Georgantzas & Acar 1995, p. 22; MacKay & McKiernan 2010a, p. 274). Today, scenarios are instrumental in understanding and anticipating environmental trends and complex systems, and in choosing a competitive strategy in the face of uncertainty (MacKay & McKiernan 2004, p. 162; Porter 1985, pp. 445-481; Ringland 2010).

The basic idea of scenarios (Albers & Broux 1999, pp. 58-60; Fink, Schlake & Siebe 2001; Graf & Klein 2003) is to take a signal at time 0 (t0) and look for the development of this signal over time, at time points tk, tm, and tl (Fig. 21). In this case, the signal knows three outcomes (or developments), which are defined as O1 (positive extreme scenario/positive development), O2 (trend or reference scenario), and O3 (negative extreme scenario/negative development). The funnel represents the imaginable space of futures. If managers capture a time slice of the funnel, they will get a picture of possible futures (scenarios) within a specific time period, for example 2015 (tm) or 2025 (tl). Of course, a number of signals exist at t0 and will develop over time. By using methodologies in order to combine signals, further scenarios will be created.

\(^8\) In 1967 Shell initiated the “Year 2000” study, a project to study the business environment that would exist in 2000. Shell later decided to further experiment with scenario planning as a potentially better framework for thinking about the future, rather than continuing to rely on conventional forecasts which were likely to be wrong in the face of a discontinuity (Gilad 2004).
Shell’s modified approach to scenario development (Fig. 22), introduced in 1998, allows insights from global scenarios to flow directly into strategy development (Gilad 2004).

After an organisation has defined the criteria for scenario building, the advantages of scenarios lie in offering stakeholders an understanding of the future (Georgantzas &
Acar 1995, p. 19; Ringland 2010; Schoemaker 2002, p. 50). The above literature recommends that first, the time frame of the scenarios should be defined and the boundaries set (is the line to be drawn around products, markets, geographic areas, technologies, related industries, and/or competitors?). The relevant stakeholders, who will work with the outcomes of the scenarios, should then be defined. The authors suggest that the stakeholders will benefit through learning about strategic uncertainty in the environment and its underlying drivers; their conventional understanding of the future can be challenged by the scenarios. Scenario driven planning and meta-learning has a great psychological effect by anticipating potential shocks to a business environment and mitigating the damage of surprises (Georgantzas & Acar 1995, p. 135; Negrila 2010; Visser 2007). An interesting approach currently available is the “Pierre Wack” school, as practiced by Shell (Gilad 2004). It is an approach based on intuitive logic. The essence of this approach is to find ways of changing mindsets so that managers can anticipate futures and prepare for them. The emphasis is on creating a coherent and credible set of stories of the future as a “wind tunnel” for testing business plans or projects, instigating public debate or establishing increasing cohesion.

Unfortunately, the literature does not provide detailed instruction on how to combine the gathered weak and strong signals, which point to a dynamic and complex future, into scenarios (Ansoff 1975; Bell 1997; Day & Schoemaker 2006; Gordon 2009; Schoemaker 2002). However, literature does exist providing methods of combining signals into scenarios, mainly via traditional quantitative based methods (Fahey & Randall 1998a; Georgantzas & Acar 1995, pp. 31-33; Huss & Honton 1987, p. 22; Ringland 1998, pp. 26-27). Criticism of quantitative methods is sometimes offered. As Georgantzas and Acar stated, “the usefulness of straight forward mathematical extrapolations is severely constrained in practice” (1995, p. 35). MacKay and McKiernan (2010b) mention that scenario thinking includes a risk that weak signals and emerging patterns could be missed in the underlying drivers of future change.

In general, scenarios are seen as a significant enrichment in strategy development. However, there are important recommendations connected to scenarios (Fahey & Randall 1998a, p. 14; Georgantzas & Acar 1995, p. 127; Godet 2001, p. 63; Van der Merwe et al. 2007) which need to be considered:

- It is important to describe a variety of potential futures, even though management may be hindered by current business thinking;
- Companies should delineate how such futures might evolve, despite the huge number of influencing forces;
- Scenarios should be linked to specific decisions, even though they might be unclear as yet, as well as to organisational procedures, for example existing structures and management functions;
- Decision makers should be involved because management needs to both recognise and understand the created futures;
- A scenario supports the necessity of integrating qualitative and quantitative information into a consistent picture;
- A scenario is not a simple forecast, but is built on the premise that the future is not the product of the past; and
- To be utilised in strategy development, scenarios need to have relevance, coherence, plausibility, importance, and transparency.

Scenarios are an important tool for understanding and anticipating future change (Georgantzas & Acar 1995; Porter 1985; Ringland 2010; Schoemaker 2002) and are directly linked to strategy development (Fink, Schlake & Siebe 2001; Gilad 2004; Graf & Klein 2003; Schoemaker 2002; Van der Merwe et al. 2007). A foresight-centric strategy planning process has been posited to allow an organisation to reflect the changes in the environment, in the context of current plans based on divergent scenarios and more open strategic debates (Albers & Broux 1999; Burmeister, Neef & Beyers 2004; Chia 2004; Hamel & Prahalad 1994; Marsh, McAllum & Purcell 2002). A process that engages with both strong and weak signals during scenario building is essential, even though the literature does not provide detailed information on how to link weak signals with scenario building (Ansoff 1975; Bell 1997; Day & Schoemaker 2006; Gordon 2009; Schoemaker 2002). Therefore,

RP1: In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process (i.e. employing envisioning and scenario building) will reflect more open strategic debate, revealing more divergent scenarios for consideration.

Overall, scenarios allow companies to think in alternatives, to describe multiple outcomes and to foster strategic conversations in organisations, in preparation for a future fundamentally different from the current situation. They are based on collected,
analysed, interpreted and combined weak and strong signals which change over time. Besides intuitive logic, as applied by Shell, the literature does not provide qualitative methods to combine signals, which point to a dynamic future, into scenarios. It is argued that quantitative approaches are insufficient to provide strategic corporate foresight, but some challenges are attached to the non-econometric or qualitative nature of scenarios: they are more demanding than traditional planning and do not deliver the sometimes preferred quantitative facts required for the purpose of strategic planning.

2.12 Scenario Building

Specialists in foresight create scenarios by combining several methods. Scenarios might be created by summarising statements of conference attendants, by combining signals from the environment or by simply using creative imaginations based on personal experience. The understanding of the future is limited only by what information is available and by the mental models and imaginations of those creating scenarios (Bell 1997, p. 316; Fahey & Randall 1998, p.6; Van der Merwe et al. 2007).

Summarising the literature, the following major methods, schools and organisations are involved in scenario building (Fink, Siebe & Kuhle 2010; Georgantzas & Acar 1995; Godet 1987; Ringland 1998, pp. 193-257; Schwartz 1991; Wilson 1998a, pp. 81-108):

- **Battelle’s BASICS**: A computer based cross-impact model to derive likely scenarios. It is an adaptation of the technique developed by RAND Corporation and is reliant on quantitative data.

- **Comprehensive Situation Mapping**: A computer based system (Georgantzas & Acar 1995) designed to go from concept to systems simulation to probabilities. It combines the advantages of cognitive mapping with a software tool and methodology based on systems dynamics and systems thinking.

- **The French School**: A tool based approach to scenarios which uses an extension of cross-impact techniques to include high order interactions (Godet 1987). This approach is data driven (quantitative) and includes the application of software tools.

- **The Futures Group**: It is based on trend-impact analysis, supported by a mainly qualitative systematic framework. Managers identify and describe alternative
business environments and then identify the market and customer needs under each of the described scenarios. In a third step, the organisation, products and services, distribution channels etc. are conceptually aligned for each market.

- **Global Business Network:** Based on the knowledge of Shell and the Stanford Research Institute, this is a method developed to tackle scenarios with creativity. The eight step model is built on the identification of issues, forces and drivers, the ranking of forces/factors by importance and level of uncertainty, the selection of the scenario logics and creation of the scenarios, the identification of implications and selection of leading indicators and signposts to further monitor the driving forces.

- **Scenario Management International:** Developed by a German consulting firm, it is based on a qualitative analysis of scenario fields, relying on systems analysis and detection of key factors, the identification of alternative projections and a quantitative-qualitative calculation and formulation of scenarios. The final step includes the analysis, mapping and interpretation of scenarios.

- **Stanford Research Institute:** Built on an experiences approach to creating focused scenarios, as the basis for strategy and decision-making. Key decision factors determine the relevant environmental forces which lead to scenario logic and scenarios. These scenarios have strategy implications and may require an adaptation of the current strategy.

In the majority of these approaches, scenario building starts with the identification and analysis of the organisational issues that will provide the decision focus, for example diversification decisions, or long-term market strategies, technology acquisitions, and so on. Following this, key decision factors are specified. They might range from market size, growth and volatility, to capital cost and technology availability. Next, the key environmental forces need to be identified and analysed, including demographic patterns, social and lifestyle factors, economic conditions, natural resources, the physical environment, political and regulatory forces, technological forces, international relations, market forces, and the competitive landscape. As soon as information (signals) about those factors is available and has been analysed and rated, a company can build scenarios.

As previously noted, the literature does not provide methods for combining weak and strong signals (decision factors and driving forces) into scenarios. So how do managers
do this in practice? Mostly, the scenario logic is presented in the form of a 2x2 matrix where the axes need to be determined, or as a pure combination of signals into internally consistent scenarios. Otherwise, personal judgment is the only method available to deal with the unknown and possible scenarios of the future (Fahey 1998, p. 192; Fahey & Randall 1998, p. 10; Godet 1987, p. 26; Godet 2001, p. 76; Godet 2004, p. 11; Lindgren & Bandhold 2003, p. 66; Porter 1985, p. 449; Schwartz 1996, p. 244; Schwartz & Ogilvy 1998, p. 75). As a result, scenario planning based on qualitative signals is still a major method for long-term planning, based on the insights from weak signals gleaned through scanning activities, and for understanding impact on strategy (Bergman, Ari & Saksa 2009; Clemens 2009; Crews 2010; Sevaguru, Nithi & Safa, Mohammad Samaun 2009). These scenarios are then tested against plausibility, differentiation, consistency, decision-making utility and challenge (Wilson 1998a, p. 91).

Next, the scenarios are discussed with management in order to foster strategic conversation and help build a company which can successfully operate in future landscapes. The implications of each scenario need to be identified and appropriate actions described. Finally, leading indicators and signposts should be selected in order to continuously monitor which of the scenarios is closest to the course of history as it actually unfolds. A recent study (Chermack & Nimon 2008) analysed the impact of scenario planning as a decision-making tool and concluded that scenarios support intuitive decision-making. Most interestingly, people who normally utilise a rational decision-making style shifted towards intuitive decision-making as a result of exposure to scenarios. It is concluded that scenarios help participants to draw more from their history and experience, rather than relying solely on rational facts. For the purpose of long-term strategy development, this open ended strategic approach, not limited by rational boundaries, seems to drive future thinking.

Following considerations of the research previously undertaken, the below steps, seen as a meta-model for scenario building, inform a framework for strategic corporate foresight:
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identification and analysis of the organisational issue/s that will provide the decision focus (e.g. the long-term corporate strategy).</td>
</tr>
<tr>
<td>2</td>
<td>Specification of the key decision factors (e.g. competitive movements, technology availability).</td>
</tr>
<tr>
<td>3</td>
<td>Identification of the key environmental forces (e.g. social and lifestyle factors, technological forces) behind the signals.</td>
</tr>
<tr>
<td>4</td>
<td>Scanning of the environment (reducing of uncertainty) by sourcing (identification and collection) weak and strong signals.</td>
</tr>
<tr>
<td>5</td>
<td>Analysing and rating of all signals and driving forces (e.g. importance and level of uncertainty).</td>
</tr>
<tr>
<td>6</td>
<td>Selecting the scenario logic (e.g. based on a portfolio analysis, where signals are placed on a future or scenario matrix). Here, literature does not provide methods for combining signals from a complex and dynamic environment and field research will try to close this gap.</td>
</tr>
<tr>
<td>7</td>
<td>Drafting of the scenarios (each signal should be represented in at least one of the scenarios).</td>
</tr>
<tr>
<td>8</td>
<td>Testing of scenarios against plausibility, differentiation, consistency, decision-making utility and challenge (e.g. their ability to generate action points).</td>
</tr>
<tr>
<td>9</td>
<td>Description (and visualisation) of the scenarios (the “scenario story”).</td>
</tr>
<tr>
<td>10</td>
<td>Discussion of scenarios with management in order to foster strategic conversation.</td>
</tr>
<tr>
<td>11</td>
<td>Identification of the implications of each scenario and of the set of scenarios taken as a whole, and analysis of the industry structure that would prevail under each scenario.</td>
</tr>
<tr>
<td>12</td>
<td>Modification and revising of scenarios, if necessary.</td>
</tr>
<tr>
<td>13</td>
<td>Identification and description of the appropriate actions and determination of the source of competitive advantage under each of the scenarios.</td>
</tr>
<tr>
<td>14</td>
<td>Selection of leading indicators and signposts in order to know as soon as possible which scenario is closest to becoming reality.</td>
</tr>
<tr>
<td>15</td>
<td>Monitoring the signposts and collecting new emerging signals on an ongoing basis.</td>
</tr>
</tbody>
</table>

Table 2: Scenario Building in a Corporate Foresight Framework Generated from the Literature (developed from Abplanalp & Lombriser 2010; Bell 1997; Fahey & Randall 1998a; Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Godet 1987; Ringland 1998; Schwartz & Ogilvy 1998; Wack 1985b; Wilson 1998a)

Managing signals and trends, and selecting appropriate processes and methods for building scenarios is seen as a process for creating conclusive knowledge of potential futures, however, the same importance should be given to the presentation of scenarios and engagement with stakeholders.
2.13 Scenario Presentation

An important element in scenario management is the linking of outcomes from the scenario building process with foresight and strategy development, and obtaining acceptance from both senior management and team members. Therefore, scenarios should be clearly described and easy to understand. User friendly methodologies, such as the visualisation of scenarios, are seen as an alternative (or additional) way to present scenarios. The use of explicit (written) scenarios reduces the uncertainty as a result of changes in the environment (Porter 1985, p. 478; Ringland 1998, pp. 99-106; Rollwagen et al. 2008; Thatcher 2006, p. 12).

A good scenario description should include the following elements (Godet 1997, p. 96; Ringland 1998, pp. 99-106):

- A good and clear name;
- A summary of the scenario;
- A description of the current and future situation, including a description of the disruption, and how and why the disruption can occur;
- Strategies and further steps of all (market) participants;
- A description of the development of the phenomena, and of all involved variables (signals);
- Consequences of disruption on the current situation;
- A presentation/booklet using images/visuals to support the verbal explanations; and
- Additional information, if required.

Prior research recommends two approaches to presenting scenarios to stakeholders. Giget (1988) and Godet (1997) utilise a tree model to visualise both the environmental drivers and the development of the organisation over time, while others (Burkhard, Spescha & Meier 2005; D'Aveni 2004, p. 42; Fink, Schlake & Siebe 2001, p. 295; Igartua et al. 2010; Rollwagen et al. 2008; Thatcher 2006, p. 13) utilise a future map (or landscape of scenarios and drivers) to visualise scenarios.
<table>
<thead>
<tr>
<th>Tree Model</th>
<th>Future Map</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Visualise scenarios in the form of continents and islands. Important characteristics of scenarios are shown as cities. Scenarios that belong to one or more scenarios are placed on one big island. The links to other scenarios are shown as ship routes. Mega trends that influence one or more scenarios are drawn in the form of weather curves or waves.</td>
</tr>
<tr>
<td><strong>Visual representation</strong></td>
<td><img src="image" alt="Tree Model Diagram" /> <img src="image" alt="Future Map Diagram" /></td>
</tr>
</tbody>
</table>

Table 3: Scenario Presentation in a Corporate Foresight Framework Generated from the Literature (developed from Burkhard, Spescha & Meier 2005; D'Aveni 2004; Fink, Schlake & Siebe 2001; Giget 1988; Godet 1997; Igartua et al. 2010; Rollwagen et al. 2008; Thatcher 2006)

The advantage of the Tree Model (Giget 1988; Godet 1997) is the ability to include the organisation’s core competencies and corporate knowledge (represented by roots), the operational functions and resources (trunk), the segments and markets (branches) and products and services (fruits) in a certain scenario. This visualisation of the company’s history and future development, when utilised in addition to a detailed description of the scenario, is an impactful way of illuminating complex systems and interdependencies to staff and management, while incorporating current organisational elements. The Future Map (Burkhard, Spescha & Meier 2005; D'Aveni 2004; Fink, Schlake & Siebe 2001; Igartua et al. 2010; Rollwagen et al. 2008; Thatcher 2006) does not have the ability to connect a scenario with an organisation’s competencies, market segments etc., but can provide a simple depiction of the drivers of a situation. This depiction allows individuals to build their own mental models, which are then spread and exchanged with others during storytelling, aiding social adoption of the concepts involved (Fink, Schlake & Siebe 2001, p. 92).
Burkhard, Spescha and Meier (2005) argue that company communications around strategy should focus on visualising the “big picture” and strategic implications of the collected signals and data. Because each stakeholder has a different educational, functional or cultural background, visualisation helps to communicate strategies in the context of the recipients, in a way that can be easily interpreted and put into meaningful action. Employees and other stakeholders do not want to see pie charts of indicators, but to understand the implications for the future of the organisation. The use of such visualisations helps to ensure that the scenario’s underlying messages receive attention and earn acceptance from stakeholders. Most recently, a third option has emerged in the form of war games and other themed workshops (Abadie et al. 2010; Abplanalp & Lombriser 2010, p. 145; Oriesek & Schwarz 2008; Schwarz 2009).

Scenario building and presentation allows an important interaction between the anticipated future and the current strategy and planning assumptions of the organisation. Ensuring that scenarios are easy to prepare, present and understand relies on user friendly methodologies and scenarios that can be readily integrated into a framework for advanced foresight. User friendly methodologies have been shown to benefit the whole organisation across all levels and business functions (Igartua et al. 2010; Rollwagen et al. 2008; Stoffels 1994). This requires top-level management support (Ansoff 1965; Armstrong 2001; Burkhard, Spescha & Meier 2005; Stoffels 1994), geared towards simplifying the process and achieving greater success in long-term planning and execution. The need for top-level management support is required in order to cultivate an environment in which foresight conversation and debate is encouraged throughout the company. Therefore,

**RP5: Operationalising the integration of weak and strong signals foresight methodologies in an organisation’s strategic planning process will require top-level management support and user friendly methodologies that can be readily interrogated by strategists at all levels of the organisation.**

However, senior leadership can negatively influence the success of foresight if, for example, the CEO is dominating the direction of conversations in scenario workshops (MacKay & McKiernan 2010a, p. 279). Since scenarios should support the strategy development process of an organisation, senior managers and other stakeholders across the organisation are those who are involved in the scenario building process and need to
work with the created scenarios. This is why scenarios should be clearly described and easy to understand, combined with an executive summary and visualisation aids: to get wider acceptance (or buy-in) by the relevant stakeholders and promote development of scenario insights.

### 2.14 Implementation of Scenario Insights and Scenario Monitoring

Scenarios need to be updated on a regular or annual basis (Fink, Schlake & Siebe 2001, p. 20; Hitt, Ireland & Duane 2001, p. 52; Lindgren & Bandhold 2003, p. xi; Porter 1985, p. 478). Constructing scenarios irregularly runs the risk that managers will overlook key changes in the environment and uncertainties in their industry. In addition, scenarios force a creative search for possible environmental changes and opportunities, and in fast changing environments companies need to adapt to new conditions immediately. The capacity to look ahead on an ongoing basis is an essential success factor.

Combining scenario development with the decision-making process of strategic management and development (common terms are “scenario learning” or “scenario thinking”) can help organisations to understand how to manage their future strategically (Fahey & Randall 1998, p.3; Lindgren & Bandhold 2003, p. 92; Micic 2010; Wack 1985b, p. 2; Wilson 1998b, p. 357).

A number of authors (Amara & Lipinski 1983; Ansoff 1988, p. 185; Courtney, Kirkland & Viguerie 1997; Day & Schoemaker 2007; Fahey 1998, p. 211 [Appendix B], Fahey & Randall 1998, p. 4; Fahey & Randall 1998b, p. 27; Georgantzas & Acar 1995; Micic 2010; Ringland 1998, p. 123; Stoffels 1994; Wilson 1998b, p. 357) present models for assessing scenarios within the context of the learning organisation, where managers must be willing to ask and answer tough questions and to challenge fundamental, long held assumptions about the industry and their own strategy and organisation. Summarising this literature, a process for understanding the implications of scenario insights could include the following steps:
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| Scenario Analysis               | - Consistency testing of the scenarios.  
- Gap analysis of today’s industry situation and the future.  
- Identification of indicators or signposts to monitor and track the evolution of the scenarios.                                                                                       |
| Future Learning                 | - Testing the company strategy for each scenario.  
- Identification of opportunities and threats under each of the scenarios.  
- Identification and definition of strategy alternatives for each scenario (“which alternatives might be potentially available to the organisation that historically have not been considered?”).  
- Definition of consequences and implications for the industry and own company (“how will the business evolve in five years under each scenario?; “shall the company shape the future, adapt to the future, or only reserve the right to play?”; “what is the typical company that could win under a given scenario?; and how substantial is the opportunity presented by the alternative?”).  
- Monitoring of results of strategy execution.                                                                                                                                  |
| Preparing the Organisation for the Future | - Highlighting of what the company should do today in order to prepare for these futures (projects and actions as part of strategic programme [or issue] management in the areas of culture, structural and process relationships, and technology).  
- Selection of one or multiple strategies and actions out of the programme management portfolio.  
- Supporting the organisation’s efforts for adaptive learning and cultural change.  
- Scanning changes in the environment to determine whether further strategy change or adaptation is required.                                                                 |

Table 4: Implications from Scenario Insights in a Corporate Foresight Framework Generated from the Literature (developed from Amara & Lipinski 1983; Ansoff 1988; Courtney, Kirkland & Viguerie 1997; Day & Schoemaker 2007; Fahey 1998; Fahey & Randall 1998; Fahey & Randall 1998b; Georgantas & Acar 1995; Micic 2010; Ringland 1998; Stoffels 1994; Wilson 1998b)

Strategic issue management is seen as the direct enhancement of the weak signals and scenario management concept. The term has previously been used in the field of public relations and relates to the process by which an organisation can identify, evaluate and respond to social and political issues that may impact it significantly (Johnson 1983, p. 22). Other authors (Ansoff 1980, p. 133; Kunze 2000: Liebl 1994, p. 367) describe it as a list of actions (programmes) forming part of an ongoing development, either inside or outside of the organisation, which is likely to have an important impact on the ability of the enterprise to meet its objectives (strategic response). Issue management sees weak signals as a source and a driver for strategic response. They need to be combined with trends (strong signals) and analysed, and if sufficiently important will require a strategic action (response). Ansoff (1965, p. 207 [Appendix C]) points out that the
framework of strategic issue management alone does not help to reach success. It is also necessary to show how strategy can be used within the overall periodic planning process of the business organisation. Here, the issue of adaptive learning (Ansoff, Declerck & Hayes 1976, p. 69) plays a vital role, where organisations continuously receive both positive and negative signals from the environment, which call for response through incremental adjustments.

With regard to cultural implications, creating scenarios is not the final phase of the overall foresight project process. A scenario only presents benefits or direction in the form of results, consequences and actions. Having this awareness is part of an open culture of learning, which includes organisational values and norms, managerial skills, knowledge and risk propensities. In addition, moving from traditional planning to scenario based strategic planning requires a transformation of corporate culture. This includes the challenge of simultaneously respecting present realities and thinking in plausible futures. In this process, implementing personal goals or “agendas” and arguing for or against biased strategic decisions should be avoided (Ansoff 1988, p. 185; Fahey & Randall 1998b, p. 35; Godet 2001, p. 64; Navarro, Hayward & Voros 2008; Stoffels 1994, p. 4; Wilson 1998b, pp. 352-368).

Once the scenarios have been developed and are used in strategy development, they need to be monitored on a continuous basis to ensure they do not become irrelevant or misleading by losing contact with developments in the external environment. A monitoring system should address two key issues, namely the fields (or topics) which need to be monitored and the processes and techniques to be utilised. It is understood (Bell 1997, p. 291; Day & Schoemaker 2007; Hitt, Ireland & Duane 2001, p. 52; Schoemaker 2002, p. 147) that the core fields are the forces which drive the scenarios built by the organisation. This process could be carried out by a centralised strategy or foresight unit (Kaplan & Norton 2005; Rohrbeck & Gemünden 2011; Stoffels 1994, pp. 75-78 [Appendix D]). For monitoring, companies can use a 2x2 matrix showing all external and internal factors (trends/issues) on the X axis and several development stages on the Y axis (Ansoff 1982, 1984 [Signals and Graduated Response]; Schoemaker 2002). It is advisable to revisit scenarios whenever the environment is moving differently than expected, as scenarios by their nature are built on assumptions (based on the collected signals and trends) which may resolve in a variety of ways. A monitoring report should be presented to top-level management prior to the annual
strategy and planning meeting, with recommendations for further steps (Bright 1970, p. 70). However, if wildcards come into play or a weak signal suddenly starts to become stronger than expected, then top-level management should be informed immediately.

To summarise, by combining external strategic analysis (signal identification and collection), scenario building and strategy development, the result can be a learning experience that will strongly influence the destiny of an organisation. Scenarios help managers to discover and understand a variety of possible contexts for decisions about the future. Scenarios are essentially constructs of the imagination, and are therefore qualitative in nature. Scenario analysis is followed by future learning, where an organisation looks for opportunities and threats and the consequences and implications for the industry and itself. With strategic issue (or programme) management, a company then prepares for the future (organisational learning). Finally, monitoring tracks the emergence of important trends from identified environmental changes (as summarised in scenarios), thereby facilitating swift development of a tailored response.

2.15 Innovation and Risk Management

Innovation and risk management are direct beneficiaries of foresight activities based on utilising signals (via environmental scanning) and scenario planning.

Innovation is an integral part of a company’s strategy, and as such needs to extend beyond an organisation’s new product development process. The entire organisation needs to be engaged with innovation for it to be successful, despite the possibility of resistance to change. Change is required to introduce something new that has significant value to an organisation’s customers or industry. It is a consequence of both personal and group creativity, as fostered by processes and techniques, and dependent on the organisational culture embracing exploration of possibilities (Afuah 1998, p. 4; Bryan 2002, p. 18; De Geus 1999, p. 75; Fagerberg et al. 2006; Higgins 1994, p. 3; Igartua et al. 2010; Moss 2006, pp. 77-79; Pohl et al. 2009).

Disruptive technologies are a major driver of innovation in organisations: technology can progress faster than market demand, which means that in a company’s efforts to
provide superior products and generate higher returns, organisations must monitor these changes in the long-term and consider strategic alternatives before the majority of consumers shift to a disruptive technology (Fig. 23), once market demand amongst early adopters reaches critical mass (Christensen 1997, p. xv-xvii; Christensen & Raynor 2003, pp. 32-35). This means that companies must constantly try to capture and interpret signals that may (or may not) impact customer needs and behaviour and which could therefore lead to a customer reaction in terms of preference for products or services that may underperform today, but will eventually outperform a competitor’s product portfolio.

Another important concept that is linked to long-term strategic planning and foresight is risk management. Risk management is the process of assessing (both strategic and operational) risk and then developing strategies to manage it. It is posited that corporate foresight may also reduce the numerous risks in managers’ decision-making processes, as scenario planning is closely linked to risk management (Aven & Renn 2009; Gilad 2004).

In the academic literature, early warning systems are sometimes described as risk management tools rather than tools that facilitate the identification of opportunities (Caragata 1999; MacCrimmon & Wehrung 1986, pp. 14-19). The drivers of these risks
are lack of control (natural and human forces, insufficient resources and information), lack of information (inadequate, unreliable, unpredictable), and lack of time (managers must choose or decide before uncertain events occur). Gilad (2004, pp. 172-182) presents the example of Citibank (Citigroup), where the concept of an early warning system (Fig. 24) was established in the 1990s under the program name “Windows on Risk” (WOR).

![Figure 24: Early Warning Model of Citigroup (Gilad 2004, p. 174)](image)

The Citigroup process is a generic method of risk identification, analysis and monitoring, using an external and internal network of employees (gate keepers), and creating preliminary scenarios out of the collected signals. A WOR committee under the lead of executive management revises and adjusts the scenarios, which will lead to a number of “revised scenarios”. These scenarios are then returned to the analysing and monitoring process. Unfortunately, the model does not provide any link to strategy development.

Two important elements with regard to a possible foresight framework can be noted: first, the sources for assessing risks are signals from the (internal and external) environment; and second, to work with the collected risks, a portfolio of scenarios has
been created in order to formulate actions by the management. For successful innovation and risk management, and also for strategy development, foresight based on scenario management seems to be a solid foundation for any of these management concepts.

2.16 Conclusion – Linking the Findings of the Literature Review

The literature review allows the synthesis of relevant literature in the area of corporate foresight, based on the links identified and research propositions articulated in section 1.5. The “Area/Topic” column refers to elements (IDs) of management and/or strategic planning, supported by a number of pieces of literature, which are seen as part of corporate foresight. The “Justification and Reasoning” column contains descriptions of the area and why a combination of two (or more) elements (e.g. A + B) is supported. All elements are listed in the sequence of a potential foresight methodology.

<table>
<thead>
<tr>
<th>ID</th>
<th>Area/Topic</th>
<th>Justification and Reasoning</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Innovation and the external environment</td>
<td>Change in the external landscape is the driver for innovation; this is strongly linked with the management discipline of strategy development.</td>
<td>Afuah 1998; Christensen 1997, 2003; Higgins 1994; Igartua et al. 2010; Shen et al. 2009; Van der Duin &amp; Den Hartigh 2009</td>
</tr>
<tr>
<td>B</td>
<td>Uncertainty and disruption</td>
<td>Uncertainty needs to be lowered and disruptive forces identified in order to defend against threats and take advantage of opportunities.</td>
<td>Ansoff 1965; Caragata 1999; Courtney, Kirkland &amp; Viguierie 1997; Cravens et al. 2009; Dibrell et al. 2007; Fink, Schlake &amp; Siebe 2001; Georganzas &amp; Acar; Gilad 2004; Hamel &amp; Prahalad 1994; Hartley 2000; Jaeger et al. 2001; Kochikar &amp; Ravindra 2007; Magnusson et al. 2009; Maguire et al. 2009; Ofek &amp; Wathieu 2010</td>
</tr>
<tr>
<td></td>
<td>The external environment (A) includes a high degree of uncertainty and potential for disruption and opportunities (B); this offers opportunity for innovation in the context of strategy development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Weak signals</td>
<td>Weak signals are vague information and can be the source of disruption and</td>
<td>Ansoff 1975, 1984; Day &amp; Schoemaker 2005, 2007; Glassey 2009; Jaeger et al.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>
| **D** | Strong signals | Strong signals (or trends) are clearly observable changes (already happening today) which are expected to continue.  
Ansoff 1975; Marsh, McAllum & Purcell 2002; Mintzberg 1987; Schwartz 1996 |
| **E** | Environmental scanning | The scanning of the external landscape is essential, since an organisation relates to its external environment.  
|   |   | Identifying weak (C) and strong (D) signals through environmental scanning (E) and using them for innovation and strategy development (A) lowers uncertainty (B), identifies opportunities and decreases the level of risk for an organisation. |
| **F** | Signals analysis | Analyse and consolidate the collected signals from environmental scanning.  
|   |   | All signals (C, D) from the environment (E) are analysed, structured and stored (e.g. in a signals database) on an ongoing basis. |
| **G** | Multiple futures | Creating multiple futures is a result of an unpredictable future environment and numerous potential developments.  
| **H** | Scenarios | Scenarios represent futures and decrease complexity in an unpredictable future environment.  
Gilad 2004; Porter 1985; Ringland 1998, 2010; Van der Heijden 1996 |
| **I** | Scenario building | Scenarios take a signal and look for the development over time. It is done, if not through mathematical models, by connecting facts and trends or by enhancing an image of the future.  
Albers & Broux 1999; Bell 1997; Fahey & Randall 1998a; Fink, Schlake & Siebe 2001; Georgantzaz & Acar 1995; Godet 1987; Graf & Klein 2003; Ringland 1998; Schwartz 1991; Van der Heijden 1996; Wilson 1998a |
<p>|   |   | Multiple futures (G) in the form of scenarios (H), based on attempts to foresee the development over time (I) of signals (C, D), are considered the appropriate method for reducing and understanding the complexity of the (future) environment (A). |</p>
<table>
<thead>
<tr>
<th>J</th>
<th>Qualitative vs. quantitative methods for foresight and scenario building</th>
<th>Foresight is a technique based on qualitative methods of foreseeing the future; quantitative techniques cannot manage the complexity of weak (and strong) signals (e.g. forecasting does not consider that trend lines can be broken and is therefore not adequate for scenario planning).</th>
<th>Ansoff 1965; Bell 1997; Bhide 2010; Caragata 1999; Cheung et al. 2009; Collis &amp; Montgomery 2008; Daheim &amp; Uerz 2008; Fink, Schlake &amp; Siebe 2001; Georgantzas &amp; Acar 1995; Godet 1987; Graf 1999; Hitt, Ireland &amp; Duane 2001; Jarratt &amp; Stiles 2010; Koncilja–da Mata et al. 2004; Lindgren &amp; Bandhold 2003; Ogilvy 2002; Ringland 1998; Schindehutte, &amp; Morris 2009; Schoemaker 2002; Smith 2007; Tsoukas &amp; Shepherd 2004; Wack 1985a, 1985b</th>
</tr>
</thead>
</table>
Once the organisation has been challenged with the outcomes of scenario development (K), for strategy input and in order to build a successful company (M), stakeholders define all necessary projects/actions in order to prepare for the future (L), either through active modification of the current company processes, structure and/or products, or purely by keeping the organisation fit for future change (cultural dimension).

Finally, a continuous monitoring of the identified signals (and scenarios) is essential to prepare for new change and/or take action. All scenarios (especially the underlying drivers) as well as the signals database are continuously observed (monitored) and updated in order to build new scenarios or modify existing ones, inform stakeholders about the potential of existing scenarios becoming reality, and to warn the organisation about immediate opportunities and threats (strategic surprises) out of environmental change (A, N).

Table 5: Key Factors of a Framework for Advancing Strategic Corporate Foresight (own illustration)

Literature review has provided support for the necessity of linking all the elements (A to N) in a meaningful way, in order to build a framework for advancing strategic corporate foresight. Figure 25 represents a visual description of a foresight framework derived from the literature, based on the table above.

The engagement with the literature and the theoretical framework for advanced foresight is reflected in the six research propositions, which acknowledge the need for a practice oriented, overarching foresight-centric planning framework, which includes the integration of weak and strong signals with scenario planning and strategy adaptation (or scenario transfer). The link between foresight and strategy development (including innovation and risk management) is strong, and the research propositions describe the benefits of such a foresight-centric planning approach: it will reflect more open strategic debate and reveal divergent scenarios and future oriented strategic projects for
consideration, and will support an innovation driven culture and thus prepare an organisation for change in the environment and allow for flexible decision-making.

Figure 25: Foresight Framework Derived from the Literature Review (own illustration)

Organisations without a foresight-centric approach, utilising only traditional planning methodologies, will only generate a convergent perspective of the future and adopt strategies that support incremental change. Foresight-centric planning needs to be supported by senior management and user friendly methodologies must be made available.
The research propositions and above framework derived from the literature will be tested through empirical research via case study research and a survey with foresight experts. Chapter 3 will introduce the research methodology to test these propositions.
3 Research Methodology

3.1 Overview and Structure of Research Methodology Chapter

This chapter will describe the current methodologies employed in strategy planning and foresight research and categorise them based on research schools which are currently debated in the literature (section 3.2) in order to identify the most appropriate methodology for investigating the research question and testing and validating the research propositions.

The chosen and supported research methodology, case study research in combination with a qualitative survey with foresight experts to enrich and validate the model derived from the literature review to build a best practice framework, will be described and justified in section 3.3. This methodology focuses on the selection of literature, cases and foresight experts (section 3.4) and the process of data collection and analysis from case organisations and experts (section 3.5).

The research method will be tested against the scientific criteria to ensure that it allows for objective analysis of the issue (section 3.6), followed by the conclusion of the research methodology chapter (section 3.7).

3.2 Research Methodologies in Strategy and Foresight Research

The selection of the appropriate research methodology is of great importance: Clark, Floyd & Wright (2006, p. 1799) reviewed papers submitted to an academic management journal and identified that 70% of all the rejected papers were rejected due to either fatal flaws in the research methods applied, or the research designs being faulty or inappropriate for the research question. Therefore, researchers must be familiar with the content, characteristics and weaknesses of existing methods (Shah & Corley 2006, p. 1827). This section will review existing schools and methodologies and identify the most appropriate research method to address the research question of how and why strategic foresight, based on the integration of strong and weak signals methodologies, can enrich the strategy process in a dynamic and changing environment.
A review of the corporate foresight and strategic planning literature\(^9\) has revealed the dominance of three major research approaches, as outlined by Guba and Lincoln (1994):

<table>
<thead>
<tr>
<th>School</th>
<th>Further Differentiation</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantitative Positivism</td>
<td>Quantitative research but without testing of hypotheses.</td>
<td>Burmeister, Neef &amp; Beyers 2004; Fuld 2003; Martinez &amp; Perez 2004; Schwarz 2006</td>
</tr>
<tr>
<td>2: <strong>Constructivism with elements of Postpositivism</strong></td>
<td>Pure Theory</td>
<td>Based on existing literature (secondary data), a new mental construction is being developed (without empirical verification).</td>
<td>Brauers &amp; Weber 1988; Ehrnberg &amp; Sjoeborg 1995; Lampel &amp; Shapira 2001; Mueller &amp; Smith 1984</td>
</tr>
<tr>
<td></td>
<td>Theory with Cases</td>
<td>Based on existing literature, but also including real world cases, a new mental model is being developed.</td>
<td>Courtney 2003; Day &amp; Schoemaker 2000, 2005; Hamel &amp; Prahalad 1994; Hollings 2000; Schoemaker 1991, 1995, 1997; Tranfield et al. 2003</td>
</tr>
<tr>
<td>3: <strong>Postpositivism with some elements of Positivism and Constructivism</strong></td>
<td>NA</td>
<td>Case study research; explorative research in order to identify research issues and to understand new phenomena.</td>
<td>Ansoff 1975; Hodgkinson &amp; Wright 2002; Milenkovic 2001; Prahalad &amp; Ramaswamy 2003; Salaman &amp; Storey 2002; Sheaffer, Richardson &amp; Rosenblatt 1998; Voros 2003</td>
</tr>
</tbody>
</table>

Table 6: Research Schools in Corporate Foresight and Scenario Planning (own illustration)

The positivist school of corporate foresight research (e.g. Jennings & Lumpkin 1992; Lyonski, Levas & Lavenka 1995; Newgren 1977; Smeltzer, Fann & Nikolaisen 1988) applies quantitative research methods in order to test hypotheses or undertake statistical analysis. These methods are appropriate to identify the reality of a situation where a management function in a certain business discipline requires description and explanation. In this school, if the sample size represents the universe, validity, 

\[^9\] This analysis is based on research articles that have been chosen from the author’s database of published papers on the subject of corporate foresight and scenario planning, from the EBSCO\(^\text{®}\) research database.
generalisability (or external validity), objectivity and reliability will fulfil scientific criteria. A criticism of this method is that it allows only limited construction of new mental models (e.g. an understandable reality is assumed to exist). In general, quantitative techniques informed by positivist beliefs include a risk that, “we are in danger of becoming overly restrictive in both our theoretical development and the solutions we offer to organisations” (Symon, Cassell & Dickson 2000, p. 457). Certainly, for the testing of hypotheses or in order to understand the current situation of an industry/market with statistical analysis, this method is valuable and meaningful. Thus, for research on corporate foresight, the paradigm of positivism has its limitations because future realities are only understandable in multiple mental constructions (which would support constructivism).

Constructivists believe that researchers can only understand external reality indirectly through their constructs, despite the fact that an external reality exists (Mir & Watson 2001, p. 1171; Raskin 2008, p. 8). While constructivism refers to personal knowledge construction (based on individual knowledge), constructionism refers to knowledge construction as a collaborative process, arrived at via relationships between people rather than derived from the experiences of specific individuals. Despite these differences, constructivism can be defined broadly to also include constructionism (Raskin 2008, p. 2).

