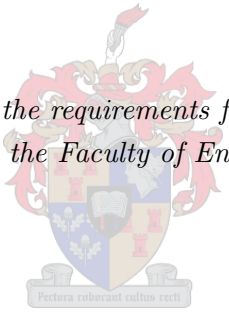
A systems engineering approach to Business Sustainability: A Business Sustainability Framework and Evaluation Tool

by

Megan Rautenbach



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Declaration

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Abstract

Sustainability is recognised as one of the primary challenges of modern businesses. The importance for, and pressure on businesses to incorporate aspects of sustainability into all business processes, that result in delivery of products and/or services, in terms of social equity, economic efficiency, and environmental performance, have increased over the last decades.

Consequently, a number of business sustainability frameworks and approaches were developed to support businesses in incorporating these three elements of sustainability into business processes. However, these frameworks present challenges on how elements of sustainability could be incorporated into business processes. These challenges are: (i) the notion that these frameworks consider the business as a whole, and not as a number of sub-components; (ii) all dimensions of sustainability are not uniformly considered; (iii) measuring the three dimensions of sustainability is not similar across the business components; and (iv) businesses adapt their business processes to a recommended framework that considers sustainability at an aggregated level.

The aim of this research is to contribute towards the body of knowledge of business sustainability through the development of a business sustainability framework that effectively facilitates a sustainable business vision through shared value. Such a business sustainability framework should address the challenges presented by existing business sustainability frameworks and approaches. The following objectives that, when addressed collectively, support the attainment of the above-stated aim are:

Initially, a systematic review of literature pertaining to existing measures of sustainability, and sustainable business frameworks that are aimed to improve business sustainability through shared value are discussed.

Using the systems engineering approach to address the challenges of sustainable business development, it allows for unpacking the business environment into business components and measure sustainability performances at these

business components which ultimately aim to achieve their full potential in terms of sustainability.

The overarching methodology which is guided by Jabareen's conceptual framework methodology proposes a qualitative systems engineering approach to business sustainability. Conceptual frameworks are products of qualitative processes, or set of concepts, that describe an event, object or process. Therefore, the conceptual framework approach enables the use of existing literature where the literature has certain relationships, features and concepts with one another and therefore the discussion of interrelations within concepts creates the applicability of Jabareen's approach.

The Business Sustainability Framework is developed using the partnership of the systems engineering approach and the conceptual framework methodology. This high-level conceptualisation of the Business Sustainability Framework illustrates the four quadrants, that are subsequently translated into three stages within the developed Business Sustainability Evaluation Tool. The Business Sustainability Evaluation Tool aims to contribute to business sustainability to serve as a mechanism to measure business sustainability within a business environment.

In conclusion, a case study application will be conducted to gain more in-depth and practical insight of how an international private hospital group considers business sustainability. Additionally, this research makes a contribution to the business sustainability field of research by providing a different view towards the contribution of business sustainability within businesses.

Opsomming

Volhoubaarheid word beskou as een van die primêre uitdagings van moderne ondernemings. Die afgelope dekade het die belangrikheid vir, en druk wat ondernemings ondervind om aspekte in te sluit van volhoubaarheid in alle besigheidsprosesse, wat lei tot die lewering van produkte en/of dienste, in terme van sosiale bilikheid, ekonomiese doeltreffendheid, en omgewingsoptrede/ prestasie toegeneem.

Gevolglik is ń aantal raamwerke en benaderings ontwikkel om ondernemings te ondersteun in terme van die insluiting van die drie elemente van volhoubaarheid in alle besigheidsprosesse. Hierdie raamwerke bied egter uitdagings aan oor hoe elemente van volhoubaarheid in sakeprosesse geïïkorporeer kan word. Hierdie uitdagings is: (i) die idee dat hierdie raamwerke die besigheid as geheel beskou en nie as ń aantal subonderdele nie; (ii) alle dimensies van volhoubaarheid word nie eenvormig oorweeg nie; (iii) die meting van die drie dimensies van volhoubaarheid is nie eenders oor die besigheidskomponente nie; en (iv) besighede pas hul sakeprosesse aan by ń aanbevole raamwerk wat volhoubaarheid op ń gesamentlike vlak oorweeg.

Die doel van hierdie navorsing is om ń bydra te lewer tot die kennis van besigheid volhoubaarheid deur die ontwikkeling van ń besigheids-volhoubaarheidsraamwerk wat ń volhoubare besigheidsvisie deur middel van gedeelde waarde effektief fasiliteer. So ń besigheids-volhoubaarheidsraamwerk moet aandag gee aan die uitdagings wat aangebied word deur bestaande raamwerke en benaderings vir besigheid volhoubaarheid. Die volgende doelwitte wat gesamentlik aangespreek word, ondersteun die bereiking van die bogenoemde doel is as volg:

Eerstens word ń sistematiese oorsig van literatuur met betrekking tot bestaande maatreëls van volhoubaarheid, volhoubare besigheidsraamwerke wat daarop gemik is om besigheids volhoubaarheid deur gedeelde waarde te verbeter bespreek.

Met behulp van die stelselsingenieurswese-benadering om die uitdagings van volhoubare besigheidsontwikkeling aan te spreek is dit moontlik om die besigheidsomgewing in besigheidskomponente uit te pak en volhoubaarheidsprestasies by die besigheidskomponente te meet, wat uiteindelik hul volle potensiaal ten opsigte van volhoubaarheid bereik.

Die oorhoofse benadering tot ń kwalitatiewe stelselsingenieurswesebenadering vir besigheid volhoubaarheid word gelei deur die beginsels van Jabareen se konseptuele raamwerk-analise. Die konseptuele raamwerk-analise stel die gebruik van bestaande literatuur in staat waar die literatuur sekere verhoudings, kenmerke, en konsepte het met mekaar en dus die bespreking van Jabareen se benadering toespaslik is.

Die Besigheid Volhoubaarheidsraamwerk is ontwikkel op grond van die vennootskap tussen die stelselsingenieurswese benadering (insluitend die kwadrant bespreking) en die konseptuele raamwerk-analise. Die hoëvlak konseptualisering van die Besigheid Volhoubaarheidsraamwerk demonstreer die vier kwadrante, wat gevolglik getransponeer is in drie fases van die ontwikkelde Besigheid Volhoubaarheid Evalueringsinstrument. Die Besigheid Volhoubaarheid Evalueringsinstrument beoog om by te dra tot volhoubaarheid wat dien as ń meganisme om volhoubaarheid te meet binne ń besigheidsomgewing.

Ten slotte word ń gevallestudie toepassing uitgevoer om te begryp hoe ń internasionale private hospitaalgroep besigheidsvolhoubaarheid oorweeg in hul besigheidsprosesse. Daarbenewens lewer hierdie navorsing ń bydrae na die besigheid volhoubaarheidsveld van navorsing deur ń ander siening voor te stel van besigheidsvolhoubaarheid binne besighede.

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Nomenclature

Acronyms

BSET Business Sustainability Evaluation Tool

BSF Business Sustainability Framework

CDP Carbon Disclosure Project

CDSB Climate Disclosure Standards Board

CERES Coalition for Environmentally Responsible Economics

CSD United Nations Commission on Sustainable Development

ESI Environmentally Sustainability Index

GRI Global Reporting Initiative

GSG Global Scenario Group

INCOSE International Council on Systems Engineering

IUCN International Union for Conservation of Nature

SASB Sustainability Accounting Standards Board

SE Systems Engineering

TBL Triple Bottom Line

UNEP United Nations Environment Programme

UNGC United Nations Global Compact Communication on Progress

Chapter 1

Introduction

This chapter serves as the introduction to this research project by providing a background and problem statement of this research. The research aim and objectives discuss the primary focus of this project. Additionally, the limitations and assumptions, and validation strategy are discussed. The research approach outlines how the objectives will be achieved followed by an overview of the structure of this report.

1.1 Background

Researchers argue that sustainable business practices improve business' operations, reputation, and market access. However, some of these benefits are realised immediately, others take time to arise (Rafat & Salama, 2017). Sustainability support businesses to grasp long-term opportunities and mitigate threats which contribute towards the resilience of the business. The resilience of the business is the ability to anticipate, avoid, and adjust to shocks in their business operating environment (Rafat & Salama, 2017). In order to understand the meaning of business sustainability, sustainability in its unique form should be first defined, followed by a discussion of the integration between the three dimensions (economic, social, and environmental) of sustainability.

Sustainability was popularised in the early 1980s when "*A global agenda for change*" was formulated by the General Assembly of the United Nations. In 1987 a world-known report was established, titled "Our Common Future" by the World Commission on Environment and Development, known as the Brundtland Report − this report introduced the concept of sustainable development and described how it could be achieved (World Commission on Environment and Development, 1987). Sustainability and sustainable development are two terms that are used interchangeably and are defined by World Commission on Environment and Development (1987), as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

To date, this definition is the most commonly used definition globally (Carter & Rogers, 2008).

Another concept of sustainable development, that the Brundtland Report highlighted, was that in essence, to become sustainable implies to not only focus on environmental aspects but also on social and economic aspects, and that these three aspects do not limit one another but are integrated and have interrelations with one another (Robert *et al.*, 2005). From this definition, another synonym of sustainable development, namely "Triple Bottom Line" (TBL), was introduced by John Elkington in 1994, and he argued that businesses should develop three different bottom lines (Elkington, 1994). Figure 1.1 demonstrates the overlap of these three bottom lines and indicates where sustainable development originates. Another important point represented by the Venn diagram is the fact that trade-offs can take place between the dimensions in order to improve one or the other. Lozano (2008) emphasizes that the diagram shown in Figure 1.1 does not change over time, which is considered a critical aspect of sustainability.

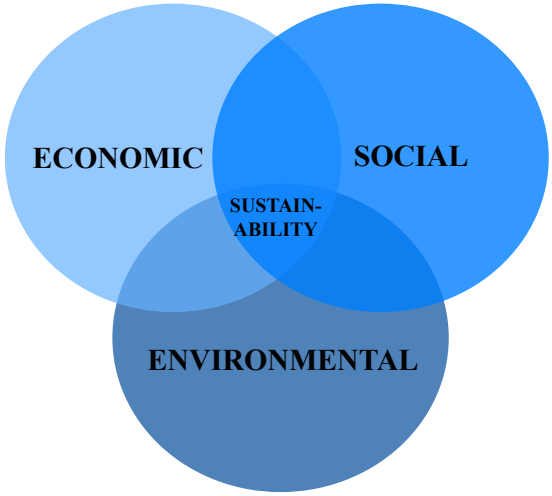

Figure 1.1: A venn diagram representing triple bottom line (reproduced from Elkington (1994)).