Constructionism (including social constructionism) is the result of intersubjective communication and interpretations of reality. These schools believe that reality is a social, multiple and subjective construction and were developed as part of the wider framework of postmodernism (Borrego, Douglas & Amelink 2009, p. 56; Guterman & Rudes 2008, p. 136; Miller & Fox 1999, p. 55; Symon, Cassell & Dickson 2000, p. 459). However, this relativistic position can be problematic as it does not build a solid basis for ethical considerations or a practice framework and therefore its generalisability is limited (Hansen 2010, p. 211; Payne 2000; Sayer 1997, p. 454). From a social constructionist perspective, ethical codes are responsive to context and culturally dependent (Guterman & Rudes 2008, p. 137). This results in concerns regarding the school’s ability to claim the truth or “descriptive validity” (Zielke 2006). It also increases the importance of applying ethical values in the research’s theoretical framework since the truth is relative, as it is based on an observer’s interaction with the research object (Guterman & Rudes 2008, p. 136; Payne 2000). As a result, researchers
need to learn and be able to engage with a research object on a situational basis (Shotter 2010, p. 17). It is not only about the engagement with the research object, it is also important to understand the perceived truth of a situation in combination with the observable dynamics between the research object and their environment and the researcher’s consequent thought process (Shotter 2010, p. 35). Social constructionism and constructivism are market-oriented paradigms (as compared to positivism) as they support the development of new knowledge, through the full involvement of research objects (i.e. managers) in the research process (as seen from the standpoint of the practitioner or consumer of frameworks) (Marsden & Littler 1996, p. 645, p. 653).

In the school of constructivism with some elements of postpositivism (e.g. Brauers & Weber 1988; Ehrnberg & Sjoeberg 1995; Lampel & Shapira 2001; Mueller & Smith 1984), research contributions rely on and explore existing theory, although sometimes authors demonstrate the application of a model in real business by pointing to some business cases. Typically, however, empirical verification is mostly missing. Research is generally based on the theoretical interpretation of existing literature, which leads to constructivism (“build a consensus understanding that is more sophisticated than the previous one”), and to some degree to postpositivism, where new research issues are being developed. Also an element of critical theory does exist, where the critique on existing structures and practices are the driver for presenting a better approach for dealing with a certain situation.

It is worth noting that the list of references is repetitious in some of the articles, which might indicate that the literature for foresight and scenario planning is limited. In addition, it is concluded that the majority of knowledge from this research approach is gained through consulting projects carried out by the authors of the articles. This approach can be valid and reliable to some degree if the synthesis of the existing knowledge base (theory) is widely supported by “good” research which fulfils scientific criteria. The approach certainly has its place in the sciences in order to identify research gaps and to construct new theoretical mental models. However, empirical research is necessary to test models against reliability and validity. Constructivism contributes to the research on strategic corporate foresight, by advocating that realities should be understandable in the form of mental constructions, and that there is (always) room for new and more sophisticated models.
Finally, the school of postpositivism with some elements of positivism and constructivism uses the research method of case studies, including case descriptions (Ansoff 1975; Hodgkinson & Wright 2002; Milenkovic 2001; Prahalad & Ramaswamy 2003; Salaman & Storey 2002; Sheaffer, Richardson & Rosenblatt 1998; Voros 2003). This methodology has an underlying postpositivism paradigm because of its strong exploratory dimension. In addition, the method helps to expose further research issues and reintroduces discovery as an element in inquiry. It includes the application of both quantitative and qualitative methods. It also has elements of positivism, because an understandable reality is assumed to exist. The use of case studies is appropriate because the enquirer’s aim is to gain an in-depth view (through exploratory research) into a certain topic on one (or more) chosen company (companies), to understand and perhaps explain a specific set of circumstances, not primarily to represent the total population (Borrego, Douglas & Amelink 2009, p. 57; Handwerker 2006, p. 106; Yin 2003, p. 13). It is noted that case studies “have mostly studied phenomena that has already occurred, i.e., it has focused on existing reality” (Azhar, Ahmad & Sein 2010, p. 87), but their unique strength is the ability to address complex situations (Bennett & Colin 2006) and to focus on a “specific, unique, bounded system” (Jacelon O’Dell 2005, p. 50).

For research utilising the underlying paradigm of postpositivism, there is one concern which must be addressed: the drawback of case study research is the limited generalisability and reliability of findings when applied to other business situations or companies. Certainly, the validity of the findings for the studied case organisation is clear, if research has been carried out correctly. Still, findings from case study research can also be valid and relevant to other organisations, especially if at the end of the research process the insights gathered from the case organisations are simplified and universalised, leading to the creation of new mental models which can be applied in a broader business context.

Postpositivists understand that reality cannot be understood perfectly, especially with regard to the topic of corporate foresight, where the reasons for commercial success are sometimes unclear and replication of past conditions is not always possible. This paradigm influences the research activities on corporate foresight (Guba & Lincoln 1994, Yin 2003), because a perfect representation of best practice foresight will be a challenging undertaking.
It is also not clear if generalisation of case study findings is always necessary, as case studies could be treated as independently valuable insights, with “readers making their own interpretation and taking the ideas from the case study into their own experience” (Rowley 2002, p. 25). Certainly, with new software supported methods for coding and analysing data, the quality of insights and reports from case study research continues to improve (Baker 2011).

Finally, case study research is argued to not necessarily be a method, methodology or research design. VanWynsberghe and Khan (2007) suggest a new conceptualisation of case study, where the case study is a “transparadigmatic heuristic” which enables the circumscription, discovery and construction of the case object or topic. This allows the generation of new knowledge influenced by postpositivism.

An assessment of over twenty-five research contributions in the field of strategy and foresight reveals that case study research based on postpositivism, with some elements of positivism and constructivism (or constructionism), is the most appropriate methodology for the testing of the six research propositions and building a framework for advancing strategic corporate foresight. A purely quantitative approach with its underlying positivism paradigm is not applicable, and knowledge development based on constructivism or constructionism paradigms would not meet the scientific criteria necessary for this kind of research.

Positivism is applicable because the researcher takes the view that the world is external to the research (Ticehurst & Veal 2000, p. 19). The goal of the research is to describe, explain and uncover facts. The existence of a viable link between future studies and positivism is supported by Bell (2003, p. 235). However, the paradigm of positivism has its limitations because future realities are only understandable in multiple mental constructions. Postpositivism can be found in case study research because it asserts the existence of a natural and social reality which can be explained to some degree by defining variables and showing how they interconnect (an understandable but imperfect reality).

This leads to constructivism and constructionism, in which reality is deemed to be multiple and socially constructed, and realities are relative and understandable in the form of multiple, intangible mental constructions, which are socially and experientially
based. In addition, constructions can only be created by interaction between and among the investigator and respondents. It recognises that people conceive things differently because of their different experiences and knowledge. Overall, constructivism offers different insights into strategy process and enriches strategy research (Mir & Watson 2001, p. 1173).

It is evident from the literature that researchers mix research methods with their underlying paradigms because the findings provide broader insights into the issues being investigated. In addition, it is widely accepted that researchers are free to select the best techniques for their research, to answer and validate their research questions and hypotheses, based on their own perspectives (Morgan 1998, p. 363; Patton 1990, p. 186; Reed 1997; Saunders, Lewis & Thornhill 2000, pp. 98-100; Ticehurst & Veal 2000, p. 20).

In terms of validity, the research propositions need to be verified (positivism and elements of postpositivism). To ensure reliability, mental constructions are critically affected by reality (constructivism and constructionism); and objectivity is ensured if the methods applied are used correctly. Objectivity should, as far as possible, be achieved and not influenced by any (inter)personal perceptions, impressions and biases in order to determine the truth. In addition, it seems to be taken for granted that ethical standards will be applied (e.g. the assumption that research results are being honestly recorded). These paradigms together allow the building of a concurrent model that is more sophisticated than the previous understandings. Corporate foresight, a topic which has not yet been fully covered in academia, may require this form of research in order to create valid, reliable and objective new knowledge (Guba & Lincoln 1994; Leedy & Ormrod 2005; Ticehurst & Veal 2000).
3.3 Research Method and Justification

As the investigation of research schools and methodologies has shown, a qualitative approach based on postpositivism, with some elements of positivism, constructivism and constructionism, will guide the research framework, and case study research has been chosen as the primary methodology to be applied in this research.

Case study research allows the creation of new knowledge to understand uncertain, complex and unique situations which can be used for theory development and to provide guidelines for implementation of effective practices. It is especially useful to improve the understanding of organisational contexts and when dealing with a process or complex real-life activity (Baker 2011; Cooper & Morgan 2008; Noor 2008), by enabling researchers to answer “how” and “why” questions (Baxter & Jack 2008, p. 5565; Borrego, Douglas & Amelink 2009, p. 56). It seeks to understand a situation by studying single examples and will help to carry out an in-depth contextual analysis of an event or a special condition, and is consequently especially appropriate for new areas of research. It is of special value to involve contrasting cases that have been studied in a similar manner. Therefore it is important to include at least two case organisations in the chosen research approach (Eisenhardt 1989, p. 532; Leedy & Ormrod 2005, p. 135, Ticehurst & Veal 2000, p. 50).

Case study research is a powerful research methodology that combines individual interviews with record analysis and observation. The objective is to obtain multiple perspectives of a single organisation or process for the purpose of learning more about an unknown or poorly understood situation (Bailey 1992; Cooper & Schindler 2006, p. 217; Leedy & Ormrod 2005, p. 108; Uprety 2009, p. 105). Using more than one case will allow running cross-case analysis and therefore provide a better understanding of the phenomenon. Case study research is close to action research (Azhar, Ahmad & Sein 2010, p. 97) where complex, practical problems about which little is known, are being studied. It is understood that in some cases, the researcher focuses on a single case because its unique or exceptional qualities can promote understanding or inform practice for similar situations (Leedy & Ormrod 2005, p. 135; Noor 2008).

The strength of case study research is that it can generate novel theory. In addition, the theory which emerges from case study research is likely to be valid, because the theory
building is closely linked with the empirical evidence from the case organisation (Eisenhardt 1989, p. 547). Case study research will inform the creation of a practice framework for advancing strategic corporate foresight. It is one of the most chosen research methodologies. In public administration, for instance, approximately 70% of all dissertations used the case study approach (Adams & White 1994, p. 573). In information systems (which is linked to some extent to the topic of foresight), case study research is the most common qualitative method (Alavi & Carlson 1992; Orlikowski & Baroudi 1991).

With regard to the weaknesses of case study research, only one major issue arises, which is that researchers cannot always be confident that the findings are generalisable to other situations. However, by identifying the context of the case, the investigator assists others who read the case study to draw conclusions about the extent to which its findings might be generalisable to other situations (Leedy & Ormrod 2005, p. 135). To reduce the major weakness of case study research, which is generalisability, the research method was extended to a second stream of investigations, utilising the findings from theory derived from literature review and independent foresight experts to create a second practice framework for foresight. The foresight experts were consulted in order to present research findings which can be replicated in other industries and businesses, and thus ensure the generalisability of the research findings from these case studies. This allowed cross-examination and the building of a generic best practice framework.

![Figure 26: Model Development Emerging through Different Methods of Research (own illustration)](image-url)
With the proposed research method, a practice framework (F1) emerged from case study research and was visualised and described. It was informed by the research propositions and processes, experiences, strengths/benefits and weaknesses of foresight activities in two case organisations. Conclusions from this practice framework were drawn and characteristics described. A second practice framework (F2) was generated from foresight experts based on their personal experiences, but connected to theory from literature. The literature review allowed the connection of different management disciplines and activities, to generate a theoretical foresight model. This generic model was enriched and validated by foresight experts to formulate the second practice framework. Again, conclusions were drawn and characteristics were described with regard to this framework. Finally, the two practice frameworks were combined to build a best practice framework for foresight (F3). As such, the best practice framework emerged through three different methods of research and was finally described and compared to the two practice views. Similarities and differences were described to contribute to theory and practice, and provide a generic framework for advancing strategic corporate foresight.

For qualitative research, and in recognition of the issues of social constructivism and constructionism (Borrego, Douglas & Amelink 2009, p. 56; Guterman & Rudes 2008, p. 136; Shotter 2010, p. 17, p. 35; Symon, Cassell & Dickson 2000, p. 45), it was important to consider at least one additional method of research (Elman 2008, p. 272; Miller & Fox 1999, p. 65) to enrich the researcher’s fact finding through dynamic interaction with other insights. The application of different methods allows the utilisation of findings across data sets and sources, and thus reduces “the impact of potential biases that can exist in a single study” (Bowen 2009, p. 28). In addition, computer assisted qualitative data analysis software was recommended for use in a social constructionist study to integrate relevance and rigour into the research process (Kikooma 2010). Therefore, this research encompasses not only case research utilising a pre-defined methodology including qualitative data analysis with a software tool, but a validation of theory based on input from foresight experts to generate new knowledge. A research approach based on multiple methods has the ability to discover the truth in the eyes of the researcher, as “the truths are inseparable from the social contexts to which they are responsive and the practices through which they are produced” (Miller & Fox 1999, p. 71).
3.4 Selection of Literature, Cases and Foresight Experts

As described in the previous section, the best practice framework (framework 3) which emerged was based on two different research methods, namely case study research (framework 1) and theory building based on literature review in combination with a survey of foresight experts (framework 2).

The selection of cases should be done with the specific purpose of theoretical replication. In addition, cases are not primarily treated as multiple respondents in a survey, but as multiple experiments (Perry & Coote 1994, p. 10; Yin 2003, p. 53). Sampling logic, which is a sample of a number of respondents, represents a bigger population but is not appropriate for the case study method, and random selection of cases is neither necessary nor preferable (Borrego, Douglas & Amelink 2009, p. 57; Eisenhardt 1989, p. 537; Perry & Coote 1994, p. 10; Yin 2003). It makes sense to select cases from extreme situations and polar types (Pettigrew 1998). With regard to the number of cases, literature recommends four to ten cases, where the minimum is two, and in some cases, the decision should be completely left to the researcher. More important than sample size is the focus and approach with which the researcher approaches an organisation (Eisenhardt 1989, p. 545; Mintzberg 1979, p. 585; Perry & Coote 1994, p. 11).

The supported principle is to choose information-rich cases which allow in-depth research, so that a wealth of insight and conclusions can be gained on issues of significance. Therefore, to understand strategic corporate foresight, the research focus had to lie with larger organisations where strategic planning is a formal process (e.g. as part of annual planning activities, or where regulation bodies require a strategic plan). Considering that a strategy has a long-term planning horizon (generally between five and ten years), the company’s strategic plan will (or should have) an element of strategic foresight, and therefore foresight knowledge, tools and skills must exist in at least one case organisation. In deciding the type of organisation and number of cases for this research, a unique situation exists in a large Swiss organisation (the second largest organisation in Switzerland with over 50,000 employees), where one business unit has substantial experience with a foresight system (a leading financial institution with over 3,000 employees), and another business unit (a major passenger transportation company with over 1,700 employees) has little experience with long-term (more than three years)
strategic planning. This allowed an investigation into two business units (two case studies) within one large corporation, where the differences in the business units’ approaches in analysing future developments and strategic planning could be analysed and compared.

Whilst the two case organisations discussed operate in different industries and have their own management team, they have a number of similarities which support the concept of embedded case study research with the goal to achieve a holistic understanding of the field of enquiry within its situational context, based on different perspectives and units of analysis (Casey & Houghton 2010; Scholz & Olaf 2002; Yin 2003). From an external point of view, both case organisations operate under the same master brand and apply the same brand guidelines. As such, they are perceived as divisions or operators of the same organisation. From an internal point of view, there are various common factors around organisational and financial reporting, culture and values, policies, collaboration efforts and joint projects, location and labour utilisation which support embedded case study research.

From an organisational point of view, both case organisations report to the same management team and hence, both senior management teams participate in the same leadership development programmes, strategy meetings and workshops. In theory, this contributes to knowledge sharing and the building of a common understanding of strategy, methodologies and values. There is a single financial report for the parent company, and in terms of culture building, the holding organisation defines overarching organisational/cultural values and principles. The main internal policies, for instance development programmes and annual reviews for staff performance, or environmental policies, are prepared by the holding organisation and apply to both case organisations. The holding organisation drives collaboration across divisions and offers shared services to both case organisations, for instance a company wide idea generation programme. Joint projects take advantage of the infrastructure and channels of both case organisations to leverage their efforts individually or as a combined organisation. Until recently, both case organisations shared the same company headquarters physically in terms of location and the actual building, and finally, there is an ongoing movement of staff between the two case organisations and other divisions, which means that knowledge, methodologies and cultural values travel between the two organisations.
Throughout this document, CO-A will refer to the passenger transportation case organisation with limited exposure to and experience with long-term planning and a traditional approach to strategy development and foresight. CO-B will refer to the financial institution with a foresight supported strategy process and a contemporary approach to strategy development. The case organisations employ a number of managers who participate in medium to long-term strategic planning (either as active planning managers or as recipients). Where possible, all relevant managers who participate in the strategic planning process were interviewed. In each case organisation, up to seven interviews were conducted.

For the purpose of the literature review and construction of a theoretical model, a number of databases were utilised to identify appropriate literature on strategy development and foresight. After an initial review of around fifty journal articles, a list with keywords was generated to conduct a detailed search of all literature available in different languages (English, French and German). The keyword list included search terms from the literature of strategy development, foresight, signals management, scenario management, innovation and risk management. The utilised databases were EBSCOhost® (Business), Factiva®, Nexis® and ScienceDirect® for subscription based sources (including journals), and the University’s library catalogue and the database of Swiss libraries (comprising 400 libraries) for books and journals. To ensure that scientifically valid materials were used, books were chosen based on the author’s reputation, their relevance in the field or their citation in academic journals. At the same time, only scholarly (peer reviewed) journals were chosen. A total of over 1,600 articles were identified, collected and reviewed as part of the initial literature research. This library of articles grew to over 2,000 items over the duration of the research.
Following the completion of the literature review and creation of a theoretical framework for foresight, six foresight experts were invited to participate in a survey on the basis of their expertise in foresight methodologies. The foresight experts are not employees of the case organisations, but independent individuals and are not necessarily based in Switzerland. They were chosen on their track record with regard to publications, academic position, and/or their business experience. The panel includes senior managers, including the former Head of Innovation for one of the largest UK companies, the former Deputy Head of Innovations for one of the largest Swiss companies, two leading foresight experts based in Germany and the USA and two accomplished university professors from the UK and the USA. On average, the six foresight experts worked in their organisations for 8.8 years and have over 27 years of experience in strategy, a combined knowledge of over 160 years. This process of
interrogation of the research findings by foresight experts was integrated into the research design to increase the level of validity, generalisability, reliability and objectivity of the practice recommendations emerging from the research findings, with reference to both the model derived from literature review and the model described in the case studies.

3.5 Data Collection and Analysis (Case Organisations and Experts)

The interviews for the case organisations and foresight experts were based on questionnaires (Appendix E) with both closed and open questions. For the case organisations, general information about the interviewee was collected (part one), including name, job title, position, age, number of years in company and number of years of experience in strategy work. Part two covered the overarching topic of strategic planning and strategy development, with focus on the overall strategy framework of the organisation and methods of creating knowledge about, and insights into, future developments. The final part put emphasis on detailed descriptions and explanations of methods of: (1) collecting signals from the environment; (2) combining qualitative, non-econometric signals into scenarios; and (3) challenging an organisation with the outcomes of scenarios. Following the methods investigation, the impact and benefits of foresight were identified, including the potential for improvements to the organisation’s long-term strategic planning and general culture, with a focus on innovation management and long-term planning.

The interviews lasted approximately forty to sixty minutes each. For interviews with regard to the case organisations, the interviews took place in meeting rooms of the case organisations’ headquarters. Each potential interviewee was advised that participation in the research was voluntary. Every interviewee signed a consent form for research participants, which included the name and purpose of the research project, name and contact details of the principal investigator and criteria to allow the investigator to carry out the interview. The University’s Ethics in Human Research Committee approved the study and contact details from the University were published on the form in case of enquires. The form was available in German and English as all participants were at least fluent in German, and a copy was given to the interviewee.
A total of eleven interviews from case organisations were conducted (Appendix F). For CO-A, four interviews were conducted, the small sample size being due to the small strategy team in that organisation. Two interviews were with CO-A’s central strategy team: one interviewee was a “business consultant”, a full-time employee embedded in a regional business unit to offer strategy and management support to the profit centre head; one interviewee was responsible for project management and strategic financial planning. On average, the group of strategy professionals was employed in the organisation for 5.75 years and they worked in strategy related disciplines for an average of 4.75 years. CO-B had a larger strategy unit and strategy tasks are distributed across the organisation. This offered a larger sample size of seven interviews, with three team members from the centralised strategy team and four team members from a strategy unit in a profit centre. Their average tenure with the organisation was 5.0 years, with an average of 5.0 years experience in strategy related management disciplines.

Interview data was then transcribed and categorised around key constructs contained in the theoretical framework. In addition, dimensions in the data relating to foresight and the strategy process not anticipated in the theoretical framework were also categorised through the support of NVivo® software. Interview data analysis (and qualitative data analysis in general) is a complex process, which can be supported by qualitative data analysis software. The application of NVivo® provides the research with a database management system to query and audit the coding of field research data (Bergin 2011), in this case of interviews and documents from case organisations. NVivo® and other qualitative data analysis tools are widely used in social science and management research in order to support the creation of an accurate and transparent picture of the data whilst providing an audit of the data analysis process as a whole (Dean & Sharp 2006; Welsh 2002).

Deficiencies in or perceived criticisms around qualitative data analysis software is around the general effects of technology on research, as it might influence the research quality, especially with regard to the potential loss of data and the abstraction that occurs once the data is in the database (Bergin 2011; Crowley, Harre & Tagg 2002). On the other side, there are a number of advantages for the application of NVivo® and other qualitative data analysis tools across the recording, collation, analysis and reporting process of qualitative research. These tools increase the robustness of qualitative research as they offer a single location for data storage, provide easy access
to the research material, support content analysis and are capable to handle large amounts of data, including additional documents. Overall, this compares more favourably with traditional approaches of data analysis (Bergin 2011; Dean & Sharp 2006; Hutchison, Johnston & Breckon 2010). NVivo® was selected for this research as it will increase the quality of the research. It is argued that NVivo® supports the establishment of credibility, validity, reliability and objectivity in research; it will provide valuable insight into the context of the research situation and will highlight relevant similarities and differences (Bergin 2011; Smyth 2006).

In addition, all available documents from the research, describing the strategy process, the strategy and strategy reviews, were collected and analysed. Documents can provide data on the context within which research participants operate; it generates supplementary research data (Bowen 2009, p. 30). It is a simple way of obtaining empirical data, which was then integrated with data from the interviews to “minimise bias and establish credibility” (Bowen 2009, p. 38). Emergent themes were shaped from all the data, compared to prior established theoretical positions, then revisited, reviewed, and revised or rejected. Data from the second case (second business unit) was then analysed and categorised (examined for consistency with developed themes), adjusted and then examined for consistency and divergence with the first case (Dey 1993; Marshall & Rossman 1994; Noor 2008). Categorisation and cross-case analysis was conducted (using a 2x2 matrix in order to categorise and compare data), following the recommendations of Ghauri and Gronhaug (2005, pp. 218-220), Huberman and Miles (1994, pp. 435-437), Noor (2008, pp. 1602-1604) and Saunders, Lewis and Thornhill (2000, p. 383).
References to the data from field research are provided via NVivo® coding in subscript. This allows back tracking to the original interview transcripts. Input and quotes from foresight experts are coded with the relevant expert’s reference number.

Example with NVivo® reference number 127 from case organisations interviews:

*The view towards the external market is considered to be retrospective, and therefore the strategy development process is seen as reactive (127).*

Example of input from foresight expert 6:

*A variation of the stress test is the “dialectical inquiry”, seen as the best process to challenge an organisation with outcomes of scenarios (expert 6).*

All research findings (chapter 4) derived from field research are therefore linked to and constructed by the coded text from qualitative data analysis utilising NVivo® (an example is provided in Appendix G).

With regard to data collection from foresight experts (Appendix F), six questionnaires were completed over the phone or by e-mail. The experts were asked to describe best practice methodologies in foresight to capture both strong and weak signals and then present their individual conclusions about how combinations of methodologies lead to foresight best practice. The questionnaire included three parts, similar to the
questionnaire used for the case organisations: part one covered general information about the foresight expert, including the number of employees in his/her practice or consulting firm, and the type and size of their clients. Part two focussed on the description of a best practice foresight framework and methodology in order to capture, process and understand weak (and strong) signals from the external environment to develop a view of the future. It proposed two foresight models (or processes) to guide conversations, namely a model presented by Liebl (1996) and the model derived from the earlier literature review. Part three investigated the methods applied to collect signals from the environment, combine them into scenarios and present them to the organisation and its stakeholders. The final part included questions which tried to identify the evidence which supports the suggested foresight frameworks and methodologies.

Following analysis of the case material, the theoretical framework derived from the literature was compared and enriched by the recommendations of the six experts on best practice corporate foresight, followed by the development of the best practice framework.

Back translation was used for some randomly selected interview sections to validate the accuracy of the original translation from German to English. In this procedure, the researcher translates the interview data from the source language (German) into the target language (English). The researcher then translates the target language text (English) back into the source language (German) to compare the original and back-translated versions for concept equivalence (Cha, Kim & Erlen 2007, p. 388; Douglas & Craig 2007, p. 30; Ramírez 2006, p. 356).

The quality of translation was satisfying, especially because the direct translation was correct for facts as well as descriptors for cultural elements. Sometimes, the reason for poor translation quality is the source language and not the actual translation (Goeran 2006).
3.6 Scientific Criteria

The objective of this research was to gather evidence of the need, methods and practicability of a framework for advancing strategic corporate foresight. In order to test and enrich the theoretical model derived from the literature review, two case organisations and six independent foresight experts were involved in the research.

Although confidence in the findings was high, they were subject to verification. The five requirements for establishing the truth about an issue are reliability, validity, objectivity, generalisability and ethics (Ticehurst & Veal 2000).

With regard to reliability, the measures applied to increase the reliability of the data included the development of clearly conceptualised questions based on the six research propositions. Some of the questions of the questionnaire included additional information for the research participants to ensure that he/she was ready for the type of questions and that there was no misunderstanding with regard to the terminology. All input from the interviews was stored (in writing in a case study protocol and in digital form for post transcription) and later reviewed and summarised. Significant quotations were highlighted. Adequate reliability is to be considered a precondition to validity. Therefore it was required to give the investigator confidence in data and prevent collection of worthless and misleading data.

Trustworthiness in qualitative research is the equivalent of validity in a quantitative study. It is generated by establishing rigor in the process of data collection and analysis (Jacelon O’Dell 2005, p. 51) and by utilising multiple data sources in order to maximise the range of data that might contribute to the researcher’s understanding of the case (Yin 2003). In addition, all insights and knowledge related to processes revealed in the data allowed transferability or external validity (Shah & Corley 2006, p. 1830, following Locke 2001). Therefore, validity or trustworthiness was ensured because the field research gathered multiple sources of evidence (a total of eleven interviews in the two case organisations and six independent foresight experts [Appendix F]).

Before starting with the field research, definitions of major terms were provided so there existed a uniform understanding of the terminology and the positioning of the topics
within the broad field of management topics. In addition, the respondents were given visualisation aids and examples of foresight in business situations.

To assure the validity of data, a centralised document was used to store and integrate data input from the respondents. As the best practice framework was developed via different iterations, with the literature review being an important starting point, it was important to consider only academic literature. The vast majority of the referenced publications are peer reviewed, academic journals. This supports the reliability and validity of the development of an advanced corporate foresight model.

For some qualitative approaches, the notion of objectivity is problematic. The research process is informed by other epistemological beliefs, as insights from qualitative research can only be represented through the researcher’s own interpretation and therefore, the research cannot be “objective” (Symon, Cassell & Dickson 2000, p. 458, p. 460). However, the claim to objectivity can be strengthened through strict data management and recording, accurate records of contacts and interviews, transcription of interviews and careful notes of observations (Shah & Corley 2006, p. 1830, following Locke 2001). The existence of an interpersonal relationship between the investigator and the participant during the field research process meant that the investigator needed to ensure that he did not inadvertently influence the interviewees’ responses during interactions. The investigator needed to adopt a neutral attitude in both case organisations, particularly as he was previously employed in marketing and strategy development in the second case organisation (the financial institution). All input was then recorded and later transcribed, which ensured data analysis based on real inputs. Objectivity in data analysis was achieved by using a software tool (NVivo®), utilising a set of nodes and classification codes (Appendix G), the key classification structure for which was: (1) strategy process; (2) culture and leadership; (3) the overarching foresight process; and (4) the details of the foresight process. Finally, the investigator participated in quality data analysis workshops.

Generalisability was an important factor in the chosen research because the goal was to build a generic best practice framework for advancing strategic corporate foresight. First, the two case studies invite comparison, especially because they were studied in a similar way (Eisenhardt 1989, p. 532; Leedy & Ormrod 2005, p. 135, Ticehurst & Veal 2000, p. 50). This allowed cross-case-analysis and therefore enhanced the understanding
of the phenomenon. The objective was to obtain multiple perspectives of a single theme/process for the purpose of learning more about an unknown or poorly understood situation (Bailey 1992; Cooper & Schindler 2006, p. 217; Leedy & Ormrod 2005, p. 108). With case study research, the goal is not always to provide a “generalisable description that is representative of most situations, but rather to describe a particular situation in enough depth that the full meaning of what occurs is made apparent” (Borrego, Douglas & Amelink 2009, p. 57). As such, the concept of generalisability from quantitative studies is replaced by the term transferability in qualitative studies: “qualitative research seeks to generalise through thick description of a specific context, allowing the reader to make connections between the study and his or her own situation” (Borrego, Douglas & Amelink 2009, p. 57). In addition, by consulting independent foresight experts, it was ensured that unbiased input enriched the best practice framework from case organisations, which made the research generalisable in such a way that the outcomes can now be applied in other organisations. This contributed to theoretical generalisability.

Finally, the research followed the ethical guidelines of the University. Participants were advised of the purpose of the research, they were confident that their data would remain anonymous and that they could decide at any time to terminate their involvement in the project. Adopting the research design outlined above provided a process and set of research methods fulfilling scientific criteria; it allowed for access to the data to validate the research propositions and to verify and enrich the framework for advancing strategic corporate foresight.

3.7 Conclusion

The best approach to research is often aligned with contradictory philosophical positions or paradigms. In some cases, there is an overlap between or mix of paradigms (Caelli et al. 2003, p. 9; Ticehurst & Veal 2000, p. 19). While some researchers have a bias against qualitative research in the management field (Shah & Corley 2006, p. 1829), others argue that it is a powerful method of collecting and analysing textual data because it enables knowledge to become dynamic, allowing the researcher to build new, or refine existing, theories (Borrego, Douglas & Amelink 2009, p. 55; Commander
A dominant research methodology has been employed to address problems in the research around strategic corporate foresight. The underlying theoretical and epistemological position influenced the choice of research methodology: case study research, a qualitative survey with foresight experts and a literature review combine to build a best practice framework.

Case study research allowed the discovery of a young topic of enquiry (foresight as part of an organisation’s strategy development utilising weak signals), and the creation of new knowledge which can be used for the development of a new theoretical framework. This framework can later be used as a guideline for practical adaptation. It aligns well to the research question and propositions. The research method fulfils the scientific criteria, namely reliability, validity, objectivity and generalisability as well as the ethical standards for conducting research.

Overall, the outcome of the field research contributed to existing literature and especially to business practice. It provides a best practice framework for advancing strategic corporate foresight; the method employed provides the opportunity to confirm the applicability of the framework emerging from the research across industries.
4 Research Findings

4.1 Overview and Structure of Research Findings Chapter

This chapter includes the comparison of the two case organisations, CO-A and CO-B, in order to test the research propositions and develop a foresight framework through examining practice (F1). In addition, the development of an alternative foresight framework will be defined through the interrogation of the theoretically derived framework in chapter 2 (F2) with six foresight experts. A comparison of the two practice frameworks through these alternative pathways then leads to discussion deriving a best practice framework (F3) to support generalisability in chapter 5.

In section 4.2, the two case organisations are described with regard to their company characteristics, including organisational structure, financial performance and their high level strategy development process. Section 4.3 includes a review and comparison of their foresight and strategy development approaches. CO-A refers to the passenger transportation case organisation, in this case described as an organisation with a traditional approach to strategy development and foresight; and CO-B refers to the financial institution with a contemporary approach to strategy development and foresight.

Sections 4.4 to 4.9 discuss the six research propositions in order to test if empirical evidence can support a foresight-centric approach to strategy planning. The investigation of the case organisations and testing of research propositions allows the building of the first practice framework, described in section 4.10.

Finally, the second practice framework will be developed based on theory from the literature review and input from the six foresight experts (section 4.11). All identified elements for a best practice framework on advancing strategic corporate foresight, from the literature review, case organisations and experts, will later be integrated in the description of such a framework in chapter 5, including conclusions and a data synthesis to identify research limitations and contribution to theory and practice.
4.2 Introduction and Profiles of Case Organisations

Both case organisations are part of a Swiss group of companies, owned by the Swiss government. This group of companies was created in 1996/1997\textsuperscript{10} as part of a wider market deregulation and therefore experienced changes in company structure, processes and approaches to managing the different business units via dedicated senior management teams. Despite being state owned enterprises, both companies are managed as quasi-independent entities with the generic commercial goals of growing and generating profits. CO-A is the leading bus passenger transportation company in Switzerland and competes with trains and around 180 other bus companies\textsuperscript{11}. CO-B is a leading provider of universal payment services throughout Switzerland\textsuperscript{12}, including financial products such as savings, investments, mortgages, loans and risk protection.

In terms of organisational structures, both organisations report to the same CEO of the holding organisation (Appendix H). CO-A has an executive management team of nine directors (CEO and eight direct reports, excluding executive support) to lead and manage an organisation with over 1,700 employees. CO-B also has an executive management team of nine directors (CEO and eight direct reports, excluding support functions such as corporate development, Compliance and PR) to lead and manage an organisation with over 3,000 employees. In comparison to CO-A, CO-B has a segment or function based organisational structure with a strong focus on market and product management. CO-A, which is structured around regions, established management consulting functions within the regional business units to compensate for the lack of a segment or product based structure. With regard to their financial performance (Appendix I), CO-B outperforms CO-A in most dimensions (revenue and profit growth, market share growth, employee base growth and customer satisfaction).

CO-A’s strategy process starts in September with a planning session, followed by strategic analysis/SWOT analysis and two workshops with the senior management (October to December). A strategic direction setting workshop is conducted in January, business unit strategies and strategic programmes and project plans will be developed between March and June and finalised in July/August. Approval is received in December, for communication from January onwards.

\textsuperscript{11} CO-A File Note Regional Market Analysis, internal document (2 December 2005).
CO-A appreciates that it is operating in a competitive market with higher customer demands in terms of services and value for money, and increased levels of maturity in the core market. Across all its strategy documents it is visible that innovation is a key priority, but CO-A makes limited investments in foresight-centric knowledge and strategy building. In June 2007, because of lack of progress with identifying new sources of growth and revenue, a proposal for an innovation management initiative was developed and presented. The goal of this programme was to: (1) conduct R&D activities; (2) lead systems management processes; and (3) consult and manage projects. The description of these activities does not necessarily fit with the definition of innovation management from the academic field (compare with literature review, section 2.15) and is very different to the foresight and innovation activities conducted by CO-B. As an example, CO-B introduced an award winning integrated e-commerce platform and offers payment of goods in retail stores via mobile phones. In 2002, CO-B became the first company to launch a product which enables businesses to send their customers electronic invoices via an e-banking platform, and customers can load admission tickets and user authorisations for sports and cultural events onto their CO-B debit card via payment over the internet. When customers proceed to the ticket counter, an RFID tag in their debit card allows access to the event.

CO-B is a highly successful company in a competitive market, which embraces innovation management and new product development. Evidence of successful innovation management is found in key metrics, with revenue and profit more than doubled in eight years (Appendix I). CO-B’s strategy planning process was first introduced in 2000. All business units start with the strategy development process in October/November, in order to contribute to the initial executive management workshop in January (bottom-up). In January, the executive board officially initiates the new planning process with a strategy workshop based on inputs from the business units. Following the planning launch, feedback is provided to business units (top-down), and the two profit centers “private customers” and “business customers” as well as service centers create their strategies. The executive team and senior managers meet for a second workshop in February to discuss and approve proposed business strategies, then communicate their plans at the end of June.

---

4.3 Analysis of Approaches to Foresight and Strategy Development

The approaches to foresight and strategy development in CO-A and CO-B were analysed and compared, based on document research and interview data from case studies (the strategy processes from CO-A and CO-B can be found in Appendix J and K, respectively).

At the time when the field research was carried out, CO-A had limited documentation around both its strategy and strategy process. The existing strategy document\(^\text{14}\) includes a logical sequence of: (1) corporate direction of the holding organisation; (2) analysis of the market, environment and insights from experts; (3) strategic direction and programmes; and (4) final notes/summary. However, the document is limited in terms of the level of open debate and strategising which it facilitates. It was a new, top-down driven strategy framework and based on a traditional strategy process. Foresight and long-term planning, especially around qualitative elements in terms of market movements/risk, were not catered for.

In CO-B, foresight and early warning management activities date back to 1998, when a proposal for such a system was presented to the executive team.\(^\text{15}\) It was centred on the idea of weak signals detection and management, described as “unclear data which might indicate strategic discontinuity”. From this time on, CO-B managed workshops with senior executives to identify and discuss early indications of change until 2002\(^\text{16}\). Early signals management included the monitoring and scanning of the environment and the management of the above mentioned workshops. In late 2003 it was mentioned in a strategy presentation to CO-B’s executive management team that the lack of foresight activities resulted in knowledge gaps that needed to be closed.\(^\text{17}\) As acknowledged in CO-B’s documentation, strategic analysis is a challenging task, especially identifying opportunities and threats in the long-run (five years plus). Consequently, a proposal for a formal foresight process to understand future developments and impacts to the organisation was prepared for the executive team in 2004 and introduced in 2005 for the strategy workshop in early 2006.

\(^{15}\) CO-B Early Warning Management System, internal document (13 November 1998).
\(^{16}\) CO-B Company Presentation Future Screening, internal document (January 2006).
\(^{17}\) CO-B Strategy Development Process, internal document (17 October 2003).
In terms of strategy development (Table 7), both organisations start their process in a similar manner with a number of strategy preparation tasks. Here, CO-B has a detailed foresight process to identify and describe potential actions as a result of weak signals, which need to be discussed in CO-B’s strategy, and to establish a sense of future research and thinking across the organisation. The framework includes the capturing of weak signals collected via different research methods in a signals database, the clustering, prioritisation and analysis of signals, the building of scenarios via workshops and analysis of potential consequences. Input from these foresight activities are an integral part of CO-B’s strategy development process.

CO-A’s only investment in foresight is an exercise to identify environmental drivers (based on a brainstorming exercise) as part of the strategy development process; at the annual workshop with the regional market leaders, success factors, actions required, environmental changes and their impact in the short and long-term (five years) are discussed.\(^\text{(18)}\) There are no formal tools available for the identification of weak and strong signals. The team of two strategy managers in CO-A work on the strategy document\(^\text{(19)}\) utilising existing market insights and knowledge, and most likely the input from the above mentioned brainstorming activity. The methodologies used to describe signals of change are primarily lists with indicators and their description, impact and probability. In addition, the traditional methods of PEST and SWOT analysis are used. The strategy document does not include any references to external sources or approaches and does not indicate a clear link between insights from the strategy workshop and the formal strategy document.

As a result of the foresight activities only found in CO-B, the organisation is able to define key strategic topics which drive strategic debates and allow the identification of “gaps” between the intended (or historical) strategy and potential future changes from the environment.

\(^{18}\) CO-A File Note Regional Market Analysis, internal document (2 December 2005).
<table>
<thead>
<tr>
<th>Process Step</th>
<th>Applied in</th>
<th>CO-A Characteristics</th>
<th>CO-B Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy preparation</td>
<td>CO-A, CO-B</td>
<td>Kick-off in September, standard planning tasks, no specific tools applied</td>
<td>Kick-off in July/August, standard planning tasks, no specific tools applied</td>
</tr>
<tr>
<td>Foresight and weak signals management</td>
<td>CO-B</td>
<td>NA</td>
<td>Integrate insights from foresight (updated report with weak signals and potential consequences from scenarios)</td>
</tr>
<tr>
<td>Definition of core strategic topics</td>
<td>CO-B</td>
<td>NA</td>
<td>Proposal with key topics based on ongoing analysis and insights from foresight process (August to September)</td>
</tr>
<tr>
<td>Strategic analysis</td>
<td>CO-A, CO-B</td>
<td>Strategy analysis using PEST and SWOT with workshops for management and executive teams</td>
<td>Strategy analysis of PEST drivers via business units, methods situational and different by business unit</td>
</tr>
<tr>
<td>Alignment of strategy with input from business units</td>
<td>CO-B</td>
<td>NA</td>
<td>Understand input from business units around key strategic topics via meetings/workshops</td>
</tr>
<tr>
<td>Alignment with strategy of holding organisation</td>
<td>CO-A</td>
<td>Communicate key challenges to holding organisation</td>
<td>NA</td>
</tr>
<tr>
<td>Strategising with the executive team</td>
<td>CO-A, CO-B</td>
<td>Define competitive advantages, business strategies and finances in a workshop with the executive team (March to May)</td>
<td>Present strategy analysis and develop long-term strategy via an executive workshop in the first week of January and a two day workshop in March</td>
</tr>
<tr>
<td>Development of strategic programmes</td>
<td>CO-A, CO-B</td>
<td>Strategic programmes include M&amp;A, marketing, supplier management etc.; workshop with the executive team (May to June)</td>
<td>Validate assumptions via market research, scenarios and define strategic initiatives (covered in above mentioned two day strategy workshop)</td>
</tr>
<tr>
<td>Development of market/business unit plans</td>
<td>CO-A, CO-B</td>
<td>Market, country and functional plans (October to December)</td>
<td>Market strategies and business plans for all functions (April)</td>
</tr>
<tr>
<td>Strategy validation and presentation</td>
<td>CO-A, CO-B</td>
<td>Consolidate plans and present to holding organisation (August to December)</td>
<td>Prepare strategy document for CO-B and holding organisation (March to June)</td>
</tr>
<tr>
<td>Communication of strategy</td>
<td>CO-A, CO-B</td>
<td>Internal and external communication of strategy (January to March)</td>
<td>Create and implement communication and strategy document distribution plans (end of June)</td>
</tr>
</tbody>
</table>

Table 7: Comparison of Strategy Processes from CO-A and CO-B (own illustration)
As mentioned above, the strategic analysis in CO-A is limited to an internal and external analysis utilising PEST and SWOT and a workshop with the management and executive teams. CO-B leaves the choice of methodology open to its business units, which utilise foresight insights, scenarios and other methods to identify future opportunities and risks. CO-B is the only organisation which follows a process driven bottom-up delivery of strategic insights and directions, while CO-A seems to invest more effort in aligning its strategy with the holding organisation. Later in the process, both organisations utilise workshop settings to strategise with the executive teams and to develop strategic programmes/initiatives as well as market and business unit plans. At this point in time it becomes clear that CO-B has a more dynamic and shorter strategy development process, with CO-A finalising its strategy document between August and December, and CO-B between March and June in the same year. While strategy is then communicated to stakeholders in CO-B at the end of June, CO-A can do this only between January and March of the next calendar year.

In terms of communicating strategy, CO-A has a relatively formal approach with a “vademecum”, a small practical booklet with 42 pages, published annually and distributed to all employees. It includes sections such as a message from the CEO, a description of the organisational culture, CO-A’s strategy, an organisational chart, a map of Switzerland with the different regional markets (and a symbol highlighting the location of the company’s headquarters), key figures around personnel, revenue, employee and customer satisfaction, emergency numbers, contributions to the CO-A budget per state and federal budget, over twenty pages with names and phone numbers of members of the management team and a twelve month calendar. The corporate strategy description is very formal and traditional and describes a finance driven culture. While the vademecum’s content is certainly of great relevance, it seems to be backward looking: a communication tool of the past with a formal, hierarchy driven language, from a time when content was still considered up to date even after a six or twelve month period. By contrast, CO-B utilises both a formal element (strategy presentations via Microsoft® Powerpoint®, intranet etc.) and a dynamic interactive approach. The latter, especially because of foresight activities, includes multimedia scenarios which describe the potential future state and how CO-B will take actions to continue its successful journey.

---

21 CO-B External Company Presentation, Head of Corporate Development, European Futurists Conference, Lucerne/Switzerland (22 November 2006).
CO-A has a traditional approach to strategy, based on workshops, brainstorming and tools which help to structure trends (e.g. PEST and SWOT). The link to the strategy development process is minimal. Weak signals are identified by chance, and most signals are strong and therefore visible. CO-B has a similar process to capture these strong signals, but has an articulated and sophisticated foresight process for weak signals. The link to the formal strategy development process in CO-B is clear: scenarios and their impacts are utilised as part of the formal strategy process (for workshop discussions and as a starting point for strategy development), and indicators for long-term potential change are highlighted separately, based on individual or clustered weak signals, in text boxes throughout CO-B’s strategy document. CO-B articulates (or operationalises) insights from foresight activities and has identified the changing forces in the long-run and impact on strategy, culture, product portfolios, channels and internal resourcing, structure and processes.

Analysis revealed that CO-B has a much older and richer process for understanding potential future changes (foresight) than CO-A. CO-B’s process demonstrates a balance between both a top-down and bottom-up approach to sharing and discussing insights with management and strategising future directions in formal and informal meetings, and cementing foresight activities and thinking across the organisation. This ongoing investment in foresight seems to have impacted CO-B’s cultural values and created a dynamic, long-term thinking and innovation building organisation. This observation implies that foresight is not only a knowledge building activity to support strategy, but more importantly a way to prepare the organisation for the future in terms of its behaviour and culture. Documentation analysis reveals that CO-A’s approach is relatively young, limited in scope and with few links to strategising, and most likely not established in its cultural values and organisational structure and processes.

The communication of results from strategising through strategy presentation is different in the two case organisations. CO-A uses a formal and traditional approach, while CO-B uses similar channels, but puts more emphasis on the visualisation of future change, includes multimedia based scenarios. These organisations have different attitudes towards management approach (top-down versus bottom-up, centralisation

versus decentralisation) and levels of foresight, strategising and innovation across organisational structures, processes, culture and communication.

4.4 Research Proposition 1

RP1: In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process (i.e. employing envisioning and scenario building) will reflect more open strategic debate, revealing more divergent scenarios for consideration.

4.4.1 Research Findings for RP1

Traditional Structured Analytical Approaches

Strategy development is an ongoing task within CO-A, starting in September each year (101). CO-A primarily uses a top-down, traditional approach to strategy development, using senior managers from different business units on an implementation level (102, 106, 127), and input from corporate group headquarters (106, 108). The process is described as “very strict and authoritarian” (127), with the corporate group headquarters setting the targets and objectives. The view towards the external market is considered to be retrospective, and therefore the strategy development process is seen as reactive (127).

The strategy development process is only one year old and CO-A has information gaps which need to be closed, especially through market research (113, 120). Other interviewees criticise the suboptimal structure (budget and financial targets were set before the company strategy process was initiated) (127) and the fact that the strategy process is not always followed (135). The actual strategy development process in CO-A is carried out in a variety of ways. There are four formal meetings with the management team to discuss strategy topics, market analysis with internal business consultants (each regional business unit has one consultant) and expert interviews/workshops with regional key account managers and centralised business functions in January/February. CO-A’s limited investment in foresight is a “fact finding” exercise conducted when participants receive an agenda for the annual strategy workshop. Part of the pre workshop task is a
set of questions where participants prepare themselves via undefined methodologies (most likely a personal brainstorming activity) for the workshop. During the workshop, future trends (example Fig. 29) are discussed and formally recorded in a file note.23

<table>
<thead>
<tr>
<th>Environmental factor:</th>
<th>Merger of schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Tendency to restructure the educational system (merge or close down schools) as councils have fewer kids because of lower birth rates in the country</td>
</tr>
<tr>
<td>Development:</td>
<td>Low to high</td>
</tr>
<tr>
<td>Impact:</td>
<td>Currently high, long-term low</td>
</tr>
<tr>
<td>Probability:</td>
<td>High</td>
</tr>
<tr>
<td>Reason Why:</td>
<td>High school consolidation implemented, primary school consolidation still underway</td>
</tr>
</tbody>
</table>

Figure 29: Example of Environmental Impact for CO-A (File Note, 2 December 2005)

In CO-A, knowledge levels regarding the strategy process in the executive team “varies very much” (412). In principle, the strategy team creates a list of situations and discusses these with the executive team (413). However, in an effort to avoid “overstraining” executives, the strategy team limits information on strategy feedback given to the executive management and subsequent discussion (324, 412). The official strategy framework does not include discussions looking ten to twenty years in the future, although this may occur informally (408).

Informal discussions and networking contribute to strategy input in equal measure (126, 671). Market analysis in the regions is not a continuous process; it is done on a periodical basis once a year (135). Market understanding and insights are not at the foreground for all members of the management team as “there are always many people from the centralised (functional) units in the (strategy) meetings who do not know (the) market” (130). Information provided via internal stakeholders is summarised by headquarters with the contents focussing on “the most important statements and the conclusions” on a corporate strategy level, and then presented during strategy workshops (136). The strategy development framework is not seen as unique, “just (as) an attempt to bring some structure into the strategic planning” (118).

23 CO-A File Note Regional Market Analysis, internal document (2 December 2005).
A Foresight-Centric Planning Process

For CO-B, strategy development along with foresight and innovation are described as being central to the organisation. The driving factors behind CO-B’s innovation capabilities are seen in the following four areas:

1) **High management attention**: foresight (or future screening) is recognised, funded and supported by the CEO and the executive management. Foresight input is required and openly shared/discussed during the annual strategy development activities.

2) **An innovation friendly culture** ("new is good"): the company is open to new ideas; it promotes innovation activities in an open, non bureaucratic environment, mainly driven by its business units rather than from a centralised innovation function.

3) **Short routes** ("flat hierarchy, open management"): CO-B has a flat management structure; most team leaders are only one or two hierarchy levels from the CEO. In addition, because of its “open door policy” and monthly senior management meetings, speaking time is given to employees who would like to present a new process or product idea and request funding.

4) **A feeling for the future**: due to CO-B’s foresight activities, which include the active scanning of the environment for the identification of weak and strong signals and the building of scenarios, both management and employees anticipate and understand potential future changes. Insights from foresight activities are shared in workshops and communicated via the strategy process.

Foresight emerges essentially “uncontrolled”, without centralised steering. On a corporate level and for the executive management, foresight and long-range planning involve two tasks: (1) preparing data on an aggregated level which suits senior management needs; and (2) presenting the cultural norms of foresight driven strategy in the organisation. The established foresight planning structure within CO-B is focussed on the ongoing process of capturing strong and weak signals in order to identify insights and emerging futures. This structure has many levels, which will be discussed in detail through the various research propositions. One integral part of this

---

24 External CO-B Company Presentation, Head of Corporate Development, European Futurists Conference, Lucerne/Switzerland (22 November 2006). The case study research supported these statements.
process is the open nature of communication and information distribution inside the company. By ensuring ongoing feedback loops, this strategy development approach allows multi-level information sharing where both top-down and bottom-up interactions occur. Another key part of the foresight strategy is the employment of future agents. Future agents are employees of the organisation drawn from across all business units and acknowledged for their unique and invaluable input. They are seen as key sources for input into the foresight process. They look ahead, gather their thoughts about future developments and deliver input to the centralised foresight function. CO-B hopes to achieve a “network effect” through these agents and to foster communication and collaboration. The corporate development department then tries to consolidate this information in order to prepare input for the strategy analysis process. In this way, CO-B has an ongoing process for capturing weak and strong signals in order to identify findings/insights and emerging futures.

Foresight in CO-B does not focus purely on strong signals where the outcomes are relatively clear. It is expected that the profit centres can anticipate trends in the market delivered with strong signals, especially for issues three to four years into the future. This is seen as the “daily business” of strategic analysis rather than foresight. Foresight is seen as a link, not necessarily as a separate activity, within the strategic planning process. CO-B highlights the importance of integrating weak signals and insights into strategy conversations on an ongoing basis, to ensure that whenever a new aspect with regard to, for example, customers, customer needs or new products arises, references can be made to foresight insights. In the most basic sense, this is simply achieved by the open way in which information is encouraged to be circulated and shared in the company. With management open to ideas and insights from experts (future agents) and all employees, signals both strong and weak are taken into account. The organisation has a detailed process for identifying, describing and interpreting weak signals, to build scenarios and integrate insights and consequences, developed through future workshops, in the strategy development process.

In this approach, strong signals, such as the aging society, the importance of individualism, health, the knowledge driven society, digital age etc. were excluded from

---

25 CO-B Future Screening project briefing, internal document (18 June 2004).
26 CO-B Future Screening, internal document (20 December 2004).
27 CO-B Future Screening, internal document (20 December 2005).
the weak signals framework and later added in the scenario workshops. CO-B explains that strong signals are already represented to some degree in weak signals (as many strong signals are an accumulation of weak signals). Strong signals are captured via traditional methods, similar to CO-A, via brainstorming activities and external reports, and later integrated in CO-B’s workshops, scenarios and strategy documents.

While CO-A operates in a traditional, top-down manner, there has been some acknowledgment of the need for stronger foresight-centric strategic planning. CO-A plans to start looking for signals and insights which are not covered in the five year planning horizon or not “understood” by the company so far (181, 187), particularly as CO-A is now investing in international markets with a considerable amount of risk. One case was mentioned where it was deemed permissible for CO-A’s operations in one European country to deliver a loss because it was more important to be visible in that market than to generate profits. However, it was mentioned that there might be public concerns in the long-run with funding of international operations through locally generated profits, and that there is a need for long-range planning (179, 198, 899, 904). Similarly, CO-A buys and finances buses for other transportation companies and for its partners: the profit from the interest arbitrage is a very lucrative business (with almost zero effort). There is also a tourism business, which includes tour operations and a bus charter service that utilises the unused capacities from the other business units (197). All

![Figure 30: CO-B Foresight Process (Internal documents, 20 December 2004; 20 December 2005)]
these activities, which represent efforts to diversify from the core business, require a degree of understanding of the markets and long-term planning.

Limitations of Traditional Approaches in Supporting Strategic Debate

Each company faces various challenges in their strategic planning. Despite awareness of the need for stronger investment in foresight-centric strategic planning, little progress has been made. CO-A’s strategy team is small (2 team members) relative to the size of the organisation. There was a sense of strategy development being an obligatory exercise, especially around collaboration with corporate headquarters. Other issues are timing and the approval process, having to always gain approval from the Board of Directors of the holding organisation. Some interviewees believe that the strategy process is the wrong way around in the company: first there is budget work and completion of the annual budget, and afterwards the organisation starts to work on the company strategy. The knowledge with regard to strategy in the executive team varies greatly and the strategy team needs to be careful to not overtax the executive team. The strategy team struggles to work with this delicate balance.

CO-A has a top-down management approach with insufficient foresight capabilities. The organisation seems to have a business culture typical of former stated-owned vendors with a virtual monopoly. It was also mentioned that there are no programmes for future growth and little insight into how to differentiate itself from other providers. The traditional analytical approach that CO-A has thus far taken has had a stifling effect on open strategic debate, very different to CO-B with its open, foresight-centric model which is seen as an enabler for, and link to, strategy development.

Strategic Debate and Scenario Development

CO-A also holds workshops with the executive team to develop strategies for the five to seven business units and then later communicates these strategies to employees. The benefits of the strategy development process include a “higher obligation towards goals”, the fact that a framework for goal setting exists and that customer satisfaction can be measured and broken down to the different business units. Conversation in CO-A is largely amongst members of the executive management in a workshop environment. Despite claims by executive management that there is a “very open culture for conversations” and that the “members of the executive team are very
open”, there is little evidence of a collaborative approach with multiple feedback loops within the company, or of the company’s hierarchy allowing for open discussion (608). In fact, there is an apparent culture of competition within the company, with people wanting to “protect” their ideas from other people in the company (608).

This is in stark contrast to CO-B, for which active conversation is an important part of preparing for the “degree of uncertainty” in the future (612). Such conversations were seen to help eliminate complexities and misunderstandings in final strategic analysis (618). It is also about CO-B maximising resources, by opening innovation to every employee (620). Different employees acknowledge that foresight and insights from the scenarios provide additional interactive inputs towards the market analysis, which again provides a foundation for reanalysing strategy (156).

As opposed to the “top-down” approach taken by CO-A, CO-B’s leadership is described as a “flat hierarchy” (286). What this means is that discussions regarding innovation and strategic development are open to every employee, in each business unit within the company. Interestingly, there is a view within CO-B that they should invest (even) more time in managing and reviewing existing weak signals, and include them in a more structured and obvious way in strategic analysis (907). Despite this, it was mentioned that CO-B often has very ambitious goals and that the mechanisms within top-down and bottom-up approaches to aligning strategic plans and creating implementation plans do not always seem to work (913, 915, 916). Just like CO-A, CO-B has found that the world is generally faster, and that entry barriers are becoming lower. This increases the importance of alternative strategies (909, 910). For CO-A, with its international expansion and need for strong regional market planning (198), it is expected that foresight information is necessary for both short and long-term success.

There are few examples in CO-B that demonstrate direct results having occurred due to corporate foresight. Results are mostly thoughts and additional ideas, used as additional input for the company’s decision-making process (145). CO-B engaged an external innovation agency (Roos & Cocca 2004) to analyse existing publications about the future of banking and changes in society and technology, to understand future implications for the industry. Based on underlying forces, the consultants and CO-B strategy managers combined the drivers of change (Fig. 31) with the key elements of the industry to identify and describe the consequences in the long-run (10+ years).
As a result of this process, in combination with other foresight insights and scenario building activities, divergent scenarios were identified. In 2006, CO-B finalised and presented its own two “worlds” or key scenarios based on weak and strong signals which could influence the organisation in the long-run. Again, CO-B collaborated with a university to identify methods for combining signals and their projections into scenarios\(^\text{28}\), as literature does not provide detailed information on recommended approaches and methods. The report recommended four methods to combine signals into meaningful, value generation scenarios (Appendix L):

<table>
<thead>
<tr>
<th>Method</th>
<th>1: Combine weak signals with trends to create bifurcations in timelines</th>
<th>2: Elaborate patterns of logical consequences</th>
<th>3: Experiment with cross-overs</th>
<th>4: Entrepreneurial creation of futures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>Track a signal’s anticipated path through time,</td>
<td>It is an approach of systems dynamics to</td>
<td>Structural changes in markets or industries can arise</td>
<td>Create entrepreneurial settings in which</td>
</tr>
</tbody>
</table>

\(^{28}\) Fuller, Ted 2005: Inventing Futures. The interpretation of “weak signals” into futures that matter. A report for CO-B’s Future Screening Project.
CO-B chose to combine and utilise methods one to three as part of its scenario building process. This allows cross-overs to acknowledge and include industry foreign concepts and combined signals to create bifurcations (projections). It then utilised matrices and impact analysis to understand patterns in logical consequences. CO-B did not consider method 4 (entrepreneurial creation of futures) as part of its first rollout of the new foresight process, as originally planned.

The starting point of this process was multiple workshops, primarily with employees from the corporate development teams (and external experts to review the work). Medium-term signals (up to ten years) were analysed and interconnections created in the form of a multidimensional matrix. This allowed the team to categorise, cluster and combine signals. The prioritisation of the collected weak signals occurred in a qualitative way, based on conversations, to determine whether the combination (logical consequences) is (1) inconsistent (both signals/projections will most likely not occur
together); (2) neutral (both signals/projections do not influence one another); or (3) positive (both signals/projections support one another or could co-exist).

The multiple projections or potential future developments (bifurcations) were identified and described for each signal, or cluster, if applicable. The methodologies used were brainstorming, visualisation of clusters and open creative conversations. Based on clusters (around signals and projections), core themes were identified and verbally described, tested against the insights and further developed and refined. This led to the creation of the two future scenarios; a convenience world (scenario I) and a security oriented world (scenario II). Both scenarios were expected to potentially occur in 2015 (ten years in the future). There was a long debate about the impact in the organisation under both scenarios. The executive team acknowledged that these are the two scenarios which are used as the basis for testing the bank’s strategic plans and the organisation’s readiness for change. The executive team decided that the “convenience” world has a higher priority than the “security” world, because CO-B is already in a very good position with regards to security (154).

CO-A, on the other hand, does not have any alternative views about the future. The company has a straight line strategic view and does not consider alternatives or disruptive changes, and as a result of this, experiences few strategic debates.

4.4.2 Conclusion Regarding Support for RP1

CO-B has adopted a foresight-centric strategic planning process where conversations about the future help to support market analysis and eliminate complexities and misunderstandings in final strategic planning. Foresight enables innovation for every employee, supports the cultural norms of foresight driven strategy, and is uncontrolled and seen as essential to the organisation. This requires and supports the flow of foresight information and thus enables strategic debate. As a result of this process, divergent scenarios were developed and tested against the organisation’s readiness for change. On the other hand, CO-A’s traditional analytical approach creates a culture where people protect ideas, where managers avoid communicating the whole picture to the executives and thus limit conversations about the emerging future. Strategy lacks the
qualitative elements that emerge through a foresight approach, and is seen as an obligation, not described as an opportunity. As a result, no alternative views of the future are generated and strategic planning is seen as a straight line process.

A foresight-centric planning process, such as used by CO-B, facilitates more open debate, thus revealing more divergent scenarios for consideration. Open conversation allows for a sense of informality within the information exchange, making more people willing to present their ideas (619). It also encourages foresight to occur at all levels of the organisation (621). This interaction across different hierarchical levels (578) combines strategy planning and communication.

The traditional method of foresight analysis favoured by CO-A does not look further than ten years ahead. Within that timeframe, scenario building was not used as a method of foresight planning (741), as, for instance, the company does not believe that “these sorts of thoughts and considerations should happen” (741). Based on the traditional foresight processes described above, CO-A seems to be driven by a need for structure and goal setting rather than innovation and long-term planning (121, 122). In contrast, CO-B has made scenario building, and all relevant conversations, an integral part of their strategy development process, across different levels of the organisation. Rather than just achieving tangible results, the goal within CO-B is to create a certain mindset within the organisation that allows long-term issues and trends to be recognised. This means that the company can try to anticipate alternative outcomes. In this way, divergent scenarios are revealed and opened up for consideration.

In comparing the data provided by CO-A and CO-B, the importance of the role of open communication and strategic debate in revealing more divergent scenarios about the future was supported. Conversation regarding foresight can determine the direction a company takes, the availability of knowledge, and the limited available interpretations of different signals. The traditional nature of CO-A’s approach to leadership is designed to prevent open-minded conversation regarding foresight. It is strict, reactive and hierarchical, and not successful in strategy development. The data on CO-A demonstrates how traditional analytical approaches can limit discussions within a company, while potentially also limiting results. Other areas that need to be addressed in CO-A are collaboration and “thinking together”. Good communication interfaces between strategy and finance teams are linking organisational goals to individual performance plans, and initiating the whole process early enough to define and
understand strategic goals at the beginning of the planning process. Goals also help to determine strategy.

In contrast, CO-B has a more forward-thinking analytical approach to strategy and has had various successes. Foresight is seen as an ongoing process that needs to be conducted to identify relevant forces which influence the overall strategic landscape. The open communication channels in CO-B have democratised strategic debate, and so more ideas are able to be considered. The “flat hierarchy” in CO-B is a reflection of a more foresight-centric approach to strategy, as opposed to traditional structured analytical approaches that use a more conventional, hierarchical approach. This enables strategic debate to occur in an open manner. Foresight experts have argued that to be successful, innovation culture must be a part of the organisation, reflecting core corporate values. CO-B demonstrates that incorporating innovation as a core part of the company culture ensures successful strategy development. Conversation of this nature is an integral part of successful strategic development. It is therefore concluded that a foresight-centric strategic planning process, based on long-term views of the future and visions and scenario building, will foster open strategic debate and a culture which will result in more divergent scenarios.

4.5 Research Proposition 2

RP₂: In comparison to organisations exhibiting traditional structured analytical approaches, those adopting a foresight-centric strategic planning process will have more future oriented strategic projects and an innovation driven culture.

4.5.1 Research Findings for RP₂

Foresight-Centric Strategic Planning and the Planning Horizon

CO-A does not discuss long-term strategic topics, although different teams in the company may look that far ahead. However, it is not a part of the official framework of the organisation’s strategy process, and as such, not part of the company culture. The planning horizon of CO-A is three years. With vague statements
such as “we sometimes think ahead”, CO-A has a limited commitment to looking further than this, with the longest point in time ever discussed being five years (133, 169, 170, 172, 173, 175). One individual in CO-A mentioned that he would like to be more future oriented and wants to cover a ten year planning horizon (176). Interestingly, CO-A’s contracts for the provision of passenger transportation with councils and states are typically of four to ten years’ duration and their buses have an average service time of fourteen years (173, 178). The long-term commitment to legal obligations is not compatible with the relatively short strategic planning horizon.

Historically, the business of CO-A has been relatively stable, and as such no disruptive changes are expected to happen in the future (173). It was mentioned that a particular strength of the company is its size, which allows it to “sleep” (178). The organisation feels comfortable losing performance in some areas, as its past performance demonstrates a steady increase in overall turnover by approximately 5% annually. As the market is “not so dangerous” and as it is a large company, CO-A does not feel the need for progressive change or great innovation (178). Despite the historical stability of its market, there is awareness in the company of the potential for sudden change (174), but CO-A still does not plan extensively into the future, instead keeping foresight focussed on the short-term. The focus of this information sharing is fairly retrospective (127), collecting information and making decisions based on current events. Overall, the strategy process is fairly new, with little financial support and very little focus on market research (113, 120). Despite showing an interest in foresight development, the process does not allow for much feedback or an easy exchange of information between various sections of the business.

Similar to CO-A, CO-B’s “traditional” planning horizon is five years (180, 182, 184, 188), whereas economic forecasts are limited to one to two years (182) and the financial planning process is limited to three years (188). At the basis of CO-B’s longer term planning process is the production of a strategic analysis document which looks at short and medium-term strong signals and longer term weak signals. This document is prepared by the Corporate Development team, based on inputs from the foresight team, future agents and business units. CO-B has acknowledged that when looking more than two to three years ahead, a level of speculation comes into play. This is the reason for a dedicated foresight process for capturing weak signals to cover issues not necessarily revealed by traditional strategy planning methods. Foresight capture and analysis, which
is a continuous process, covers at least five to ten years (182, 183, 184, 187). CO-B is open to looking beyond ten years, however as the business is considered relatively static, the company does “not need to know today what will happen in thirty years” (533), and the ability to determine the likelihood of the future decreases remarkably (826).

The traditional structure of CO-A lacks foresight activities, and as such has created an environment that stifles the potential for long-term planning and innovation. CO-A is a company with organisational silos due to the isolation of its regional business units, a proposed innovation management team which will focus on product and project management rather than organisational development, a reactive leadership approach, a low level of executive support for change and missing links/processes to connect foresight with the strategy development framework (274, 472). There is uncertainty as to whether railway companies are competitors or partners: in some cases, railway companies have expanded CO-A’s services from the protected market into the open local passenger transportation market and operate buses to extend their network (206, 901), for instance via cooperation with regional service providers (207). At the same time, CO-A will compare itself against the Swiss railway company, especially when CO-A has a comparative cost disadvantage. Without a foresight planning framework, CO-A has little chance of identifying opportunities in the market place. Clear direction for the company, and a common understanding of what to focus on, are much needed by CO-A (208).

**Foresight, Innovation and Organisational Change**

The most recent innovative project undertaken by CO-A occurred twelve years ago, when a new service offering was introduced (384). This lack of recent innovation has been noted and an innovation programme established in order to solve the “innovation jam” (384). This, however, has not been properly developed beyond hiring an external company to deliver ideas (394). CO-A has, though, begun to reinvest in one previously successful innovative project regarding digital information boards (389). While there appear to be attempts at innovation, the essentially conservative nature of the company makes it unwilling to take risks and present a portfolio of innovative and/or future oriented strategic projects. A focus on producing a quality product is highly regarded, and while this is a positive characteristic, it also makes the company “blind” to further innovation (392).
Both CO-A and CO-B have noted the “uncontrolled” and “spontaneous” nature of innovation. CO-B has created infrastructure in order to enable “uncontrolled” innovation to be directed. Since winning an award for innovation in 2006, CO-B has started to formalise its innovation management. As everyone is encouraged to bring ideas to the table, CO-B has some employees whose sole occupation is the management of ideas, causing one interviewee to suggest that perhaps innovation has too much of a priority. There is no denying the support CO-B gives to innovation, with a generous budget approval history, and an open and generous attitude.

Strategic alternatives and innovations that have been considered by CO-B are numerous, and have been used as a tool to “enrich” the future of the company. One example given in the interviews was the introduction of the “convenience” approach. Research, interviews and foresight workshops led CO-B to realise the importance of convenience to its customers in order to stay relevant in the marketplace. This required a “cultural change” in the company, and a goal to “have easier products, less products” and more clarity in their market strategies. This is a whole new direction that CO-B pursued as a result of the entire foresight process. As a result, the entire company is now “ready for change”. A “time map” has been created that highlights and identifies weak signals that have clear potential to become important in the future; issues or areas that “are not yet fit enough for future change”. Despite the apparent success of the “convenience” approach, one interviewee claimed that there has only been a “marginal” cultural change, and that foresight strategy is still “not highly prioritised and communicated”; CO-B is still “far away from this”. Despite this comment, the response in the interviews was overwhelmingly positive. This “convenient” world shifted the public image of the company, as CO-B’s brand is already “strongly connected to security”, which in a security oriented society is a “very good position”. As a result, they have actively tried to simplify the structure of the company for customers, making it more convenient and easy to do business with. This meant an upgrade of services in 600 branches and an offer of extended counselling, in direct response to the results of strategic analysis. These decisions have been based on “intuition”, on the results of the workshops with the executive team” and through open

---

29 A. T. Kearny media statement, 28 April 2006 (“CO-B convinced the jury particularly by its excellent innovative strategy. Its status as a state owned enterprise forces CO-B again and again to identify and occupy new business areas in an innovative way …”).
CO-A and CO-B displayed different levels of change implementation thus far in their strategy development. CO-A did not display any significant company changes as a result of the foresight gained and strategy development. Executive management has not so far “been confronted with the fact that strategic surprises could influence the company” (643), despite an awareness of changes in the market and potential advantages for themselves. For instance, CO-A is aware that the Swiss Railway charges more and has a negatively geared cost structure during non-peak hours, however the company is yet to take advantage of this potential opportunity in the market, instead relying on “political discussions” with the government (642). A more foresight-oriented company would perhaps invest in research that is focussed on such opportunities and determine how they could take advantage. This uncommitted response to such potential foresight research is partially a result of past failures, such as the company’s inability to succeed in the tourist market (644), or the limited success in international expansion (645). This is very different to CO-B, which delivered strategic projects and alternatives as a result of foresight activities.

4.5.2 Conclusion Regarding Support for RP$_2$

In order for an organisation to have more future oriented strategic projects, innovation and foresight needs to be a part of the culture. Here, CO-A can be described as a market dominating, traditionally managed organisation with little fear of, or respect for, discontinuities and therefore a perceived limited need for long-range planning and strategic discussion. The fact that CO-B has potentially a more vulnerable market position than CO-A may explain why it is more advanced in terms of foresight. CO-B’s vulnerability has forced it to evolve and grow, using more foresight-centric focused strategies than the traditional methods that CO-A continues to use.

There seems to be a conflicting nature to the corporate culture of CO-A. When asked to describe CO-A in some key words, interviewees used phrases such as “open, transparent” and “friendly” (357), yet when later detailing various roadblocks employees
experience with innovation, the culture of CO-A was described as “money oriented, very hierarchical, authoritarian and tough” (364). It seems that CO-A's priority is to appear as though employee satisfaction is of central concern. A standardised employee satisfaction survey is undertaken “but there are absolutely no actions based on the results” (363). There are leadership tools available (363), and official company values developed (364), but only because they “exist” (363). Despite “complaints and unhappiness” recorded as a result of the surveys, no proactive action has been undertaken (363). One interviewee goes so far as to infer that human beings are of no significance to CO-A (364).

The flat hierarchy of CO-B allows for open discussion throughout the entire company, fostering a positive and open working environment for employees, however this friendly atmosphere means that conflicts are sometimes kept “under the table” (370, 371). This hesitation to cause conflict, and desire for consensus, perhaps makes investment in innovation a bit “lethargic” (370, 372). However, overall, the culture of “openness” appears to be a positive, a point that is reiterated again and again. According to one interviewee, the CEO encourages innovation and foresight (373). Accordingly, change within the company happens in one of two ways: “revolutionary” or “evolutionary” (374). When a change in strategic direction occurs as a result of an idea or vision of the CEO, the result is one of “chaos and confusion”, which is described as “revolutionary” change. Once this change is understood and accepted by the company as a whole, an “evolutionary” change occurs (374). Despite these difficulties with change, there is an overall culture of innovation in CO-B (368). This attitude demonstrates the importance of strategic corporate foresight to CO-B, and the role it has in creating awareness of market trends and being an innovator (650).

Due to the traditional nature of CO-A’s strategy process, managers only participate in the conversation and practice of foresight twice a year. The more advanced CO-B understands the need for continuous innovation. This is particularly necessary in order to prepare for strategic surprises; scenarios are created, for instance an IT crash, and then a wildcard situation is added to the scenario. This wildcard example given in the interview was a terrorist attack, and an employee of CO-B explained how the company would adjust foresight strategy focus according to the wildcard (651). This proactive attitude is largely a result of the culture in CO-B regarding foresight as integral, and encouraging changes to direction as a result of various scenarios (652). Strategic
programmes in CO-A are national programmes that cover the “most important projects” (824). The management of each business unit is responsible for the strategic programmes they participate in (825). These programmes do not look further than two to three years in advance (825). In terms of success, CO-A has realised that its strategic programmes are “relatively weak”, and as such it has plans to invest “millions” in hiring an external company to brainstorm and deliver ideas (827). This reflects openness to change, and awareness within the company of the importance and benefits that foresight development could provide.

CO-B has a formalised, yet open foresight driven innovation programme. It is seen as a tool which enriches the future of the company. As a result, awareness of market trends is widened and numerous strategic alternatives have been developed. It is concluded that foresight has led to a degree of cultural change. This long-term view is not part of the official strategy framework in CO-A. Its market is described as stable, and no disruptive changes are expected. There are limited investments in market research, with reactive planning and little support for foresight driven innovation. Innovation is kept at product level and there is no link between the limited foresight activities and strategy development. As such, CO-A does not take advantage of opportunities and in return, this limits the number of future oriented projects.

The data provided by CO-A and CO-B demonstrates that organisations that use foresight-centric strategic processes will have more future oriented strategic projects and an innovative culture. Using the traditional structured analytical approaches to foresight, CO-A is devoid of any actual results. Their efforts are minimal and they are unable to produce any successful future projects or innovations. CO-B, on the other hand, has adopted a more future oriented strategic attitude towards foresight projects, and as such has a more innovative culture and more success to display. It is therefore concluded that research proposition 2 is valid: organisations with a foresight-centric strategic planning process will have more future oriented projects and an innovation driven culture.
4.6 Research Proposition 3

RP₃: Conversations around the future environment of organisations generated as a consequence of using traditional structured analytical frameworks in strategic planning such as SWOT and PEST will generate a convergent perspective about the future and lead to the adoption of strategies that support incremental change.

4.6.1 Research Findings for RP₃

Traditional Analytical Frameworks

The strategy of CO-A is determined in a top-down manner (248). As is typical of many corporate environments, hierarchy is an integral part of the culture and affects the manner in which innovation and strategy occurs. When strategy is implemented, it is based on the decision of the corporate group, and employees are only later informed (252). CO-A’s strategy process has started to promote a framework within the company in which each division has goals to reach. These goals, while based on the information summarised in the strategy document, are ultimately based on decisions made by the corporate group (127, 253, 256). Management is in control of this whole process, to the point of stifling input from other areas of the company (102). This hierarchical method in which strategy development is decided has had some negative results: one interviewee noted that the highest proportion of staff hired has been at the headquarters, rather than where vacancies more desperately need to be filled in the regional centres and that it is a “very centralistic oriented company” and “a little bit inconsiderate” (257). It is statements like these that are reflective of a cultural challenge within CO-A. Management centred and hierarchy focused, the organisation is not open to a foresight-centric and innovation driven strategy planning approach. CO-A is also limited by an insufficient budget allowance for long-term planning. Rather than using foresight to prepare for strategic surprises, the budget only allows for reactive strategies. For instance, one interviewee noted that as a part of strategy development, CO-A observes the market to see what is going on. This is, of course, “a very reactive way of building strategy” (127). The final decisions are still left to the corporate management (260). Interviewees noted that CO-A requires better tools, especially additional qualitative elements, more clarity around the roles in the strategy process and more extensive involvement of the executive team members (today they seem to have a passive attitude) (205).
Using interviews with regional managers as a source for collecting market insights, CO-A summarises the information using PEST and SWOT to create “a list with opportunities and threats” (295). Outcomes from these interviews are compared with the success potential of competitors (293). Here, PEST and SWOT are barely more than frameworks used in “an attempt to bring some structures into the strategic planning” (294). This means that the information is static and not necessarily further used in the strategy development process, for instance to build alternative views of the future or link insights with innovation/growth building initiatives. Similarly to CO-A, CO-B also uses the PEST and SWOT frameworks during their analysis, but it is not the key focus of its activities, nor the preferred tool set. They “do not want to establish a lot of infrastructure” with large content collections in order to avoid information going stale, or “rotting” (296). This mainly refers to long tables with information which no one in the organisation will ever use. Keeping information fresh is most suitable to the current business climate, as in an environment of rapid change, information becomes outdated very quickly.

Rather than using PEST and SWOT as the means of strategic analysis, CO-B focuses on qualitative methods and information, while PEST is only used to structure and classify the results (297, 298). CO-B’s framework is more institutionalised, exchanging knowledge amongst team members and using the internal future agents and strategy workshops (303). CO-B runs market research, holds interviews with individuals from “future industries” and industries believed to need knowledge about the future, and then as a secondary analysis refers to a variety of literature (297). Based on the information gathered, the SWOT analysis is updated and threatening scenarios for the future (five to ten years ahead) are hypothesised. These are described, with possible consequences and actions for CO-B evaluated (300, 303, 304). Despite using PEST and SWOT to consolidate and summarise information, the process includes additional qualitative elements, using intuition and verbal communication to support scenario planning (305).

**Analytical Tools and Convergent Strategies**

CO-A does not have a strategy development process based on long-term qualitative market signals. Despite an awareness of potential risks or danger in the future, employees are unwilling to discuss such things with the executive team (452). In fact, executive management has never been confronted with the idea that strategic surprises...
could influence the company. As they are based on a traditional structure, it is ultimately the Board of Directors of the holding organisation which approves every strategic move the company makes.

In terms of tangible outputs for CO-A from strategy development and foresight, it is interesting to note that the only examples given were of unsuccessful projects. One such failed project had the goal of cost cutting. As a result, there were significant lay-offs in the company, a move that had to be later reversed. The company now has “considerably more employees than before this project, due to the negative impact the strategic project had on the company overall”. Another example given was transportation services for tourists. For reasons that CO-A seems unable to pinpoint, they have not been successful in this market. Despite investing money and having good employees, they have had a negative business result in this unit. For instance, they recognised a market for Asian tourists who would like a tour directly from the airport throughout the whole of Switzerland. However, because “competition was stronger” or perhaps because “private bus companies are better and/or bigger” in this market, their investment in this project was unsuccessful.

Another example where strategy was unsuccessful for CO-A was with international expansion, when the company planned to expand a line directly from the south of Switzerland to an airport in Milan, Italy. This solution too no longer exists. Despite having a “basic structure” for formal and planned innovation utilising PEST and SWOT, described as traditional structured methods, one employee claims these failed to deliver structural outputs and were the result of spontaneous decisions, and that there is “no innovation stimulus in the organisation”. The recent “innovation push” in the company based on new products, managed through a centralised team, did not hold much promise either, with less than fifty ideas even being considered.