Businesses have an important role to play when sustainability is considered (De Lange *et al.*, 2012). Within the context of businesses, sustainability is known as an approach that businesses adopt into their business actions that considers the economic, social, and environmental factors in a balanced, holistic, and a long-term vision that benefits the current and future generations of concerned stakeholders (De Lange *et al.*, 2012). Business sustainability has become known for its management and coordination of economic, social, and environmental demands and concerns to ensure ethical, responsible and continuous success (Colbert & Kurucz, 2007). Additionally, Lüdeke-freund *et al.* (2018) described business sustainability approaches as a descriptive, analysis, and managerial supporting

mechanism for the use of businesses to communicate their sustainable value proposition to their customers and all stakeholders. The supporting mechanism explains the strategy of how the business creates and delivers value, how it captures economic value while maintaining or regenerating economic, social, and natural capital (Colbert & Kurucz, 2007).

Lately, business sustainability concepts have proposed an equilibrium between economic growth and social, and environmental responsibilities to bridge the gap between the business approaches that address either one of these concepts (Ajmal *et al.*, 2017; Cambra-Fierro & Ruiz-Benítez, 2011). The drive towards sustainable practices has become part of the business responsibilities to present opportunities for future growth (Svensson *et al.*, 2016). Therefore, businesses are forced to leap towards a re-thinking, re-designing, and re-developing business practice that result in sustainable business practices (Ajmal *et al.*, 2017). The consequence of businesses not adopting these practices nor addressing sustainability issues will result that the business is being at a competitive disadvantage (Cambra-Fierro & Ruiz-Benítez, 2011).

Sustainable businesses are ones that create economic growth for all stakeholders while protecting the environment and improving the life of societies with whom they interact (Cambra-Fierro & Ruiz-Benítez, 2011). Therefore, sustainability, effectiveness and efficiency should not be revival concepts and rather be social and environmentally conscious and have ecologically-friendly business strategies that generate competitive advantages and an increase in financial performance for businesses (Cambra-Fierro & Ruiz-Benítez, 2011).

Figure 1.2 illustrates the discussion of the absolute forms and relative forms of value creation within business in context of business sustainability. The absolute forms of value creation are known as economic effectiveness, eco-effectiveness and socio-effectiveness (Lüdeke-Freund *et al.*, 2016). Economic effectiveness serves the aim of business management and economic success with the aim to support the other sustainability dimensions. Socio-effectiveness relates to business social management and the absolute performance of these social demands. Eco-effectiveness serves as the absolute reductions and improvements of the business's negative impact on the environment.

The relative forms of value creation are defined as eco-efficiency, socio-efficiency and eco-justice (Lüdeke-Freund *et al.*, 2016). Eco-efficiency represents the relative proportions of an economic and physical measure. Socio-efficiency represents the relative proportions of economic and social measures. Eco-justice reflects on the relationships of environmental and social objectives (Lüdeke-Freund *et al.*, 2016).

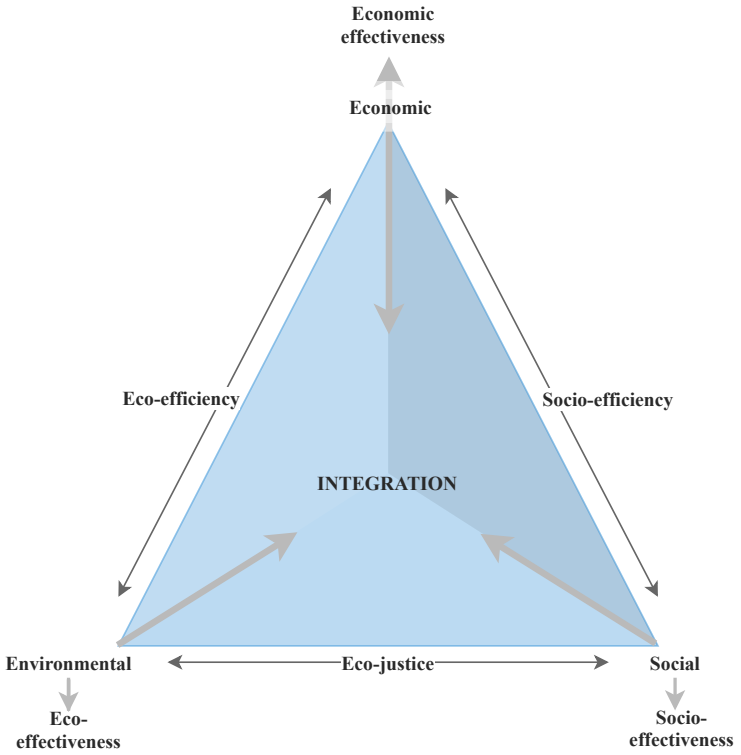

Figure 1.2: Integration of challenges within business sustainability (reproduced from Lüdeke-Freund *et al.* (2016)).

These sustainability strategies describe generic possibilities on how businesses can focus on business sustainability. A holistic strategy with a competitive advantage will focus on sustainability issues within all business activities and will deliver customers and stakeholders a unique advantage (Baumgartner & Ebner, 2010). In order to understand this holistic strategy, a description of how these business activities are functioning in the business environment is required.

Over the past decade, individual business concepts in the business environment have become well-known topics for discussion in the fields of research and professional practice (Lüdeke-Freund & Dembek, 2017). At the same time, sustainability has come to be recognised as one of the key challenges facing modern-day businesses. Sustainability experts have begun to investigate how the business environment and sustainability actions can be integrated into one system or model (Lüdeke-Freund & Dembek, 2017). The environment in which a business operates is considered as the sum of all the factors and variables that influence the creation, growth and continued existence of the business, either positively or negatively; thereby promoting or hindering the achievement of its objectives (Porter & Kramer, 2011). It is thus evident that business contexts and environments play a significant role in sustainable business development.

1.2 Problem statement

Sustainability is recognised as one of the key challenges of modern-day businesses. The need for, and pressure on, businesses to incorporate aspects of sustainability into all business processes that result in the delivery of products and/or services, in terms of social equity, economic efficiency and environmental performance, have increased over the past few decades. Consequently, a number of business sustainability frameworks and approaches were developed to support businesses in incorporating these three elements of sustainability into business processes. However, these frameworks present challenges on how elements of sustainability could be incorporated into business processes. These challenges are (and discussed in detail in Section 2.5): (i) the notion that these frameworks consider the business as a whole, and not as a number of sub-components; (ii) all dimensions of sustainability are not uniformly considered; (iii) measuring the three dimensions of sustainability is not similar across the business components; and (iv) businesses adapt their business processes to a recommended framework that considers sustainability at an aggregated level.

Thus it is argued that by considering sustainability at an increasingly granular level, and also ensuring that all sustainability dimensions for each business component is considered, will contribute to an improved understanding of business sustainability. The evaluation thereof, and ultimately to provide guidance on the actions required to continuously improve the sustainability of businesses.

1.3 Research aim and objectives

The aim of this research is to contribute towards the body of knowledge of business sustainability through the development of a business sustainability framework that effectively facilitates a sustainable business vision through shared value. Such a business sustainability framework should address the challenges presented by existing business sustainability frameworks and approaches. The objectives that, when addressed collectively, support the attainment of the above-stated aim are:

(i) Conduct a comprehensive literature review to:

  (a) Identify a number of sustainability frameworks that address sustainable development in the business environment and explore the challenges identified within such sustainable frameworks;

  (b) Determine the required design specifications in order to address the challenges identified within sustainable frameworks identified in (i);

(c) Investigate the systems engineering approach as a problem-solving approach that will address certain challenges faced by the sustainability frameworks; and

(d) Identify the business environment, the various business components within the business environment and how these components will create and deliver value.

(ii) Introduce the systems engineering approach as a guiding principle for the conceptual framework development.

(iii) Propose a framework and evaluation tool that contributes towards increased business sustainability by providing a framework that substantiates industry-specific problem-solution combinations of the business components' level of the business environment.

(iv) Validate the developed conceptual framework of business sustainability towards the business components' level of the business environment.

(v) Conduct a linear-analytic structure as a case study between a healthcare context and the developed framework and tool.

1.4 Research approach

This research consists of three sections (see Figure 1.3), namely: business sustainable measures, the contextual business environment, and the framework development and validation. Each of these sections consists of subsections and are discussed below. Section one and two contribute to the development of section three.

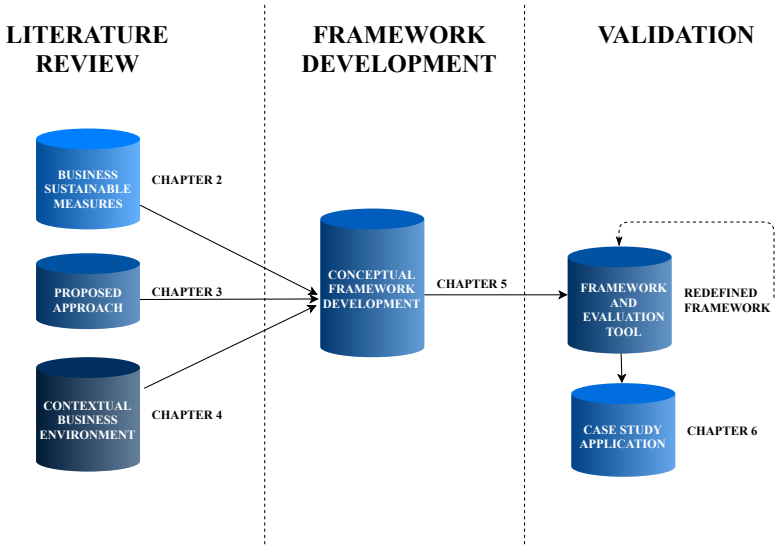

Figure 1.3: Research methodology.

1.4.1 Business sustainable measures

Business sustainable measures consist of two stages and are executed in Chapter 2. Firstly, with the use of a systematic literature review, existing measures of sustainability, business sustainable frameworks, and sustainability definitions within the business environment is investigated and clearly described. The second stage is the discussion of the challenges identified from such frameworks and the identification of design specifications to address these challenges.

1.4.2 Contextual business environment

Firstly, a systems engineering approach is proposed to address the concerns that emerged from the business sustainable measures in Chapter 3. Subsequently, Chapter 4 reviews literature pertaining to the contextual business environment. Additionally, this section investigates and defines the business environment as it relates to the internal and external factors influencing the business outputs. Therefore, it allows for the unpacking of the contextual business environment into business components. This in turn allows for measuring of sustainability performances of these business components which ultimately aims to contribute towards business sustainability.

1.4.3 Framework development and validation

The framework development in Chapter 5 is developed on Jabareen's conceptual framework analysis[1] with the use of a literature review. This conceptual framework development approach enables the use of existing literature from the preceding sections where the literature has certain relationships, features and concepts with one another and therefore the discussion of interrelations within concepts create the applicability of Jabareen's approach. The framework and evaluation tool are developed based on the use and the principles of the systems engineering approach and the conceptual framework analysis. The framework is validated with the assistance of subject matter experts, which is used to make necessary changes to the invalidated framework and evaluation tool. Lastly, the validated and redefined framework and evaluation tool are tested using a linear-analytic structure method of a case study to compare how business sustainability is addressed in a healthcare system in Chapter 6.

[1] Jabareen (2009) defines a conceptual framework as a group of interlinked concepts that yield a comprehensive understanding of a phenomena.

1.5 Validation strategy

Validation plays an important role in this research. The validation process is a way of progressing and clarifying the arguments and propositions made in order to reach certain conclusions in terms of the validity of the expected outcome of this research. Thus the validation process is designed to gather data through qualitative approaches, where qualitative approaches are the way to understand and motivate the phenomenon within this research context. A number of subject matter experts are selected that provide a perspective view between literature and the industry. The subject matter experts have experience in research and in practice that are aligned with the contexts of this research inquiry. They provide a renewed perspective on the research section that are validated.
Two validation strategies are used in this research namely; (i) semi-structured interviews with subject matter experts; and (ii) a case study application for the healthcare domain. The process for the semi-structured validation strategy is as follows: the subject matter experts are contacted via email, requesting their willingness to take part in the validation process. Upon approval, the subject matter experts receive a validation document of the research section that requires validation (the validation document is shown in Appendix C). The subject matter experts are requested to read through the document before a scheduled meeting or Skype meeting is set up for explanation of the validation strategy. Thereafter, the subject matter experts provide feedback based on the validation questions.

The case study application process is similar to the semi-structured interviews. Initially the research section that requires validation is based on a generalised view and for the case study this generalised view is compared and then customised according to certain concepts towards the healthcare domain.

1.6 Limitations and assumptions of research

This section puts forth the limitations and assumptions to set out the scope of this research project that will be researched.
The initial scope of the research was to use the literature pertaining to the capability maturity model as a guideline to support sustainable business development. However, with the extensive review of business sustainable frameworks, a gap were identified between the business environment within which a business operates and the sustainability frameworks. Therefore, the research was further developed as follows.

The literature findings will view sustainability and business sustainability frameworks from a generalised approach. The systematic review provides interest into business sustainability measuring frameworks, but aims to answer a set of specific questions only. The literature pertaining to the business environment is solely defined from extensive publications and contributes to management theory and practice which have a resulting approach on organisational growth and development. The business environment literature will support the business to solely understand its own strengths and limitations within a business sustainability context.

The framework and evaluation tool is developed based on the results of the literature findings in this research. The framework is developed from a high-level strategic point of view of a problem-solution space, and the evaluation tool is developed for the detailed level which − is derived from the developed framework. Definitions of concepts are defined from literature findings within the business sustainability context of this research. The developed approach taken for the framework and evaluation tool is generic and conceptual. Available resources such as time and funding as part of the validation process do not allow for actual application of the framework and evaluation tool. Thus the framework and evaluation tool that are developed are not implemented at full scale in a real-world scenario. It is thus acknowledged that the scope for continuous improvement and recommendations should be considered once the framework and evaluation tool is implemented. Generic concepts within the framework and evaluation tool have the possibility to change to have a different applicability to the user's specific industry or business.

Additionally, the research is an engineering-based study which resides in a logical and rational paradigm which believes that the causes and effects of the phenomena may be studied and to a moderate extent be uncovered and analysed within the limited capacity of knowledge; and the implemented causes result in the desired effects. In conclusion the interpretation is dependent on the author's understanding of this research study and thus the content evaluation limits the bias of human interpretation.

1.7 Document structure

The structure of this document is as follows:

Chapter 2: Sustainability frameworks literature

A systematic review is introduced in this chapter that explicitly identifies and discusses sustainability frameworks. The sustainability frameworks are assessed with a purpose to identify certain challenges in the sustainability frameworks, followed by a discussion. A

proposition is set with the aim to address these challenges experienced by the sustainability frameworks.

Chapter 3: A proposed approach

The primary concern with systems engineering, fundamental approaches and systems design within systems engineering is discussed in this chapter. The structure and methodology of the systems engineering approach are discussed and how it can be applied to the proposition in the previous chapter.

Chapter 4: The business environment: A systems engineering approach

The discussion and application of systems engineering approach to the business environment are conducted in this chapter. It explicitly discusses the business environment in terms of its various components and how these components can create value. A value chain discussion is used to facilitate how the business environment and the conceptualisation of the systems engineering approach can create and deliver shared value.

Chapter 5: Towards the development of a Business Sustainability Framework: Conceptual framework approach

An overview of the conceptual framework literature[1], including a discussion of Jabareen's conceptual framework analysis and phases is conducted in this chapter. The systems engineering approach is used as a guiding principle to develop the conceptual framework. The Business Sustainability Framework is developed using the phases and literature from Chapter 2 to Chapter 4. This high-level conceptualisation of the Business Sustainability Framework illustrates four quadrants adapted from the systems engineering approach, that are subsequently translated into three stages within the developed Business Sustainability Evaluation Tool. Each quadrant consists of a number of elements that contribute to the overall quadrant definition and explanation. This chapter concludes with the validation and discussion of the framework and evaluation tool.

Chapter 6: Business sustainability in a healthcare system: A case study

Business sustainability and whether it exists in the healthcare system context is reviewed in this chapter. This chapter aims to investigate the applicability of the developed framework and evaluation tool to the healthcare sector, and to infer to what extent the developed framework should be customised to/for the healthcare industry. A case study application

[1] Conceptual frameworks are products of qualitative processes, or set of concepts, that describe an event, object or process (Meredith, 1992).

is conducted between an international private hospital group's approach to contribute towards business sustainability and the developed framework and evaluation tool. The discussion will include both frameworks, tools, and expected outcomes of different business sustainability strategies.

Chapter 7: Conclusion and future work

The concluding chapter is a summary of the completed research inquiry and the results of the study. This chapter concludes with a discussion of recommendations of future work.

1.8 Research outputs

The research outputs produced from this research include one national conference article and one international conference article.
National conference article − An article titled "Towards a systems-based capability maturity model to support sustainable business development" has been produced from a large portion of the content in Chapter 2 (refer to Section A.1 in Appendix A). Authors: Megan Rautenbach; Imke de Kock; Alan Brent. Status: Published in the SAIIE28 conference proceedings.

International conference article − An article titled "A systems engineering approach to business sustainability" has been produced from a large portion of the content in Chapter 3 and 4 (refer to Section B.1 in Appendix B). Authors: Megan Rautenbach; Imke de Kock; Louzanne Bam; Alan Brent. Status: Published in the IAMOT2018 conference proceedings. Award: Best student paper.

1.9 Chapter 1: Conclusion

In this chapter the research study and the proposed approach to the project are introduced. A brief introduction of business sustainability is introduced as well as the problem statement regarding this phenomenon. The research objectives address the problem statement of the study and the research approach discusses the steps to achieve the objectives. Lastly, the chapter concludes with a description of the structure of the thesis.

Chapter 2

Measures of sustainability, sustainable business frameworks and definitions within business environments: Systematic literature review

Sustainability is recognised as one of the primary challenges of modern times in an organisation. A number of researchers have developed frameworks and approaches to incorporate the three elements (economic, social, and environmental) of sustainability into business processes. This Chapter thus evaluates existing measures of sustainability, sustainable business frameworks and definitions within business environments, as well as existing models that are aimed at improved business sustainability through shared value.

2.1 Chapter 2: Introduction

Over the years, the extensive need for business sustainability developed and businesses promoted the idea of sustainable business strategies. Businesses are experiencing increasing pressure to incorporate environmental and social development goals and performance measures into their strategies and business operations, and thus the dynamics that surround the term 'business sustainability' should be fully understood (Elkington, 1994). Initially, the definition of business sustainability is defined as "*business models and managerial decisions that create value over the short, medium, and long term, based on mutually beneficial interactions between the company's value chain and the social and ecological systems on which it depends*" (Lüdeke-Freund *et al.*, 2016).

The next section provides an overview of the approach taken in this research inquiry; a systematic review of available literature in order to address the research objective (see Section 2.2.1), which argues for the case of a system-based Industrial Engineering approach to incorporate sustainable development to organisational goals and objectives.

2.2 Systematic review methodology

A systematic review is defined as "*a review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review*" (Siddaway, 2014). A systematic review thus aims to establish existing research that has progressed towards a clarifying problem. Systematic reviews are characterised by being unbiased, methodical, transparent and replicable. It therefore involves a methodical search process to locate studies which address a particular question, as well as the findings of the results of this search. Titles, abstracts, keywords, geographical locations, and year published, are used to distinguish a large group of documents to a smaller group that is used in this study. Figure 2.1 indicates the five steps that are executed during a systematic review, followed by an in-depth discussion to ensure the results are unbiased and transparent (Khan *et al.*, 2003).

Figure 2.1: Systematic review procedure (Siddaway, 2014).

2.2.1 Research objective(s)

This chapter analyses literature concerning sustainability assessment frameworks in a universal context with the aim of addressing the following research objective:
Review existing sustainable assessment frameworks that promote sustainable actions in order to incorporate sustainable development into organisational goals and objectives.

2.2.2 Search for relevant studies

The search for relevant studies was initially conducted using the known online search tools, Scopus and google scholar. The initial search included single word phrases. For sustainability, the keywords 'triple bottom line', 'sustainability' and 'sustainable development'

were used. Keywords such as 'indicators', 'business models', 'business development' and 'maturity models' were used for the approach. Due to a large amount of data gathered, a criterion was established to narrow down the documents. The first step in the criteria was to combine the above-mentioned single word phrases with one another to narrow down the search with the focus to be on sustainable measurement frameworks. The primary focus of the documents should entail the overall theme of sustainability, methods or indication on how sustainability can be measured. The combined search terms provided a total of 543 documents that were used for further analysis. Table 2.1 illustrates a summary of the combined search terms.

The titles and keywords listed were evaluated to ensure this criterion correlates with the overall theme. The next filtering process included publications after the year 2000 and thus narrowed down the research data to 200 documents. These 200 documents were further analysed by changing the mode of publication and ensuring the titles and keywords were aligned with the overall theme. The titles and keywords should be aligned with the following phrases: 'sustainability frameworks', 'sustainability measurements', 'sustainable development assessment' etc.. This analysing process resulted in a total of 70 documents. Thereafter the 70 documents were analysed by reviewing the abstracts and identifying sustainability measurement approaches and proposed results. A total of 35 documents was selected after the abstract reviewing process. Additionally, to the 35 documents, seven documents were hand-picked which supported the sustainability theme. Figure 2.2 illustrates the narrowing down of the documents throughout the criteria process.

Table 2.1: Results of the combined search terms.