Within CO-B, corporate foresight happens “without centralised steering”, and there is a structure that fosters and encourages innovation. The future agents theorise future developments, and their input is used in strategy workshops that determine trends and scenarios five to ten years in the future. Open discussion between all levels of the company ensures team members attain mutual understanding and agree on what is important, which encourages more open conversation. This is a very important point in CO-B, as its attitude is not focused on the analysis itself, but on delivering
uniform commitment to treating thinking ahead as a priority (460). Staff at CO-B are not purely looking at the results from PEST and SWOT analysis, and as such are not being moulded into a convergent perspective about the future that only provides leverage for incremental change. CO-B is driving strategic conversation beyond that structure provided by traditional methods relying on SWOT and PEST.

In terms of IT support used by CO-A for foresight purposes, the company tends to use Microsoft® programmes (539, 543). CO-A would like to have a new marketing database in the future that would manage market insights and automatically generate reports for them (541). This system, it is hoped, will reduce redundancies and ensure regularity (542). This is different to CO-B which does not wish to utilise specialised foresight software (545). CO-B’s hesitation to explore different tools and databases is due to the belief that data will “rot” over time and that an exchange of knowledge adds more value to the organisation than sophisticated signals management software (574). It is interesting that CO-B is unwilling to take advantage of newer technologies, such as sophisticated databases, to support signal collection and processing activities. While the organisation is leaving itself open to the possibility, it seems that traditional software remains the preference (551). One valid reason provided by CO-B for not using technology is the difficulty of translating qualitative results into a quantitative framework or database: software tools will not be able to support this process (552).

4.6.2 Conclusion Regarding Support for RP₃

An important part of strategic planning is keeping conversation and debate regarding the future environment of an organisation as open and fluid as possible. This will expose the company to more ideas, providing a more divergent perspective about the future and, potentially, an abundance of strategic ideas that may be adopted. Using more traditional approaches that focus on SWOT and PEST analysis will generate a convergent perspective about the future, and as such any changes will be incremental.

CO-A has a top-down, centralised and reactive traditional planning approach utilising static information via PEST and SWOT analysis. It utilises internal experts (regional market leaders) and some external market research, but it was mentioned that the
organisation requires better tools and additional qualitative elements. The company is unsuccessful with new innovations, benefiting from incremental growth from its core business; traditional planning methods have not provided a stimulus for innovation. On the other hand, CO-B, while still applying traditional methods for the purpose of classification, focuses on qualitative methods, using intuition and verbal communication to support scenario based planning via its internal future agents and external industry and future experts. Due to the traditional way in which CO-A has structured its analytical framework, based on the strategic planning of SWOT and PEST, there are no programmes for future growth and little insight into how to differentiate itself from other providers (896). The desire of CO-A to use traditional analytical frameworks such as PEST and SWOT is understandable. Foresight experts have argued that “many organisations have difficulties dealing with increasing speed, complexity and globalisation issues: they try to focus on managing the day-to-day business and often times leave strategic planning issues to external consultants” (582). This temptation to outsource these conversations is largely unsuccessful, as demonstrated by the evidence above.

Unlike CO-A, CO-B does not give major weight to traditional structured analytical frameworks. They do use the PEST and SWOT frameworks (in most cases for strong signals only) during their analysis, but it is not the key focus of its activities, or the preferred tool set. This is what makes CO-B more successful in envisioning the future using weak and strong signals. It is the task of the whole organisation to look forward, not just for their specific area but also for the organisation in its entirety (453). Ultimately, CO-A has so far been shackled by a “very strict and authoritarian process” (255), that reveals a lack of initiative. For CO-A, there had been “no innovation stimulus in the organisation”, and “no new products” (836). While interviewees did point out that there had been a “higher planning accuracy” with “quantitative planning” (835), the lack of viable strategic programmes is reflective of the way in which strategy planning is undertaken at CO-A. As it is the Board of Directors of the holding organisation which approves every strategy, “we can infer that it is in fact the Board that lacks vision” (450). As foresight is “a process of social construction of knowledge”, it is not an exact science (470). To limit strategic discussion, culturally or structurally, limits the potential for success. Field research supports research proposition 3. CO-A, which utilises traditional structured analytical frameworks, has a track record of limited (or no) success with new projects, and is entirely dependent on incremental growth from its
core business. Unfortunately, CO-A lacks a corporate strategy developed on the basis of long-term market insights and opportunities, and is limited by cultural boundaries which hinder innovation.

4.7 Research Proposition 4

RP$_4$: Strategising in organisations that integrate both strong and weak signals foresight methodologies will generate strategic imperatives that both address current challenges and prepare the organisation to address anticipated industry and market reconfigurations.

4.7.1 Research Findings for RP$_4$

*Weak Signals Foresight Methodologies*

Each of the companies has a variety of resources, both internally and externally, through which weak and strong signals are examined. Foresight occurs in CO-A in a “relatively concentrated form” (655). The expert interviews (an internal resource) (655, 671) cover competitor and market information to visualise and classify environmental drivers (657). In other words, they are examining already existing information on strong signals. These interviews are the main source of information for future development (659), covering “the environment, markets and industries, and external influences” (661). This document allows CO-A to build “competitor and market information systems”, so they are able to “visualise and classify environmental drivers” (657). CO-A also uses external research projects, largely from market research organisations due to their more scientific nature (663). This whole process is connected to the corporate headquarters, which retains control within management over strategy development in CO-A (662, 664). CO-A seldom speaks about weak signals and uncertainties regarding the future, and is therefore focusing on strong signals in its environmental scanning activities.

Gathering information for strategic analysis is an ongoing process within CO-B, as the importance of having “someone who is doing the back-breaking work” is recognised (668). This heavy work includes collection and classification of signals, summarising as
necessary in a catalogue, and highlighting weak signals while working in conjunction with market researchers to confirm direction and progress (668). CO-B has an extensive variety of information sources, both internal and external. The future screening project within CO-B involves generating knowledge through research projects with focus on weak signals, and using representatives in the future agent network to focus on strategic foresight (666). The strategy process reflects a collaborative method, involving the corporate development department, input from the strategy team (280) and the previously mentioned future agent network (281). The network is made up of twenty members of the company, representing most divisions (282). The information gathered is consolidated in order to have input ready for the strategic analysis and includes both strong and weak signals (281). CO-B uses a variety of information to run their qualitative analysis, including trend reports, future web sites, science fiction literature, economic data and information from external partners (667).

In collaboration with a Swiss university, CO-B created the most complete and practice oriented study on methods to scan the environment.30 After two months of investigation, the research team collected around 128 different methods (Appendix M). They were clustered in five categories: (1) trend analysis; (2) monitoring and intelligence; (3) modelling and simulations; (4) creativity methods; and (5) expert opinion) that were called “method families” (Appendix N). To assess the over 120 identified methods (with focus on the 53 identified qualitative methods), CO-B created a list with more than 30 criteria to evaluate the most appropriate, practice oriented scanning methodologies. Based on results from this research project, it was recommended that CO-B starts the process via trend scanning and monitoring, focusing on desk research to utilise existing knowledge from experts, authors and universities. As presented above, CO-B followed these recommendations.

Foresight, Strategic Imperatives and Organisational “Readiness” for Change

Using the information gathered in its strategic market research, CO-A comes to conclusions based on the market view, following which strategic action is defined (310). With an understanding of the market in which they are active, CO-A breaks down corporate strategy into single business units’ goals (324). While there is strategy

---

30 Koncilja-da Mata, Christiane; Nguene Nguene, Gustave; Peter, Marc K.; Rossel, Pierre; Steiner, Beat & Wyser, Beat D. 2004, Methods to find Weak Signals for Foresight and Scenario Planning: Report for Project Future Screening, November, EPFL Lausanne, Switzerland.
development for the company as a whole, the individual business units in the regions create their own market plans as “this is the business of the regional area managers” (324). Senior management is not aware of potential strategic surprises as weak signals are not identified and connected (325). Nevertheless, CO-A does intend to improve its strategy development efforts. Despite its centralised decision-making system, CO-A encourages employees to think more strategically (333). Whereas there used to be no strategy on a group level, discussions of possibilities and existing potential in the market are now “more healthy” (333, 334). However, when trying to identify drivers for the future, they cannot find, and virtually ignore, weak signals. Consequently, instead anticipating and preparing for industry and market reconfigurations, CO-A waits and adapts later. CO-B is more successful in integrating both weak and strong signals. Its foresight process is almost perfectly aligned with the recommendations from foresight experts. Input gained from user observation, expert interviews, market and competitor analysis, market trials and anthropological studies leads to CO-B “prototyping the future” (517).

CO-A is now in the process of developing and building an innovation management team (489) with little focus on direct financial benefits, which is surprising given the aforementioned focus on monetary gain in CO-A. Through the new process, CO-A finds it feasible to look up to five years ahead (493). This process is being further developed, with the goal of eventually being able to reduce redundancies, ensure regularity and make relevant information available for discussion (494). At present, it is believed that the level of investment to understand the future is too “time consuming” (494). In contrast, there is a level of respect within CO-B for the nature of foresight, particularly displayed in the acknowledgement that staff are not “in charge of everything, or have an influence on everything” (495). The organisation has followed expert recommendation in dealing with the relativity and fallibility of knowledge (522). As such, economic forecasts have been separated from the rest of the foresight activities. The economic forecasts require more certainty, so they look no further than two to three years ahead. The rest of the future screening goes longer than this, covering issues that are not necessarily covered in the regular strategy planning process (498).

Foresight is a process that occurs at all levels of CO-B and there are various set processes within the company in which foresight is a driver. There is an analysis focus around December, in which primarily strong signals are captured, and with “a degree of
certainty” they can predict the near future. A foresight project generates knowledge using external input from foresight experts focusing more on weak signals, the future agent network uses information from external studies and workshops within the company to create “strategic analysis” to identify trends five to ten years in the future, and workshops are held within the company for scenario development and discussion. This combination ensures that the foresight process is completely “decentralised”. Discussions resulting from this foresight process also prevent the ideas becoming so “abstract and complex” that no one can understand them. It prepares and encourages people to be always thinking ahead. From this, a document is created that includes traditional analysis alongside weak signal analysis. Ultimately, strategic projects are created and prioritised from the information this document provides. Every three to four years, the company runs an in-depth screening process into reading signals and environmental scanning, to support the information provided by their future agent network. This is all used as input for the strategy development process, which includes updated business plans and updated strategic analysis on a yearly basis.

CO-B takes a collaborative and somewhat uncontrolled approach to assessing the future. In recognition of the fact that the future is largely unknowable, the focus is on maximising the number of people providing input on priorities. However, because participation in strategy development is voluntary, not all areas of CO-B are involved. While initially noting the importance of keeping foresight insights and reports up-to-date, as they have the propensity to become outdated quickly, it was later admitted that there has been no concerted effort to update the foresight report recently. Without a clear idea of who is in charge, or even who is involved in a certain project, and no clear policy on how often the report should be updated, there can be no accountability and there is therefore a risk that the evaluation remains “a puzzle”. Despite these problems, though, strategy development in CO-B can be considered a success thus far.

As a result of this strategy process, which incorporates both weak and strong signals, CO-B has the ability to describe strategic imperatives that prepare the organisation for industry and market reconfigurations. The quantifiable output of this process was the development of the two scenario based future “worlds”. The executive team acknowledged that these are the two scenarios which are used as a basis for testing the
bank’s strategic plans and the organisation’s readiness for change. After long debates and many workshops, management defined a list of actions required under each scenario, but decided to implement the changes required to prepare for the “convenience” world (154). These included a degree of cultural modification, a new organisational structure, and a review of current medium-term market strategies and market positions, and product portfolios (755, 758, 828).

Further, the strategic imperatives support the organisation’s ability to act as a learning system, as the process has delivered thoughts and ideas for future consideration and additional input to support the strategic decision-making process. This cultural mindset enables the organisation to reorient itself as the environment changes (149, 649, 652, 758, 830). It is concluded that as a result of this process, CO-B’s level of readiness for change has improved (830) as it has created strategies to address both current and future challenges.

4.7.2 Conclusion Regarding Support for RP4

CO-B has a strong focus on the collection and interpretation of weak signals: the organisation analyses internal and external data, including consumer information, past trends, market research, customer surveys and desk research. When all of these “components come into play”, weak signals are created (718). Using this variety of methods and sources, CO-B paints a picture of both weak and strong signals (718). The extent to which it has chosen to extend its foresight portfolio is a reflection of CO-B’s commitment to strategy foresight, and its ensuing success.

The focus in CO-A is on strong signals and forecasting (rather than foresight), and management does not consider strategic surprises in its strategy development process. Therefore, the organisation has a short-term view and reactive approach to changes in the environment. There are no results in the form of scenarios which would allow a multiple view of the future and would thus prepare CO-A for industry and market changes in the long-run and build a portfolio of strategic alternatives. CO-B, on the other hand, tries to identify and understand weak signals (and strong signals for short and medium-term market analysis) in its foresight process to allow a conversation on long-term trends outside of its regular, formalised strategy planning process. This
decentralised process benefits from knowledge not necessarily accessible in regular strategy planning. A list of potential alternative strategic actions/projects is created from scenario planning workshops and results in a level of readiness for change and updated plans on both a business unit and company level.

According to foresight experts, interpretation of weak signals can be used to the advantage of a company in allowing its management to “gain new insights and alternatives about the future of their organisation, marketplace and industry” (599). Despite this, CO-A focuses on strong signals only, with an inherent degree of certainty. They have recently, however, begun to include consultants in certain regions in their strategic analysis. In doing this, CO-A has attempted to identify weak signals (593). Looking at the overall information provided in the interviews, it is clear that due to CO-A’s unwillingness to take further risks, it has not prioritised foresight activities. On the other hand, CO-B is looking to invest more time in identifying weak signals for inclusion in strategic analysis (594).

Experts said that “foresight is not so much about techniques as about judgments; judgments about the salience of one idea over another, of one trend over another, of one concept over another” (585). In order to make an educated assessment of the relative salience of ideas, both weak and strong signals must be taken into consideration. By examining the evidence, it is clear that a pattern has been established by differences between CO-A and CO-B. While they are often lacking in the same areas, it is consistently CO-B that is aware of these areas and attempting to make changes. This continues to be the case with the use of strong and weak signals in strategy development. By focussing on strategy development with a foresight-centric goal, CO-B actively examines both strong and weak signals that emerge in the marketplace. By doing this, they are able to anticipate the future, and in a variety of ways they can change their organisation accordingly. While there is no certainty in reading or understanding strong and weak signals, to ignore them is to ignore the potential an organisation has for innovation and market competition. Therefore, research proposition 4 is supported by the data, as CO-B with its strong focus on both strong and weak signals foresight, has a wider set of strategies to deal with the future across all elements of the market and industries, including discontinuous patterns of change.
4.8 Research Proposition 5

RP5: Operationalising the integration of weak and strong signals foresight methodologies in an organisation’s strategic planning process will require top-level management support and user friendly methodologies that can be readily interrogated by strategists at all levels of the organisation.

4.8.1 Research Findings for RP5

Investment in the Strategic Planning Process, its Management and Analytical Tools

There are noticeable differences between CO-A and CO-B in terms of such investment. In CO-A, despite an awareness of the importance of strategic planning, executive management is unwilling to put sufficient economic investment into this area (242) and as such, strategic planning does not have top-level management support within CO-A. CO-B has made a much more significant investment in foresight and long-term strategic planning. They have established a corporate development department that is focused on driving strategy development and innovation, with substantial support from executive management. The corporate development department has a team of over fifteen employees and is supported by a network of future agents who contribute to foresight activities (247).

CO-B demonstrates a dedication to foresight strategy, utilising input gathered from throughout the entire company by the trans-departmental strategy committee (243), and generated through running workshops that challenge the whole organisation in scenario development, with the aim of decentralising foresight strategy (245). While some executives do not see it as a high priority (246), a significant number do and this is reflected in the annual budget set aside specifically for foresight and strategic analysis (247).

In CO-A, the basic strategic planning structure revolves around an annual strategy workshop. In CO-B, corporate foresight occurs in an “uncontrolled manner, without centralised steering” (278). The strategy process reflects a collaborative method, involving the corporate development department, input from the strategy team (280) and the future agent network (281). This network involves any interested employee, opening
up the forum of debate. This allows the executive management to gather signals from the company base via different channels, and for the employees to be actively involved in the future of the company. Due to the subjective nature of foresight research, the goal in CO-B is not for the foresight development to necessarily produce monetary results, but rather for people within the company to have the ability to “say what they think is important”. With this information, CO-B can create a picture of the future and potentially enrich their company culturally, along with instigating long-term monetary gain. This collaborative, open process favoured by CO-B allows it to keep up-to-date because listening to and using information in a “top-down and bottom-up process” maximises the information available for review. This is reflected in the way CO-B continuously documents, updates and aligns strategy and business plans. This allows CO-B to be in a constant state of “change”. The organisation responds to the content of the strategic analysis as necessary, using elements of foresight to prioritise company goals and projects. Based on this, they focus on “threatening scenarios which go above the (regular) strategy period (of five years), up to ten years ahead” and evaluate the threat to the company. The developed scenarios are roughly described and discussed with the management, and based on these discussions, the most important scenarios are chosen and described in detail, with possible consequences and actions for CO-B defined and evaluated. CO-B has pre-appointed managers representing each department of the company on the strategy committee in which team building exercises take place. This committee enables the employees to open discussion, exchange opinions and share thoughts with a focus on getting “to know one another better” rather than simply “collecting information”. CO-B’s management displays a willingness to take risks, acknowledging future planning is “not an exact science” and allowing that while some foresight projects may fail, such planning is still beneficial and justified by one success and further potential for success. There is a deliberate push to ensure that the process of sharing information remains largely informal. This is done in order to avoid complicating the process in which the information is socialised.

Overall, there is a more “open” and “generous” attitude toward foresight in CO-B. The goal is to “push” their employees to go one step ahead, looking into the future. Past experiences in which CO-B has been caught unprepared for the future (for example, when a fee-free credit card was introduced by competitors) have made CO-B’s
management acknowledge the need for preparation. While there is most certainly encouragement of innovation discussions within CO-B, there is an attitude that strategy has a maximum horizon of three years due to the “mental limitation” of humans. As a result, the company re-orientates itself according to strategy discussions every year. Despite having created a corporate structure that encourages strategy and foresight, CO-B largely believes that innovation is “not about the tool, it is about the brain”.

**Utilisation of Foresight Methodologies**

The biggest challenge with CO-A and its strategy approach is the fact that it is not a continuously applied foresight methodology and therefore, CO-A cannot realistically anticipate strategic surprises. CO-A is aware that strategic analysis should be an ongoing task, and one interviewee stated that there is “no concrete” method in the company to identify trends.

The foresight research undertaken by CO-B has given it a fairly good understanding of its industry, and it has been able to conclude that “the banking industry is not the real innovator” as it tends to react to developments, rather than proactively initiate change. The methods used to collect weak and strong signals are based on corporate “knowledge management”, which entails responding to research (both investigations of past phenomena and foresight analysis), continuing to track the current market, and focusing on trend analysis and competitive analysis. It also includes looking to other countries or companies that are “more developed”: CO-B, for instance, looks to Finland for inspiration, due to the innovative nature of various programmes within that country.

One interviewee pointed out that due to the varying nature of each of the business divisions within CO-B, and the different customer needs the divisions deal with, CO-B has developed an “information collective” that reflects these differences. This enables each head of department to effectively look after their own needs, and focus on their own situation, while still maintaining a “big picture” focus. This also ensures that the information collected is relevant to the entire company. Despite not wanting to “establish a lot of infrastructure”, there is an understanding that CO-B needs “some kind of structure/framework”. CO-B uses the information gathered to understand which are the most important areas for the company, and then consolidates efforts and
focus on those areas. CO-B can thereby interpret trends, follow “what kind of meaning they have” and “define the consequences for CO-B” accordingly (698). The focus areas chosen cover both positive and negative situations, but there is a large focus on the threats so that CO-B can “build defence mechanisms” (698).

During the interviews, an element of CO-B’s key foresight project, using internal and external experts on top of desk research, was explained (691). The project involved interviewing over twenty experts to achieve a “qualitative” mix (690) of responses. This project, funded by the CEO’s office, was creatively open (691), which means that it was not limited to a pre-defined topic. Once the project team had collected information from the experts and the research, a list was created in which over 400 signals had been identified and defined (Table 9). The signals were then analysed and grouped (692) and their potential impacts were assessed and prioritised, in an attempt to narrow down the signals. Signals with redundancies or signals that were difficult to comprehend were removed from the analysis, using a process that was “purely qualitative” (728), requiring judgement calls and some guess work (725). In this way, the list of signals was reduced to 150 (728). Throughout the process, it was recognised that only qualitative techniques can capture weak signals, and that a statistical quantification of signals was not a valid assessment mechanism. A progress report with an overview of weak signals (an example of the “raw” data is in Appendix O) was prepared and presented to the management teams. Every signal included a name, an identification number, a brief description, the time horizon or likelihood when the signal would have an impact, and the source of information.

<table>
<thead>
<tr>
<th>Category</th>
<th>Weak Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking</td>
<td>54</td>
</tr>
<tr>
<td>Financial Services</td>
<td>26</td>
</tr>
<tr>
<td>Consumers</td>
<td>69</td>
</tr>
<tr>
<td>Technology</td>
<td>59</td>
</tr>
<tr>
<td>Market</td>
<td>58</td>
</tr>
<tr>
<td>Health</td>
<td>30</td>
</tr>
<tr>
<td>Population</td>
<td>15</td>
</tr>
<tr>
<td>Values</td>
<td>27</td>
</tr>
<tr>
<td>Work</td>
<td>16</td>
</tr>
<tr>
<td>Safety</td>
<td>17</td>
</tr>
<tr>
<td>Traffic</td>
<td>11</td>
</tr>
<tr>
<td>Education</td>
<td>9</td>
</tr>
<tr>
<td>Knowledge</td>
<td>9</td>
</tr>
<tr>
<td>World</td>
<td>8</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>8</td>
</tr>
</tbody>
</table>
In order to extract as much information as possible, CO-B then runs foresight workshops, which allow the company to make use of all available resources. These workshops also make the information more manageable, bringing it away from an abstract (document based) level, and enabling employees to visualise the future (726). The value of these workshops is “not quantifiable, not at all, and from a qualitative point of view, during conversations, it is all based on the type of participants in the workshops” (730). This project was open to the future of the entire company, rather than specifically focussed on one area. In the future, CO-B plans on orienting their projects towards a “special topic” (693).

Unlike CO-A, CO-B has made foresight and scenario building an integral part of its strategy development process, and has created various methods in which they can be developed. There is a formal scenario building stage, based on the results of the previously collected trends and signals. The analysis of the scenarios’ consequences is done by the executive team, despite some interviewees feeling that it is not possible to correctly make any reliable assumptions about the future (745). Once the draft scenarios have been created, they are presented to the core project strategy team (including representatives from every business unit), which spends a day discussing them in a workshop (749). During the workshop, the scenarios are enriched and developed by employees (750) who are given the task of presenting potential responses to various scenarios in a visual manner. For instance, the example was given of a strategy workshop in which Powerpoint® presentations were used to illustrate a hypothetical response to a scenario, with visuals and sounds. This method of presentation had a “very good response” (751). These workshops also help to dismiss certain scenarios (such as a “flying car”) as being too unlikely, or too far away to be of importance (752). These workshops are reflective of the democratic nature of CO-B, with such a wide platform on which employees can express their opinions and get involved, with the support of management. They also “make employees sensitive to the future” (753). According to

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>2</td>
</tr>
<tr>
<td>Politics</td>
<td>8</td>
</tr>
<tr>
<td>...</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>446</strong></td>
</tr>
</tbody>
</table>

Table 9: Extract of CO-B Weak Signals Categories (CO-B Foresight Process, internal document, 20 December 2005)
experts, all scenarios “should be able to withstand robust critique”. With CO-B encouraging open discussion and debate, it is opening the strategy process up to such a critique (765). Another part of the workshop is recognising potential strategic surprises or wildcards as a separate group, and then formulating appropriate responses. CO-B utilises this approach based around small scenarios on a business unit level. These scenario “games” cause a change in attitude within CO-B towards certain business aspects, with scenario’s outcomes now having a higher priority in the company (743).

Scenario building is not just the responsibility of the specialised foresight group but also part of every business units’ constant foresight process (748). This is the “daily business of strategic analysis”, and covers essential topics such as “credit cards and geometry” (748). As it is a daily occurrence in CO-B, it is an ingrained part of the culture of the company. Although managers look broadly at the future, there is a definite focus on threatening scenarios (756). These scenarios are not referred to as “extreme shocks” or “wildcards”, but rather are thought of as concentrating on the economy and the competitive markets. In other words, the threatening scenarios that they focus on examine how certain situations could lead to a reduction of CO-B’s market share (758). As a result, CO-B is intensely aware of its vulnerabilities in the market, especially the fact that it is “vulnerable to substitutes” (758). This constant threat probably explains to some extent the difference in culture between CO-A and CO-B, with CO-A much more confident about the stability of its market and thus less inclined to invest in foresight.

4.8.2 Conclusion Regarding Support for RP₅

CO-A experiences limited support from top-level management around strategic planning and foresight. In order to receive funding for new and innovative ideas, a strict business case approval process needs to be followed, which is purely focused on direct monetary gains (242). Strategic planning is a top-down approach and a limited tool set for foresight and innovation is available. As such, a foresight-centric planning approach does not exist. In contrast, CO-B’s senior management team has made significant investments in strategy, foresight and innovation capabilities. It built a strong and large corporate development team to drive strategy and innovation, established a trans-departmental strategy committee and fosters a top-down and bottom-up decentralised
strategy building process. The organisation acknowledged the need for preparation for future changes and funded the establishment of a foresight framework and future agent network, directly approved and supported by the CEO’s office. It offers a large, qualitative tool set covering multiple methods, including support from external experts for the initial work. CO-B demonstrates that a simple, yet value generating foresight method is required to work through the volume of signals. It created a practical methodology around qualitative methods for the collection, analysis and grouping of signals, the creation of scenarios and management of workshops with stakeholders to identify issues and formulate responses to future change.

In order for a company to successfully utilise foresight and strategic planning, it must invest sufficient resources in this area. The data discussed above highlights the differences between the strategic approaches of CO-A and CO-B. Both organisations are aware of the process of strategic analysis, and of the benefits of interpreting strong and weak signals for their future strategies. However, only CO-B successfully integrates both strong and weak signals into its strategy, with its more foresight-centric focus. This is due to a significant difference in top-level management support between the two companies. While CO-B has a culture of innovation, and a budget and system that supports change and evolution, CO-A uses more traditional methods that require more certainty and fact for changes to occur. As CO-B actively encourages input from all areas of the company, it has made its foresight methodologies user friendly and simple. Both companies have noted the “uncontrolled” (395) nature of innovation, yet only CO-B has created infrastructure that enables innovation to be directed. CO-A instead uses its apparently “stable” environment as a reason for not undertaking investments in foresight.

The importance of top-level management support for the future success of an organisation is supported by the research. It will not be possible to embed foresight activities without top-level management support and practical, user friendly methodologies and tools which can be utilised across all levels in the organisation. As such, data from field research supports research proposition 5.
4.9 Research Proposition 6

RP₆: In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process will exhibit flexible decision-making later in the process as strategies are being implemented.

4.9.1 Research Findings for RP₆

Comparing the data between CO-A and CO-B reveals differences between traditional structured analytical approaches and foresight-centric planning with regard to flexible decision-making.

Foresight and Flexible Decision-making

There is evidence in CO-B that foresight activities have led to more flexible decision-making. CO-B wants to achieve a “network effect” through utilising future agents to foster communication and collaboration. This means that knowledge of future potential changes is embedded in the organisation across functions and hierarchies. This mitigates the risk of foresight knowledge being lost and ensures that more managers consider future impacts during planning activities. This also means that the organisation is conceptually and culturally prepared for change and will require a decreased response time in future situations. Interviewees confirmed that foresight results include “mostly thoughts, additional ideas, and... additional input for the decision-making process”.

Foresight also provides a certain degree of peace of mind if decisions need to be made in the future. As an example, CO-B recognised through foresight activities that it is in a good position with regard to exposure to security risks under the “safety oriented society” scenario. Reducing stress levels regarding decision-making in the face of strategic surprises allows for a more flexible and sophisticated decision-making process. The open communication channels in CO-B have stimulated strategic debate and, therefore, more ideas are able to be considered. The advent of the convenience world led CO-B to realise that a cultural change in the company was necessary, to simplify the organisation’s portfolio and create more clarity in its market strategies. As a result of the foresight process, the entire company is now “ready for change”. Rather than the delivery of tangible results, the goal of foresight within CO-B is to “carve a certain
mindset within the organisation that allows long-term issues and trends to be known”. This means that the company can try to anticipate alternative outcomes and everyone understands that instead of “just moving ahead, we could also turn to the right or to the left” (149). In addition, foresight delivered valuable strategic alternatives to its decision-making process (648) in response to which, CO-B has actively simplified the structure of the company. Decisions made later in the process have been based on the results of the foresight workshops with the executive team and through continuing, open conversation (649), as insights become available when needed, and helped to form the final strategic decision” (649).

CO-A, utilising a traditional approach to strategic planning, points out that 80% of its business is conducted in a relatively stable market (356), and that the size of its organisation allows it to “sleep”, that is to lose performance in some areas (367). An average increase in turnover of approximately 5% per year means it does not regard performance loss as a danger, and as such it does not have the motivation to invest in foresight and innovation (367). The organisation suffers from conflict between innovation and bureaucracy, limiting its ability for flexible decision-making. CO-B avoids such complications by focusing on actual short and medium-term strategic projects, as it believes that to be led by projects and professional project management is a key success factor for innovations (399). However, there is a keen awareness of the changing nature of the future (397), and as such, there is strong encouragement, even “pressure”, to be innovative and creative (396).

While CO-A’s CEO is criticised for being too conservative and cautious (387), the CEO of CO-B understands the importance of open communication between all levels of the company and the impact this can have on innovation (398). “Everything new is good according to our (CO-B) CEO” (400), even if it does not achieve immediate financial success (such as the organisation’s mobile payment project) (398).

*Communication and Cultural Influence on Decision-making*

Despite claims by the executive management of CO-A that there is a “very open culture for conversations” and that the “members of the executive team are very open”, the hierarchy of the company does not facilitate open discussion (608), and thereby reduces the levels of strategising, future planning and thus flexibility in decision-making. In
fact, there is an apparent culture of competition within the company (608). Further, a quantitative culture has meant that future thinking and discussion is not actively encouraged (417). There have been instances when this attitude toward foresight and strategy development has created problems.

CO-A appears to be resting on past successes, confident that it does not need drastic changes or innovation in order to be successful. The conflict of interest between innovation and traditional approaches to strategy in CO-A has meant that it is unable to make quick or flexible decisions. Due to the so far steady nature of its business, it remains relatively inflexible in its decision-making. This leaves the organisation open to various threats in the marketplace, and as a result it has proven to be ill equipped to deal with them. For instance, when the largest French bus company opened an office in Zurich, there was speculation that it was going to enter the Swiss market, a possibility for which CO-A was completely underprepared. One interviewee described it as “a situation full of panic” (602). As CO-A uses the more traditional approach to strategic planning, it was inadequately prepared and this led to a situation which could have been avoided, or at least, for which the organisation could have been prepared (415).

This is in stark contrast to CO-B, for which active conversations to support decision-making is an important part of preparing for the “degree of uncertainty” in the future (612). It is in fact a goal of the company to “have more conversations” (612). While it is very seldom that a concrete project will occur as a result of foresight conversations, their inherit value is still understood and they “strongly flow” into the company’s “corporate thinking” and decision-making (612). While these conversations do not produce tangible results, the focus is on helping employees understand how fellow team members think (615), thereby helping to eliminate complexities and misunderstandings in final strategic analysis and decisions (618). With open conversations occurring all the time, foresight in CO-B is never closed or finished. It is constantly evolving and open to change. While mistakes may occur when making predictions this way, it enables CO-B to increase its strategic flexibility and thereby its chances of covering the widest range of possible future scenarios. When imperatives generated this way are successful, such open conversation “is already justified” (620). Conversational freedom encourages foresight to occur at all levels of the organisation (621). This interaction across “different hierarchical levels” combines strategy planning and communication; strategy becomes a “summary of the different discussions” (623). It is interesting to note how each company
has actually been able to gather the knowledge for their foresight development, and how it is then harnessed.

*Impact of Foresight on Decision-making*

CO-A has a strategy document in which knowledge is stored about each region in which the company operates. According to the information in this document, CO-A determines the influence of outside forces, such as other companies, and the probability of these affecting CO-A itself. One interviewee describes this foresight process as “painful”, due to the laborious nature of evaluating each region manually through Excel. It is described as inefficient as only selected areas of the company actually look at innovation. This convoluted process does not support fast change or flexible decision-making.

The project management department is part of the innovation capability in CO-A, however it lacks the economic support from the company it needs to be fully successful. For instance, when the CEO of CO-A was asked for CHF 5 million for project work specific to innovation, the department was informed that such money would only be allocated when there was a clear, definite threat; a “must”. This is a reflection of the “very conservative” nature of CO-A: It does not have an immediate incentive to act innovatively, as its marketplace is currently stable and has “so far lived well”. The greater concern in CO-A is product quality, an immediate concern that takes precedence over innovation and foresight development. This, however, is putting the company at future risk as it is falling “far behind” in innovation.

CO-B has a very different approach to foresight knowledge. The starkest difference is in the spread and distribution of knowledge in the company, with the approach being to encourage communication of knowledge between all areas. There is actually a focus on the lower organisational level of the company, in an effort to encourage input from all divisions. This spread of knowledge and the existence of numerous strategic alternatives “enriches” the future of the company and supports flexible decision-making.
4.9.2 Conclusion Regarding Support for RP6

CO-B’s foresight knowledge is spread across the organisation and, with its future agent network and strategy committee, it achieves a network effect of sharing, communicating and debating strategy. This mitigates the risk of loss of market, strategy and foresight knowledge and conceptually and culturally prepares the organisation for change from the environment. As a result, it eliminates complexity and misunderstandings around strategy, reduces the risk of strategic surprises and limits the time required to adapt to a new situation. Foresight drives a “flat” organisational structure because of strategic conversational streaming across all levels of the organisation. In return, this builds trust for the strategy and connects strategy with the actual business activity, allowing for responsive decision-making. CO-A’s traditional approach to strategic planning, with no methodology or toolset for foresight, hinders innovation and strategic planning beyond forecasting. As a result, CO-A is not prepared for change and exhibits a reactive approach to environmental changes, which consumes more time and resources.

Foresight planning is intrinsically ambiguous, as there is always the possibility of unknown wildcards or unforeseeable events. Inherent in reading strong and weak signals is a sense of uncertainty. As such, it is crucial for companies to approach their foresight planning with openness and flexibility. Foresight plans need to be able to adapt according to current events and be malleable for the future. Traditional structured analytical approaches rarely allow for such necessary flexibility. Due to the hierarchical, structured nature of traditional approaches, there is very little flexibility allowing for sudden or significant change. A foresight-centric strategic planning process, however, is designed to be responsive. As such, when the need for flexible decision-making arises, organisations using a foresight-centric approach will have greater success with the strategies they are implementing.

In order to allow for flexible decision-making in the implementation of foresight strategy, the foresight process itself must be ongoing and open. If strategic ideas are constantly being analysed and discussed, the strategic process itself is continually evolving and changing. This demonstrates an already agile approach to change that can be seen in foresight-centric strategic planning. The rigid nature of traditional approaches does not allow for such flexibility, as illustrated by CO-A. Using a traditional approach, strategic analysis is not an open process. Rather, CO-A’s management uses a top-down
approach, with involvement of senior managers only occurring from an implementation point of view (214), rather than fostering strategic debates among other levels. CO-A is described as very hierarchical and authoritarian (364).

Essentially, foresight-centric strategic planning allows for companies to handle the unpredictable nature of foresight in a manner that most benefits them. The evidence above demonstrates that the prevalence of strategic surprises is acknowledged by both companies; however CO-A’s preparation for such situations is inadequate as it is supported by a traditional, rigid structure with limited foresight, which does not allow for flexible decision-making as strategies are being implemented. Consideration of strategic surprises is considered to be a part of the expert interviews that occur only once a year (601). Outside of these interviews, little is documented, let alone analysed for preparation of suitable counter measures (601). CO-A’s system for innovation is hierarchical and lacks support from top-level management. There is, however, definitely an awareness of the potential for surprises in CO-B, as it has already implemented techniques to prepare for such events. When CO-B builds scenarios in the future screening process, the process is extended by incorporating wildcards, for instance by adding them to the imperatives and discussing the resulting implications (603). Strategic conversations are open, continuous and encouraged. Open conversation also allows for a sense of informality with the information exchange, and as such reduces the pressure (619) from the uncertain environment.

This proactive attitude is largely a result of the culture in CO-B regarding foresight, and the encouragement received to change direction according to various scenarios (652). Based on the data provided, it is evident that CO-B is much better prepared for the spontaneous nature of environmental development. This shows that a foresight-centric strategic planning process enables flexible decision-making and delivers more success as foresight strategies are being implemented. Consequently, research proposition 6 is supported: organisations with a foresight-centric approach to strategic planning will experience flexible decision-making later in the process as strategies are being implemented.
4.10 The Foresight Framework Emerging from Case Study Research

As described in chapter 3, case study research informed the development of a practice framework (F1), predominantly through input and experiences from CO-B, a company which utilises foresight in practice, and through the validation of the research propositions based on the field data gathered in CO-A and CO-B.

In terms of strategy development and planning, a foresight-centric planning process is considerably more advantageous than the more traditional approaches for many reasons. The key to successful strategic planning is to consider every available option and opportunity and then to develop the organisation in accordance with this information. With a foresight-centric planning process, there is more opportunity for open strategic debate, which in turn reveals more divergent scenarios for consideration. This openness is embedded in every step of foresight focused planning, as revealed when comparing CO-A with CO-B.

4.10.1 Foresight in CO-A and CO-B

The foresight process in CO-A is still in its infancy, and as such there has only been a minimum amount of investment made. The organisation’s foresight and supported innovation process is based upon a traditional, hierarchical model that restricts its success potential in many ways. The process currently developed in CO-A involves formal meetings with the management team to discuss strategy and an annual market analysis with internal business consultants and internal expert interviews. CO-A also runs workshops to develop strategy amongst the heads of departments. Its strategy team is very small and any strategic decisions made in CO-A are made solely by the executive management. This has created a complex approval process for any innovative ideas, due to the top-down, traditional approach to strategy development and planning. A significant part of CO-A’s strategy development is surrounded with safety cushions: the cautious, conservative nature of CO-A’s innovation approach encourages safe and easy strategic decisions. This means that weak, uncertain signals are either not detected or are quickly disregarded, and CO-A’s strategy is often reactive rather than pre-emptive. This culture of caution also discourages any employees from confronting the
management with any potential strategic surprises. An additional result of its cautious, conservative nature is CO-A’s use of traditional methods of analysis, such as PEST and SWOT. Unwilling to take risks, CO-A bases its strategic decisions on financial matters, prioritising according to direct monetary output potential. The company does not engage in general foresight, innovation development, weak signals management or scenario building.

Therefore, as CO-A’s strategy development process is relatively new, it has not yet developed any concrete manuals, processes or methods with which to identify trends, nor has it accumulated any data specifically related to weak signals. All of CO-A’s strategic information is in an annual corporate strategy document with a focus on strong signals, written by its corporate development team and driven by the executive management, further enforcing the hierarchy within the company. Their current aims are to look three years ahead for general trends, and five years ahead for financial and political matters. There is no sense of urgency in the strategic decisions made within CO-A, largely due to the stable nature of the market in which the company operates. The absence of this need, along with the authoritarian nature of the strategy development process, has resulted in a low output of innovative ideas and projects. The list of failed projects in CO-A’s recent past are most likely proof of its inability to innovate and implement strategy, insufficient funding and management support, limited capabilities, cultural values, management approach and the methods they currently use.