Combined search terms	**Results**
TITLE-ABS-KEY ("triple bottom line") AND TITLE-ABS-KEY (indicators))	165
TITLE-ABS-KEY ("triple bottom line") AND TITLE-ABS-KEY ("business model"))	40
TITLE-ABS-KEY ("sustain ") AND TITLE-ABS-KEY ("business model") AND TITLE-ABS-KEY ("framework")	149
TITLE-ABS-KEY ("sustain ") AND TITLE-ABS-KEY ("maturity model")	189
	543

2.2.3 Mode of publication

The document search outlined above was extensive, and ultimately resulted in a total of 42 documents being selected to use for the remainder of this research inquiry. Of these 42 documents, the majority are journal articles, and a small fraction are reports. These papers and articles address the overall literature concerning sustainability within the context of the formulated research objectives. Table 2.2 illustrates the search structure conducted during the systematic review. The 42 documents are compiled of 31 journal articles, four reports and seven web pages.

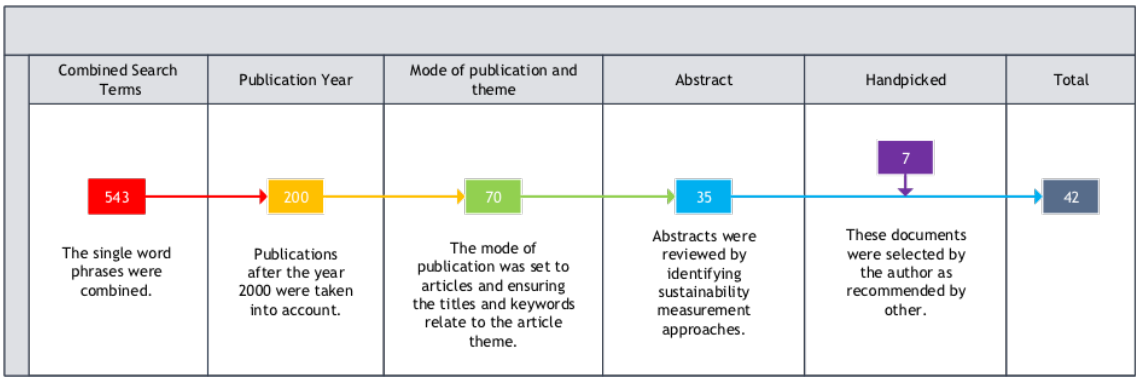

Figure 2.2: Narrowing down of the criteria used on literature.

Table 2.2: Data classification.

Type of data	Results
Journal articles	31
Reports	4
Web pages	7

2.2.4 Synthesising the data

The documents were analysed and synthesised according to the overall theme it addresses concerning sustainability. In order to have a comparison between the different sustainability measurement frameworks, a criterion was identified. Firstly, throughout the review of the frameworks, dimensions were identified. These dimensions are discussed in detail in the following section. After the dimensions were identified, the key performance indexes were set out at each framework according to the sustainability factors. Table 2.5 and 2.4 in Section 2.3.9, illustrate a summary of these dimensions. Section 2.4 describes the assessment that was used to find the best or most suitable sustainability measurement framework for future use.

2.2.5 Findings

The eight measurement frameworks of sustainability, obtained from the systematic review will be discussed in Section 2.3. These eight frameworks are identified by the research conducted by Parris & Kates (2002) about sustainability measurement frameworks. Parris & Kates (2002) provide one of the 42 articles obtained throughout the systematic review, and are deemed the most prominent sustainability measurement frameworks; this research inquiry, however, builds on the work produced by Parris & Kates (2002) by means evaluating the remaining 41 articles that resulted from the systematic literature analysis outlined above.

2.3 Measurements of sustainability

The evaluation of sustainable development within business environments, enables businesses to identify areas which have already achieved sustainable goals and objectives, as well as areas that require improvement initiatives in terms of any of the three pillars of sustainability. Sustainability indicators are a simple instrument that allows businesses to evaluate economic, social and environmental objectives as well as the social and environmental impact of their businesses. An indicator that includes the necessary features of a system or shows how maintenance or improvements can be done on a system is classified as a good indicator (Parris & Kates, 2002).

By now it should be clear that sustainability measurements are required to support the implementation process of sustainability goals in any organisation (Ciegis *et al.*, 2009). In order to understand the measurement of business sustainability, the aim of such measurements should be clearly defined. The aim of a business sustainability assessment or measurement includes the following (Waas *et al.*, 2014):

(i) It generates information for better understanding of the meaning of sustainability and its contextual interpretation;

(ii) The integration of sustainability issues into decision-making efforts by identifying and assessing the past or current sustainability impacts;
and,

(iii) It promotes sustainability objectives throughout the organisation.

The above-mentioned aims should be considered in all sustainability enrolment decisions in any business. Several sustainability assessment frameworks exist, which include the above-mentioned aims to varying extents, and can be used as guidance for the measurement of sustainability. A framework is defined in simple terms, as a structure that is composed of components which are framed together to support a subject (Fonseca *et al.*, 2013). Thus, a sustainability assessment framework, which supports sustainable development consists of elements such as indicators, models, and policies or other frameworks (Fonseca *et al.*, 2013).
Waas *et al.* (2014) identified two methodological approaches that exist in sustainability measurements. The first approach is a top-down approach and also referred to as 'reductionist' and developed by experts who use explicit methodologies. The second approach is a bottom-up approach also known as 'conversational' and developed by stakeholders who use implicit methodologies. A top-down approach is distinguished by quantitative

indicators and a bottom-up approach by qualitative indicators (Bell & Morse, 2001; Waas *et al.*, 2014).

Parallel with the above outline, the following dimensions, which allow for a systematic comparison of various systems approaches to sustainability assessment frameworks, have been gathered:

(i) Actors and networks: Actors are the different groups that are connected to each other in a network. Actors can be humans or non-human objects. A network is the outcome of two or more actors that are connected (Dankert, 2011);
and,

(ii) Discipline: The discipline of the assessment framework refers to the specific academic discipline the framework is applicable to. The framework can range from a generalised framework or to a more specific discipline framework that focuses on certain commitment initiatives (Krishnan, 2009).

(iii) System boundaries: The system boundaries are based on the sustainability domains the assessment framework focusses on. The sustainability domains include the economic, social and environmental dimensions. A fourth domain that contributes additionally to the system boundaries are institutional programmes that are controlled by governmental bodies (Division for Sustainable Development, 2001);

Table 2.3 illustrates the occurrence of the eight identified sustainability measurement frameworks in the 42 articles obtained from the systematic review.

Table 2.3: Framework findings.

Sustainability measurement framework	References	Findings
Global Reporting Initiative G4 Sustainability Reporting Guidelines	Carter & Rogers (2008); Parris & Kates (2002); Fonseca *et al.* (2013); Bonini & Swartz (2014); Azapagic & Perdan (2000); Azapagic (2004); Elkington (2004); Singh *et al.* (2009); United Nations Global Compact (2015); Illankoon *et al.* (2016); Labuschagne *et al.* (2005); United Nations Global Compact (2017); Lozano (2008); Joyce & Paquin (2016); UNDESA (2015)	15
CDP Environmental Disclosure System	Parris & Kates (2002); CDP Worldwide (2017)	2
United Nations Commission on Sustainable Development	Parris & Kates (2002); Division for Sustainable Development (2001); Singh *et al.* (2009); Illankoon *et al.* (2016); Labuschagne *et al.* (2005); Shrivastava & Berger (2010)	6
International Union for Conservation of Nature	Division for Sustainable Development (2001); Mebratu (1998); Lele (1991); Andersen (2006); IUCN (2017)	6
Environmental sustainability index	Parris & Kates (2002); Waas *et al.* (2014); World Economic Forum (2002)	3
Global Scenario Group	Parris & Kates (2002); Global Scenario Group (2017)	2
Sustainability Accounting Standards Board	Parris & Kates (2002); Sustainability Accounting Standards Board (2017)	2
United Nations Global Compact Communication on Progress	Parris & Kates (2002); Bonini & Swartz (2014); United Nations Global Compact (2012); United Nations Global Compact (2017); United Nations Global Compact (2015); UNDESA (2015)	6

Parris & Kates (2002) discussed other frameworks as well, but due to the unavailability of data or the scope of the frameworks, made it impossible to include them.

2.3.1 Global Reporting Initiative G4 Sustainability Reporting Guidelines

The United Nations Environment Programme (UNEP) formed a partnership with the Coalition for Environmentally Responsible Economics (CERES) and established the Global Reporting Initiative (GRI) in 1997. The aim of the GRI is to enhance the quality, rigour and utility of sustainability reporting (Singh *et al.*, 2009). Sustainability reporting as mentioned by the GRI standards is an organisation's application of reporting on the organisation's economic, environmental and social impacts and contributions towards the end goal of sustainable development (Global Reporting Initiative, 2016).
The fourth generation of the guidelines was launched in May 2013. The aim of G4 is to support reporters to prepare sustainability reports that are valued and to make sustainability reporting a standard practice. G4 provides guidance through a designed compatible range of different reporting formats. It supports businesses on the strategic journey and encourages businesses to only provide information on the issues and challenges that are critical to sustainable development in order to achieve the organisation's goals for sustainable development.

Figure 2.3: Overview of GRI G4 reporting guidelines (Global Reporting Initiative, 2014).

The G4 guideline is user-friendly and enables businesses to better inform markets and society on sustainability matters. This guideline is designed to be universally applicable to all enterprises; small, medium and large, globally. The G4 guideline provides extensive guidance on how sustainability disclosures in different report formats should be presented. Figure 2.3 presents an overview structure of the G4 reporting guidelines. The second row

presents the system boundary dimension (economic, environmental and social), the third row presents the subsequent categories in each subsequent system boundary and the last row presents the number of important aspects (list of subjects covered by the guidelines) that needs to be considered in the allocated categories.

The guidelines are presented in two parts, the reporting principles and standard disclosures and the implementation manual. The first part encompasses the reporting principles, standard disclosures, definitions of key terms, and the criteria which should be followed by an organisation when preparing its sustainability report. The second part encompasses explanations of how the reporting principles should be applied, how to prepare the information to be disclosed, and how to interpret the various concepts in the guidelines (Global Reporting Initiative, 2014).
GRI consists of a global network, which includes reporters, experts and advisers in sustainability reporting around the world. This global network has a multi-stakeholder approach which serves as the actors. The governance body is formed from a diverse range of experts in the sustainability reporting field. Reporters that use GRI guidelines have access to the following global strategic partnerships of GRI; Organisation for Economic Co-operation and Development, the United Nations Environment Programme and the United Nations Global Compact (Global Reporting Initiative, 2014).