CO-B has made a substantial investment in its strategy development and planning. Using a foresight framework, internal future agents, strategy workshops, external market research and experts from future industries, it maximises the opportunities available to gather weak and strong signals. The structure established by CO-B aims to keep its strategy development process as simple as possible, removing any unnecessary infrastructure. At the same time, it invests in sophisticated, yet user friendly methodologies. CO-B has adopted a flat hierarchy, with foresight activities, strategy development and planning being open to all departments and employees. This multi-level approach removes the power-structure hurdles that often create a disincentive for people to present new ideas. This uncontrolled approach, without strict centralised steering from management, also allows strategising to evolve in a more organic manner. Equal contribution from all employees is highly valued in CO-B. In order to integrate foresight into strategy conversation, CO-B has fostered an open environment.
Innovation is strongly supported by the executive management. The network effect of CO-B’s flat hierarchy and network of future agents encourages communication and collaboration between all departments. Limited formal approval processes during the early stages of an innovation ensures that most ideas are considered. CO-B also actively gives equal weight to both strong and weak signals, reiterating the long-term, unbiased and democratic nature of the company’s strategy development. However, the eagerness to allow input from all departments can slow the strategy development process down, with so much input having to be considered. This uncomplicated approach allows CO-B to keep its options open. It has been able to cultivate a certain mindset that fosters innovation, and as such CO-B is the leader in the market in terms of foresight and innovation capabilities, as reflected in its strong growth rates.

4.10.2 Framework Derived from Research of Case Organisations

There are various similarities and differences in the ways that CO-A and CO-B have approached strategy development. While CO-A has chosen to establish a clear hierarchy that focuses on executive management, CO-B bases its strategy development on a more democratic model that values equal input from all business units and employees across the organisation, structured around segments and products. This basic difference is reflective of a vast difference in attitude towards foresight.

Using a top-down strategy process, traditional planning approaches and hierarchy, CO-A has a very cautious and considered approach to foresight. Strong signals take precedence over weak in CO-A, and there is a tendency to react to situations only once they have occurred. CO-A also prefers to use methods that are more established in the management field and more quantitative, thus ensuring more certainty in the short-term, but with no or only a limited view of the long-term. CO-B is open to much more risk, valuing weak and strong signals while engaging in many qualitative methods. While CO-B ensures that foresight and innovation are continuous processes, constantly updating its data and encouraging conversation, CO-A follows a more formal top-down process.
In gathering information, both CO-A and CO-B are using a combination of external and internal sources. Both companies also agree that it is virtually impossible to foresee more than ten years into the future, and so neither have established frameworks that go beyond that point. The differences between the two organisations are the basis of their differences in direction and success. An evaluation of their respective success in financial terms demonstrates that CO-B is the more successful organisation. This may be due, to some degree, to CO-B’s open minded, innovation and foresight driven attitude to strategy development. However, further research is needed to support a direct link between financial performance and foresight, innovation, strategy and cultural characteristics.

There are numerous advantages to adopting a foresight-centric approach to strategy management. A foresight-centric approach will allow an organisation to prepare for the future, adapting their products or their structures according to potential foreseen events of significance. This preparation requires a constant production of new ideas, thus making a foresight-centric approach an innovation-driven approach. This will provide an organisation with more future oriented strategic projects, aiding preparation for the future. This will also help the organisation retain or grow its market share, determining the direction and pace of its growth, rather than trailing and reacting to competition or consumer demand. Adopting a foresight-centric approach encourages long-term success for an organisation, as it opens up strategic debate within the organisation, and also allows for advantages such as flexibility. Therefore, utilising the experiences from CO-B and through evidence from the supported research propositions, a practice framework for foresight includes the following components:
Through environmental scanning, both weak and strong signals are collected and wildcards (or strategic surprises) are acknowledged (sometimes, the organisation tests its strategy and organisations against wildcards on an ad hoc basis). In order to identify and collect weak signals, qualitative methods (Fig. 32, method set 1) are used, such as trend scanning and desk research utilising reports, future web sites, science fiction literature and economic data, as well as information from external partners, and interviews with expert and futurists from a variety of industries. Strong signals are removed from the core foresight model as they can and should be captured via traditional strategy methods by all managers of the business. They will, however, later
be integrated to stimulate the conversation and add value in the scenario or future workshops.

The weak signals database stores data on every collected signal, including the signal’s name, a number for identification purposes, a brief description, a priority flag (if relevant), the time horizon or window within which the signal is most likely to have an impact, and the source of the information. Part of this work is carried out in the signals analysis and processing phase, which also includes the classification and prioritisation of signals. In addition, the connections between signals and their logical consequences are identified and recorded.

As part of the foresight process, scenario management is the chosen methodology for understanding interactions between signals, creating multiple futures, presenting findings and engaging the organisation in a conversation about future change and impact on the organisation’s strategy. Again, qualitative methods (Fig. 32, method set 2) are utilised, including cross-overs (industry foreign concepts), bifurcations (qualitative projections of a signal’s most likely behaviour) and as noted above, logical consequences. Overall, these qualitative methods rely on a mix of expertise in the relevant fields (for instance with the help of experts) and creative open conversations requiring judgement calls and some guess work. The building of draft scenarios is seen as a top-down process, as the initial work is mostly carried out by a small team of strategy managers.

The scenarios are presented and discussed in scenario workshops with senior management and key stakeholders with the aim of identifying and understanding the level of potential change in the market and its impact on the organisation. This can be part of a preparation workshop for the annual strategy development process. Significant or widespread market trends and strong signals will be added to the conversations around the identified scenarios. In addition, the scenarios will be enriched and validated through conversations and input from business units’ strategy teams. This is seen as a bottom-up approach, integrating the experiences and views of all managers. The combination of a top-down and bottom-up approach in the foresight model is aligned with the same mechanics in the strategy development process of CO-B. As a result of these interactions, additional insights and characteristics of the “new worlds” can be added to the draft scenarios. The qualitative methods (Fig. 32, method set 3) utilised for
these activities are open creative conversations and stress tests (via scenario games and strategic surprises where appropriate response strategies have to be defined) with a well composed group of participants.

A report from these workshops with the finalised scenarios and the detailed analysis of potential consequences will be created via the foresight or strategy teams. The report includes matrices with descriptions of consequences, for both the industry generally and the organisation in particular, if one of the scenarios becomes reality, and a list of core topics which need to be covered in the regular strategy development process. As an example from CO-B, in the convenience world, banks will have to build products and product value propositions which would allow them to fulfil specific segment based needs. In this scenario, the competition for healthy (profitable) customers would increase and mobility (across products and channels) would gain a higher priority. However, in the safety oriented world, customers would chose individual security levels, new products would be established (such as safety consulting for small and medium sized enterprises), trust and safety will become the key themes in marketing communications, a national e-banking platform would be established (instead of banks’ individual online sites) and the demand for personal safes would increase. This exercise of managing CO-B in each world and formulating strategy accordingly can be considered a “stress test” in which scenarios help to identify gaps between potential future events and current strategies and strategic developments.

The “scenario transfer” is the point at which insights from signals management and scenarios are integrated into the formal strategy development process, socialised to the operational business units, and implemented in marketing and product plans. It allows the organisation to formally prepare and present future oriented strategic projects for potential growth and to create response strategies for changes driven by the environment. Again, workshops across the organisation help to ensure a successful knowledge transfer. Scenarios should be communicated as multi-media presentations or movies to increase the impact on the audience and trigger “foresight thinking”. A time map is then utilised to monitor the signals and scenarios on their path to becoming reality. The organisational unit which ensures the monitoring of signals and updating of the signals database is the future agent network. Its main task is to provide for ongoing development of future scenarios and feeding of the weak and strong signals database. It is comprised of around fifteen to twenty representatives from different departments (in
an organisation of 3,000 employees), and most departments of the organisation are represented. The future agents meet both ad hoc and formally between three and four times a year to discuss changes in the environment based on new signals and to prepare input for strategy reviews and the strategy development process. The key success factors for a future agent network are voluntary participation, proximity to the daily business, and participation being independent of existing company hierarchies.

Besides the formal outputs delivered from a foresight framework as part of scenario workshops, strategic programme management and scenario transfer, successful foresight organisations can benefit from a “foresight continuum”. This means that throughout the process of engaging with the uncertain environment and potential futures, an organisation will benefit from flexibility in decision-making, and experience increased innovation capabilities and ongoing learning through strategic debate. It sets an organisation into a perpetual state of change and thus helps to mentally prime participants and structurally prepare the organisation for upcoming changes. This practice framework, developed through case study research, will later be compared to, and enriched by, the model derived from theory and foresight experts to enable generalisation (chapter 5).

4.11 The Foresight Framework Emerging from Interviews with Experts

As a mechanism to validate the framework emerging from the case study research, a second practice framework (F2), utilising the theoretical model from the literature review as a starting point (from section 2.16), was generated from the personal, consulting, professional and academic experiences of foresight experts. The panel of six foresight experts shared their views about a best-practice foresight framework to capture, process and understand weak and strong signals from the external environment, and take appropriate actions.

First of all, the selection criteria for the most appropriate foresight methodology depended on context (expert 5). The primary best practice is to recognise that the external environment contains phenomena that have an effect on the future, and to be sensitive to what these possible impacts might be. Weak signals identification, analysis and
prioritisation are seen as a key success factor for any foresight methodology. However, the main issue in collecting data of any kind is to be absolutely clear about why it is being collected, i.e. to retain focus on the question of which futures one is concerned with (experts 4, 5).

The most common approach to collecting signals is media scanning and bibliographic analysis in order to understand what is and is not being talked about in the media (expert 1). In addition, companies should look at consumer and business behaviour to understand what people are actually doing and how they are using current systems and technology. This is typically done through observations, for instance through monitoring service and web site usage (experts 1, 2). Additional input may be gained from social anthropological field studies involving users or potential consumers (expert 2). Other methods include general, rather than just competitive, company analysis (what are other companies producing and doing?), utilising external contacts (i.e. from other companies, industries, sectors etc.) and internal foresight networks or future agents (including experts from industries, academia or business partners), and scrutinising general web resources (experts 1, 2). In some cases, a technology analysis or assessment is necessary (experts 2, 4), which can lead to maturity diagrams, portfolios and technology maps. The establishment of a strategic think tank is recommended, constituted of an interdisciplinary team of about four to seven people, using a trend-opportunity matrix, and reporting directly to C-level management or the Board of Directors (expert 3). The feasibility of such a think tank depends upon the size of the organisation.

Quantitative methods, including Delphi, are not supported as they demonstrate a flawed process for “dealing with the relativity and fallibility of knowledge” (expert 5). Despite this, cognitive mapping (or Comprehensive Situation Mapping – CMS) and influence diagramming is an approach from the quantitative school of methods, which is supported (expert 6). CSM supports the analytical combination of internal and external factors or signals, as long as most can be treated as numeric variables, and computing the propagation of change throughout a causal network. CSM builds a bridge between the two schools of quantitative and qualitative approaches in a novel and creative way for the development of organisational foresight.

As a summary, the combined set of recommended methods for identifying and collecting signals/indicators about future market environments are (all experts):
- Media scanning on a regular basis (two to three days per month) to identify trends and changes in the landscape;
- Networking with partners (expert interviews/panels), and best practice research;
- Internal knowledge, for instance from senior managers and future agents;
- Regular contact with other foresight professionals to discuss trends etc.;
- Observation of consumer behaviour (with the rise of the internet, consumer behaviour is driving business behaviour and therefore has a greater influence on the future);
- Innovation laboratories, or innovation “spaces” in organisations; and
- General market analysis and environmental scanning (competitive environment, industries etc.).

Once signals are collected, experts confirmed the importance of working with analogies and utilising methods such as trend-opportunity radars and trend data analysis (measurement of signal strength through time) to gain new insights and consider new alternatives for the future of the organisation, marketplace and industry (experts 3, 4, 5). They recommended this be followed by scenario building (experts 1, 2, 3, 4, 6), typically with associated industry experts (expert 1). As a rule, foresight experts advise the utilisation of qualitative methods to combine qualitative (non-econometric) signals into scenarios and/or images of the future for use in strategy development (experts 1, 2, 3, 4, 5).

The most frequently mentioned qualitative methods were creativity workshops, brainstorming, corporate think tanks, narratives and story-telling, systematic description of potential new business (ventures), prototyping and mock-ups (experts 2, 3, 4, 5, 6). Different techniques can be applied, for instance (expert 1) one master scenario may be developed (instead of multiple scenarios), and as many stakeholders as possible should then modify the “prototype” to ensure that all aspects/views are incorporated (scenario stress testing). This exercise is typically undertaken in a workshop format with disparate groups of people.

In general, experts suggest creating multiple futures or scenarios (experts 2, 3, 4, 5, 6). There are views that qualitative modelling can be combined with quantitative models, for instance to overlay qualitative models on quantitative approaches to look at how the two could interact and what the possible consequences could be. However, it was suggested
that qualitative signals and scenario analysis is more appropriate (experts 1, 4). Probability assumptions are later added to each scenario in a second or third round (expert 3).

These scenarios can help to “prototype the future” (expert 2) using mock-ups, prototypes, flash presentations, videos (and sometimes only PowerPoint®) in order to communicate and anticipate future changes in the organisation. In some cases, focus groups and creativity workshops are adequate to “test” the future, potentially in combination with market trials (experts 2, 4). Scenarios developed from foresight activities are a process of social construction of knowledge, and recognising this is the most important methodological issue. It must be acknowledged that the future is not absolute and inevitable, and instead the management and evaluation of relative claims to knowledge is required (expert 5).

Utilising scenarios to challenge an organisation and its stakeholders with the insights of future market environments is regarded as the most difficult part of the foresight process (experts 1, 5). One expert says that he has not yet found a satisfactory method, and that active foresight and innovation can only be found in start-up companies (expert 3). However, one successful method is the “strategy stress test” (experts 1, 5, 6) where the company’s strategy is tested against the various scenarios. Through this process, stakeholders will gain insights and modify existing strategies, if necessary. The stress test can also create buy-in for the scenario building process itself. For many employees in operational positions, and even for some strategists, the ability to understand non-incremental change is difficult and being presented with long-term scenarios can therefore be challenging.

A variation of the stress test is the “dialectical inquiry”, seen as the best process for challenging an organisation with outcomes of scenarios (expert 6). The method uses creative conflicts to help identify and challenge assumptions to create new perceptions (derived from Mason & Mitroff 1981). Another method includes management workshops with scenario or prototype demonstrations, to encourage discussions and joint explorations around the potential of scenarios (expert 2), or to encourage competition of ideas and critical analysis of data (which, it is contended, is closer to reality as in an open economy competitive forces tend to shape futures) (expert 5).
It can be concluded that methods themselves do not help to change an organisation, nor do organisations change because they have developed insights into the future. If foresight is not part of the innovation culture and corporate vision of the organisation, and the CEO and senior management are not supportive of foresight (expert 2, 3, 4), change will not happen. Change requires the interplay of multiple factors, including ongoing communication, reward and recognition, the fostering of competencies, events and training, rules and policies, an organisational structure, a physical environment that nurtures innovation, and information collection and analysis systems (expert 4). In all cases, and based on all available information, scenarios will have to result in the formulation of action steps and tasks in response to these anticipated futures, including impact assessments and second and third order implications (expert 4). Once the first set up scenarios are available, trends need to be continuously monitored and assessed (issues monitoring and management). It is recommended that this is conducted via an in-house model with external support (expert 3).

One consultant (expert 5) mentioned that the models provided (Appendix E; foresight experts questionnaire) may be appropriate if it is assumed “that adequate knowledge can be produced about the dynamics of the present, in the forms of rational argument and narratives, which set a context for rational choices. One has to ask whether the context of a specific organisation is sufficiently stable for re-conceptualisations informed by abstractions of the present to form the basis of reasoned judgements. More important is the question of how sustainable such re-conceptualisations are in practice, and how resilient the organisation is to the failure of such conceptualisations. Foresight is not so much about techniques as about judgments; judgments about the salience of one idea over another, of one trend over another, of one concept over another”.

The modified foresight model (Fig. 33) derived from theory (chapter 2) highlights six differences and similarities as important elements of a practice model, as listed in Table 10.
First of all (I1), the foresight experts did not discuss the importance or utilisation of strong signals and wildcards in a foresight framework. In their point of view, weak signals are the key drivers for potential changes within the uncertain environment. They are seen as key success factors for foresight, whereas other drivers from the environment can be neglected, or are already present in the current thinking of managers. This staunch emphasis on focusing on only weak signals was inconsistent with the framework derived from the literature (Ansoff 1975, 1982, 1984; Bell 2003; Collis 2008; Day & Schoemaker 2005; Fink, Schlake & Siebe 2001; Harris & Zeisler 2002; Huber, Jungmeister & Zahld 2007; Liebl 1996; Marsh, McAllum & Purcell 2002;
Martinet 2010; Ofek 2010; Wack 1985a) which provided the foundation of the discussion with experts.

<table>
<thead>
<tr>
<th>Insight</th>
<th>Validation or Enrichment of Theory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>Validation and Enrichment</td>
<td>It is evident that weak signals are the main components of a foresight framework, as opposed to strong signals and wildcards.</td>
</tr>
<tr>
<td>I2</td>
<td>Enrichment</td>
<td>The development and implementation of a scanning strategy is required to set the focus of environment scanning.</td>
</tr>
<tr>
<td>I3</td>
<td>Validation</td>
<td>Qualitative methods are required to (a) collect weak signals from the environment and (b) build scenarios or images of the future from the collection of weak signals.</td>
</tr>
<tr>
<td>I4</td>
<td>Enrichment</td>
<td>The use of internal foresight networks/future agents and think tanks are recommended by foresight experts.</td>
</tr>
<tr>
<td>I5</td>
<td>Validation and Enrichment</td>
<td>Future workshops for scenario presentation are the most challenging element in the foresight process, utilising qualitative methods.</td>
</tr>
<tr>
<td>I6</td>
<td>Validation and Enrichment</td>
<td>Reviews need to include policies, levels of ongoing communication, training, skills and competencies, and reward and recognition programmes.</td>
</tr>
</tbody>
</table>

Table 10: Key Differences and Similarities from Input from Foresight Experts (own illustration)

Another element not broadly considered in the literature is the development and application of a scanning strategy (I2). Only Day and Schoemaker (2006, p. 28) and Stoffels (1994, p. 22, p. 95) refer to scanning strategies. To determine the focus of environmental scanning, the knowledge needs of management and the knowledge synthesis of perceived environmental uncertainty must be formulated and integrated in the scanning strategy. This allows an organisation to be clear as to why signals are being collected and will enable focus on the question of what an organisation is concerned with.

The conversations with foresight experts validated the view derived from the literature that quantitative methods (I3) are not generally supported in foresight processes because they fail to deal with the “relativity and fallibility of knowledge” (expert 5). Only one expert suggests the use of a hybrid model, where quantitative components enrich the qualitative method set to identify potential consequences. This hybrid model was consistent with the model derived from the literature (Bell 1997; Fahey & Randall 1998a; Georgantzas & Acar 1995; Godet 1987; Huss & Honton 1987; Ringland 1998;
Tsoukas & Shepherd 2004). Five out of the six foresight experts suggest the use of qualitative methods (supported by literature [Ansoff 1975, 1984; Day & Schoemaker 2005, 2007; Glassey 2009; Jaeger et al. 2001; Marsh, McAllum & Purcell 2002; Mintzberg 1987; Schwartz 1996]), for instance media scanning, literature review, observations, expert interviews, networking, laboratories, internal foresight networks and think tanks to gather weak signals from the environment. The selection of the appropriate methodology depends on the context of the organisation and the environment and is most likely determined by the scanning strategy. The link between signals management and scenario building is strong and again, qualitative methods (creativity workshops, brainstorming, think tanks, storytelling, and prototyping) are suggested to combine weak signals into meaningful pictures of the futures. Qualitative methods are an important element of a foresight model and are aligned with the findings from the literature review (Ansoff 1965; Bhide 2010; Caragata 1999; Cheung et al. 2009; Clemens 2009; Ireland & Duane 2001; Koncilja–da Mata et al. 2004; Lindgren & Bandhold 2003; Huber, Jungmeister & Zahld 2007; Ogilvy 2002; Schoemaker 2002).

The foresight experts have mentioned the use of foresight networks and future agents (I4), in combination with think tanks (reporting to C-level management), to enrich and work with signals and scenarios and provide an organisational structure for foresight. This element of a foresight framework was not specifically found in the reviewed literature (Amara & Lipinski 1983; Ansoff 1965, 1980; Fink, Schlake & Siebe 2001; Georgantzaz & Acar 1995; Liebl 1996; Ringland 1998; Voros 2003), but was described by others (Ansoff 1975; Gilad 2004; Kaplan & Norton 2005; Rohrbeck & Gemünden 2011; Stoffels 1994) utilising different terminology. However, it is concluded that this offers an important enabler for foresight and should be constituted in a foresight framework. The importance of scenario or creative future workshops (I5) was elaborated to test the future and learn and understand the impact of future changes on the organisation (i.e. to test the current strategy against the different scenarios). As a different form of “future testing”, market trials were also suggested. Interestingly, this part of the foresight framework was considered the most difficult aspect of the process and it seems that a best practice method set is not yet available. The challenges here are not only to find and select the most appropriate method, but also to deal with the human elements of mental barriers (it is difficult to appreciate and comprehend future changes outside of incremental changes) and resistance to change. The literature (Burkhard, Spescha & Meier 2005; D'Aveni 2004; Fink, Schlake & Siebe 2001; Igartua et al. 2010;
Rollwagen et al. 2008; Thatcher 2006) has supported this process step and offers different methods for use in future workshops, such as war gaming (Abadie et al. 2010; Abplanalp & Lombriser 2010; Oriesek & Schwarz 2008; Schwarz 2009). However the literature did not consider this step to be more labour intensive or challenging than any other step in the foresight model and does not necessarily describe it in detail. This might suggest a need for additional research for contribution to theory and practice. The methods suggested by foresight experts include creativity workshops, open discussions, focus groups, market trials, utilising start-up companies, strategy stress tests, creative conflicts and competitions.

Finally, in order for foresight to be successful, an open cultural environment and support from senior management are preconditions. At the same time, foresight can only drive and support change in an organisation via policies and rules and through ongoing communication, events, training, reward and recognition, and the necessary skills and competencies. This illustrates the need for a performance review (16), perhaps not so much focusing on the direct outcomes of foresight, but to ensure that the success metrics are in place throughout the organisation. This is different to the findings from the literature (Eschenbach, Eschenbach & Kunesch 2003, p. 74; Halme 2002, p. 1101) where the focus was on measurement of efficiencies and effectiveness.

Having enriched the model derived from theory (chapter 2), this modified practice framework based on input from foresight experts allows broader generalisation and supports reliability and validity of the concepts and methodologies discussed. The framework will be utilised in combination with the practice framework from case study research to determine a best practice model (chapter 5).
5 Conclusion and Recommendations

5.1 Overview and Structure of Conclusion & Recommendations Chapter

The final chapter includes a synthesis of the two practice models derived from the research and a discussion of a best practice foresight model. Contributions to and implications for practice and the limitations of the research will be presented, in combination with directions for future research.

The combination of research from case organisations, foresight experts and theory outlined in the literature review provides the foundation for the development of a best practice framework. This framework, which includes the foresight process, its methods and relevant foresight roles, is described in section 5.2.

The closing sections include a summary of the research contributions to theory and practice, highlighting nine specific contributions in section 5.3, the limitations of the research and directions for future research (section 5.4), and the conclusion in section 5.5.

5.2 Framework for Advancing Strategic Corporate Foresight

Emerging from the Research

5.2.1 Comparison of Practice Frameworks Emerging from the Research

The driving question for this research is how and why strategic foresight, based on the integration of strong and weak signals methodologies, can enrich the strategy process in a dynamic and changing environment. Based on the literature review, research findings and data synthesis from case organisations and foresight experts, a practice oriented model for advancing strategic corporate foresight has now been compiled. Evidence from research highlights that such a framework needs to exist and requires further articulation, and methods must be selected and provided to organisations.
The analysis and comparison of the two practice frameworks emerged from case study research (framework 1, Fig. 32) and from foresight experts in conjunction with theory derived from the literature review (framework 2, Fig. 33). These sources informed the development of a best practice framework for advancing strategic corporate foresight. In order to build the best practice framework and contribute to professional practice, differences (enrichment) and similarities (validation) between the two frameworks are identified and described in Table 11 (the visual representation of the modified framework with insights one to twelve can be found in Appendix P):

<table>
<thead>
<tr>
<th>Insight</th>
<th>Validation or Enrichment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>Validation and Enrichment</td>
<td>Wildcards and strong signals are necessary (as supported by literature and case study research), but to enrich scenario/future workshops, rather than to utilise them for signals management and scenario building (from case study research and foresight experts).</td>
</tr>
<tr>
<td>I2</td>
<td>Enrichment</td>
<td>Once signals are identified, weak and strong signals are stored in separate databases. The identification of strong signals is a standard management task, while weak signals management requires special methods and is the core of a foresight framework; strong signals will be added later in the process (from case study research).</td>
</tr>
<tr>
<td>I3</td>
<td>Validation</td>
<td>The process step of signals analysis and processing is confirmed and supported by both frameworks.</td>
</tr>
<tr>
<td>I4</td>
<td>Validation and Enrichment</td>
<td>Scenario building based on drivers of change is confirmed by all practice frameworks, but foresight experts and case study research contributed to practice by way of suggested scenario building methods as a top-down approach to foresight.</td>
</tr>
<tr>
<td>I5</td>
<td>Validation and Enrichment</td>
<td>Both practice frameworks propose scenario/future workshops to present, discuss and enrich scenarios, but foresight experts and case study research contributed to practice in terms of suggested methods to strategise with stakeholders as part of a bottom-up approach to foresight.</td>
</tr>
<tr>
<td>I6</td>
<td>Validation and Enrichment</td>
<td>Strategic programme management to define the potential consequences and actions from scenarios is supported by both practice frameworks; case study research suggests that key topics will be identified for consideration in the strategy development process.</td>
</tr>
<tr>
<td>I7</td>
<td>Validation and Enrichment</td>
<td>Both practice frameworks support this process step, but scenario transfer offers more than input for the strategy development process; it is a key contributor to prepare and build readiness for change in terms of future strategic projects and innovation and culture building.</td>
</tr>
<tr>
<td>I8</td>
<td>Validation and Enrichment</td>
<td>Both practice frameworks confirm that monitoring is an important element of a foresight framework (for instance via future agents); case study research revealed that more investments in this area should be carried out and introduced the</td>
</tr>
</tbody>
</table>
time map, a tool for monitoring the current signals database.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I9</td>
<td>Enrichment</td>
<td>While literature and foresight experts confirm the need for this process step, case study research has highlighted that a formal process for performance reviews is missing and more work in this area should be carried out to ensure that policies, training etc. are in place to allow an organisation to benefit from foresight.</td>
</tr>
<tr>
<td>I10</td>
<td>Validation</td>
<td>Both practice frameworks highlight the importance of a future agent network and think tank (or strategy committee in the case of CO-B) to continuously monitor the environment and enrich both the signals database and the current scenarios.</td>
</tr>
<tr>
<td>I11</td>
<td>Enrichment</td>
<td>A scanning strategy is necessary to determine the direction and scope of scanning activities (as supported by literature and foresight experts); case study research has confirmed the need for such a strategy.</td>
</tr>
<tr>
<td>I12</td>
<td>Enrichment</td>
<td>One of the key contributions from case study research is the acknowledgment of the foresight continuum, which enables an organisation to benefit from increased flexibility in decision-making, innovation and ongoing learning through strategic debate, initiated and supported via foresight activities.</td>
</tr>
</tbody>
</table>

Table 11: Key Differences and Similarities between Practice Frameworks (own illustration)

The comparison of the two practice frameworks (F1 and F2) and identification of the above similarities and differences informed the development of the best practice framework as presented in section 5.2.2.

5.2.2 The Best Practice Framework and Overarching Considerations

The two practice frameworks, from case study research and foresight experts in conjunction with theory, include a similar set of processes and methods, which have been used to inform the best practice framework. However, as discussed in the previous section, there are some alterations which will be made to the best practice framework, especially in the case of additions of a “best practice” element, such as the inclusion of a scanning strategy as recommended by foresight experts and theory (I11, as discussed in section 5.2.8), which was initially undervalued, not having been identified in the literature, but later confirmed by both the foresight experts and case study research.

The framework for advancing strategic corporate foresight (Fig. 34) is based on the integration of weak and strong signals into scenarios to analyse potential consequences
and create response strategies. An additional benefit is the building of a foresight continuum in the organisation to reduce uncertainty and foresight boundaries in support of long-term innovation and growth. While literature does not offer such an integrated framework and does not describe the process’ steps and methods in enough detail for them to be practical and user friendly (Ansoff 1975, 1982, 1984; Amara & Lipinski 1983; Day & Schoemaker 2005, 2007; Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Gilad 2004; Glassey 2009; Liebl 1996; Martinet 2010; Ringland 1998; Stoffels 1994; Van der Heijden 1996; Voros 2003), its elements can be linked and confirmed (section 2.16).

Figure 34: Best Practice Foresight Framework Emerging from Research (own illustration)
The environmental analysis, which incorporates information from both the internal and external environment, includes all sources from which signals can be identified. Weak signals are either active in terms of being accessible through the organisation’s environmental scanning and monitoring activities, or passive, which prevents them from being identified in the scanning efforts. Of course, over time, the signal’s behaviour can change, and a signal which was hidden yesterday could be visible tomorrow. Strong signals (or mega trends), which to some degree are already well known, have to be considered as well, as they indirectly provoke competitive movements because of their open exposure to the market, and therefore have an influence on the organisation’s actions. They are utilised later in the process to enrich scenario workshops and do not require the application of special methods. Finally, wildcards are weak or strong signals with much more radical impacts, even potentially catastrophic consequences, but with a low probability of actually occurring. Again, wildcards are used later in the process, during the scenario workshops.

As an organisation’s ability to capture all (active) signals is limited, only part of the signals can be caught by the corporate surveillance radar; these signals are called “identifiable” signals. Qualitative methods (Fig. 34, method set 1) need to be used to deal with (primarily) weak signals throughout the identification and collection process, such as by trend scanning, observations, expert interviews, networking, laboratories and internal foresight networks. The literature (Ansoff 1975; Bell 2003; Burmeister, Neef & Beyers 2004; Day & Schoemaker 2006; Fahey 1998; Fahey & Randall 1998a, 1998b; Georgantzias & Acar 1995; Godet 1987, 2001; Huss & Honton 1987; Lindgren & Bandhold 2003; Porter 1985; Ringland 1998; Schoemaker 2002; Schwartz 1996; Schwartz & Ogilvy 1998), foresight experts and case study research all confirm that available qualitative methods need to be utilised and that traditional planning approaches (i.e. PEST and SWOT) do not support foresight apart from offering a classification system (Ansoff 1976; Bhide 2010; Cheung et al. 2009; Clemens 2009; Collis & Montgomery 2008; Cravens et al. 2009; Day & Schoemaker 2006; Gunn & Williams 2007; Jarratt & Stiles 2010; Jennings 2001; Karami 2005; Kotler et al. 2004; Maguire et al. 2009; Marshall & McKay 2002; Ofek & Wathieu 2010; Oosthuizen 2000; Reger 2001; Schindehutte, & Morris 2009; Smith 2007; Spence 2003; Van der Duin & Den Hartigh 2009; Voros 2001; Wilson 1999).
The signals that the organisation manages to identify and collect are placed into a signals database, in which weak signals and strong signals are stored separately due to their different applications in the foresight process. The signals, especially weak signals, need to be analysed and described; this may include the classification and prioritisation of signals and identification of relationships. In the next step, these signals are combined to create scenarios (images of the future), using mainly qualitative methods (Fig. 34, method set 2), as scenario building in a complex and dynamic environment with a high degree of uncertainty should be carried out by scenario building methods with a non-econometric approach, preferably by combining signals in a meaningful way via creative workshops and conversations. This is seen as the “top-down” component of the frameworks, as these scenarios are mostly developed by a smaller team, utilising internal and external resources (for instance the foresight or strategy department in combination with foresight experts). The outcome of this process is a set of draft scenarios, which need to be enriched and validated through input from managers and other stakeholders in scenario workshops. The creation of multiple possible scenarios or futures in strategic planning is necessitated by an unpredictable and changing future environment.

Once developed, scenarios help to challenge stakeholders within the organisation with the threats and opportunities inherent in the potential futures outlined in the scenarios. Stakeholders, in turn, assess their current strategies, plans and products against the outcomes of scenarios and start to tailor their future actions or response strategies (stress tests). This can take place in scenario or future workshops, where stakeholders will defend and describe the current strategy as well as products, services, channels and brands in the presented scenarios. Here, strong signals and wildcards will be integrated to enrich the conversation. This is seen as the “bottom-up” component of the scenario development process and requires qualitative methods (Fig. 34, method set 3), such as scenario games and open creative conversations. In such workshops, actions are described as corporate initiatives and future projects, summarised as strategic programme management, and will be disseminated to all affected areas of an organisation, with any necessary strategy adaptation. The scenarios will be finalised and potential consequences and response strategies described. In addition, the core strategic topics will be described and discussed, thereby educating stakeholders and influencing the organisation’s strategy development process. This “scenario transfer” will help to prepare an organisation for the future, by both building strategic alternatives/actions
(future projects) and keeping the organisation fit for future change (the cultural dimension).

A monitoring system will ensure that the signal database is up to date and that changes in signals’ behaviour are noticed and the scenarios modified and updated accordingly. It will inform stakeholders of the potential for existing scenarios to become reality and alert the organisation to immediate opportunities and threats (strategic surprises) arising from environmental change. The proposed tool to support monitoring activities is a time map, which visualises the collected signals over a time horizon.

Finally, performance reviews support the learning capabilities of the organisation by instigating the assessment of policies, the analysis of training and skills needs, the implementation of reward and recognition programmes and optimisation of the foresight framework, if necessary.

A future agent network is an important organisational unit designed to support the process by scanning the environment, identifying and gathering signals, helping to build scenarios and share foresight insights throughout the organisation. A think tank or strategy committee can be utilised to discuss strategic impacts, deliver strategic imperatives from business units and align foresight with strategy development.

In order for the scanning activities to be targeted and meaningful, the development and implementation of a scanning strategy is required, elements of which need to be defined, including scanning fields, sources, methodologies and processes. All these foresight activities contribute to the building of a foresight continuum.

Implementing the initiatives and activities in the best practice foresight framework discussed above will offer enhanced flexibility, innovation capabilities and ongoing learning through strategic debate. Research has identified these to be key benefits of foresight activities, which are complemented by the long-term benefits arising from scenario transfer. Working with signals and scenarios not only increases an organisation’s chances of survival and competitive advantage, but also initiates a learning process that will ultimately help the organisation to stay dynamic, and improve its innovation capabilities.
The Importance of Information Systems Support in Operationalising the Foresight Framework

It should be noted that it is evident from the literature, case study research and foresight experts that there is minimal information systems support for foresight in practice. As an example, CO-B tries to limit the level of technology support in its foresight process and Microsoft® programmes seem to be the most utilised tools. The company’s view is that foresight data is quickly outdated and a human to human exchange of foresight knowledge adds more value to the organisation than sophisticated foresight software. Software tools are perceived as being incapable of supporting the process of translating qualitative insights/results into a quantitative framework or database.

On the other hand, systems may become necessary as a result of the volume of weak and strong signals and their complexity. Through the linking of signals with scenarios, a system could support organisational efforts to monitor signals and signposts and, as soon as a signal or signpost changes, facilitate the amendment or adaptation of its connected scenario/s in response to changes in the opportunity/risk profile. In addition, the signals database would help to produce reports for senior management, business units and strategy planners. The scenarios database would manage all the created scenarios, including descriptions, characteristics, consequences and visualisations. However, it would not “create” the scenarios, as qualitative methods are recommended for scenario building.

One of the key elements is the linking of underlying drivers (signals) with their strategic consequences, including strategic alternatives and response strategies. These potential response strategies are stored in a strategic actions database. The three databases would work in conjunction to manage, maintain and present the logic (connections) between signals, scenarios and response strategies. However, as mentioned above, practice evidence shows that organisations do not necessarily want to utilise IT driven foresight databases and systems.

Practice Implications Derived through the Research

An important element of foresight is the balance between top-down and bottom-up communication channels, to sustain a platform where foresight can be experienced by all employees. Therefore, the foresight process must be ongoing and requires a multi-
level approach with continuous feedback loops, accessible by various stakeholders. This balance is demonstrated in the combination of a top-down approach to building, describing and visualising scenarios, with the help of various stakeholders in an innovative environment, and challenging the organisation with the outcomes of scenarios in future workshops through the involvement of a wider group of managers (bottom-up).

As a rule, organisations need to overcome the major hurdles which hinder foresight, such as lack of internal resources or user friendly methodologies, money, time and management support, structural issues and cultural elements. Therefore, to drive foresight, management must support the programme culturally and monetarily and establish user friendly processes and methodologies. Foresight should be centrally funded to allow continuity, but managed in a decentralised way without constant approval from senior management being required for every step in the process. The use of information systems is not supported through the research, but might add value in complex, high volume, foresight projects.

5.2.3 The Uncertain Environment

The relationship between environmental uncertainty and foresight processes was evidenced in the literature (Ansoff 1965; Caragata 1999; Courtney, Kirkland & Viguerie 1997; Cravens et al. 2009; Dibrell et al. 2007; Fink, Schlake & Siebe 2001; Georgantzas & Acar; Gilad 2004; Hamel & Prahalad 1994; Hartley 2000; Jaeger et al. 2001; Kochikar & Ravindra 2007; Magnusson et al. 2009; Maguire et al. 2009; Ofek & Wathieu 2010) and validated by case study research. The foresight experts did not mention the application of strong signals in a foresight process. However, research has now shown that wildcards and strong signals are necessary, not as a key contributor for signals management and draft scenario building, but to enrich conversations and scenarios (based on weak signals) in the scenario/future workshops.

The scanning of the environment (or environmental or strategic surveillance) is the starting point (Fig. 35) because it is the source of knowledge about future developments, and this knowledge allows an organisation to decrease uncertainty in order to protect
itself against threats and take advantage of opportunities. Organisations should scan the environment for competitive or entrepreneurial sources of information, combined with political, economic, ecological, social and technological influences, changes in industry structure and the flux of competition and customer, business partner and employee behaviour. This is essentially a fact finding exercise.

Figure 35: The Uncertain Environment (own illustration)

Issues identified through environmental scanning will differ in the amount of information available. Some issues, called trends or strong signals (Ansoff 1975, 1982, 1984; Bell 2003; Cheung et al. 2009; Chia 2004; Collis 2008; Courtney, Kirkland & Viguerie 1997; Fink, Schlake & Siebe 2001; Harris & Zeisler 2002; Marsh, McAllum & Purcell 2002; Ofek 2010; Ofek & Wathieu 2010; Wack 1985a), will be sufficiently visible to allow the organisation to define and implement a strategic response. Other issues will come to the organisation’s attention by way of weak signals (Ansoff 1975, 1982, 1984; Day & Schoemaker 2005; Glassey 2009; Huber, Jaeger et al. 2001; Jungmeister 2006; Jungmeister & Zahld 2007; Liebl 1996; Marsh, MacKay & McKiernan 2010b; McAllum & Purcell 2002; Martinet 2010; Ofek & Wathieu 2010; Roberto, Bohmer & Edmondson 2006; Schwartz 1996; Tsoukas & Shepherd 2004), which are difficult to capture and understand, requiring specific qualitative methodologies to aid comprehension (Clemons & Hann 1999; Collis & Montgomery 2008; Harris & Zeisler 2002; Huber, Jungmeister & Zahld 2007; Martinez & Perez 2004; Ofek & Wathieu 2010). Foresight experts confirm that weak signals management is the core component of the foresight methodology. Wildcards, critical events or strategic surprises (Ansoff 1984; Day & Schoemaker 2007; Glassey 2009; Godet 1997;
Kerfoot 2003; Koncilja–da Mata et al. 2004; Massé 1965; Sheaffer, Richardson & Rosenblatt 1998) are events which are completely outside existing mental models and ways of managing, but will influence the course of the business. As mentioned above, research highlighted that successful foresight organisations have a strong focus on the collection (and interpretation) of weak signals. When all of these sources and scanning methods are understood and utilised by the organisation, signals can be identified and described. Foresight experts support an emphasis on weak signals as they are a key ingredient for the successful generation of foresight insights.

Strong signals (or mega trends) are easier to capture and therefore, in most cases, traditional methods are sufficient. Research shows that some organisations do not include strong signals in their foresight process as these signals are already known. It is even expected that individual profit centres can anticipate trends in the market represented by strong signals without the existence of a foresight framework, especially for issues three to four years in the future. This is seen as the “daily business” of ongoing strategic analysis, rather than a specific foresight objective. In the best practice framework, strong signals and wildcards will be added later in the process to enrich scenario conversations or enable stress tests or scenario games.

No industry can escape the impact of a subset of these drivers of environmental change; these signals are changing and creating new industries and ventures and can, depending on the context of the organisation, include both opportunities and threats. They will develop over time and are difficult to see and interpret, but can be vital to the success or survival of an organisation. Once identified and processed, they will allow the creation of knowledge that can help to set a new direction for future growth. Overall, the scanning of the external (and internal) environment allows an organisation to capture weak signals, strong signals (or trends) and potential wildcards, sometimes limited by the fact that not all signals are visible, or by the adverse impact of cultural norms and blind spots on the efficiency of the corporate surveillance radar. Evidence from research shows that organisations have a variety of sources from which to collect weak and strong signals. It is essential that organisations realise the necessity of weighing weak and strong signals equally and harnessing the information to positively influence their own future.
Practice Implications Derived through the Research

The necessary openness, communication and cultural acceptance of the concept of strategic surprises being able to influence the course of an organisation’s direction, must be demonstrated particularly by senior management. In order for an organisation to understand market dynamics in the long-run, it needs to scan both the internal and external environment for signals, accessing different sources. The extent to which a company chooses to invest its resources in these activities reflects the organisation’s commitment to strategy foresight and its ensuing success. A best practice foresight framework will have the ability to deliver knowledge about future change and generate imperatives which will help to draft response strategies, which in turn will prepare the organisation to address changes in the environment through industry and market reconfigurations.

5.2.4 Environmental Scanning, Databases and Signals Analysis

Research has shown that signals identified during environmental scanning (Fig. 36) should be stored in separate weak and strong signals databases. While the literature (Ansoff, Declerck & Hayes 1976; Burmeister, Neef & Beyers 2004; Christensen 1997; Day & Schoemaker 2005, 2007; Fiegener 1994; Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Gilad 2004; Hamel & Prahalad 1994; Hitt, Ireland & Duane 2001; Ringland 1998; Rubin & Kaivo-Oja 1999; Stoffels 1994; Van der Heijden 1996; Whipp, Rosenfeld & Pettigrew 1998; Wilenius 1999) does not specifically recommend separating the signals, the necessity of this approach became evident through case study research, and the comments by foresight experts who focus on weak signals only.

In most cases, foresight activities cover signals with a potential impact timeframe of at least five to ten years ahead, and in some cases, organisations look beyond ten years. The signals that an organisation manages to identify and collect are placed into the signals databases (signals collection and storing). There, a signals management team needs to further analyse and process the signals (Aguilar 1967; Ansoff 1980; Duncan 1972; Fink, Schlake & Siebe 2001; Fuld 2003; Georgantzas & Acar 1995; Haeckel 1999; Huber, Jungmeister & Zahld 2007; Stoffels 1994). This includes the addition of descriptions and the defining of characteristics for every signal source, followed by
signal classification and analysis, and potentially first reports to senior management and stakeholders. Research shows that trend scanning is the optimal method of collecting weak signals, focusing on desk research by cross functional teams utilising existing knowledge from experts (expert opinions and panels), authors (trend reports and science fiction novels) and universities. CO-B utilised over 60 data sources and conducted over 20 expert interviews to collect over 4000 signals from the external and internal environment.

For the collection of strong signals or mega trends (such as the aging society, the importance of individualism, health developments, the knowledge driven society, the rise of the digital age etc.), traditional methods such as brainstorming activities and external scanning using PEST and SWOT are regarded as sufficient and are recommended (Cheung et al. 2009; Clemens 2009; Collis & Montgomery 2008; Cravens et al. 2009; Day & Schoemaker 2006; Gunn & Williams 2007; Jennings 2001; Karami 2005; Kotler et al. 2004; Maguire et al. 2009; Marshall & McKay 2002; Oosthuizen 2000; Reger 2001; Schindehutte, & Morris 2009; Smith 2007; Spence 2003; Van der Duin & Den Hartigh 2009; Wilson 1999). As discussed previously, these strong signals are excluded for the purpose of signals analysis and processing in the best practice framework, and only later added back to the process in the scenario workshops in order to enrich and test scenarios.
There is evidence that a successful framework for signals collection and analysis requires an institutionalised process to ensure that knowledge amongst team members will be exchanged while retaining flexibility in the system. Generally, research and evidence from practical successes suggest applying the following methods (evident through case study research and foresight experts, supported by the literature [Ansoff 1975, 1984; Day & Schoemaker 2005, 2007; Glassey 2009; Jaeger et al. 2001; Marsh, McAllum & Purcell 2002; Mintzberg 1987; Schwartz 1996]) to identify and collect signals:

- General market and trend analysis, via environmental and media scanning;
- Expert interviews and panels (external) and future agent networks (internal);
- Networking with partners and exchange of best practice research with other organisations;
- Observation of consumer behaviour; and
- Innovation laboratories or innovation “spaces” in organisations, utilising creativity methods.

PEST and SWOT are barely more than frameworks used in an attempt to bring structure into the strategic planning process and their use is not advisable for identifying weak signals. Successful organisations use these qualitative methods and utilise PEST only to categorise insights. Research shows that companies which consider results solely from traditional planning tools prepare and describe convergent perspectives on the future, which only provides leverage for incremental change; the potential of these traditional analytical frameworks is intrinsically limited by their structured nature.

The need for signals analysis and processing is confirmed and supported by the literature, foresight experts and case study research. The signals processing methodology is described as follows: collected signals are grouped according to categories and their potential projections, redundancies are removed, and then prioritised to narrow down the number of signals. This process is entirely qualitative and is conducted in a workshop environment (with internal future agents, senior managers and external experts attending), based on judgement and guess work.

In terms of the research question, the foresight steps of signals collection, analysis and processing support an organisation’s effort to prepare for the future and subsequent flexible decision-making, to generate future strategic projects and nurture an innovation
driven culture. It is important to provide a tool set of user friendly, qualitative methodologies which allow the collection, analysis and description of weak signals.

**Practice Implications Derived through the Research**

Foresight cannot succeed where rigid hierarchical strategy development is enforced: a centralised and authoritarian process will limit the lack of initiative in the organisation and as a result, makes it blind to potential strategic foresight. Qualitative methods and tools are necessary to successfully apply foresight. PEST and SWOT methods only result in “lists” with no meaning for stakeholders and contribute little value to foresight and the strategy development process. It is acknowledged by both case organisations that the main use for these methods is structuring information around strong signals. Traditional, analytical and structured methodologies suffer from a conflict between innovation and bureaucracy and therefore limit the availability of foresight knowledge, prevent the exposition of alternative strategies and actions, and therefore restrict the ability for flexible decision-making later in the process. The methodology approach chosen is largely dependent on senior management’s approach to strategy, culture and innovation.

### 5.2.5 Scenario Building (Images of the Future)

The building of scenarios (Fig. 37) based on drivers of change is confirmed as an integral element in all the practice frameworks, but foresight experts and case study research promoted the view that this process step is beneficial to the top-down component of foresight development. To create the top-down driven draft scenarios, a team of foresight specialists, corporate development managers and future agents combine or cluster signals with mainly qualitative methods to create and describe draft scenarios (the bottom-up component is the scenario/future workshops, as described in section 5.2.6). The literature confirms that scenario building in the foresight discipline needs to be based on qualitative methods (Ansoff 1965; Bhide 2010; Caragata 1999; Cheung et al. 2009; Clemens 2009; Ireland & Duane 2001; Koncilja–da Mata et al. 2004; Lindgren & Bandhold 2003; Huber, Jungmeister & Zahld 2007; Ogilvy 2002; Schoemaker 2002).
Scenarios can bundle, connect and present weak signals (in combination with or supported by strong signals) in a meaningful way in order to decrease the complexity in an unpredictable future environment and help to educate stakeholders regarding potential changes. Managers will benefit from scenarios through learning about strategic uncertainty and opportunities in the environment and the underlying drivers, and will in turn add value by identifying and describing the consequences for the rest of the organisation. Successful organisations describe scenario building as an integral part of both their strategy development process and every business units’ continuous foresight process. These organisations actively encourage all their employees to participate in the development of scenarios through an unfettered discussion of ideas and an open mindset.

Figure 37: Scenario Building (Images of the Future) (own illustration)

The need to canvas multiple futures (or scenarios) is strongly supported by literature (Bhide 2010; Brown & Eisenhardt 1998, p. 135; Burmeister, Neef & Beyers 2004, p. 72; Cheung et al. 2009; Godet 1987, p. 21; Godet 2001, p. 63; Lindgren & Bandhold 2003, pp. 21-28; Ogilvy 2002, p. 11; Ringland 1998, pp. 46-47) and foresight experts. However, in business practice, preparing an organisation to anticipate a variety of potential environments that are fundamentally different not just from each other but also the present, is inherently problematic and represents a radical departure from traditional approaches to strategic planning.

Successful scenario building methodologies seem to be largely unstructured, using gut-feeling and verbal communication. Unfortunately, the literature (except Fuller 2005; Koncilja–da Mata et al. 2004) does not provide detailed information on recommended approaches and methods for combining qualitative, weak signals into scenarios, but case
study research has indicated that three methods can be utilised in a best practice framework:

<table>
<thead>
<tr>
<th>Method</th>
<th>Combine weak signals with trends to create bifurcations in timelines</th>
<th>Elaborate patterns of logical consequences</th>
<th>Experiment with cross-overs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>Track a signal’s anticipated path through time, considering possible turning points (or “bifurcations”) where the path splits into two directions.</td>
<td>A systems dynamics approach is utilised to identify and recognise interconnections between signals and describe the consequences.</td>
<td>Structural changes in markets or industries can arise because new practices or technologies (cross-overs) are introduced from another industry.</td>
</tr>
<tr>
<td>Practical Application (Best Practice)</td>
<td>Using insights from patterns of logical consequences and by identifying and describing the potential development of signals (projections), images of the futures (or draft scenarios) can be developed.</td>
<td>Matrices and impact analysis help to cluster signals, understand patterns in logical consequences and therefore create signals with assumed logical interconnections or dependencies.</td>
<td>Cross-overs are utilised to acknowledge and include industry foreign concepts to create the foundation of a draft scenario or combine signals to describe new concepts or behaviours.</td>
</tr>
</tbody>
</table>

Table 12: Recommended Methods for Scenario Building (own illustration following Fuller 2005)

The case organisation adopting a foresight approach did not consider a fourth method (entrepreneurial creation of futures; see section 4.4.1) as part of its first rollout of the new foresight process. This method advises the use of entrepreneurs to create potential new futures and business ventures. Entrepreneurial settings are characterised as highly competitive open environments and are associated with rich particular personal or local knowledge, in combination with a presentation of the organisation’s collected signals and insights into future change. The approach is to allow a small group of entrepreneurs (internal or external participants) to combine signals of change into opportunities and threats to build a future world (or scenario) where they could build a new business venture. The outcome of this process is a set of well argued business models (or scenarios) for new ventures that take account of needs, motives and practical issues and
make transparent assumptions about the nature and extent of the transformation which the present must undergo.

Based on a combination of the three methods for combining signals (outlined in Table 12), clusters around signals, projections and core themes can be identified and verbally described, tested, then further developed and refined. This leads to the creation of long-term future images or draft scenarios. In organisations applying a foresight approach, they are created during multiple workshops, primarily with corporate development teams, future agents and external experts (foresight experts recommend associated industry experts) to review and enrich the draft scenarios. The recommended methodologies, informed by both practice frameworks and literature (Albers & Broux 1999; Bell 1997; Brown & Eisenhardt 1998; Burmeister, Neef & Beyers 2004; Fahey & Randall 1998; Fahey & Randall 1998a; Fink, Schlake & Siebe 2001; Georgantzas & Acar 1995; Godet 1987; Graf & Klein 2003; MacKay & McKiernan 2010a; Ogilvy 2002; Ringland 1998; Schoemaker 2002; Schwartz 1991; Van der Heijden 1996; Wilson 1998a), are qualitative methods such as creative sessions, brainstorming, corporate think tanks, narratives and story-telling, visualisation of clusters, prototyping/mock-ups and open-creative conversations. Some foresight experts suggest that qualitative scenario modelling can be combined with quantitative methods, for instance to overlay qualitative models on quantitative data, to determine how the two models could interact and the possible consequences. Gaining acceptance and stakeholder buy-in from both senior management and team members is considered vital when working with scenarios. Therefore, scenarios should be clearly described and easy to understand. The visualisation of scenarios is an alternative (or complementary) way to present scenarios. Both the literature (Burkhard, Spescha & Meier 2005; D'Aveni 2004; Fink, Schlake & Siebe 2001; Igartua et al. 2010; Rollwagen et al. 2008; Thatcher 2006) and organisations adopting a foresight framework utilise future maps to visualise scenarios and their underlying drivers.

Scenario building is likely to be one of the most important steps in the foresight process and the utilisation of qualitative methods to combine signals is crucial. In terms of the tested research propositions, it is the foundation for open strategic debate and innovation, which will determine the scope of future strategic projects and enable responsive decision-making later in the process. The required investment to build scenarios based on a catalogue of hundreds of identified signals and in collaboration
with a group of managers and foresight or industry specialists is significant. Therefore, it is essential to apply user friendly methodologies which will reduce complexity and generate meaningful and robust scenarios.

**Practice Implications Derived through the Research**

As literature does not provide user friendly, qualitative and practical methods to combine weak signals, case study research informed the utilisation of a mix of methods from Fuller (2005), namely cross-overs (combine signals which support the building of industry foreign concepts), bifurcations (create qualitative projections of a signal’s most likely behaviour, for instance in combination with other signals) and logical consequences (combine signals and create signal maps depending on their neutral, negative or positive attitudes towards one another). The building of draft scenarios is the top-down component of the foresight framework, followed by the bottom-up element which takes place in the scenario/future workshops.

### 5.2.6 Scenario/Future Workshops

Both practice frameworks and the literature (Abplanalp & Lombriser 2010; D'Aveni 2004; Fink, Schlake & Siebe 2001; Igartua et al. 2010; Rollwagen et al. 2008; Thatcher 2006) propose conducting scenario/future workshops to present, discuss and enrich scenarios, understand potential consequences, create future action plans and trigger foresight thinking (Fig. 38). However, foresight experts and case study research supplemented the best practice framework by providing some suggested methods for collaborating with stakeholders as part of a bottom-up approach to foresight. The need for the bottom-up approach is indirectly confirmed by the literature (Carr, Durant & Downs 2004; Choi 2006; Cravens 1998; Dwyer & Mellor 1993; Hamel 1998; Harari 1995; Kemelgor 2002; Kouzes & Posner 1996; Lichtenhaler 2009; Mintzberg 1994; O’Shannassy 2003; Ringland 2010; Van der Merwe et al. 2007; Visser 2007), as effective strategy formulation and decision-making arises from the free flow of information and unfettered communication between employees.

During the workshops, the scenarios will be discussed with management, strategists, marketing managers and other stakeholders in order to foster strategic conversations and
help to build an organisation which can successfully operate in future landscapes. The implications of each scenario need to be identified and appropriate actions described. Finally, scenario drivers (or leading indicators and signposts) should be selected for monitoring purposes, in order to increase the level of certainty regarding the possibility of certain scenarios becoming reality.

Combining scenario building with the decision-making process of strategy development (common terms are scenario learning or scenario thinking) can help organisations to understand how to manage their future strategically. For example, stakeholders will be asked to describe the future market positioning of their business unit, product, etc. under each of the presented scenarios. In so doing, they defend the current strategy as well as products, services, channels and brands in the presented scenarios and define projects/actions necessary to minimise the risk and/or benefit from the new market opportunities.

![Scenario/Future Workshops](own illustration)

One of the aims of a successful foresight process is to challenge and change established norms. In organisations adopting a foresight framework, this bottom-up component of foresight requires a heterogeneous group of people to discuss and potentially oppose the scenario, with the result being enriched and robust scenarios, the identification of knowledge gaps, and stress tests for current strategies (to determine how they would react in each situation) and an adapted, or even new, strategy approach. Both positive and negative situations should be discussed, but with a strong focus on mitigating threats, building organisational defence mechanisms and identifying growth opportunities. In addition, the conversation will be enriched and informed by reference to strong signals, and will recognise the potential impact of strategic surprises or
wildcards requiring agile strategic responses. These workshops are preparation for the annual strategy development process.

In addition to the main scenario workshops, case study research has shown that mini workshops should be held with members of every business unit to enrich the scenarios. It is recognised that foresight and scenario thinking must occur at all levels of the organisation: open discussions between all levels in the company ensure that employees understand how other departments perceive the future, which in turn encourages more open strategic conversation. This is a very important step, as a successful organisation’s approach is not only focused on the analysis itself, but also on emphasising across the company that foresight thinking is a priority. In addition, it allows the organisation to gather signals from the company base and via different channels and sources, and for the employees to be actively involved in the future of the company.

Once more, support from senior management in this process is important. In the example of the case organisation, the executive team acknowledged and approved the proposed scenarios and used them as a basis for testing the organisation’s strategic plans and readiness for change. Debates and elaborations on scenarios are tools to eliminate complexities and misunderstandings in final strategic analysis, decision-making and strategy assessment. Organisations utilising a foresight approach acknowledge that due to the subjective nature of foresight research, the goal of foresight cannot necessarily be reduced to producing direct monetary results (the value of these workshops is not quantifiable). Instead, the goals of foresight include encouraging employee participation in the long-term strategic planning process and in turn, building an innovative culture and creating a flat hierarchy in the organisation, to facilitate employees’ interaction and connection. Foresight experts conclude that scenarios help to prototype the future in order to formulate communication plans in anticipation of future changes within the organisation. They support the view of the case organisation that scenarios developed from foresight activities are a process of social construction of knowledge, and recognise that this is the most important methodological issue.

Scenario workshops are the foundation for open strategic debate (and thus more divergent scenarios) and aid in preparing an organisation for the future via the identification of gaps and definition of actions for future strategic projects. Workshops are key contributors to an innovative culture and mind set in the organisation, and will
potentially allow and deliver game changing initiatives which stimulate high growth opportunities. Traditional strategic planning methods will most likely deliver organic incremental growth. Again, user friendly methodologies are important to the communication and sharing of foresight insights with employees and the subsequent further enrichment of the scenarios. The proposed qualitative methods (supported by both practice frameworks) are creative future workshops, open discussions, focus groups, future testing, market trials, stress tests, creative conflicts and war gaming. As future knowledge is widely distributed and available in the organisation, potential future changes, scenarios and action plans are available and well-known and their drivers and signpost are recognised, it will allow the organisation to decide on strategic decisions with a higher degree of certainty and flexibility later in the process as strategies are being implemented.

**Practice Implications Derived through the Research**

Discussions of scenarios within a foresight framework, and the testing of current strategy and organisational capabilities against those scenarios, are important steps. This will result in more divergent scenarios, but it is not anticipated that foresight will itself identify opportunities for new ventures or projects; rather it will deliver new thoughts and additional ideas for the company to consider in its strategy and decision-making processes. In the stress test, the organisation compares scenarios against current strategies and shares findings with the relevant departments. In workshops those departments will then be asked to define the consequences of such a scenario and provide possible solutions or responses. Scenarios will again be enriched with feedback from workshops and utilised in strategy development. Methods and processes are well chosen if outputs from foresight help to enrich the strategy development process with insights and influence and prioritise company goals and projects. It is important that the scenario building methodology allows multiple iterations, with both top-down input from senior management and bottom-up modifications and enhancements by business units and team members. The scenario workshops make the information more manageable, bringing it away from an abstract level and enabling team members to visualise the future.
5.2.7 Strategic Programme Management and Scenario Transfer

Practice frameworks validated and enriched these two foresight steps to define the potential consequences and actions from scenarios and to deliver input to strategy development. One of the contributions to new practice is the identification of core strategic topics. At the end of the series of scenario/future workshops, an organisation is capable of defining the key strategic topics which will influence strategy development (Fig. 39). In the example of the case organisation, these topics are used to start the strategy process. Scenario transfer is the driver for preparing an organisation and building readiness for change in terms of future strategic projects, innovation and culture building. This link between scenario building and strategy development is also confirmed by the literature (Abadie et al. 2010; Aguilar 1967; Amara & Lipinski 1983; Ansoff, Declerck & Hayes 1976; Daheim & Uerz 2008; Fahey & Randall 1998, 1998b; García-Arca & Prado-Prado 2007; Godet 2001; Graf & Klein 2003; Havas et al. 2010; Johnson 1983; Kunze 2000; Lichtenthaler 2009; Liebl 1994; Lindgren & Bandhold 2003; Micic 2010; Mietzner & Reger 2009; Porter 1985; Schoemaker 2002; Teece 2007; Wack 1985b, 1998b).

Figure 39: Strategic Programme Management and Scenario Transfer (own illustration)

Results and insights from scenarios and future workshops flow into strategy development and initiatives, referred to as strategic programme management and scenario transfer (business adaptation). Part of this process is to describe what the organisation should do in order to prepare for these futures, including initiatives and actions in the areas of culture, company structure and processes, technology and internal communication. An organisation can regard corporate strategy as a portfolio of
initiatives, a portfolio fed by innovation and initiatives arising from a foresight process. Scenario transfer occurs when an organisation uses scenarios to identify possible business opportunities, to test or refine the company’s strategy based on its new understanding of what is required to succeed in a variety of possible futures, or to scan the environment for new or changing signals to determine whether further strategy change or adaptation is required. In the case organisation, the updated description of the enriched and validated scenarios, conclusions from the scenario workshops and the detailed analysis of consequences were created via the centralised corporate development team. The results of this process are tables with itemised descriptions of consequences for the industry and organisation if one of the scenarios becomes reality. This delivers a portfolio of new strategic alternatives which can be considered and allows the organisation to enrich its strategic plans. This portfolio of strategic alternatives and initiatives around opportunities and threats is the basis for an organisation’s strategic planning process (referred to as a strategic analysis document) which describes the scenarios and the supporting drivers (or signposts) in the form of short-term strong signals and longer term weak signals.

A successful future oriented and innovation driven organisation acknowledges that it requires a level of respect for future planning, particularly because an organisation is not in control of the future and does not have influence on all drivers of change. Scenario transfer is the connecting bridge enabling communication and application of foresight insights in business practice. This will ensure that consequences of future change and potential strategic alternatives and initiatives will be integrated in strategy development, innovation management, culture building and other company wide or functional business units (marketing, risk, finance etc.) initiatives. Again, it is recommended that workshops be held throughout the organisation to ensure a successful knowledge transfer. Scenarios should be enhanced and visualised via multimedia applications to increase the impact in the audience and trigger “foresight thinking”. This final step is to invite the whole organisation to participate in future thinking and stress test the organisation against current plans. In conversations within functional departments, operational consequences for market offer, processes, structure, capabilities and team culture should be defined, as well as possible solutions or responses. Action plans from these functional sessions should be communicated back to the centralised corporate development or foresight teams to further enrich the scenarios and the strategic programme management.
In the example of the organisation adopting a foresight framework, the outcomes from the application of the foresight process were either thoughts, additional ideas and input for the decision-making process, or concrete actions regarding cultural and organisational changes (for example, to improve the customer experience, to upgrade service levels in 600 branches and to simplify the product portfolio). Therefore, it is important to integrate foresight thinking in the strategy conversations on an ongoing basis, to ensure that whenever a new aspect with regard to (for example) customers, customer needs or new products would arise, references can be made to foresight and foresight insights (scenarios, drivers of change, consequences, strategic alternatives and initiatives). In the most basic sense, this is simply achieved by encouraging the open sharing of information with the whole organisation. In the case of the organisation adopting a foresight framework, scenario workshops and transfers resulted in a realisation that the organisation requires cultural change, simpler and fewer products, and more clarity in functional market strategies, to be successful in a potential new environment. In terms of culture building, evidence shows that the successful integration of foresight is based on the supporting values of the organisation, the methods applied and the degree of top-level management support. This will allow an uncontrolled, collaborative, forward looking and spontaneous approach to innovation. It means that the organisation is conceptually and culturally prepared for change and will minimise the time investments required to understand a future situation and thus decide on appropriate actions.

**Practice Implications Derived through the Research**

An important insight is that the implementation phase (strategic programme management and business strategy adaptation) must immediately follow scenario building and presentation. CO-B experienced numerous strategic alternatives as a result of foresight, which have enriched future strategies and alternatives for the organisation and supported decision-making. In addition to the projects directly resulting from foresight, the process also helps to stimulate an innovative and proactive culture. In order to deliver value, senior management has to support foresight in terms of financial and internal resources, potentially change existing approval processes and acknowledge that future planning is not an exact science, so even if short-term success is not apparent, long-term benefits may still be reaped. From a cultural point of view, an element of risk taking is necessary to understand and foster the concept of corporate
foresight. A report from these two foresight steps with the finalised scenarios and the detailed analysis of potential consequences will be created via the foresight or strategy teams. The results of this process are matrices with descriptions of consequences for the industry and the organisation if one of the scenarios becomes reality, outlines of future projects and response strategies and a list of core topics which need to be covered in the regular strategy development process. This scenario transfer is the point at which insights from signals management and scenarios are integrated into the formal strategy development process and the operational business units, marketing and product plans. It allows the organisation to formally prepare and present future oriented strategic projects for further growth and to create response strategies for environmental change. The workshops discussed help to ensure a successful knowledge transfer throughout the organisation. Scenarios should be communicated as multi-media presentations or movies to increase the impact in the audience and trigger “foresight thinking”.

5.2.8 Scanning Strategy and Monitoring System

The literature and foresight experts have enriched the case study research with the view that a scanning strategy is necessary to determine the direction and scope of scanning activities, even though support from theory (Day & Schoemaker 2006; Stoffels 1994) is limited. In order to determine the focus of environmental scanning, to consider the elements of the uncertain environment based on the current knowledge levels and by considering the strategic knowledge needs of management, a scanning strategy (Fig. 40) provides the necessary guidelines for the process of identifying, collecting and monitoring signals. In terms of a monitoring system, both practice frameworks confirmed that monitoring is an element of a foresight framework. Monitoring is widely supported in the literature (Bell 1997; Bright 1970; Day & Schoemaker 2007; Fink, Schlake & Siebe 2001; Glassey 2009; Higgins 1994; Hitt, Ireland & Duane 2001; Krystek & Müller-Stewens 1990; Lindgren & Bandhold 2003; Mietzner & Reger 2009; Schoemaker 2002; Schwartz 1996), but the limited use of monitoring in the case organisations indicates the need for investment in this area (CO-B recognised that the organisation is at risk without policies and accountabilities for the scanning, monitoring and updating of foresight knowledge), for instance via the utilisation of a time map and the future agent network. The time map highlights and identifies weak signals and
topics that have a clear potential to become important in the future, but do not yet require a strategic response or are not yet understood in detail.

Once the scenarios have been developed and are used in strategy development, they need to be monitored, together with their drivers and signals, on a continuous basis in order to observe and update insights from the external environment. A scanning strategy and monitoring system should address two key issues, namely the fields (or topics) which need to be monitored and the processes and methods applied in order to do so. It is advisable to revisit scenarios whenever a signal or the competitive environment is behaving differently than expected. Evidence from the case organisation supports that every three to four years, an organisation utilising a foresight approach should re-run the entire, in-depth foresight process. At the same time, the established foresight framework should be focussed on the ongoing process of capturing strong and weak signals, not only to enrich the database of signals, but also because of potential strategic surprises or wildcards. The importance of keeping foresight insights and reports up-to-date is recognised in practice, as they have the propensity to become quickly outdated. It is important to implement policy and procedures to clarify responsibilities and accountabilities to update and manage the foresight process, and how often the teams should report to senior management and share insights via their future agent network across the organisation. In the organisation adopting a foresight framework, a “working document” exists, which is continuously enriched with foresight content. The need for articulated policy and procedures is supported by foresight experts, who also conclude that once the first set-up scenarios are available, trends need to be continuously monitored and assessed.

As a result, in order to anticipate changes in the environment and develop potential innovations, organisations must systematically monitor the environment. It is seen as a process to further analyse the signals and indicators unveiled through environmental scanning. At each phase in the development (lifecycle) of the signals, a company needs to decide whether to act on the signal (graduated response) or continue with observation. It is recommended to apply the same methods used for scanning activities, including reports and media scanning, expert interviews and panels, future agent networks, observation of consumer behaviour and innovation laboratories in organisations, utilising creativity methods. A monitoring report should be presented to senior management prior to the annual strategy and planning meeting with new insights,
signals developments and recommendations for further steps. However, if strategic surprises or wildcards come into play or a weak signal suddenly starts to become stronger than expected, management needs to be informed immediately. This will allow flexible decision-making as strategic responses are being defined and implemented.

**Figure 40: Scanning Strategy and Monitoring System (own illustration)**

*Practice Implications Derived through the Research*

Continuity in foresight requires a scanning strategy and the continuous monitoring of signals and scenarios (for instance with a time map of signals) because of potential strategic surprises or wildcards. Foresight is an ongoing process, but it seems that every three to four years, a major investment, for instance from a corporate team, is required to update the foundations of insights around future developments. An infusion of either human resources or financial support seems to be necessary to aid this periodic update. Despite the intention to run innovation in an uncontrolled and decentralised manner, a certain degree of control is necessary to provide a framework, process and a minimal set of methods (outlined in the scanning strategy), in combination with sufficient funding. There is a direct connection to the company’s culture and willingness to take risks: without an innovation driven framework and with low appetite for growth and risk,
strategic foresight will not be prioritised in a company and therefore weak signals will virtually be ignored. These companies will not anticipate and prepare for industry and market reconfigurations, but simply wait and adapt, or react later.

5.2.9 Future Agents & Think Tanks

Research validated through both practice frameworks (foresight experts and case study research) that a future agent network and think tank (or strategy committee in the case of CO-B) are of great value to an organisation in its efforts to continuously monitor the environment, enrich both the signals database and the current scenarios, exchange foresight knowledge and participate in conversations, open debates and link foresight with strategy (Fig. 41). Most interestingly, this element of foresight is not specifically discussed in the reviewed literature (Amara & Lipinski 1983; Ansoff 1965, 1980; Fink, Schlake & Siebe 2001; Georgantas & Acar 1995; Liebl 1996; Ringland 1998; Voros 2003) on frameworks, but is described by others (Ansoff 1975; Gilad 2004; Kaplan & Norton 2005; Rohrbeck & Gemünden 2011; Stoffels 1994) as a strategy, planning or foresight unit or committee.

The future agent network is an important element for such a flexible but institutionalised exchange of foresight knowledge and the approach is strongly supported by foresight experts. The main objective of a future agent network is to ensure an ongoing feeding and updating of the weak and strong signals database and the development of future scenarios. Future agents are seen as the primary source for input into the foresight process. They look ahead, gather thoughts about future developments and deliver input to the centralised foresight function. They meet both ad hoc and formally three to four times a year to discuss changes in the environment based on new signals and to prepare input for strategy reviews and the scenario building and strategy development process. The key success factors are voluntary participation, their proximity to the daily business and a requirement that their participation is independent of existing company hierarchy. Companies hope to achieve a “network effect” through these agents, independent of a centralised management structure, and to foster communication and collaboration. This network enables open discussion, exchange of opinions and thoughts with a focus on future change and impact on the organisation; it
means that knowledge of future potential changes is embedded in the organisation across functions and hierarchies; it mitigates the risk that foresight knowledge can be lost and ensures that more managers consider future impact during planning activities. The future agent network will not only enable a company to collect, analyse and process signals, but to monitor and update the signals database (and scenarios) on an ongoing basis later in the process.

![Diagram of environmental scanning process]

Figure 41: Future Agents and Think Tanks (own illustration)

The think tank (or strategy/foresight committee) will discuss current and future developments and help to identify opportunities and threats and decide on strategic responses to surprises, wildcards and changing behaviours in the environment. The committee represents every business unit with strategic relevance and reports to the CEO and/or Board of Directors. The committee members, most of them senior managers, are potentially rewarded by incentives (and/or punished by sanctions). They meet ad hoc if required (for instance when strategic surprises or wildcards emerge) and
formally on a quarterly basis in order to discuss current and future developments, to identify opportunities and threats and to allocate budgets for relevant projects and actions. Once a year, the committee also decides on relevant strategy input for the annual strategic planning process. Their competencies are to decide on risks/threats and opportunities; their responsibility is to avoid environmental signals of change being ignored by the organisation.

The responsibilities and accountabilities of the two foresight roles, future agents and the think tank members, in combination with the senior management of the organisation, can be listed as follows (from case study research, Table 13):

<table>
<thead>
<tr>
<th>Process Tasks</th>
<th>Roles</th>
<th>CEO/Board of Directors</th>
<th>Future Agent</th>
<th>Foresight Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foresight framework, process, method sets and infrastructure</td>
<td></td>
<td>P/O</td>
<td>O</td>
<td>D/O/C</td>
</tr>
<tr>
<td>Environmental analysis; signals collection and storing</td>
<td></td>
<td>D/O</td>
<td>P/E/O</td>
<td>O/C</td>
</tr>
<tr>
<td>Signals analysis and processing</td>
<td></td>
<td>-</td>
<td>E</td>
<td>O/C</td>
</tr>
<tr>
<td>Scenario building</td>
<td></td>
<td>-</td>
<td>O</td>
<td>D/O/C</td>
</tr>
<tr>
<td>Scenario/future workshops</td>
<td></td>
<td>O</td>
<td>E</td>
<td>D/O/C</td>
</tr>
<tr>
<td>Analysis of consequences and strategic alternatives/initiatives</td>
<td></td>
<td>D/E/C</td>
<td>E</td>
<td>D/E/C</td>
</tr>
<tr>
<td>Scenario transfer and business strategy adaptation</td>
<td></td>
<td>(L/P) D/E/C</td>
<td>E/O</td>
<td>(D) O/C</td>
</tr>
<tr>
<td>Monitoring of scenarios and signals</td>
<td></td>
<td>O</td>
<td>E/O</td>
<td>O/C</td>
</tr>
<tr>
<td>Performance reviews</td>
<td></td>
<td>P/D/C</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Key: L = Lead, P = Plan, D = Decide, E = Execute, O = Cooperate, C = Check

Table 13: Corporate Foresight Tasks and Roles (own illustration)

The performance of the members from the foresight network and foresight committee could be linked to the company’s overall performance in order to drive the foresight function and continuously measure the achievements of foresight activities. Criteria could be innovation strengths, successful project implementation and time to market, financial benefit and shareholder value.
Practice Implications Derived through the Research

Foresight has an element of delivering aggregated foresight information to senior management, which means that there is a link to strategy and business management/adaptation. However, it is equally necessary to push the cultural aspect of foresight in the organisation. This means that foresight tasks need to be allocated to various stakeholders across the organisation, reflected by the two roles of future agents and think tank members, which represent and cover all areas and organisational levels of the business. The roles of all stakeholders in the strategy process, especially foresight, need to be clarified and described. CO-B is moving away from focusing purely on structured processes and traditional analytical methods: its focus is on exchanging knowledge through a network of internal future agents and strategy or future workshops, and signals analysis and scenario building is mostly based on qualitative methods, using intuition, verbal and visual communication. It is about bringing people within the company to a common understanding regarding the need to think ahead. Therefore, the starting point for foresight could be the establishment of a corporate development or strategy team, in combination with a future agent network or think tank, which allows focusing on the foresight process while spreading accountabilities and sources for foresight insights across the organisation. A future agent network in combination with future workshops is seen as a simple and user friendly methodology to be utilised to scan the environment, build scenarios and challenge an organisation with outcomes of scenarios. For a medium sized organisation, around fifteen to twenty future agents will meet three to four times a year to update the list of signals, analyse them and update or modify scenarios, and report back to senior management. The key success factors for a future agent network are voluntary participation, proximity of members to the daily business and involvement being independent of existing company hierarchies.

5.2.10 Performance Reviews and the Foresight Continuum

Research has enriched the practice framework from case study research through the identification of the component of performance reviews (Fig. 42). Both the literature and foresight experts confirm the role of this element in a foresight framework to ensure that policies, training and skills are present in order for an organisation to take
advantage of foresight. Through this process, an organisation can enrich its learning capabilities for foresight. This performance review (Eschenbach, Eschenbach & Kunesch 2003; Halme 2002) occurs at the end of the foresight process; it will assess the organisation’s willingness to adapt and identify the difficulties of managing strategic and cultural change, implementing strategic initiatives and formulating strategic responses based on foresight knowledge.

Figure 42: Performance Reviews and Foresight Continuum (own illustration)

One of the key contributors to new practice from case study research is the acknowledgment of the foresight continuum, which enables an organisation to benefit from increased flexibility in decision-making, innovation and ongoing learning through strategic debate, initiated and enabled by a foresight framework. While the literature confirms the benefits of foresight through future planning (Chia 2004; Hamel & Prahalad 1994; Magnusson et al. 2009; Maguire et al. 2009; Marsh, McAllum & Purcell
from scenario building, to enable adaption to change (Gehani 1992; Haeckel 1999; Huber, Jungmeister & Zahld 2007; Sandström et al. 2009) and grow an organisation (Braganza, Awazu & Desouza 2009; Davis 2008; Ofek & Wathieu 2010; Rohrbeck & Gemünden 2011; Van der Duin & Den Hartigh 2009), it is argued that the “foresight continuum” is a more capacious term to describe the ongoing and strategic benefits.

In investigating the research propositions, it became evident that there is a stronger link between foresight and innovation than initially anticipated. A foresight-centric planning process reflects more open debate and reveals more divergent scenarios for consideration. Through the open conversations, employees are more willing to present and debate ideas across all levels of the organisation, in turn re-energising strategic debate and supporting innovation. Foresight experts have argued that to be successful, innovation culture must be a part of the organisation, reflecting core corporate values. In CO-B, innovation is part of the company culture, ensuring successful foresight and strategy development via listening to and using information in a top-down and bottom-up process. This creates a flat hierarchy and allows an organisation to be in a constant state of change and means that the organisation is conceptually and culturally prepared for change. Case study research provided evidence that foresight supports innovation, corporate thinking and strategic decision-making through the elimination of complexities and misunderstandings.

*Practice Implications Derived through the Research*

A toolset for advancing strategic corporate foresight can only succeed if the organisation’s culture embraces innovation, and the reverse is also true: without a foresight process and adequate methods and techniques, a company cannot foster innovation. In addition, company structure and hierarchy seems to have an influence as well. As innovation is “uncontrolled” and “spontaneous”, both processes and tool sets should be used as guiding elements or an infrastructure, and not viewed as stiff boundaries for foresight and strategy support. In CO-B, the whole organisation is helping to look forward, with limited centralised steering. This is different to CO-A where employees try to “protect” their ideas. Corporate culture plays a vital role as the organisation’s culture must support innovation; the company vision and strategy must
be connected with market insights and programmes need to be available to support future growth.

Foresight is a prerequisite for innovation and ongoing debates and conversations are essential, during workshops, through future agents or by way of any other channel of communication. The outcomes of these workshops will be included in the overall strategy development process and enrich the strategic analysis. Sharing of foresight knowledge with the executive management allows them to feed relevant information back to the foresight team and stakeholders across the organisation. This, in turn, allows foresight conversations from both a top-down and bottom-up perspective and enables a strategic debate to happen across the whole organisation.

A downside of foresight-centric approaches to strategic planning is that decision-making can take longer because of its democratic nature. The research revealed that organisations with traditional approaches to, and tools for, strategic planning will exhibit a narrow, one dimensional view of the future and in return, will anticipate only incremental change and convergent perspectives on the future. By contrast, foresight driven organisations which utilise strategic programme management and scenario transfer, enable and prepare themselves with a culture of innovation, future oriented debates and conversations and readiness for change. It allows them to build a portfolio with divergent, strategic alternatives and initiatives and enrich, align and prepare their functional business units to consider strategy, future thinking and consequences. This readiness for the future will again allow flexible decision-making as strategies are being implemented. Although time consuming, it is evident that a dedicated, continuous foresight process is necessary in order to cover issues not necessarily catered for by traditional strategy planning processes.

5.2.11 Support for Best Practice Model from Foresight Experts

This best practice framework is supported by the findings from the case study research and the insights and feedback provided by the six foresight experts with combined foresight experience of over 160 years, gathered during practice oriented foresight activities for over one hundred companies (all experts).
One expert described their background as “twelve years of experience trying to get a large bureaucratic organisation to recognise that the future was going to be non-linear and the technology was going to have a major disruptive affect on all aspects of its business”. This expert had drawn best practice conclusions from experiments with many approaches in a large number of companies around the world (expert 1). It seems that many organisations face difficulties dealing with increasing speed, complexity and globalisation issues; they try to focus on managing the day-to-day-business and often leave strategic planning issues to external consultants (expert 3).