GRI guidelines are developed in order to be applicable to any discipline. Additionally, to this generalised guideline, GRI has developed guidance on sector-specific issues, aiming to increase the number and quality of reports and to improve sustainability performance in the sectors covered. The following sectors have additional guidelines: airport operators, food processing, construction and real estate, electric utilities, financial services, media, mining and minerals, non-governmental businesses and oil and gas sector (Global Reporting Initiative, 2014).

2.3.2 CDP Environmental Disclosure System

The Carbon Disclosure Project (CDP), is an organisation based in the United Kingdom which enables companies, cities, states and regions to measure and manage their environmental impacts. It contains a comprehensive collection of self-reported environmental data in the world (CDP Worldwide, 2017). CDP asks companies, cities, states and regions for data of their environmental performances. The data are transformed into a detailed analysis about critical environmental risks, opportunities and impacts. There-after the investors, businesses and policy makers use the data and insights to improve decisions, manage risk and capitalise on opportunities. CDP focusses on climate change, forests and

water programmes, which support businesses to capture the accredited data and to submit it to the investors (CDP Worldwide, 2017).

The Climate Disclosure Standards Board (CDSB) and CDP work together to provide a complete, reliable and verified system for climate disclosure. The CDSB has developed two frameworks for the process of reporting environmental information or natural capital and climate change-related information in corporate reports. These frameworks support investors with essential decisions about environmental information while considering capital allocation.
CDP creates a network between companies, cities, states and regions, investors, purchasers, non-governmental businesses, intergovernmental businesses and governments to exchange environmental information for any further actions. Similarly, to GRI, CDP developed a generalised guideline to support the environmental system boundary. Additionally, a supply chain programme is developed. The programme supports the in-taking of a new approach to climate change, water and forest-risk management, by collaborating and encouraging transparency in the value chain; businesses can demonstrate engagement, tackle the risks, take advantage of opportunities, and ensure business continuity (CDP Worldwide, 2017).

2.3.3 United Nations Commission on Sustainable Development

The United Nations Commission on Sustainable Development (CSD) was established by the UN General Assembly in 1992 to be ensured of effective follow-up of the Earth Summit. During the Earth Summit, indicators have been recognised as playing an important role when supporting countries to make informed decisions concerning sustainable development (social, economic and environmental) (Division for Sustainable Development, 2001). Agenda 21 specifically focuses on efforts to develop sustainable development indicators at national, regional, and global levels, including the incorporation of these indicators that are in common, ensuring they are regularly updated and widely accessible.

The main objective of the CSD programme is to ensure the indicators of sustainable development are accessible to decision-makers and to clarify their methodologies and to provide training and capacity building activities within the context of business sustainability. The CSD programme consists of the following key elements (Division for Sustainable Development, 2001):

(i) Information should be exchanged among all interested actors on research, methodological and practical activities, that are associated with the indicators;
and,

(ii) Methodology sheets[1] must be developed, which describe the indicators individually and their relevance to policies that are available from governmental bodies.

Countries at national level, as well as international governmental and non-governmental businesses form part of the network and serve as actors when methodology sheets are drafted. These businesses serve as agencies to guide the overall process of the methodology sheets. Individuals who have experience in establishing sustainability serve as advisories when indicator information is required. Together with these actors and networks, the CSD has developed multi-stakeholder partnerships that focus on certain initiatives.
The CSD programme is based on general sustainability programme and the following partnerships: Higher Education Sustainability Initiative, Partnerships for Small Island Developing States, Every Woman Every Child and Global Water Partnership. These programmes will increasingly be tied to their ability to manage and share knowledge and expertise about the issues, processes, and solutions that they are promoting business sustainability in all countries and all sectors (UNDESA, 2015).

2.3.4 International Union for Conservation of Nature

The International Union for Conservation of Nature (IUCN) was established in 1948 between the partnership of the government and civil society businesses. The purpose of the IUCN is to provide public, private and non-governmental businesses the knowledge and tools that enhance human progress, economic development and nature conservation (IUCN, 2017). The IUCN has developed in the world's largest and diverse environmental network with approximately 1300 member businesses and 1600 inputs from experts. IUCN's mission is to encourage and assist societies globally to safeguard the diversity of nature and to ensure the use of natural resources is sustainable.
IUCN's experts are divided into the following six assignments: species survival, environmental law, protected areas, social and economy policy, ecosystem management, and education and communication. By facilitating these assignments, IUCN supports governments and institutions at all levels to ensure universal goals are achieved. IUCN consists of a credited group of best practices, conservation tools, and international guidelines and standards to support the sustainable assessment framework (IUCN, 2017).
The expertise network of IUCN provides a stable foundation for a large and diverse portfolio of conservation projects globally. The aim of these projects is to reverse habitat loss, restore ecosystems, and improve human wealth. To ensure this aim is accomplished,

[1] Methodology sheets contain the basic information of the indicators, the purpose and usefulness of the indicators and definitions and measurement methods (Division for Sustainable Development, 2001).

the latest science, with knowledge of local communities should be gathered and incorporated in the projects on a continuous basis. The actors (governments, non-governmental businesses, scientists, businesses, local communities, indigenous people's businesses) contribute to these networks of projects and the contribution of knowledge and policies (World Resources Institute *et al.*, 1992).
The IUCN provides a framework for planning, implementing, monitoring and evaluating the sustainable development initiative. The programme has three primary matters (World Resources Institute *et al.*, 1992):

(i) Valuing and conserving work on biodiversity and emphasising tangible and intangible values of nature;

(ii) Supporting and promoting effective and fair governance of natural resources combining IUCN's projects about people-nature relations, rights and responsibilities, and political and economic matters;
and,

(iii) Developing nature-orientated solutions to societal challenges which expand projects about nature contribution by addressing problems of sustainable development.

The IUCN has 15 themes or discipline areas where in-depth analysis in terms of social, environmental issues is executed. These themes are business and biodiversity, climate change, economics, ecosystem management, environmental law, forests, gender, global policy, marine and polar, protected areas, science and knowledge, social policy, species, water, and world heritage (IUCN, 2017).

2.3.5 Environmental Sustainability Index

Environmental sustainability index (ESI), an initiative developed by the World Economic Forum, was a composite index published during the period between 1999 to 2005. ESI measured progress toward environmental sustainability for 142 countries. The measurements consists of 20 indicators, each with eight variables for a total of 68 data sets. The following five core components are the successes measured in the different countries: environmental systems, reducing stresses, reducing human vulnerability, social and institutional capacity, and global stewardship (World Economic Forum, 2002).
ESI executes a cross-functional comparison of environmental sustainability in a systematic and quantitative manner. It therefore promotes a more analytically diligent and data driven manner to environmental decision-making. ESI therefore enables identification of issues where national performances are below or above expectations, priority-setting

among policy areas within countries and regions, the tracking of environmental trends, quantitative assessment of the success of policies and programmes, and the investigation into interactions between environmental and economic performance, and the factors that influence environmental sustainability (World Economic Forum, 2002).
The World Economic Forum thus forms partnership with governments, the private sector, communities and individual citizens to gather the information and data required to execute the ESI measurements. A broad overview is given by the measurements that focus on a general discipline.

2.3.6 Global Scenario Group

In 1995, the Global Scenario Group (GSG) was convened by the Stockholm Environment Institute. The GSG is an independent, international body which engages in the process of scenario development. The central theme around this scenario development was the identification of policies, actions and human decisions required to ensure a more sustainable and equitable future. The GSG provides a unique framework to researchers, decision-makers and the general public. A scenario method is used to clarify and understand concepts to a greater degree, in which direction the progress is headed, and the flow of events towards a more desirable future. These scenarios are pursued at global, regional and national level. This in-depth analysis ensures that all sets of issues and opportunities are analysed in terms of social, economic and environmental system boundaries (Global Scenario Group, 2017).

GSG scenarios have four discipline areas: market forces, policy reform, fortress world, and great transition. Market forces is a market-driven scenario in which demographic, economic, environmental and technological trends are discovered. World development is characterised by globalisation and convergence, which ensure that the adjustment of institutions is executed gradually without major disruptions. The integration of economic proceeds rapidly and the socio-economic structures of poor regions grow into a developed model of the rich regions. Lastly, the significant factor in global affairs is the environmental transformation which shows progress in the desired direction (Global Scenario Group, 2017).

Policy reform emphasises the disclosure of strong political will for taking prompt actions to ensure a successful transition to a more equitable and environmentally resilient future. This scenario is designed to achieve a set of future sustainability goals where the development pathways for reaching the goals are clearly identified. Both policy reform and market forces explore simultaneously the requirements to achieve social and environmental goals under high economic growth conditions (Global Scenario Group, 2017).

The fortress world scenario, a variant of the barbarization scenario of GSG, manages critical natural resources. The great transition scenario evaluates solutions to the sustainability challenge, including new socio-economic arrangements and fundamental changes in values. This scenario enhances transition to a society that preserves natural systems and provides high level of wealth through material sufficiency (Global Scenario Group, 2017).

2.3.7 Sustainability Accounting Standards Board

Sustainability Accounting Standards Board (SASB), an independent standard-setting organisation, was founded in 2011. SASB focusses on industry-specific sustainability factors that most likely have material impacts and maintain sustainability accounting standards for 79 industries. The standards are designed in a manner to support businesses to comply with existing regulatory commitments, using the existing framework within United States laws. SASB's mission is to ensure the existence of natural evolution in corporate reporting. SASB maintains sustainability standards that support public corporations to drive value and improve sustainability outcomes (Sustainability Accounting Standards Board, 2017).

What differentiates SASB standards from other initiatives is the fact that the standards are decision useful, they provide industry-specific, reliable data and comparable material. The standards are the only sustainability standards that are developed according to the 'materiality' definition, defined by security laws. To gather accurate data, SASB deepens industry participation in terms of economic, social, and environmental sustainability matters to ensure the market's needs are met.

The transparent process of SASB consists of two phases. The provisional phase includes industry research, evaluation of the research, standards development, public comment and provisional standards release. The codification phase consists of two steps, consultation and codification of the standards. This transparent process forms the network between the partnerships and engagement with investors, regulators, accountants, the engagement with issuers, and the education of market actors (Sustainability Accounting Standards Board, 2017).

SASB has developed groups based on material sustainability risks and opportunities where investors can effectively understand the impact of sustainability risks on certain disciplines and effectively analyse these sustainability issues. These groups are consumption, healthcare, infrastructure, financials, non-renewable resources, services, renewable resources and alternative energy, technology and communications, resource transformation and transportation (Sustainability Accounting Standards Board, 2017).