Foresight activities must be supported from the top of the organisation, with CEOs and corporate teams driving these activities, but involving all employees at all levels in the organisation. However, most organisations and leaders lack the imagination and courage to do more than create a plan that changes as soon as it is printed. Top-level management often spends too little time on the company vision and scenario development for long-term planning, and fail to provide tangible goals to the stakeholders (experts 2, 3, 4). Companies once considered 10+ years to be a standard strategic planning horizon and now the horizon is limited to three to five years, and often less than that. The result is that semi-tactical plans are leading to decisions that can be contextually inappropriate, even though long-term is a relative measure of time (experts 1, 3, 5). This could well lead to a revival of long-term planning and corporate foresight as the perceived value of strategic planning increases with the speed of innovation and globalisation (expert 3). As one expert says, organisations must “plan or be planned for” (expert 6).

The input from foresight experts supports and enriches the approach chosen by CO-B and validates all six research propositions. It demonstrated how and why strategic foresight, based on the integration of strong and weak signals methodologies, can enrich the strategy process in a dynamic and changing environment. Foresight-centric strategic planning processes will reflect more open strategic debate and reveal more divergent scenarios (RP₁) and therefore more future oriented strategic projects and an innovation driven culture (RP₂), resulting in new growth opportunities (RP₃). Strategising and scenario management based on weak and strong signals foresight methodologies generate strategic imperatives that both address current challenges and prepare the organisation to address anticipated industry and market reconfigurations (RP₄). It
requires top-level management support and user friendly methodologies (RP_5) and will exhibit flexible decision-making later in the process, as strategies are being implemented (RP_6).

5.3 Research Contributions and Implications

The new practice frameworks introduced here, and supported by foresight experts and CO-B’s experience and success, contribute to the best practice of foresight in both theory and practice. This framework emphasises the significance of weak signals, giving them a fresh relevance. In practice, this framework can have a considerable impact on the culture and success of organisations operating today. The framework requires open communication and a continuous focus on foresight, both significant changes if an organisation is not already modelled in this manner. It also requires a more fluid power structure in order to succeed, which again requires potential hierarchical changes within an organisation. The research contributes to existing practice and policy, especially because foresight is still a young field of empirical enquiry; it will enrich the discussion of the concept of weak signals management. It summarises important, new and relevant findings from theory about corporate foresight and identifies how a leading retail bank in Switzerland has implemented its corporate foresight system, and has highlighted the insufficiencies of traditional strategy planning methodologies through the testing of the research propositions.

The research provides a framework for strategic corporate foresight with focus on the implementation of weak and strong signals. One part of this framework provides a process to collect, analyse and describe weak signals, and to combine them into scenarios which can challenge the existing mental models of strategy managers and test the existing strategies of the organisation. The focus of strategy development in companies will therefore shift from today’s traditional approach to strategy development to an integrated framework that connects strategy decisions with corporate planning, marketing, product management and innovation. This contemporary approach to strategy development should stimulate companies to look beyond a three or five year planning horizon and to take better advantage of opportunities and build more robust defences against long-term threats via advanced foresight.
To reiterate the value propositions established in the research, the proposed framework for advancing strategic corporate foresight provides a generic best practice process and tool set which allows an organisation to benefit from foresight and create a foresight continuum through:

- Open strategic debates, revealing more divergent scenarios for consideration in the strategic planning process;
- More future oriented strategic projects and the building of an innovation driven culture;
- Strategic imperatives that address current challenges and prepare an organisation for change in the long-run; and
- Flexible decision-making capabilities, as strategies are being implemented.

Through a comparison of the differences between the framework informed by the literature and the enrichment through foresight experts and case study research, the following key contributions to practice were made (Table 14):

<table>
<thead>
<tr>
<th>Insight</th>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>Best practice model</td>
<td>Research contributed to one of the most detailed descriptions of a best practice framework for advancing strategic corporate foresight, utilising weak (and strong) signals and scenario management. Foresight experts and case study research revealed that scenario building is the top-down component, and scenario workshops the bottom-up component of a foresight process, similar to the mechanics of contemporary management and strategy frameworks.</td>
</tr>
<tr>
<td>I2</td>
<td>Research propositions</td>
<td>Research confirmed that organisations with a foresight-centric strategic planning process will generate more open strategic debate and build an innovation driven culture. This will generate strategic imperatives (and key topics to be considered in the strategy planning process) which deliver more divergent scenarios and future oriented strategic projects, allow flexible decision-making and prepare an organisation for future change. This requires top-level management support and user friendly methodologies, while traditional structured analytical frameworks will generate only convergent perspectives about the future and lead to the adoption of strategies that support only incremental change.</td>
</tr>
<tr>
<td>I3</td>
<td>Scanning strategy</td>
<td>Field research has highlighted the need for a scanning strategy in a contemporary foresight framework. This need was supported by the foresight experts, illustrated by the lack of policies/clarity in the case organisations, and evidenced by the lack of emphasis on this element in the literature. This will set scope and focus for environment scanning via the definition of scanning fields, sources, methodologies and processes. A “time map” was recommended as a practical tool for enabling the monitoring of existing signals and scenarios.</td>
</tr>
<tr>
<td>I4</td>
<td>Strong signals and</td>
<td>While the literature clearly defines wildcards, weak signals and strong signals, the application of these concepts in practice to create scenarios</td>
</tr>
</tbody>
</table>
Wildcards is not discussed in detail. While foresight experts exclude strong signals from the core foresight and scenario building process (the identification of strong signals is seen as a standard task for managers), case study research has revealed a practical use for strong signals and wildcards later in the process, to enrich the scenario workshops by providing additional input, and to enable debate and stress test an organisation for more immediate challenges from the environment.

<table>
<thead>
<tr>
<th>Table 14: Contributions to Practice (own illustration)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wildcards</strong></td>
</tr>
<tr>
<td>is not discussed in detail. While foresight experts</td>
</tr>
<tr>
<td>exclude strong signals from the core foresight and</td>
</tr>
<tr>
<td>scenario building process (the identification of strong</td>
</tr>
<tr>
<td>signals is seen as a standard task for managers), case</td>
</tr>
<tr>
<td>study research has revealed a practical use for strong</td>
</tr>
<tr>
<td>signals and wildcards later in the process, to enrich</td>
</tr>
<tr>
<td>the scenario workshops by providing additional input,</td>
</tr>
<tr>
<td>and to enable debate and stress test an organisation</td>
</tr>
<tr>
<td>for more immediate challenges from the environment.</td>
</tr>
</tbody>
</table>

| **Qualitative Methods**                                 |
| The utilisation of qualitative methods is supported by  |
| some of the literature, but details of practical tool   |
| sets for use in the different phases of a foresight     |
| process are missing. Field research identified the      |
| qualitative methods used in practice to: (a) collect    |
| weak signals from the environment; (b) build scenarios  |
| or images of the future from the collection of weak     |
| signals; and (c) present the scenarios and challenge an |
| organisation with the outcomes of these scenarios.      |

| **Methods for Presenting Scenarios/Challenging an        |
| Organisation**                                         |
| Literature offers a small number of methods, limited to |
| workshop instructions and games (e.g. war gaming).      |
| Despite this lack of scrutiny, the research, informed   |
| by both the foresight experts and case studies,         |
| identified this to be one of the most challenging steps |
| in the foresight process. Evidently more research is    |
| required in this discipline, although the current      |
| research already provides an overview of suggested      |
| practical methods.                                     |

| **Future Agents**                                      |
| In the reviewed literature on foresight models, the    |
| utilisation of a foresight network or future agents    |
| was not specifically described. Research (both practice |
| frameworks) identified this to be a major component of  |
| a contemporary foresight framework. Future agents      |
| continuously monitor the environment to observe and    |
| enrich the signals database and the current scenarios, |
| and provide an organisational structure to share      |
| insights and trigger future thinking.                  |

| **The Foresight Continuum and the Link to Innovation** |
| One of the key contributions to practice is the        |
| emerging concept of the “foresight continuum”, a set   |
| of intrinsic but informal values or benefits generated |
| through foresight. This includes the building of       |
| enhanced organisational flexibility (for instance for  |
| strategic decision-making), innovation driving        |
| capabilities and ongoing learning through strategy     |
| debate. This is different to the formal results (i.e.  |
| response strategies or future projects), which are     |
| tangible deliverables identified in the formal process.|

| **Information Systems**                                |
| Case study research concluded that IT/ICT support for  |
| foresight is not required at sophisticated levels and  |
| that Word®, PowerPoint® and Excel® are the most utilised |
| software tools. There is even a tendency to want to    |
| reduce the level of technology involved, as it is not |
| presently capable of supporting the process of         |
| translating qualitative insights into innovation and   |
| strategy. Human interactions and the exchange of       |
| foresight knowledge add more value to the organisation |
| than sophisticated foresight software. This supports   |
| the need for a practice oriented framework with        |
| processes and qualitative methods rather than the      |
| provision of IT infrastructure.                        |

As discussed, research has generated practice contributions by illustrating the validity and benefits of foresight, foresight framework building with a focus on critical process
elements, the identification of qualitative methods and the notion of the foresight continuum.

The six research propositions investigated in the research, offer the following contributions and implications or theory and practice:

*RP1:* In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process (i.e. employing envisioning and scenario building) will reflect more open strategic debate, revealing more divergent scenarios for consideration.

The research has supported the conclusion that a foresight-centric planning process supports uncontrolled, ongoing strategic planning through the flow of foresight information. In turn, this enables strategic, open debate and supports innovation and a forward facing culture. Open conversations make people willing to present their ideas to provoke debate and interaction between different hierarchical levels combines strategy planning and communication. Where such conversations happen, unnecessary complexities related to and resulting from misunderstandings between business units can be reduced or eliminated. Foresight enables and encourages every employee to become involved in innovation and, as a result of maximising input, the most divergent scenarios can be developed and tested against an organisation’s readiness for change.

Rather than just focusing on direct tangible results, the goal of foresight-centric organisations is to form and sustain an organisational culture that allows for the identification and scrutiny of long-term issues and trends. This can be achieved via a think tank or a future agent network. Traditional structured analytical approaches to strategy planning create cultures where employees protect ideas and avoid communicating the whole picture to the executives, and thus limit conversations about the future and new opportunities. This means that an organisation which requires a divergent view of the future for planning purposes should try to move to a contemporary, foresight driven planning framework.

*RP2:* In comparison to organisations exhibiting traditional structured analytical approaches, those adopting a foresight-centric strategic planning process will have more future oriented strategic projects and an innovation driven culture.
Organisations with a foresight-centric strategic planning process regard innovation and long-term planning as part of their culture. This cultural value of “openness” appears to have a positive impact on continuous and incremental innovation, via the dissemination of knowledge of market trends, and builds a proactive attitude towards innovation and future changes which may result from, for instance, strategic surprises. Senior management encourages changing the strategic direction (cultural and structural change, reviews of market strategies and product portfolios) according to various scenarios, delivered through foresight and scenario building. This foresight-centric process is a tool which enriches the future of the company through the identification of strategic alternatives; it helps to stimulate an innovative and proactive culture. An important link exists between foresight and the implementation phase of strategy. Therefore, business strategy adaptation must follow immediately after scenario building and presentation. In contrast, traditionally managed organisations with little regard for discontinuities, and therefore a perceived limited need for long-term planning, do not offer the tools required to drive foresight and deliver strategic alternatives or future oriented projects. This traditional framework only allows strategic conversations in a formal environment and on a planned basis. Innovation is kept at a product level and there is no link between the limited foresight activities and strategy development. Consequently, these organisations do not take advantage of long-term opportunities thereby limiting the number of future oriented projects. Therefore, for an organisation to build an innovation driven culture and generate a pipeline of future oriented projects, a foresight framework should be implemented.

RP3: Conversations around the future environment of organisations generated as a consequence of using traditional structured analytical frameworks in strategic planning such as SWOT and PEST will generate a convergent perspective about the future and lead to the adoption of strategies that support incremental change.

Traditional hierarchical approaches to strategic planning do not deliver foresight knowledge as they limit the level of innovation stimulus in an organisation. Qualitative methods are required to successfully apply foresight; SWOT and PEST methods result only in static “lists” which classify current knowledge and which generate little value for long-term planning. They generate convergent perspectives on the future, and as such, any resulting changes will be incremental. These traditional approaches can be found in top-down, centralised and reactive organisations utilising static information.
While traditional quantitative approaches result in higher planning accuracy in the short-term, long-term growth opportunities are not considered. CO-B focuses on qualitative foresight methodologies, using intuition and verbal communication to support scenario based planning via its internal future agents and external industry and future experts. For organisations that seek strong growth, the focus should be on exchanging knowledge through networks to generate a long-term view of the future and build an innovation driven culture, which in turn will generate future oriented initiatives.

*RP4:* Strategising in organisations that integrate both strong and weak signals foresight methodologies will generate strategic imperatives that both address current challenges and prepare the organisation to address anticipated industry and market reconfigurations.

The focus of foresight-centric planning is on weak and strong signals, as opposed to traditional planning methods which focus primarily on strong signals only. The collection and interpretation of weak signals leads to the creation of scenarios which allow for multiple views of the future and thus prepare for long-term industry and market changes. In addition, it allows an organisation to build a portfolio of strategic responses or alternatives. Focusing on strong signals and forecasting reduces an organisation’s ability to prepare for future changes and strategic surprises; rather it supports a short-term view and reactive approach to changes in the environment. To be successful, organisations need to scan the environment for weak and strong signals on an ongoing basis, accessing different sources to deliver knowledge about future change and generate imperatives which guide the drafting of response strategies to address changes in the environment brought about by industry and market reconfigurations.

*RP5:* Operationalising the integration of weak and strong signals foresight methodologies in an organisation’s strategic planning process will require top-level management support and user friendly methodologies that can be readily interrogated by strategists at all levels of the organisation.

For successful foresight and integration of weak signals in an organisation’s strategic planning process, significant initial, as well as ongoing, investments must be made. This includes a strong and well staffed corporate development or foresight team, the
establishment of a trans-departmental strategy or foresight committee and a future agent network or think tank which will collect and discuss signals of change from the environment. In addition, an organisation requires a qualitative tool set covering multiple methods for the collection, analysis and grouping of signals, the creation of scenarios and management of workshops with stakeholders to identify issues and define actions for future change. In a best practice application, this support must be provided directly from the CEO. To drive foresight, management must support the programme culturally and fiscally. A future agent network, in combination with future workshops, is the foundation of a user friendly set of processes to support weak and strong signals foresight methodologies.

RP6: In comparison to traditional structured analytical approaches, a foresight-centric strategic planning process will exhibit flexible decision-making later in the process as strategies are being implemented.

A foresight-centric strategic planning framework, especially through a network of future agents and a culture open to innovation, generates and distributes foresight knowledge across the organisation. This primes the organisation for change, via long-term development of strategies and alternatives, and eliminates complexity and misunderstandings around strategy. Therefore, it not only offers a portfolio of strategic responses relevant to different scenarios, but also limits the reaction time required to adapt to a new situation. Culture and trust building are important elements of such a foresight-centric framework, as strategic conversations are required to build the strategy portfolios as well as to determine the appropriate decisions in the new environment. Traditional approaches to strategy planning with no framework for long-term planning in the face of uncertainty and without accounting for the possibility of disruptions, does not offer strategic flexibility and choice as strategies are being implemented.

Treating the future as a linear progression from the past is simplistic but persists as a mainstay of traditional planning approaches and forecasting. However, most organisations have experienced decline and/or growth as a result of different strategies applied during their pasts, in conjunction with changes in the environment. Organisations with a foresight-centric approach to planning foster a climate where debate and knowledge about potential future changes can occur and grow and thus deliver divergent views of the future and strategic alternatives which can be faster
implemented as the environment changes. It can be concluded that organisations should establish a foresight-centric strategy planning framework, which supports innovation and establishes a portfolio of long-term, alternative strategic options and initiatives.

5.4 Limitations of the Research and Directions for Future Research

In a critical reflection of the research, four limitations or issues regarding its direct applicability to theory and practice were identified. These limitations translate directly into the need and directions for future research.

1. Scope, generalisability and validity across industries and company sizes

The limitation of case study research, with its underlying postpositivism paradigm, is generalisability and reliability in other business situations or companies. While theory building is supported by the empirical evidence from the case organisations (Eisenhardt 1989, p. 547), the investigator always has to draw conclusions regarding the extent to which the findings are generalisable (Leedy & Ormrod 2005, p. 135). This research was centred on six foresight experts, the literature and two large divisions of a Swiss organisation, with 1,700 and 3,000 employees respectively. In the establishment of a foresight function, there must be recognition of the “economies of scale” principle; smaller organisations do not necessarily have the ability to set up a formal strategy planning or foresight framework, or fund the extensive foundation building research activities. In addition, this best practice framework was established on the basis of an example from a Swiss retail bank. This industry can be characterised as a high volume, technology driven and competitive environment: not all industries might have the need for innovation and foresight at a similar level. Therefore, one of the main limitations of the research is the restricted ability to extrapolate general principles from CO-B’s unique structures, industrial history, size and culture, but also the market situations of the case organisations, which were used to prepare this best practice framework.

In order to support generalisability, a mix of research methods was applied, where two practice frameworks (one informed by the literature and enriched and validated by foresight experts, and one informed by case study research) were utilised to create a best practice framework. For the development of the first practice framework, an intensive
database of literature was utilised, mostly from peer reviewed, academic journals, thereby addressing the scientific criteria of reliability and validity. With the development of two frameworks and the utilisation of industry neutral foresight experts, generalisability should be achieved. However, for this best practice framework for advancing strategic corporate foresight to be incorporated into other organisations, differences in company size, industry, market position, organisational values and culture and other relevant characteristics or contextual factors must be acknowledged. Further research in other industries and different sized organisations, or with a larger sample size, is required for full validity and generalisability across industries and companies of smaller size.

2: Further investigations and descriptions of qualitative methods

For some, the weak signals theory is still seen as inferior because it does not allow for processing and description of the identified signals in terms of their character, impact (opportunity or threat) and action alternatives (Eschenbach, Eschenbach & Kunesch 2003, p. 67; Kunze 2000, p. 51f). This research wanted to identify and outline three tool sets containing qualitative methods which may be used to provide a sophisticated and practical basis for weak signals management, from the collection of signals, to the combination of signals into scenarios and ultimately to the use of scenarios to challenge and prepare an organisation.

While the study of existing literature, case organisations and interviews with foresight experts have unveiled a range of best practice qualitative methods (described in chapter 4 and section 5.2), the lack of a more sophisticated and validated overview and description of best practice tools for successful foresight is still felt, especially in the areas of collaboration and quality control mechanisms for the outputs of the scenario and future workshops. The number of such methods recommended, or even mentioned, by the literature, is still low and the field research did not add much in this area.

Additional elements highlighted in the research that might require further investigation, scrutiny or elucidation include: practice oriented tools for the monitoring of scenarios and signals in combination with the development of a scanning strategy; the application and usefulness of performance reviews; and the benefits of (physical) innovation spaces. The recommended “entrepreneurial” approach to combining signals into
scenarios is apparently new and is therefore yet to be explored in the literature or rigorously tested in practice. Further research on these topics could provide fresh input to foresight and strategy development, in areas which are not based on culture, values or specific industries and products and which therefore have universal application.

3: Existing cultural and mental models and the unreliability of human nature

In this framework, signals are collected and scenarios and strategic programmes are created, principally through environmental scanning, market research, open conversation and debate, and the use of foresight experts and workshops. Every single step of this framework relies on people and human skills and experiences within an organisational value framework, and it is not possible for the information to be unaffected by this: both a person (with his/her social interests and beliefs) and a process are required to drive innovation and, therefore, the person-process perspective (Griffin et al. 2009; MacKay & McKiernan 2004; Pohl et al. 2009), or the person-process-organisation perspective, must be addressed.

The human factor discounts the possibility of pure objectivity, as humans are subjective beings by nature. This research chose not to consider the issues, risks and consequences of the human factor, the skills required and social interactions within organisations. However, it is recognised that the recipe for successful strategy development and innovation is not only the establishment of a foresight framework, but also the cultural values and norms, the talents and skills in the organisation and the interaction of these elements driving foresight and delivering results. Further research is needed to understand the requisite organisational and human values and skills, as well as the social and institutional interactions, to establish a successful foresight function and drive long-term strategy development and innovation.

4: Linking foresight with financial benefit and performance

While research has shown that the more innovative and financially more successful organisation employed a foresight-centric approach to strategy planning, the confirmation of a definitive link between financial performance and the type of foresight or strategy process utilised in an organisation requires further investigation. This research was not intended to prove that a contemporary foresight-centric approach will outperform organisations with a traditional hierarchical process: the monetary
benefits may vary case to case, according to unique cultural, structural or market specific circumstances.

In order to demonstrate financial benefit, sustain foresight processes and teams, and strengthen the link between shareholder value building and innovation and foresight, more comprehensive research must be undertaken, for instance with a larger sample pool and over a longer period of time, perhaps five to eight years after an organisation has implemented a foresight framework.

Considering the four limitations outlined above, the research should be seen as a basic set of recommendations for integrating weak signals into scenario building and strategy development. It is an exploration of a niche area of research and current business practice, where a need for additional validation and empirical evidence exists. Future research will require a wider range of sample organisations to expand on the comparative analysis of modern and traditional foresight methodologies. Using a wider sample, there will be more certainty regarding the superiority of contemporary foresight based methods; it will allow the comprehensive description and validation of the qualitative methods and strengthen the links between foresight and financial performance.

5.5 Conclusion

When weak and strong signals are combined with scenario building and strategic debate, strategic knowledge will be created and innovation supported; this concept is summarised as the “foresight continuum”. Foresight is an important contemporary management discipline because it proactively attempts to highlight long-term opportunities and threats in advance. It expands beyond traditional boundaries and leads to a continuous process of developing and debating strategy. This creates a culture driven by innovation and provides strategic alternatives for continuous and discontinuous futures. In all probability, the importance of foresight in strategy development will increase because market pressure and dynamics will remain the same or even increase, leading to stronger competition and consequently a need for long-term innovative planning capabilities. Organisations might find themselves in situations
where foresight leadership is a key success factor in management, as they try to gain a competitive advantage from superior understanding of trends, discontinuities and changes in the environment, in order to identify new business ventures, expand market presence via innovations or shift competition to a different dimension.

This research contributed to current practice through the development of a framework for advancing strategic corporate foresight and by confirming the research propositions which support a contemporary foresight-centric strategy development process. In addition, the research highlighted the need for a scanning strategy, demonstrated the value of, and optimal approach to, utilising strong signals and wildcards, confirmed the value and role of future agents, and established the need for qualitative methods in foresight. At the same time, it generated evidence in support of a fairly minimalist approach to the role of ICT capabilities and infrastructure in foresight, and identified a significant need for additional methods to support the process of presenting and challenging an organisation with the potential futures. All these elements together allow an organisation to benefit from a foresight continuum, which enables an organisation to grow and prepare for the future through open debates, innovation capabilities and a cultural mindset which displays responsiveness and readiness for change.

There is no single pathway to foresight, as its application and success depend on the organisation’s culture, the challenges faced and its readiness for change, the environment and industry, as well as the existing mental models of managers. Still, small, medium and large organisations can all benefit from foresight activities. In larger organisations, and to some degree in medium-sized organisations, foresight might require a specialised strategy or foresight team and a network of future agents, in conjunction with a think tank or future committee comprised of senior executives responsible for the management of the portfolio and response strategies in each business unit. In smaller organisations, foresight can be embedded in the organisation’s culture and values and regarded as a basis for identifying the next disruptive innovation to grow the business and ensure survival in a competitive environment.

While forecasting from past knowledge and data will become less accurate as discontinuities or strategic surprises from the environment trigger immediate or long-term change, the scanning of the environment for weak signals will become increasingly important to the strategic success of an organisation. Foresight activities will not
prevent companies from failing, but there are clear benefits to organisations challenging themselves with the potential future(s), in preparation for both formal and cultural strategic responses to changes driven by the uncertain environment.
6 List of References


Abplanalp, Peter A. & Lombriser, Roman 2010, Strategisches Management: Visionen entwickeln, Erfolgspotenziale aufbauen, Strategien umsetzen, 5th ed., Versus, Zurich, Switzerland.


Bergin, Michael 2011, “NVivo 8 and Consistency in Data Analysis: Reflecting on the Use of a Qualitative Data Analysis Program”, *Nurse Researcher*, vol. 18, no. 3, pp. 6-12.


Burmeister, Klaus; Neef, Andreas & Beyers, Bert 2004, Corporate Foresight: Unternehmen gestalten Zukunft, Murmann, Hamburg, Germany.


Burt, George; Wright, George; Bradfield, Ron; Cairns, George & Van der Heijden, Kees 2003, “Limitations of PEST and its Derivatives to Understanding the Environment: the Role of Scenario Thinking in Identifying Environmental Discontinuities and Managing the Future”, EIASM Workshop on Understanding Organisational Context, June 12/13, St Andrews, UK.


Koncilja-da Mata, Christiane; Nguene Nguene, Gustave; Peter, Marc K.; Rossel, Pierre; Steiner, Beat & Wyser, Beat D. 2004, Methods to find Weak Signals for Foresight and Scenario Planning: Report for Project Future Screening, November, EPFL Lausanne, Switzerland.


Marsh, Nick; McAllum, Mike & Purcell, Dominique 2002, Strategic Foresight: The Power of Standing in the Future, Crown Content, Melbourne, Australia.


O’Regan, Nicholas & Ghobadian, Abby 2007, “Formal Strategic Planning Annual Raindance or Wheel of Success?” *Strategic Change*, vol. 16, January-April, pp. 11–22.


Ramírez, Susan Elizabeth 2006, “From People to Place and Back Again: Back Translation as Decentering – An Andean Case Study”, *Ethnohistory*, vol. 53, no. 2, pp. 355-381.


Roos, Georges T. & Cocca, Teodoro D. 2004, Future of Banking. Identifying Drivers and Trends which will potentially shape banking in the next 10-20 years. Roos Office for Cultural Innovation and University of Zurich, Swiss Banking Institute, Lucerne, Switzerland.


7 Appendices

7.1 Appendix A: Documentation of Environmental Information

In order to document and process the gathered signals, Stoffels (1994, pp. 111-114) suggests the use of a form which includes the following criteria:

<table>
<thead>
<tr>
<th>Documentary Source</th>
<th>Personal Source</th>
<th>Idea/Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Title</td>
<td>- Person</td>
<td>- Idea/Inference</td>
</tr>
<tr>
<td>- Author</td>
<td>- Date</td>
<td>- Date</td>
</tr>
<tr>
<td>- About Author</td>
<td>- About Person</td>
<td>- Source</td>
</tr>
<tr>
<td>- Source</td>
<td>- Place</td>
<td>- References</td>
</tr>
<tr>
<td>- Source type, date, page</td>
<td>- Context</td>
<td>- Context</td>
</tr>
<tr>
<td>- Scanner, scan date</td>
<td>- Scanner, scan date</td>
<td>- Scanner, scan date</td>
</tr>
<tr>
<td>- Keywords</td>
<td>- Keywords</td>
<td>- Keywords</td>
</tr>
<tr>
<td>- Dimension focus</td>
<td>- Dimension focus</td>
<td>- Dimension focus</td>
</tr>
<tr>
<td>- Abstract</td>
<td>- Abstract</td>
<td>- Abstract</td>
</tr>
<tr>
<td>- Implications/Inferences</td>
<td>- Implications/Inferences</td>
<td>- Implications/Inferences</td>
</tr>
<tr>
<td>- Database no.</td>
<td>- Database no.</td>
<td>- Database no.</td>
</tr>
</tbody>
</table>

Table 15: Documentation of Environmental Information (based on Stoffels 1994, pp. 112-114)
7.2  Appendix B: Assessing Industry Scenarios

Figure 43: Assessing Industry Scenarios: Key Steps and Questions (Fahey 1998, p. 212)
7.3 Appendix C: Strategic Issue Management

Figure 44: Strategic Issue Management (Ansoff 1975, p. 31)
7.4 Appendix D: The External Environment Council

Stoffels (1994, pp. 75-78) suggests the implementation of an “external environmental council” which is responsible for the following tasks:

- Sustaining the locus of scanning activities;
- Representing distinct organisational contexts;
- Providing specialised communication interfaces;
- Coordinating organisation-wide environmental knowledge;
- Monitoring environmental adaptation; and
- Measuring accountability.

Figure 45: The External Environmental Council as Part of the Environmental Scanning Structure (Stoffels 1994, p. 76)
7.5 Appendix E: Questionnaire for Case Organisations and Foresight Experts

Case Organisations

1 General Information

101 Company/Division Name
102 Interview Date
103 Participant Name
104 Job Title
105 Position
106 Age
   O 25 to 35    O 36 to 45    O 46 to 55    O over 56
107 Number of Years in Company
108 Number of Years in Strategy Work
   with current division / before employed with current division

2 Strategic Planning and Strategy Development

A strategy is a corporate plan that describes how a company will achieve its long-term objectives. Long-term planning is carried out in order to better know future developments and future market environments so the company is prepared for these changes driven by weak and strong signals. Weak signals are soft impulses from the market (e.g. from customers or competitors) which “signal” such possible changes in the business environment of your company in the future. Strong signals can be seen as mega trends which we already know will influence your company in the future.

201 Please visualise and describe your strategy development process (strategy framework).

202 As part of this strategy development process, in detail, how do you create knowledge about the future (future market environments) – what do you do in order to understand what will (or might) happen in the future (for instance by collecting and processing signals/indicators that announce long-term changes in the environment)? Please visualise and describe this process.
3 Special Topics

301 In detail, which methods do you use in order to identify and collect signals/indicators about future market environments (investigator shows example/s)?

302 In detail, which methods do you use in order to combine qualitative (non-econometric) signals into scenarios and/or images of the future to use them in strategy development (investigator shows example/s)?

303 In detail, which methods do you use in order to challenge your organisation (all relevant stakeholders) with the insights of future market environments (investigator shows example/s)?

304 What was the impact (changes in organisational culture and structure/processes, differences in the strategy team, changes in product portfolio, etc.) and benefit of your process to better get to know future market environments?

305 How would you describe the strategies that emerged (e.g. new/emerging segments, new competitors, new capabilities, new business partners, global expansion) from this process?

306 How do you prioritise the emerged insights about future developments with regard to the implementation in the organisation?

307 Do you have any ideas how to improve your strategy process with regard to long-term strategic planning?

308 How would you describe the company’s/division’s corporate culture, especially with regard to innovation management and long-term planning (keywords only)?

309 Do you have any comments with regard to long-term strategic planning?
Foresight Experts

1 General Information

101 Date

102 Company Name

103 Participant Name

104 Anonymity   O yes   O no (name can be published)

105 Job Title

106 Position

107 Age
   O 25 to 35   O 36 to 45   O 46 to 55   O over 56

108 Number of Years in Company

109 Number of Years in Strategy Work
   with current company / before employed with current company

110 Year Company Incorporated

111 Number of Employees (full time equivalents)

112 Type and Size of Clients

2 Long-Term Strategic Planning (Corporate Foresight)

A strategy is a corporate plan that describes how a company will achieve its long-term objectives. Long-term planning is carried out in order to better know future developments and future market environments so the company is prepared for these changes driven by weak and strong signals. Weak signals are soft impulses from the market (e.g. from customers or competitors) which “signal” such possible changes in the business environment of your company in the future. Strong signals can be seen as mega trends which we already know will influence your company in the future.

201 What is/are the best practice-oriented foresight methodology/ies in order to capture, process and understand weak (and strong) signals from the external environment in order to understand the future?
Example from Liebl (1996):

The Strategic Foresight Process according to Liebl (1996, p. 11)

Example from Investigator’s Literature Research:

The Strategic Foresight Process derived from Literature Review (own illustration)
3 Special Topics

301 In detail, which methods do you (or would you) use in order to identify and collect signals/indicators about future market environments (e.g. best practice analysis, trend analysis, expert interviews)?

302 In detail, which methods do you (or would you) use in order to combine qualitative (non-econometric) signals into scenarios and/or images of the future to use them in strategy development (e.g. combining weak signals with trends, classification aids, creativity workshops)?

303 In detail, which methods do you (or would you) use in order to challenge an organisation (all relevant stakeholders) with the insights of future market environments (e.g. so that the manager has to defend his/her product/s or show product/s modifications for the future market)?

304 How did you reach that conclusion (foresight methodology/ies and methods applied)?

305 Do you have any comments with regard to long-term strategic planning?
7.6 Appendix F: Profiles of Interviewees and Experts

**Interviewees CO-A**

Interview period: January/February 2007

<table>
<thead>
<tr>
<th>Key</th>
<th>Role</th>
<th>Numbers of years in company</th>
<th>Number of years of Strategy experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT1</td>
<td>Expert Strategy Management</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>INT2</td>
<td>Head of Strategy</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>INT3</td>
<td>Head of Project Management &amp; Strategic Financial Planning</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>INT4</td>
<td>Business Consultant (Internal)</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 16: Interviewees CO-A as of 2007

**Interviewees CO-B**

Interview period: January/February 2007

<table>
<thead>
<tr>
<th>Key</th>
<th>Role</th>
<th>Numbers of years in company</th>
<th>Number of years of Strategy experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT5</td>
<td>Corporate Foresight Specialist</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>INT6</td>
<td>Head of Corporate Development</td>
<td>3.5</td>
<td>5</td>
</tr>
<tr>
<td>INT7</td>
<td>Head of Market Research</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>INT8</td>
<td>Head of Market Management</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>INT9</td>
<td>Senior Market Manager</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>INT10</td>
<td>Market Manager</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>INT11</td>
<td>Senior Market Manager</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 17: Interviewees CO-B as of 2007
**Foresight Experts**

Survey period: January to March 2007

<table>
<thead>
<tr>
<th>Key</th>
<th>Role</th>
<th>Numbers of years in company/organisation</th>
<th>Number of years of Strategy experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSE1</td>
<td>Head of Innovation for one of the largest UK companies, now Managing Director of a foresight consultancy</td>
<td>1</td>
<td>20+</td>
</tr>
<tr>
<td>FSE2</td>
<td>Deputy Head of Innovations for one of the largest Swiss companies, now Professor of Innovation Management</td>
<td>1</td>
<td>25+</td>
</tr>
<tr>
<td>FSE3</td>
<td>Leading foresight expert in Europe and founder and Chief Futurist of a foresight consultancy in Germany</td>
<td>10</td>
<td>15+</td>
</tr>
<tr>
<td>FSE4</td>
<td>Leading foresight expert in the US and Director of a foresight consultancy</td>
<td>14</td>
<td>30+</td>
</tr>
<tr>
<td>FSE5</td>
<td>University Professor (UK) with major experience in strategic planning and foresight</td>
<td>4</td>
<td>35+</td>
</tr>
<tr>
<td>FSE6</td>
<td>University Professor (USA) with major experience in strategic planning and foresight</td>
<td>23</td>
<td>35+</td>
</tr>
</tbody>
</table>

Table 18: Foresight Experts as of 2007
Appendix G: Nodes and Interviews from Qualitative Analysis with NVivo®

Nodes

A  STRATEGY PROCESS
A01_Overall Strategy Process
A02_Strategy Time Horizon
A03_Strategy Challenges
A04_Strategy Debates and Conversations
A05_Investment of Resources
A06_Process Sequential Hierarchical
A07_Process Iterative Collaborative
A08_Structured Analytic Frameworks (PEST, SWOT)
A09_Strategy Output

B  CULTURE & LEADERSHIP
B01_Corporate Culture
B02_Corporate Culture Innovation Management
B03_Leadership and Communication
B04_Teambuilding and Collaboration
B05_Envisioning with Strong and Weak Signals
B06_Mental Models

C  FORESIGHT PROCESS
C01_Foresight Process (what, when, who)
C02_Foresight Time Horizon
C03_Foresight Tools and IT
C04_Foresight Challenges
C05_Signals Strong
C06_Signals Weak
C07_Signals Wildcards
C08_Foresight Conversations
C09_Foresight Knowledge
C10_Strategic Alternatives
C11_Strategies for Innovation
D FORESIGHT PROCESS DETAILS

D01_Environment Sources
D02_Environmental Scanning incl. Methods
D03_Signals Collecting and Storing
D04_Signals Analysis
D05_Scenario Building
D06_Scenario Building Quantitative Projective Techniques
D07_Scenario Building Qualitative Foresight Techniques
D08_Future Workshops incl. Methods
D09_Strategic Programme Management
D10_Foresight Projects and Results
D11_Foresight Projects Prioritisation
D12_Strategy Business Adaptation (Link to Strategy Process)
D13_Performance Reviews
D14_Monitoring
D15_Proof Foresight Experts

Linking of Research Findings (Chapter 4) to NVivo® Codes

All research findings (chapter 4) derived from field research are linked to and constructed by the coded text from qualitative data analysis utilising NVivo®. As an example, the conclusion that “with vague statements such as “we sometimes think ahead”, CO-A has a limited commitment to looking further than this, with the longest point in time ever discussed being five years” (section 4.5.1.) was generated through the analysis and combination of the following six (133, 169, 170, 172, 173, 175) NVivo® codes/references:

Reference 133
INTx: It depends on the type of questions … how do we forecast our business, this is the first question. Which are the trends, for instance as part of our expert interviews … here we focus on three to five years. For the concrete analysis of the trends – this is very structured – based on the questionnaire … this is then not so far ahead. But I think the “big” questions are only for the next couple of years.
INTx: Yes and no … of course we sometimes think ahead, but with regard to the financial planning we only do three years.

INTx: More or less five years.

INTx: This is institutionalised by the corporate headquarters, and the strategic planning horizon is, reduced by corporate headquarters, three years. This means that for today, 2007, we plan for 2008 to 2010. And this is the framework, based on which we align our planning horizon. This of course does not mean that we do not look further ahead. I personally would say, however, that we do not look more than five years ahead.

INTx: And here I can just say that our business is relatively stable. … In principle, you are right, it would be nice if we would know what will happen in ten years from now on, but I personally think that if we can just do five years, we will already be very good.

INTx: From a financial point of view – I worked in the Finance department – it was a five year planning horizon for the medium-term planning.

RESEARCHER: Is there also a long-term planning document?
INTx: No, there is not. Perhaps they also called it long-term …

Unedited NVivo® Transcripts from Interview Analysis (with Reference Numbers)

The source data for the qualitative field research analysis (over 200 pages of NVivo® interview transcripts) can be downloaded from www.mkpeter.com/fs/nvivo-analysis.pdf until 31 October 2011. These transcripts contain confidential and commercially sensitive data, and are therefore available only to the supervisors and examiners.
7.8 Appendix H: Organisational Structures of Case Organisations

Both organisations report to the same CEO of the holding organisation. CO-A has an executive management team of nine directors (CEO and eight direct reports, excluding executive support) to lead and manage an organisation with over 1,700 employees.

![Organisational Chart](image)

Figure 46: CO-A Organisational Chart (Vademecum 2007)

The organisation is based on four overarching functions: (1) two CEO support functions, (2) three geographical markets, (3) one corporate strategy, marketing, product and innovation team, and (4) three support functions (HR, Finance and Logistics). The function of Information and Traffic Politics (or new Communication) highlights the political environment in which CO-A operates and the need for strong stakeholder and partner management. HR seems to occupy a large number of functions and individuals at a senior level, while Finance and Logistics functions are structured and resourced in a similar way to other known organisations. Strategy and foresight activities are driven by two key functions: the Strategy team (INT1, INT2) within Corporate Development, and the Management Consulting roles (INT4) in Market West and Market East.
Most recently, Innovation Management was established under the Market team, which includes product management. The management consultants offer leadership and strategy development support to the regional heads. There were minor changes implemented between 2007 and 2010\(^\text{31}\):

- Introduction of a Communication department, reporting to the CEO (this is most likely the former “Information and Traffic Politics” function);
- Name change of “Corporate Development” to “Marketing and Strategy”;
- Region 6 under Market East moved to the Foreign Market division; and
- Executive Support is no longer listed in the official organisational chart.

Overall, CO-A’s company structure is driven by its regional markets, with centralised support functions.

CO-B, on the other hand, has an executive management team of nine directors\(^\text{32}\) (CEO and eight direct reports, excluding support functions such as corporate development, Compliance and PR) to lead and manage an organisation with over 3,000 employees.