2.3.8 United Nations Global Compact Communication on Progress

In 2000, the United Nations Global Compact (UNGC) was established as a policy platform and a framework which businesses can use to conduct business in a sustainable and responsible way. UNGC supports businesses that aim to have responsible business actions assuring the business strategies and operations are aligned with the ten principles of human rights, labour, environment and anti-corruption. UNGC also encourages businesses that takes strategic actions to advance broader societal goals with the emphasis on collaboration and innovation (United Nations Global Compact, 2017).
UNGC addresses environmental risks and leverage opportunities, emphasising that businesses are tied to the planet. Opportunities and impacts effecting employees, workers in the value chain, customers and local communities are managed in terms of the social aspect UNGC addresses. UNGC supports the economic development of societies and enhances good governance and stability.
UNGC's 2030 vision, which is their new global strategy, aims to mobilise a global movement of sustainable businesses and stakeholders to create the desired world. This strategy includes existing work around the ten principles as well as enhancing new directions including driving business action in support of the sustainable development goals. The focus areas will include responsible business and leadership practices, impact analysis, measurement and performance, global to local platform and connectors, and the sustainable development goals as the 'lighthouse'.

The UNGC network consists of 12000+ businesses in 170 countries, which use the provided framework, exchange sustainable development information among others and ensure full commitment to their sustainability strategy. Oil and gas, chemicals, basic resources, media, retail, and healthcare are just a few of the many sectors these businesses operate in. The ten principles are the following disciplines: human rights, decent work, gender equality, anti-corruption, peace, humanitarian action, food and water, climate action, breakthrough innovation, sustainability reporting, supply chain, and financial innovation.

2.3.9 Summary of the sustainability measurement frameworks

Tables 2.4 and 2.5 provide an overview of the dimensions; system boundaries, actors and networks and discipline at each assessment framework.

Table 2.4: A summary of the dimensions of the sustainability frameworks.

Sustainability frameworks	2. Actors and networks	3. Discipline
Global Reporting Initiative G4 Sustainability Reporting Guidelines	Business, governmental, non-governmental organisation (gold community, knowledge unit, GRI and governments).	Any discipline, and additional to the following sectors: airport operators, food processing, construction and real estate, electric utilities, financial services, media, mining and minerals, NGO, oil, and gas etc.
CDP Environmental Disclosure System	Companies, cities, states and regions, investors, purchasers, non-governmental businesses, inter-governmental businesses, and governments.	General and supply chain
United Nations Commission on Sustainable Development	Countries at the national level, as well as international, governmental and non-governmental businesses.	General, Higher Education Sustainability Initiative (HESI), Partnerships for Small Island Developing States, Every Woman Every, Child, Global Water Partnership etc.
International Union for Conservation of Nature	Governments, NGOs, scientists, businesses, local, communities, indigenous people's businesses.	Business and biodiversity, climate change, economics, ecosystem management, environmental law, forests, gender, global policy, social policy, species, water, world heritage etc.
Environmental sustainability index	Governments, the private sector, communities and individual citizens.	General
Global Scenario Group	Researchers, decision-makers, general public.	Market forces, policy reform, fortress world, great, transition
Sustainability Accounting Standards Board	Public corporations, market actors, investors, accountants.	Consumption, health care, infrastructure, financials, renewable resources and alternative energy, technology and communications, resource transformation, transportation etc.
United Nations Global Compact Communication on Progress	Government groups, local networks, private working groups.	Human rights, peace, humanitarian action, food and water, climate action, breakthrough innovation, sustainability reporting, supply chain, financial innovation etc.

Table 2.5: A summary of the system boundaries dimension of the sustainability frameworks.

Sustainability frameworks	Economic dimension	Social dimension	Environmental dimension
Global Reporting Initiative G4 Sustainability Reporting Guidelines	x	x	x
CDP Environmental Disclosure System	-	-	x
United Nations Commission on Sustainable Development	x	x	x
International Union for Conservation of Nature	-	-	x
Environmental Sustainability Index	-	-	x
Global Scenario Group	x	x	x
Sustainability Accounting Standards Board	x	x	x
United Nations Global Compact Communication on Progress	-	x	x

The eight mentioned sustainability frameworks will support guidance when business sustainability measurements are established. The business sustainability frameworks are based on the belief that business sustainability is a continuous process of evolution in which a business will be continuously seeking to achieve its vision of sustainable development in uninterrupted cycles of improvement, where at each new cycle the business starts the process at a higher level of business sustainability performance.

2.4 Assessment of the sustainability measurement frameworks

This section aims to evaluate the sustainability measurements above in order to find appropriate requirement criteria to find the most appropriate sustainability measurement for future use. Analysing the sustainability measurements and setting out each assessment's type of measurements in terms of economic, social, and environmental sustainability, made the identification of the requirement criteria possible. Du Plessis & Bam (2017) conducted a study about a scoping phase comparison, and was used as a reference when the requirement criteria were identified.

(i) **Data disclosure**

The required indicators that are gained from the sustainability measurement frameworks will contribute strongly to the development of the proposed sustainability framework. It would be beneficial if the accumulated data is used only in an aggregated framework (Du Plessis & Bam, 2017). The data should have a clear and concise description of what is expected of the accumulated data.

(ii) **Flexibility**

The description of the indicators should be of such a nature or generalised form that the indicators are of use in any industry. It would be beneficial if any of the sustainability measurements consist of additional documentation that explains the sustainability measurements to a more specific industry.

(iii) **Indicators**

The indicators of the different sustainability measurement frameworks should consider all aspects of sustainability. Indicators that address the equivalent opportunities should be compared to find the most prominent indicator. Frameworks that consist of standardised indicators will be beneficial when valuing the frameworks to find the most suitable framework. The description of the indicators should be clear and concise.

(iv) **Measuring method**

Different measurement methods must be analysed in depth to eliminate confusion in the represented indicators. Each indicator must consist of clear and concise targets. Numerical values or descriptions are assigned to ensure that organisational goals are aligned. These measuring methods are represented in terms of economic use of revenue, quantity, units, risk, percentages or impact.

The sustainability measurement frameworks mentioned in Section 2.3 that consider all three aspects of sustainability were used in the above assessment process. Frameworks that focussed on a specific sector were eliminated because of the proposed framework that will be developed for a more generalised industry. Table 2.6 illustrates the outcome of the requirement criteria towards the selected sustainability measurement frameworks that assess all three aspects and focused on a general concept.

Table 2.6: Summary of the sustainability frameworks according to the requirement criteria.

	GRI G4 Sustainability Reporting Guidelines	United Nations Commission on Sustainable Development	Global Scenario Group	Sustainability Accounting Standards Board
Data disclosure	Unrestricted right of use	Unrestricted right of use	Limited right of use	Limited right of use
Flexibility	Adaptive	Adaptive	Non-adaptive	Adaptive
Indicators	Standardised and comprehensive	Standardised and comprehensive	Non-comprehensive	Standardised and comprehensive
Measuring method	Comprehensive	Comprehensive	Restricted detail	Comprehensive
Colour key:		Strong	Acceptable	Weak

From this table, it is noticeable that none of the sustainability measurement frameworks can be considered as a strong candidate but three of the four frameworks are an acceptable to strong candidate. The GRI G4 Sustainability reporting guidelines and the United Nations Commission on Sustainable Development both performed strongly in the criteria. The depth of the detail at the measuring methods from both frameworks is inadequate,

but the description of the methods is of such a matter that it is still possible to measure the accurate information.

2.5 'Black box' perspective

From the overview of the business sustainability frameworks, it is evident that these frameworks address business sustainability aspects as an overarching approach to the business and not in terms of the individual components of a business. Even though the 'internal' [1] business components are not considered in these frameworks, the external environment (non-governmental organisations, governments, communities, etc.) are considered to varying degrees. This research enquiry accordingly focuses on the 'internal' business environment.

From this perspective, and considering research done by Dyllick & Muff (2015), debating business sustainability challenges, which in realising could be ascribed to the existing frameworks' lack of focus on internal business environments, thus implies that businesses within these frameworks are to a large extent considered as a whole, and not as a product of a number of parts. In other words, the lack of integration of different business components and sustainability actions arise, or the lack of integration of sustainability actions and micro level actions of the business (Dyllick & Muff, 2015). It is evident how this focus on the external environment contributes to a 'black box'[2] perspective on business sustainability and the decoupling of the business environment together with the sustainability actions are required to address the business sustainability aim (Jackson, 2008).

One contribution of the 'black box' perspective to challenges in business sustainability may be attributed to the fact that measures of the three elements of sustainability and potential in terms of the three elements of sustainability are not necessarily similar across different (internal) business components. Thus, the sustainability targets for individual business components differ in terms of the various sustainability elements (Dyllick & Muff, 2015). Recognising this will contribute to sustainability initiatives that are more focussed and defined at a greater level of detail and are therefore more likely to be effective in achieving their full potential.

Another challenge in realising business sustainability, given the 'black box' perspective of business sustainability frameworks, could be that businesses adapt their business processes to a recommended framework that considers sustainability only at an aggregate level, or

[1] Internal business environment refers to internal resources and factors that affect the running of the business and fall within the control of the business (Aastha *et al.*, 2011).

[2] The concept of a 'black box' is a metaphor for modular components of argumentative discussion that are, within a particular discussion, not open to expansion (Jackson, 2008).

does not consider all the elements of sustainability. This would result in the business not addressing sustainability across all levels of an organisation or across the various business components and/or business functions Dyllick & Muff (2015); or in businesses operating in a sustainable manner to a limited extent only, rather than aiming to achieve holistic sustainability.

Subsequently, in realising the availability of business sustainability studies are the methodological approaches that have limited to no information about the classification and resembling of information and that this knowledge is in need of synthesis and consolidation (Lüdeke-freund *et al.*, 2018).

Sustainable development objectives should align with the existing strategies of the business and should complement each other. However, from the 'black box' perspective, the frameworks define objectives that seek to achieve the sustainability of the business as a whole, but these are not translated into sub-objectives that would guide the various business components and/or functions to address sustainability. In line with the arguments set out in this section, it is argued that this increased level of granularity is essential to enable businesses to achieve their full potential in terms of sustainability.

If business sustainability, and thus business sustainability frameworks, were to consider the individual components that make up the system, as well as the relationships between the respective components, it would be possible to address the shortcomings associated with sustainability frameworks.

The following five design specifications, derived from the business challenges identified within the sustainability frameworks, need to be addressed through the development of the Business Sustainability Framework.

(i) **Sustainability to be considered at an increased level of detail:** The business sustainability framework should focus on the multiple individual business components working together as a whole, and therefore not only consider sustainability from the perspective of the business as a whole, but at an increased level of detail in terms of the components that constitute the business.

(ii) **All three dimensions of sustainability should be included throughout the framework:** The business sustainability framework should incorporate all three dimensions of sustainability across all levels of consideration, thus all three dimensions of sustainability should enjoy equal consideration irrespective of the level of analysis in the business sustainability framework.

(iii) **Sustainability dimensions should be considered in the same level of detail:** The business sustainability framework should consider all three dimensions of sustainability in the same level of detail for the specified unit of analysis; thus in the same level of detail for each identified business component in terms of each sustainability dimension.