Figure 47: CO-B Organisational Chart (10 April 2007)

\(^{31}\) CO-A Organisational Chart, internal document (26 June 2010).
\(^{32}\) CO-B Organisational Chart, internal document (10 April 2007).
The number of direct reports for the CEO is extremely high (fourteen including his two personal assistants). This might be one of the reasons why CO-B provides its senior leaders with a high degree of freedom, has fast decision-making via its CEO and is open to new projects and ideas. The structure includes five key functions: (1) The two profit centres with strategy/market management teams and product management; (2) the Distribution team with revenue and customer responsibility; (3) the go to market “enablers”, Operations/Productions and IT; (4) support functions (Finance, Treasury and HR/Logistics); and (5) CEO leadership functions including corporate development and communications. Corporate Development includes three teams, namely Strategy, Marketing Services and Partner Management.

The corporate development team has a high standing in the organisation, as a partner to the senior management team and to functional teams/business units. Its strategy team is responsible for the strategy development process, strategic controlling and market and competitor analysis\(^{33}\). Strategic controlling includes the “translation of strategy into action” based on a balanced scorecard approach, which supports the business in breaking down company goals to functional, team and individual targets. Market and competitor analysis teams offer a variety of ongoing and ad-hoc reports.

Strategy development and foresight activities can be found throughout the entire organisation and especially within certain business functions such as Risk, Treasury and IT. Market driven foresight in terms of environmental change occurs primarily in the Market and Product Management teams in the Private Customers and Corporate Customers business units, in the Distribution Development function and in Corporate Development. Similar to CO-A, HR seems to have a strong weight in the company's organisational structure. The strong Operations and IT teams are a reflection of CO-B’s industry. There were multiple changes implemented between 2007 and 2010\(^{34}\):

- The head of Corporate Development became a member of the executive team;
- The three business units (Private Customers, Corporate Customers and Distribution) restructured into two new teams: Products (which includes the former product management functions) and Markets and Distribution (which includes the former market management, key account management and distribution functions);

\(^{33}\) CO-B Corporate Development profile, internal document (June 2003).
\(^{34}\) CO-B Organisational Chart, internal document (20 July 2010).
- Risk Management reports directly to the CEO (this was part of Finance & Risk Management in 2007);
- Treasury moved into the new Finance function; and
- PR merged with Marketing Communications, to become Communications.

In contrast to CO-A, CO-B has a segment or function based organisational structure with a strong focus on market and product management. CO-A seems to compensate this management discipline with the establishment of management consulting functions within the regional business units. Within CO-A, some functions do not exist in all regional business units, such as process management or market development. This might be a reflection of the saturated market in which CO-A operates. CO-B’s strong structural focus on markets and products could be described as a separation of strategic functions from operational activities, as all go to market activities are summarised in the distribution (or new “markets and distribution”) department. On the other side, CO-A has a very strong and centralised Corporate Development department with both strategic and product (profit and loss) driven teams. The P&L function particularly is decentralised within CO-B and split between market segments.

In terms of support functions (HR, finance and industry specific disciplines), both organisations demonstrate a similar structure to other organisations within their industries. Strategy development and foresight are carried out in more (around eight to twelve) functional teams and hierarchical levels (level three management, which is all functions reporting into a member of the executive team) in CO-B, as opposed to CO-A where only three to four teams are involved in strategy planning and foresight. There might be an overemphasis on foresight, planning and risk management activities in CO-B because of the nature of its industry (financial services). This could be an explanation for the relatively low number of functions in CO-A which contribute to strategy. But even if Risk and IT strategy functions are excluded from CO-B, its level of foresight across the entire organisation, as well as for specific teams, is more widely distributed.
Appendix I: Profiles and Financial Performance of Case Organisations

CO-A celebrated its centenary in 2006. What began as a small and humble operation is now, one hundred years later, an established partner of citizens in all Swiss cities, agglomerations and peripheral regions\(^{35}\). The company services approximately half of all transportation routes, the other half is serviced by over 200 private transportation companies, known as “CO-A operators”, who own and manage their own buses. With the revision of the Swiss Railways Act in 1996, CO-A faces increased competition in the field of regional public passenger transport. More and more states are farming out concessions for the routes as part of an open tender process. Many concessions expired in 2008 and had to be renewed. Around 180 bus companies compete with CO-A in its core business\(^{36}\). These companies are predominantly owned by states and municipalities.

**Key metrics CO-A**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenue (CHF million)</td>
<td>447</td>
<td>470</td>
<td>494</td>
<td>518</td>
<td>538</td>
<td>559</td>
<td>579</td>
<td>585</td>
<td>584</td>
<td>604</td>
</tr>
<tr>
<td>Operating profit (CHF million)</td>
<td>-5</td>
<td>-2</td>
<td>9</td>
<td>12</td>
<td>37</td>
<td>29</td>
<td>28</td>
<td>32</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Operating profit in % of revenue</td>
<td>-1%</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Employees (fulltime equivalents)</td>
<td>1,120</td>
<td>1,232</td>
<td>1,326</td>
<td>1,340</td>
<td>1,376</td>
<td>1,392</td>
<td>1,502</td>
<td>1,521</td>
<td>1,570</td>
<td>1,570</td>
</tr>
<tr>
<td>Passengers (millions)</td>
<td>94</td>
<td>95</td>
<td>97</td>
<td>102</td>
<td>103</td>
<td>106</td>
<td>111</td>
<td>115</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>Number of vehicles</td>
<td>1,889</td>
<td>1,945</td>
<td>1,958</td>
<td>1,954</td>
<td>1,995</td>
<td>2,029</td>
<td>1,989</td>
<td>1,909</td>
<td>1,989</td>
<td>2,066</td>
</tr>
<tr>
<td>Network size (kilometres)</td>
<td>8,500</td>
<td>10,316</td>
<td>10,316</td>
<td>10,387</td>
<td>10,363</td>
<td>10,450</td>
<td>12,268</td>
<td>10,210</td>
<td>10,345</td>
<td>10,429</td>
</tr>
<tr>
<td>Market share (%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>-</td>
<td>65</td>
<td>66</td>
<td>67</td>
<td>67</td>
<td>68</td>
<td>68</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer satisfaction: leisure travellers</td>
<td>-</td>
<td>81</td>
<td>81</td>
<td>83</td>
<td>81</td>
<td>81</td>
<td>82</td>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer satisfaction: commuters</td>
<td>-</td>
<td>74</td>
<td>74</td>
<td>75</td>
<td>73</td>
<td>73</td>
<td>73</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unweighted average customer satisfaction</td>
<td>77</td>
<td>77</td>
<td>79</td>
<td>77</td>
<td>77</td>
<td>78</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


CO-A wants to maintain its position as the largest service provider of regional, public road-based passenger transport in Switzerland. As such, the company must offer its customers good service at competitive prices. In order to do so, it requires the same level playing field as its competitors and other commercial organisations. Its core business remains the provision of transport on standard routes. Within this core business of regional passenger transport, special services like school buses, late night transportation services and charter services for excursions are continuously expanded.


\(^{36}\) CO-A File Note Regional Market Analysis, internal document (2 December 2005).
In addition, CO-A seeks to establish itself as a systems management operator for the national public transport sector and to further grow in international niche markets and in municipal and urban transportation.

Since 1906, CO-B has been providing a universal basic payment service throughout Switzerland in a competitive market. With legislative changes in the 1990s, CO-B has been growing into a comprehensive financial institution; services associated with payment transactions such as savings, investments, loans, risk protection and cash advisement, have enhanced the product range. In 1996, the parent company integrated the financial services department as an independent division and established the brand of “CO-B”.

CO-B positions itself as a fully-fledged financial services provider. In recent years, the company strengthened its market position by introducing new and innovative products and services. It has set new standards in the financial sector with numerous innovations. CO-B was one of the first providers in Switzerland to offer online banking in 1998. Five years later, in 2003, more than half a million customers generated around 35 million electronic transactions with a total value in excess of CHF 500 billion. The company enriched its service portfolio with mortgages for private customers and since 2004, loans for small and medium-sized enterprises. As of 2008, CO-B was ranked fifth among Swiss financial institutions with two million private customers and 300,000 corporate customers. More than 840 million payment transactions a year make CO-B the leader in the Swiss financial transaction market. To enable CO-B to develop further, its parent company is championing a level playing field in the financial market. For CO-B this would mean that it would come under the supervision of the Swiss Federal Banking Commission. If the scope of the Financial Markets Supervisory Authority Act was widened to cover CO-B, the same framework conditions would apply to all competitors in the financial market.

38 Overview of Important Innovations CO-B, internal document (18 February 2004).
**Key metrics CO-B**

<table>
<thead>
<tr>
<th>CO-B</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenue (CHF million)</td>
<td>-</td>
<td>-</td>
<td>867</td>
<td>919</td>
<td>977</td>
<td>1,529</td>
<td>1,587</td>
<td>1,937</td>
<td>2,191</td>
<td>2,160</td>
</tr>
<tr>
<td>Operating profit (CHF million)</td>
<td>164</td>
<td>167</td>
<td>202</td>
<td>243</td>
<td>276</td>
<td>312</td>
<td>245</td>
<td>318</td>
<td>229</td>
<td>441</td>
</tr>
<tr>
<td>Operating profit in % of revenue</td>
<td>-23%</td>
<td>-26%</td>
<td>-28%</td>
<td>-28%</td>
<td>-24%</td>
<td>-20%</td>
<td>-15%</td>
<td>-16%</td>
<td>-16%</td>
<td>-20%</td>
</tr>
<tr>
<td>Employees (fulltime equivalents)</td>
<td>1,690</td>
<td>1,859</td>
<td>2,001</td>
<td>2,148</td>
<td>2,246</td>
<td>2,390</td>
<td>2,526</td>
<td>2,709</td>
<td>2,889</td>
<td>3,042</td>
</tr>
<tr>
<td>Customer accounts (thousands)</td>
<td>2,246</td>
<td>2,372</td>
<td>2,577</td>
<td>2,746</td>
<td>3,008</td>
<td>3,154</td>
<td>3,335</td>
<td>3,509</td>
<td>4,019</td>
<td>7,245</td>
</tr>
<tr>
<td>Transaction (millions)</td>
<td>737</td>
<td>775</td>
<td>826</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>801</td>
<td>833</td>
<td>865</td>
<td></td>
</tr>
<tr>
<td>Avg balance of deposits (CHF million)</td>
<td>20,838</td>
<td>22,236</td>
<td>26,707</td>
<td>32,759</td>
<td>35,652</td>
<td>39,352</td>
<td>41,807</td>
<td>45,019</td>
<td>50,497</td>
<td>50,497</td>
</tr>
<tr>
<td>Market share (%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>-</td>
<td>66</td>
<td>68</td>
<td>69</td>
<td>70</td>
<td>69</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Customer satisfaction: business customers</td>
<td>-</td>
<td>76</td>
<td>79</td>
<td>80</td>
<td>81</td>
<td>82</td>
<td>82</td>
<td>83</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>Customer satisfaction: private customers</td>
<td>-</td>
<td>80</td>
<td>83</td>
<td>82</td>
<td>84</td>
<td>84</td>
<td>85</td>
<td>85</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>Unweighted average customer satisfaction</td>
<td>76</td>
<td>81</td>
<td>81</td>
<td>83</td>
<td>83</td>
<td>83</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>84</td>
</tr>
</tbody>
</table>


Even though the case organisations are operating in two different markets, it is interesting to acknowledge the differences in some key metrics\(^{40}\):

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenue (CHF million)</td>
<td>447</td>
<td>470</td>
<td>494</td>
<td>501</td>
<td>538</td>
<td>559</td>
<td>579</td>
<td>585</td>
<td>604</td>
<td>640</td>
</tr>
<tr>
<td>Operating profit (CHF million)</td>
<td>-5</td>
<td>-2</td>
<td>9</td>
<td>12</td>
<td>27</td>
<td>28</td>
<td>32</td>
<td>27</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Operating profit in % of revenue</td>
<td>-1%</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Employees (fulltime equivalents)</td>
<td>1,120</td>
<td>1,232</td>
<td>1,326</td>
<td>1,340</td>
<td>1,376</td>
<td>1,392</td>
<td>1,502</td>
<td>1,521</td>
<td>1,570</td>
<td>1,736</td>
</tr>
<tr>
<td>Market share (%)</td>
<td>-</td>
<td>-</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>-</td>
<td>65</td>
<td>66</td>
<td>67</td>
<td>67</td>
<td>68</td>
<td>68</td>
<td>67</td>
<td>74</td>
<td>-</td>
</tr>
<tr>
<td>Unweighted average customer satisfaction</td>
<td>77</td>
<td>77</td>
<td>76</td>
<td>74</td>
<td>71</td>
<td>78</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CO-B</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenue (CHF million)</td>
<td>-</td>
<td>-</td>
<td>867</td>
<td>919</td>
<td>977</td>
<td>1,529</td>
<td>1,587</td>
<td>1,937</td>
<td>2,191</td>
<td>2,160</td>
</tr>
<tr>
<td>Operating profit (CHF million)</td>
<td>164</td>
<td>167</td>
<td>202</td>
<td>243</td>
<td>276</td>
<td>312</td>
<td>245</td>
<td>318</td>
<td>229</td>
<td>441</td>
</tr>
<tr>
<td>Operating profit in % of revenue</td>
<td>-23%</td>
<td>-26%</td>
<td>-28%</td>
<td>-28%</td>
<td>-24%</td>
<td>-20%</td>
<td>-15%</td>
<td>-16%</td>
<td>-16%</td>
<td>-20%</td>
</tr>
<tr>
<td>Employees (fulltime equivalents)</td>
<td>1,690</td>
<td>1,859</td>
<td>2,001</td>
<td>2,148</td>
<td>2,246</td>
<td>2,390</td>
<td>2,526</td>
<td>2,709</td>
<td>2,889</td>
<td>3,042</td>
</tr>
<tr>
<td>Market share (%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>-</td>
<td>66</td>
<td>68</td>
<td>68</td>
<td>69</td>
<td>70</td>
<td>69</td>
<td>70</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Unweighted average customer satisfaction</td>
<td>78</td>
<td>81</td>
<td>81</td>
<td>83</td>
<td>83</td>
<td>83</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>84</td>
</tr>
</tbody>
</table>


CO-B had operating revenue of CHF 2,160 million in 2009 and had more than doubled this number within eight years (CHF 867 million in 2002). In the same period, CO-A increased its revenue by 30% (from CHF 494 million in 2002 to CHF 640 million in 2009). Operating revenue growth rates for CO-A are relatively stable between 1% and 7.4% per year, compared with CO-B with its more aggressive, but also fluctuating rates.

of between -1.4% (2009) and 56.5% (2003). In the long-run (2003 to 2009), CO-B outperforms CO-A with an average growth rate of 15.2% compared to 3.8%.

![Operating revenue growth rates](image1)

Figure 48: Operating Revenue Growth Rates 2003 to 2009 (Annual Report of Holding Organisation 2009, 24 March 2010)

CO-B had a healthy profit of 20% of revenue in 2009 (CHF 441 million) and has experienced considerable growth rates since 2004 (an average of 17% per year). At the same time, CO-A delivered 4% profit on total revenue (CHF 27 million in 2009) with flat growth rates since 2005. Without the peak in 2004, the average growth of CO-A per year is around 1.2%, which is basically equivalent to the inflation rate.

![Operating profit growth rates](image2)

While CO-A has maintained its market share at 15% over the past five years, CO-B has grown its share from 7% in 2005 to 12% in 2009, representing an increase of over 60%. Both CO-A and CO-B are large companies, with over 1,700 employees for CO-A and over 3,000 employees for CO-B. While CO-A’s workforce grew by 55% over ten years (2000 to 2009), CO-B has almost doubled its workforce (80% increase over ten years), growing at approximately 7% per year compared with 4.5% for CO-A.

For both employee and customer satisfaction, both organisations maintained similar levels in the period between 2002 and 2009 (average employee satisfaction is 68% for CO-A and 70% for CO-B; and unweighted customer satisfaction is 77% for CO-A and 82% CO-B). However, while CO-A has maintained a stable customer satisfaction level of 77% in eight years (2002 to 2009), CO-B has increased this metric from 78% in 2002 to 84% in 2009.
7.10 Appendix J: Strategy Process of CO-A

CO-A’s strategy\footnote{CO-B Strategy 2009-2012, internal document (March 2009).} is challenged by three drivers: (1) the environment is changing, especially with regard to changes in legislation and increased competitive pressure; (2) customers demand better and more efficient services; and (3) growth opportunities in the core business are limited. Therefore CO-A’s strategic key priorities are to:

- Cement the current position in regional transportation and invest in suburban transportation;
- Invest in systems support (i.e. data management, frontend and backend systems); and
- Cement the “special” transportation business and grow abroad.

CO-A has a four-year strategy cycle. Its strategy process can be broken down into ten steps\footnote{Strategic Planning Approach of CO-A, October 2007.}:

**Step 1: Strategy development preparation**
- **Goal:** Prepare the planning framework for the annual strategy development process
- **Content:** Goals, processes, project team, tasks and time planning, budget
- **Methods:** NA
- **Timing:** September

**Step 2: Strategic analysis and foresight**
- **Goal:** Identify and understand key challenges for the organisation
- **Content:** Analysis of the current situation and assumed developments, presentation of results (basis scenario and SWOT analysis), analysis of impact/s and definition of key challenges for the organisation
- **Methods:** Workshop with management meeting (1 day), workshop with executive team (1 day)
- **Timing:** October to December
Step 3: Corporate strategy and strategic directions
- **Goal:** Utilise market opportunities, reduce market threats; allocate resources to strategic business units
- **Content:** Validate corporate strategy, validate/define strategic businesses, validate/analyse market positioning, evaluate alternatives, define market growth, investments and cash flow goals for all strategic business units
- **Methods:** Workshop with executive team (1 day)
- **Timing:** January to February

Step 4: Alignment with strategy of holding organisation
- **Goal:** Communicate challenges for strategic business units to the holding organisation and align with goals from holding organisation
- **Content:** Describe key topics based on key challenges, align with corporate and holding strategy, rate key topics based on implementation priorities and value generation potential for the organisation, approval of strategic direction
- **Methods:** Agenda item for executive meeting
- **Timing:** January to May

Step 5: Business unit strategies
- **Goal:** Develop and cement competitive advantages
- **Content:** Validate and evaluate business unit strategies, detailed description of business strategies via definition and evaluation of competitive advantages and positioning, evaluation of alternatives, definition of investments and cash flow goal
- **Methods:** Workshop with executive team (1 day)
- **Timing:** March to May

Step 6: Strategic programme management
- **Goal:** Increase the implementation success levels and build the foundation for an evaluation of the overall strategy
- **Content:** Development of strategic programmes (incl. M&A, marketing, supplier management, HR and company structure) and project plans
- **Methods:** Workshop with executive team (1 day)
- **Timing:** May to June
Step 7: Finalising corporate strategy
- Goal: Prepare strategy documentation for holding organisation
- Content: Corporate strategy including business unit strategies
- Methods: NA
- Timing: July to August

Step 8: Strategy validation and implementation
- Goal: Ensure strategic alignment of all plans and create the foundation for annual target setting
- Content: Consolidate and finalise strategic plans, formally approve plans, stakeholder management with holding organisation
- Methods: Agenda item for executive meeting
- Timing: August to December

Step 9: Market, country and functional plans
- Goal: Develop implementation plans for markets and centralised functions
- Content: Market and country plans, as well as functional plans according to corporate strategy and business unit strategies
- Methods: NA
- Timing: October to December

Step 10: Communication of strategy
- Goal: Create the basis to better understand the corporate strategy
- Content: Development of communication plan and communication by stakeholder levels, both internally and externally
- Methods: NA
- Timing: January to March
The current 2012 to 2016 strategy cycle is in line with the strategy process of 2004 to 2008. CO-B has a four-year strategy cycle with long-term considerations of future developments. Its strategy process can be broken down into ten steps:

**Step 1: Strategy development preparation**
- **Goal:** Prepare the planning framework for the annual strategy development process
- **Content:** Goals, processes, project team, tasks and time planning, budget
- **Methods:** NA
- **Timing:** July to August

**Step 2: Definition of “deep dive” (core) strategic topics**
- **Goal:** Identify key strategic topics for the current strategy cycle
- **Content:** Create a proposal with key topics based on ongoing analysis and insights (for instance from future screening activities), present topics to executive management and decide on area/s of focus. Briefing to management teams to kick off work on deep dive strategic topics.
- **Methods:** Analysis and presentations
- **Timing:** August to September

**Step 3: Strategic analysis and foresight**
- **Goal:** Analyse markets, customers, competitors and the general environment
- **Content:** Analysis of the current situation and assumed developments, including core strategic topics
- **Methods:** not defined (via business units)
- **Timing:** September to November

---

Step 4: Alignment of deep dive (core) strategic topics with strategy team
- **Goal:** Understand input from business units around key strategic topics and align with centralised strategy development activities
- **Content:** Presentation of business units insights and strategic intent and discussions and alignment with corporate development insights
- **Methods:** Meeting/workshops between LBUs and strategy team
- **Timing:** November to December

Step 5: Strategising with Executive Team
- **Goal:** Present strategy analysis and insights from core strategic topics; develop strategic directions for the business
- **Content:** Present all LBU strategic analysis and core strategy team analysis, including insights from foresight activities and key strategic topics; develop the long-term strategy for the business, define strategic initiatives and define gaps and “next steps” in the strategy process
- **Methods:** Workshop with the executive team (2 days)
- **Timing:** first week of January

Step 6: Complete strategic deliverables and identify gaps in the existing strategy
- **Goal:** Complete work on strategy deliverables (from step 5, executive workshop) and describe the delta/variation to the current strategy
- **Content:** Gain knowledge or validate assumptions via market research, scenario building, internal workshops or description of strategic initiatives; highlight and describe the delta to the current strategic intent and investments necessary to change direction/plans
- **Methods:** not defined (depending on topic/area)
- **Timing:** January to March
Step 7: Strategising with Executive Team
- Goal: Present complete strategy analysis and strategic plans to discuss, confirm and prioritise plans with the executive team
- Content: As above (step 5), plus discussion on gap analysis and agreement on level of investments
- Methods: Workshop with the executive team (2 days)
- Timing: end of March

Step 8: Finalisation of Business Unit Strategies
- Goal: Finalise and deliver input from business unit strategies
- Content: Based on the overall strategic direction of the organisation, business units will finalise their specific plans (market strategies and business plans) and deliver input towards the core strategy development process
- Methods: not defined
- Timing: April

Step 9: Finalisation of corporate strategy
- Goal: Prepare strategy documentation for CO-B and holding organisation
- Content: Corporate strategy including business unit strategies; presentation of draft version to the executive management, with individual interviews to gather feedback and buy-in
- Methods: NA
- Timing: March to June (draft version presented and individual feedback conversations with executive team members in May)

Step 10: Strategy approval and communication
- Goal: Approval of strategy and commencement of communication/distribution of plans
- Content: Formal approval of strategy documents
- Methods: Agenda item for executive meeting
- Timing: end of June
Appendix L: Method to Combine Signals into Scenarios

From Fuller 2005, pp. 10-14.

Method 1: Combine weak signals with trends to create bifurcations in timelines

It can generate valuable insights to track particular paths through time, considering possible turning points, or “bifurcations” where the path splits into two directions (multiple bifurcations in paths over time produce diverse and multiple patterns). The “logical” approach to this is to produce decision points or break-points in the timeline of a particular phenomenon.

Method 2: Elaborate patterns of logical consequences

The implications of the growth in strength of a particular feature in the landscape can be elaborated as a chain of consequences. For example, from a central issue (e.g. carbon tax), a whole series of implications, each of which itself has a network of consequences, could emerge. Such a network may show signs of coherence (i.e. convergent patterns) or divergent patterns from which particular scenarios can be produced.
Figure 51: Elaboration of Patterns of Logical Consequences (Fuller 2005)

This approach is an open variation of systems dynamics. Whereas system dynamics models are data-driven short-term scenarios, this approach can produce models illustrating profound systemic changes.

**Method 3: Experiment with cross-overs**

Structural changes in markets or industries can arise because new practices or technologies are introduced from another industry. The introduction of technologies from one industry to another is called “cross-over.”

Figure 52: Experiment with Cross-Overs (Fuller 2005)

Introducing a concept or type of behaviour from one community of practice (or context) to another can create instability which breaks existing patterns of behaviour. An intellectual challenge is to re-order everyday practices with new combinations of resources, or new combinations of values. For example, divergence in digital media has produced a number of cross-over technologies that are having a distinct impact on advertising and media. In society we see cross-over in, for example, the values of ethnic groups (faiths, families). The challenge is to start to link emergent patterns from domains that are seen as “irrelevant” or “outside” the norm with current practices. The historical message is that few significant innovations have come from the industries that such innovations threatened.
Method 4: Entrepreneurship as the creation of futures

A key idea from the field of entrepreneurship is the nature of “foresight” in entrepreneurial settings. Entrepreneurial settings are characterised as highly competitive open environments in which individual agents have strong ties to each other, that is they co-evolve collaboratively and competitively. They also are not able to see the “whole picture” in which they are a player.

Figure 53: Entrepreneurial Creation of Futures (Word® Clip Art collection)

Entrepreneurial ventures are closely associated with particular “local knowledge”. They are usually based on individual experience within a network of relationships; thus in entrepreneurial experiments, those participating should include people with a wide range of experiences and outlooks.

It is possible to “experiment” with entrepreneurial settings. The approach is to allow small groups of people to assume small “twists of reality” that take account of possible changes identified through trend analysis. Their aim is to articulate the kinds of problems and issues that people will face in relevant settings (e.g. social settings, market settings or consumer settings) and then to create modes of behaviour (services, products) in the form of new ventures that address those problems and concerns. The outcome of this process is a set of well argued business models for new ventures, that takes account of needs, motives and practical issues and has made clear and traceable assumptions about the “changes” the present must undergo to instigate the need for or facilitate the arrival of the new models.
## Appendix M: Techniques in Foresight Studies


<table>
<thead>
<tr>
<th>Foresight process</th>
<th>Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analyse the Environment</strong></td>
<td>- Benchmarking</td>
</tr>
<tr>
<td></td>
<td>- Best practice analysis</td>
</tr>
<tr>
<td></td>
<td>- Environmental scanning (via PEST, SWOT)</td>
</tr>
<tr>
<td></td>
<td>- Opportunity searches</td>
</tr>
<tr>
<td></td>
<td>- Phantom competitor analysis</td>
</tr>
<tr>
<td></td>
<td>- Speed reading</td>
</tr>
<tr>
<td></td>
<td>- Trend analysis</td>
</tr>
<tr>
<td></td>
<td>- Weak signal monitoring</td>
</tr>
<tr>
<td></td>
<td>- Wildcards management system</td>
</tr>
<tr>
<td></td>
<td><strong>Techniques</strong></td>
</tr>
<tr>
<td><strong>Recognise problems</strong></td>
<td>- Camelot method</td>
</tr>
<tr>
<td></td>
<td>- Checklists</td>
</tr>
<tr>
<td></td>
<td>- Inverse brainstorming</td>
</tr>
<tr>
<td></td>
<td>- Limericks and parodies</td>
</tr>
<tr>
<td></td>
<td>- Listing complaints</td>
</tr>
<tr>
<td></td>
<td>- Responding to someone else</td>
</tr>
<tr>
<td></td>
<td>- Role playing</td>
</tr>
<tr>
<td></td>
<td>- Suggestion programmes</td>
</tr>
<tr>
<td></td>
<td>- Workouts</td>
</tr>
<tr>
<td><strong>Identify problems</strong></td>
<td>- Bounce it off someone else</td>
</tr>
<tr>
<td></td>
<td>- Consensus building</td>
</tr>
<tr>
<td></td>
<td>- Draw a picture of the problem</td>
</tr>
<tr>
<td></td>
<td>- Experience kit</td>
</tr>
<tr>
<td></td>
<td>- Fishbone diagram</td>
</tr>
<tr>
<td></td>
<td>- The king of the mountain</td>
</tr>
<tr>
<td></td>
<td>- Redefining the problem or opportunity</td>
</tr>
<tr>
<td></td>
<td>- rewrite objectives in different ways</td>
</tr>
<tr>
<td></td>
<td>- Squeeze and stretch</td>
</tr>
<tr>
<td></td>
<td>- What do you know?</td>
</tr>
<tr>
<td></td>
<td>- What patterns exist?</td>
</tr>
<tr>
<td></td>
<td>- Why-why diagram</td>
</tr>
<tr>
<td><strong>Make assumptions</strong></td>
<td>- Assumption reversal</td>
</tr>
<tr>
<td></td>
<td><strong>Create alternatives - individual</strong></td>
</tr>
<tr>
<td></td>
<td>- Analogies and metaphors</td>
</tr>
<tr>
<td></td>
<td>- Analysis of past solutions</td>
</tr>
<tr>
<td></td>
<td>- Association</td>
</tr>
<tr>
<td></td>
<td>- Attribute association chains</td>
</tr>
<tr>
<td></td>
<td>- Attribute listing</td>
</tr>
<tr>
<td></td>
<td>- Back to the customer</td>
</tr>
<tr>
<td></td>
<td>- Back to the sun</td>
</tr>
<tr>
<td></td>
<td>- Circle of opportunities</td>
</tr>
<tr>
<td></td>
<td>- Computer programs</td>
</tr>
<tr>
<td></td>
<td>- Deadlines</td>
</tr>
<tr>
<td></td>
<td>- Direct analogies</td>
</tr>
<tr>
<td></td>
<td>- Establish idea sources</td>
</tr>
<tr>
<td></td>
<td>- Examine IT via the senses</td>
</tr>
<tr>
<td></td>
<td>- The FCB Grid</td>
</tr>
<tr>
<td></td>
<td>- The focused objective technique</td>
</tr>
<tr>
<td></td>
<td>- Fresh eye</td>
</tr>
<tr>
<td></td>
<td>- Idea bits and racking</td>
</tr>
<tr>
<td></td>
<td>- Idea notebook</td>
</tr>
<tr>
<td></td>
<td>- Input-output</td>
</tr>
<tr>
<td></td>
<td>- Listen to music</td>
</tr>
<tr>
<td></td>
<td>- Mind mapping</td>
</tr>
<tr>
<td></td>
<td>- Name possible uses</td>
</tr>
<tr>
<td></td>
<td>- The Napoleon technique</td>
</tr>
<tr>
<td></td>
<td>- Organised random search</td>
</tr>
<tr>
<td></td>
<td>- Personal analogies</td>
</tr>
<tr>
<td></td>
<td>- Picture simulation</td>
</tr>
<tr>
<td>Create alternatives – Group Panels, other expert groups and workshops</td>
<td>Choose alternatives</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>- Brainstorming</td>
<td>- Management support systems</td>
</tr>
<tr>
<td>- Brainwriting</td>
<td>- Decision support system (DSS)</td>
</tr>
<tr>
<td>- Brainwriting pools</td>
<td>- Group decision support system (GDSS)</td>
</tr>
<tr>
<td>- Brainwriting 6-3-5</td>
<td>- Executive information systems (EIS)</td>
</tr>
<tr>
<td>- Creative imagining</td>
<td>- Artificial neural networks (ANN)</td>
</tr>
<tr>
<td>- Creative leaps</td>
<td></td>
</tr>
<tr>
<td>- Creative circles</td>
<td></td>
</tr>
<tr>
<td>- Creativity circles</td>
<td></td>
</tr>
<tr>
<td>- Crawford’s slip method</td>
<td></td>
</tr>
<tr>
<td>- Delphi technique</td>
<td></td>
</tr>
<tr>
<td>- Excursion technique</td>
<td></td>
</tr>
<tr>
<td>- Gallery method</td>
<td></td>
</tr>
<tr>
<td>- Gordon/little technique</td>
<td></td>
</tr>
<tr>
<td>- Group decision support systems</td>
<td></td>
</tr>
<tr>
<td>- Idea board</td>
<td></td>
</tr>
<tr>
<td>- Idea triggers</td>
<td></td>
</tr>
<tr>
<td>- Innovation committee</td>
<td></td>
</tr>
<tr>
<td>- Inter-company innovation groups</td>
<td></td>
</tr>
<tr>
<td>- Lion’s den</td>
<td></td>
</tr>
<tr>
<td>- Lotus blossom method</td>
<td></td>
</tr>
<tr>
<td>- Mitsubishi brainstorming method</td>
<td></td>
</tr>
<tr>
<td>- Morphological analysis</td>
<td></td>
</tr>
<tr>
<td>- Mind mapping</td>
<td></td>
</tr>
<tr>
<td>- NHK method</td>
<td></td>
</tr>
<tr>
<td>- Nominal group technique</td>
<td></td>
</tr>
<tr>
<td>- Philips 66</td>
<td></td>
</tr>
<tr>
<td>- Photo excursion</td>
<td></td>
</tr>
<tr>
<td>- Pin card technique</td>
<td></td>
</tr>
<tr>
<td>- Role playing</td>
<td></td>
</tr>
<tr>
<td>- Scenario writing</td>
<td></td>
</tr>
<tr>
<td>- SIL method</td>
<td></td>
</tr>
<tr>
<td>- Storyboarding</td>
<td></td>
</tr>
<tr>
<td>- Synetics</td>
<td></td>
</tr>
<tr>
<td>- Take five</td>
<td></td>
</tr>
<tr>
<td>- TKJ method</td>
<td></td>
</tr>
</tbody>
</table>

Table 22: Techniques in Foresight Studies (Korcilja–da Mata et al. 2004)
7.14 Appendix N: Method Families for Foresight Studies


**Method 1: Trend Analysis**

These methods study the data that exhibits an ongoing upward or downward pattern that is not due to seasonality or random noise. Analysing trends is useful in detecting patterns that could lead to forecasting future demand. Trend analysis is mainly done by sophisticated computer programmes, large enquiries and ongoing studies. CO-B was advised to consider existing trend reports, rather than start its own trend research programme. Only a few of these methods are purely qualitative methods and therefore beneficial to CO-B’s needs. Most of them have at least a small quantitative part and were not recommended for CO-B’s foresight framework.

**Method 2: Monitoring and Intelligence**

Monitoring is normally concerned with inputs, activities and outputs. Monitoring systems can, however, also generate information on progress at the purpose level. The term “intelligence” also has different meanings, but is used here to mean the ability to comprehend and profit from insights. In foresight, these two terms are used to explain methods that collect all sorts of information and then cluster and visualise the data on a chart, map or in a table. These methods are suitable for desk research; they can be used at the beginning of a foresight project but also at the end when it is necessary to implement a monitoring system to continuously track and explain the identified patterns. These qualitative methods are highly regarded by foresight experts and CO-B and therefore recommended as part of the foresight framework.

**Method 3: Modelling and Simulations**

Modelling is an investigative technique that uses a mathematical or physical representation of a system to explore its potential characteristics and limits. Many models are programmed as computer simulations of causes and effects within the system. These models are often used to test the effects of a change in system components on the overall performance of the system. Modelling involves creating a numerical representation of an existing situation or set of circumstances, whilst simulation involves predicting new situations or circumstances. In both cases, a model
is produced that provides a numerical representation of the situation or circumstances being studied. These definitions imply that modelling and simulation methods always have a strong mathematical basis and most of them are purely quantitative methods. CO-B was not advised to use these methods in its foresight activities around weak signals.

Method 4: Creativity Methods

Creativity is the ability to think and approach a problem in an original or flexible way, or to bring something new into existence. Creativity methods such as analogies and metaphorical thinking are very useful to support group working and training and can thus be used in workshops. As open dialogue and debate are extremely important, this group of methods is seen as a key factor for scenario building and for challenging an organisation with outcomes from scenarios later in the process.

Method 5: Expert Opinion

An opinion is a personal view about a specific theme. Expert opinions are methods that make use of the opinions of a special group of people. Most often, people that were asked for their opinion are real experts; professors, top-level managers, politicians or other high level people that are either well known or highly respected. It is recommended that expert opinions also come from so called “non-experts”: customers, suppliers or people on the street. It was suggested that CO-B should include this approach for its foresight framework.
### 7.15 Appendix O: Example of CO-B Weak Signals Database

From Future Screening project report CO-B, 30 December 2004.

<table>
<thead>
<tr>
<th>No.</th>
<th>Signal</th>
<th>Category</th>
<th>Description</th>
<th>Time Line</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Banking Titans</td>
<td>Comp.</td>
<td>If a new wave of U.S. consolidation heats up the biggest banks may ultimately reach two or even three times the size of the current four titans, dwarfing all other financial institutions in the world.</td>
<td>6</td>
<td>7, p. 45</td>
</tr>
<tr>
<td>22</td>
<td>Islamic Banking</td>
<td>Cust.</td>
<td>Based on the Sharia, the religious/ethnic codes of behaviour (no interest for customer deposit) could gain in influence and importance.</td>
<td>7, p. 46</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Women and Silver Banking</td>
<td>Cust.</td>
<td>Banks specialized on the needs of women or elderly people.</td>
<td>7, p. 46</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Leapfrog behaviour</td>
<td>Cust.</td>
<td>Consumers are angry about fast technological development. Their daily life facilities get more and more difficult to handle. People start refusing to buy technical equipment and wait for the next generation.</td>
<td>10, p. 4</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Life-long PIN</td>
<td>Polit.</td>
<td>In order to reduce the gap between Users and Non-users of digital services, states would provide each citizen with a PIN to be used all life long for voting, phone calls, banking services etc.</td>
<td>7, p. 88</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Data safety</td>
<td>Polit./Socio.</td>
<td>Biometric data would be used in health insurance, access to buildings, planes, financial services etc. and for safety reasons (terrorism...). What if these data once get hacked or lost by virus attacks? They can’t be changed as PINs can...</td>
<td>7, p. 88</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Increasing individual mobility</td>
<td>Socio.</td>
<td>Not only on an international level (Asia, Africa) mobility (cars, flights etc.) will vastly grow, but also in Central Europe. 2020: 20% more cars than 2003; 2030: four times the number of seniors owning and driving cars. The problems would less be the provision of energy (which can be solved by new forms) but the flow of the enormous number of cars, trains, buses etc. in urban areas. Intelligent cars measuring distances to other cars, to the road or controls pace etc. and traffic guiding systems will solve the problem.</td>
<td>2020 / 2030</td>
<td>12, p. 11</td>
</tr>
<tr>
<td>50</td>
<td>D-Weapons</td>
<td>Socio./Polit./Techno</td>
<td>Based on Data Weapons, biological, chemical etc. weapons, terror would have tremendous impact. Cyber Attacks on dams, chemistry plants, hospitals, airports etc. would challenge security and governments.</td>
<td>12, p. 14</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Security markets</td>
<td>Socio./Polit.</td>
<td>In case that tensions between religions, political systems, economic wealth levels etc. will not be solved, all aspects of security gain importance. For personal safety, people would be willing to pay. Total control (e.g. based on biometric data) and the trace of everybody's data all day would be rather normal.</td>
<td>12, p. 15</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Health technology</td>
<td>Techno</td>
<td>Based on medical research innovations, diseases could be healed. The question is who will pay for research and who will be healed. Would e.g. African citizens profit as well?</td>
<td>12, p. 17</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Longer lives</td>
<td>Socio</td>
<td>People will live longer. By 2030 life expectation grows to 100 years. 2025 one third will be over 60. (AUT) Social security would be unpayable, social values would turn more conservative, Golden Agers have and spend a lot of money.</td>
<td>2025 / 2030</td>
<td>12, p. 18</td>
</tr>
<tr>
<td>54</td>
<td>Intelligent apartments</td>
<td>Techno</td>
<td>Based on computers houses and rooms would react on peoples feelings, health, interests: Sound, light, colours, smells, but also the content of the frigde would be programmable by 2040.</td>
<td>2040</td>
<td>12, p. 19</td>
</tr>
<tr>
<td>55</td>
<td>Fusion of man and computer</td>
<td>Techno</td>
<td>Performance of chips and connections will further increase. 2050 calculating performace of human brains will be in the reach of computers. Direct connections between the human brain and a PC will simplify exchange of data, replace keyboards and screens. Robots will be human like with self perception and consciousness and later be able to learn.</td>
<td>2050</td>
<td>12, p. 20</td>
</tr>
</tbody>
</table>

Table 23: Collection of Weak and Strong Signals (Future Screening project report CO-B, 30 December 2004)
7.16 Appendix P: Best Practice Foresight Framework with Insights

Figure 54: Best Practice Foresight Framework with Insights One to Twelve (own illustration)