(iv) **Allow for differentiation in the definition and measurement of sustainability dimensions:** The business sustainability framework should allow for differentiation of the definition and measurement of the three different sustainability dimensions across the various levels and units of analysis.

(v) **Integrated approach between business components and sustainability dimensions:** Ultimately, given requirements (i)−(iv), the business sustainability framework should take an integrated approach that combines sustainability dimensions with a detailed level and unit of analysis, that still allows for the definition and measurement of sustainability at an adequately aggregate level, without yet again imposing a 'black box' perspective on business sustainability.

The following proposition proposes to address the 'black box' perspective and the business sustainability challenges, and the end goal of this proposition is to achieve the design specifications, mentioned above.

Proposition: Considering the challenge and 'black box' perspective businesses experience, it therefore, enables to propose using the systems engineering approach to address this challenge faced by businesses. The systems engineering approach allows for de-constructing a problem into a subset of functional parts and subsequently for developing a solution for each part in every subset. In conclusion, the systems engineering approach will support the development and conceptualisation of a business sustainability framework.

2.6 Chapter 2: Conclusion

This chapter introduced existing measures of sustainability, sustainable business frameworks and definitions within the business environment. The chapter included a systematic review of available literature pertaining to sustainable measures and sustainable frameworks. Given the sustainability frameworks discussed, a number of challenges in the existing frameworks came to realisation which contributed to the 'black box' perspective. The proposed systems engineering approach will be used to address the challenges faced by businesses. The proposed systems engineering approach will be discussed in the following chapter.

Chapter 3

A proposed approach

This chapter is primarily concerned with systems engineering to definitively answer the question of whether SE is the most suitable approach to address the issues or challenges around the 'black box' perspective identified in Chapter 2. At first SE should be defined in terms of its fundamental approaches and system design, but also related key concepts namely; systems thinking and a system. Once this fundamental concept of SE is defined, the SE approach will discuss how the proposition mentioned in Chapter 2 will be addressed.

3.1 Chapter 3: Introduction

The foundation of systems engineering (SE) is the use of systems thinking and the understanding of systems. Systems engineering was considered as a new inter-discipline and approximately 100 years ago, systems integration was only in the hands of the craft specialist (Parnell *et al.*, 2011). During the 1960s, programmes in the systems engineering discipline became widely available and many sectors started to adapt their business processes to the methodology of this discipline (Parnell *et al.*, 2011).

3.2 Systems engineering

Systems Engineering is defined by the International Council on Systems Engineering (INCOSE) as "*an interdisciplinary approach encompassing the entire technical effort to evolve into and verify an integrated life-cycle balanced set of system people, product, and process solutions that satisfy the customer need*" (Blanchard & Fabrycky, 1998; International Council on Systems Engineering (INCOSE), 2017). The following concepts; fundamental approaches, models of SE and system design of SE will be discussed to understand this holistic approach.

Fundamental approaches of SE

From this definition of systems engineering, it is noticeable that SE is not a traditional engineering discipline such as electrical engineering, civil engineering, industrial engineering, mechanical engineering, or any other known discipline (Blanchard & Fabrycky, 1998). SE is a process that make use of appropriate technologies and management principles in a cooperative manner which is a well-planned and highly disciplined approach. SE application requires synthesis and the focus on process, along with a new 'thought' process (Blanchard & Fabrycky, 1998). Various approaches exist in the SE domain and are as follows:

(i) A *life-cycle approach* that describes all the phases that are included in the system design and development, production and construction, product use, phase-out, and disposal. Previously, only design and system acquisition activities were emphasised regardless the impact they have on production, operations, support, and disposal (Blanchard & Fabrycky, 1998).

(ii) A *top-down approach* that views the system as a whole and thus this requires the necessary overview and understanding of how the various components of the system effectively perform together (Blanchard & Fabrycky, 1998).

(iii) An *interdisciplinary* approach is executed throughout the system design and development process to certify the design objectives that are being undertaken in an effective and efficient way. Furthermore, this requires the understanding of various disciplines and their interrelationships, as well as tools and techniques that will ultimately support the implementation of the system engineering process (Blanchard & Fabrycky, 1998).

(iv) The initial *definition of system requirements* should be fully comprehended and thus relate these requirements to the specific design criteria, the follow-on analysis effort whilst ensuring the decision making in the design process is effective. These system requirements should be well traceable and visible throughout the various levels of the system (Blanchard & Fabrycky, 1998).

Studying a dynamically complex system requires an approach that has been developed for understanding this complex system by isolating the system into smaller parts. Using a combination of the above-mentioned approaches, enables a process to better approach complex systems and finding a suitable solution (Situmeang, 2016).

System design

Systems design can be considered as the prime mover of systems engineering, with system design and evaluation as the compass. System design requires iteration and integration that coordinate a synthesis, analysis, and evaluation process (Blanchard & Fabrycky, 1998). These system design requirements are schematically shown in Figure 3.1. Synthesis requires the synthesising of the project, and the proposed set of customer requirements. Synthesis is the initial process where the creative and new ideas are collaborated into new combinations. Analysis requires the forecasting and determining of information by analysing the newly created combined ideas alongside the customer requirements (Blanchard & Fabrycky, 1998). It also includes the system design evaluation and method identification for the necessary design domain. The evaluation process includes the evaluation process where various candidates are evaluated and composed to one another and finding the most suitable solution whilst addressing the customer needs.

Figure 3.1: System design methodology (adapted from Blanchard & Fabrycky (1998)).

SE is a repetitive process while executing optimisation and efficient elements ensuring operational and strategical actions in the business are met (Ahram & Karwowski, 2013). The engineering part of SE indicates the execution of the tools and structured approaches to developing a product or service (Ahram & Karwowski, 2013). SE acquires management technology and various knowledge principles in order to achieve the ultimate success of a SE effort (Sage & Rouse, 2009). The following sections; systems thinking, and systems and complex systems will be discussed in order to comprehend the holistic approach of SE.

3.2.1 Systems thinking

Systems thinking is defined as a "*scientific framework for understanding the change and complexity of a system as an interconnected whole rather than components in isolation through the study of dynamic cause and effect over time*" (Griffin *et al.*, 2016; Maani & Cavana, 2007). Systems thinking provides a new way of thinking based on the primacy of the 'whole' and its relationships. Additionally it controls economic, social, environmental and business systems, and mental models (Maani & Cavana, 2007) that are ever present in systems.

Numerous reasons exist why systems thinking is required in any activity or business action. Some of these reasons are the increase in complexity in personal lives, an ever increase in growing interdependence of the world, and a critical need for change management (Maani & Cavana, 2007). In order to grasp an in-depth definition of systems thinking, the various properties and principles will be discussed below.

Properties of systems thinking

Systems thinking has three well-defined properties, or dimensions, namely: paradigm, language, and methodology (Griffin *et al.*, 2016). Paradigm demonstrates the way of thinking, from seeing the bigger picture, recognising that things change, understanding the operations of certain actions, and lastly recognising that the end can influence the cause (Maani & Cavana, 2007).

The language dimension includes discrete attributes that can be found in its toolkit. This dimension is a visual representation which illustrates precisely how certain things should be done according to a set of rules. Ultimately, the language must be translated into visual perceptions which emphasize the interdependencies between the elements (Griffin *et al.*, 2016).

The ultimate goal of the methodology dimension is to incorporate learning technologies and tools which ultimately understand the complex system. Some examples of these tools include casual loop diagrams, stock and flow models, system dynamics, simulation, and group model building to mention a few (Griffin *et al.*, 2016).

Principles of systems thinking

Systems thinking consists of seven principles which provide a framework for its notion and practise. These principles are discussed below (Maani & Cavana, 2007).

(i) *The big picture:* This principle teaches that the whole is more than the sum of its parts and any problem experiencing is related to larger forces and interactions.

Therefore, grasping a clear idea of the smaller parts enables the ability to see how the bigger picture is set out.

(ii) *Short-and long-term:* While constantly solving short-term problems that can be long-term outcomes, one should not ignore short term measures.

(iii) *Soft indicators:* More indicators exist that a system can be measured by the conventional performance indicators, such as KPIs and Balanced Score Card (BSC).

(iv) *System as a cause:* Most problems organisations experience are created internally and each individual contributes to it personally because of not thinking beforehand of what might be the cause of the initial decision.

(v) *Time and space:* This principle teaches that cause and effect are not close in space and time and that time can delay the chain effects of actions.

(vi) *Cause versus symptom:* In some cases when a problem is referred to, it rather refers to a symptom of the problem. Nonetheless, a problem can be solved without understanding the causes the problem generates.

(vii) *Either-or thinking:* Nowadays science suggests that any reality has a potential with multiple outcomes for given problem or situation as well as multiple effects.

One of the key advantages of systems thinking is the ability to effectively identify proposed solutions to difficult problems by raising our thinking level to the proposed solution level which ultimately will solve the complex system process (Situmeang, 2016). Adopting systems thinking approach enables the user to eliminate some uncertainties throughout the system and enables a process of bringing systems into being and improving these systems that already exist in a holistic way (Le On & Calvo-Amodio, 2017).

3.2.2 Systems and complex systems

A system can be defined in many ways but Blanchard & Fabrycky (1998), authors of the well-known book, *Systems Engineering and Analysis*, define a system as a "*combination of functionally related elements forming a unitary whole*". Systems consist of various components which interact with one another which ultimately aiming to achieve a certain or specified goal (Parnell *et al.*, 2011). Complex systems are composed of a number of components whose behaviours are emergent, where the behaviour of the systems cannot be surmised from the behaviour of its components (Bar-Yam, 1997).

To understand these systems and complex systems, various aspects of these systems should be defined in terms of its properties, hierarchical nature of systems and the classification of systems.

Properties of a system

A system's properties consist of components, attributes, and relationships. These properties are described below (Blanchard & Fabrycky, 1998):

(i) *Components* are the parts of the system.

(ii) *Attributes* are the properties or characteristics of the components and of the system as a whole.

(iii) *Relationships* between two or more linked components are the result of engineering the attributes of the components, aiming that the desired component-pair operates effectively, whilst contributing to the systems' objective (Blanchard & Fabrycky, 1998).

(iv) The *state* is a condition at a certain point in time of the system or a system's component, according to its attributes and relationships.

(v) A *behaviour* occurs when a connected series of actions in the desired state change over time.

(vi) A *process* consists of all behaviours with their relative sequence (Blanchard & Fabrycky, 1998).

Thus, taking this into mind, a system is therefore a set of interrelated components functioning together ultimately aiming to achieve a common goal (Blanchard & Fabrycky, 1998).

Hierarchical nature of systems

In order to clearly grasp the definition of a system one should consider its position in a hierarchy of systems. It is well-known that a system is composed of components, and these components can be broken down into smaller components and thus when two hierarchical levels are involved, the lower level is conveniently called a subsystem (Blanchard & Fabrycky, 1998). As the various levels of a system are defined, the boundaries and limits of a system should be defined. Any aspect outside the boundaries of the system is known as the environment, but no system is entirely secluded from its environment (Blanchard & Fabrycky, 1998). An example of such a case is when materials, energy or information has

to pass through the boundaries of the system as inputs. This allows the classification of systems based on the systems properties.

Classification of systems

Systems can be classified into various divisions in order to gain insight into the wide range of the existing divisions. These classifications are known as natural and human-made systems, physical and conceptual systems, and closed and open systems. The origin of systems is natural systems that followed a natural process into existence. Human-made systems is the process where human beings intervened through components, attributes, and relationships (Blanchard & Fabrycky, 1998).
Secondly, physical and conceptual systems exist. Physical systems represent themselves in a physical form and are composed of components and may be contrasted with conceptual systems. Conceptual systems are systems composed of symbols that illustrate the attributes of the components of such conceptual systems (Blanchard & Fabrycky, 1998).
Lastly, a closed system does not interact with its environment, whereas an open system allows information and energy to cross its boundaries (Blanchard & Fabrycky, 1998). Ultimately an open system would be considered in a sustainability environment, in order to be able to adjust changes, or actions to improve the desired sustainable actions.

In this section, a clear definition of a system was given as well as the properties of a system; components, attributes and relationships and how they interact with one another. Additionally, the various classifications of systems were introduced. Furthermore a system can be divided into subsystems.

3.3 Systems engineering approach

The SE approach thus provides a mechanism to address the critique levelled at the 'black box' argument of sustainability frameworks by unpacking the business into subsets and understanding how each of these subsets contributes toward, and interacts within the business environment system.
Figure 3.2 illustrates the SE approach as a system problem that is complex as a whole (Quadrant I), but can be broken down into smaller sub-problems (Quadrant II). In the second quadrant, the definition of the individual sub-problems facilitates a greater understanding of the problem as a whole, as the sub-problems are viewed as single components that can be analysed more easily. Sub-solutions can be found for the sub-problems (Quadrant III) and, finally, these sub-solutions can be pieced together to find an ultimate solution for the whole (Quadrant IV) (Snyman *et al.*, 2014).

Built-in feedback systems contribute to problem solving and ensure that a desired objective is achieved using the SE approach. In the real world, this feedback system is enclosed between each of the quadrants, aiming to solve the problem (Snyman *et al.*, 2014).
The motive is to unpack the business environment in different subsets and emphasise that sustainability performance and targets differ for the various subsets. Thus, the comparison of sustainability to the different subsets is required for a more comprehensive understanding of sustainable business development.

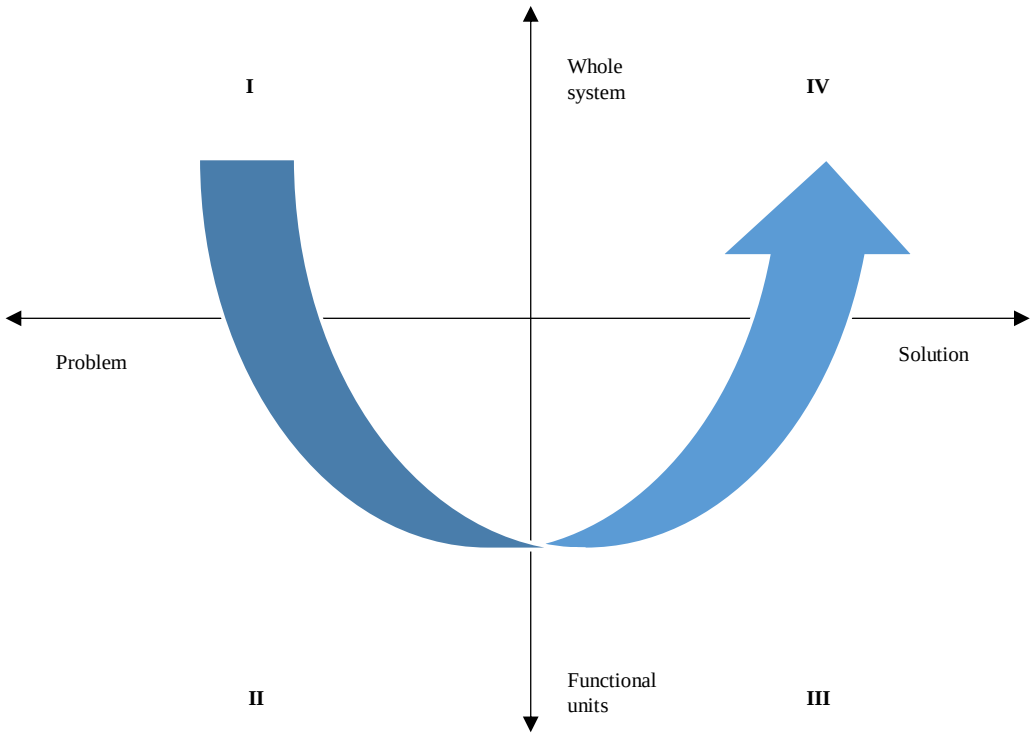

Figure 3.2: Flow of real world problem solving (adapted from Porter (1991)).

3.4 Chapter 3: Conclusion

This chapter emphasises the detailed level of understanding the concept of the systems engineering approach. Initially this chapter introduces the fundamentals of SE, stating that any SE process requires the synthesising of new concepts, thereafter analysing the new concepts by measuring them against the customer requirements and lastly, evaluating the solutions whilst achieving the customer requirements. Therefore, this SE approach answers the proposition in Chapter 2 by addressing and achieving all the design requirements. Therefore, the business environment will be analysed, and divided into components. Ultimately, each component of the business environment will be evaluated in terms of the various sustainability dimensions.

Chapter 4

The business environment: A systems engineering approach

This chapter argues that applying an SE approach to both the business environment and business sustainability considerations will contribute towards addressing the challenge associated with the 'black box' perspective of sustainability frameworks. Sustainability is approached as it applies to each of the elements of a business, with the objective of unearthing the status quo of sustainability as it relates to each element, namely with the objective of determining how each element contributes to, influences and/or enables businesses to produce value to society. This chapter therefore allows the proposal of the perspective taken on business sustainability along the multiple dimensions that may be used to consider a business.

4.1 Chapter 4: Introduction

Over the past decade, individual business concepts in the business environment have become well-known topics for discussion in the fields of research and professional practice (Lüdeke-Freund & Dembek, 2017). At the same time, sustainability has come to be recognised as one of the key challenges facing modern-day businesses. Sustainability experts have begun to investigate how the business environment and sustainability actions can be integrated into one system or model (Lüdeke-Freund & Dembek, 2017). The need for, and pressure on, businesses to incorporate aspects of sustainability into all business processes that result in the delivery of products and/or services, in terms of social equity, economic efficiency and environmental performance, have increased over the past few decades. Consequently, a number of business sustainability frameworks and approaches were developed to support businesses in incorporating these three elements of sustainability into business processes. However, these frameworks present certain challenges in terms of how

they incorporate elements of sustainability into business processes (Lüdeke-Freund *et al.*, 2016).

By using the systems engineering (SE) approach to address the challenge of sustainable business development, the business environment is de-constructed into a collection of business environment facets that are important to consider when developing a sustainable business, as well as a set of entities, actors, and stakeholders that influence business performance, profitability, growth and sustainability (Lüdeke-Freund *et al.*, 2016). Examples of internal business environment facets include values, vision, mission, markets, business departments such as logistics, production, finances, and corporate culture to mention but a few. Examples of external business environment facets include both the micro and macro environments (Porter & Kramer, 2011).

The environment in which a business operates is considered as the sum of all the factors and variables that influence the creation, growth and continued existence of the business, either positively or negatively; thereby promoting or hindering the achievement of its objectives (Porter & Kramer, 2011). It is thus evident that business contexts and environments play a significant role in sustainable business development. However, the ever-changing nature of such contexts and environments – together with numerous elements of the business value chain that ultimately create value for customers and thus constitute the outputs of the business – has to be acknowledged and taken into account when aiming to incorporate sustainability into businesses.

4.2 Business environment

The environment in which a business operates should be fully understood to ensure the business is operating successfully at any given time. As the environment changes, the successes and failures of businesses are influenced by the challenges experienced, for instance rising customer expectations, increasing competition and expanding markets (Flamholtz & Aksehirli, 2000).

Business development, organisational growth, strategic planning, performance management, organisational structure, management and leadership development, and culture management are all components that need to be considered when analysing the business environment. Every component is discussed in detail below, followed by a brief discussion of the business value chain system. The respective components are subsequently analysed in relation to the value chain system, and the discussion concludes with findings on the business sustainability argument.

4.2.1 Business components

There is an ever-increasing need to understand the business environment and organisational growth, and to discover the motive behind successes and failures over the long term (Aastha *et al.*, 2011). Thus, a business environment and the elements that constitute a business – in addition to processes, procedures, and activities – are all the external factors, forces and institutions affecting the functionality of the business enterprise (Flamholtz & Randle, 2007a). Understanding this environment requires a clear picture of the various components that make up a business structure. The following subsections thus focus on the various business components that are discussed in the literature.

4.2.1.1 Business development

A business structure consists of six factors that are built on a business foundation, including business strategy, strategic mission and vision, and the values and principles covered under the business concept. Business strategy entails the central theme for planning how the business aims to compete in terms of achieving its strategic mission. The strategic mission defines what the business wants to achieve over a certain period, while the business concept defines the business function and goal. According to Flamholtz & Randle (2007a), the six factors that are the key drivers of organisational success, based on the business foundation, are as follows:

(i) **Markets:** When developing an organisation, the initial step is to identify and define the market and niches the business will address. A market is defined as the potential buyers of the products or services that a business intends to sell (Flamholtz & Randle, 2007a). The market niche is a place in the market where specific customer needs and competitor challenges are addressed (Miller, 2010).

(ii) **Products and Services:** This factor entails the process of analysing potential customer needs to ensure the developed product or services satisfy these needs. However, the ability to design a product or service and at the same time produce that product or service for the chosen market is equally important (Flamholtz & Randle, 2007a).

(iii) **Resource Management:** Resources need to be developed for current and foreseen future operations. These resources are required to effectively develop the product or services for the identified market (Flamholtz & Randle, 2007a). Among these resources are human resources, financial resources, and technological and physical resources that contribute to the design of new innovations (Miller, 2010).

(iv) **Operational Systems:** Operational systems are required for developing mandatory functions for day-to-day operations. Well-known operations include accounting, billing, collections and sales (Flamholtz & Randle, 2007a).

(v) **Management Systems:** Management systems comprise all the functions required to operate a business over the long term. These systems include strategic planning, organisational structures, management development, and performance management. Strategic planning involves all the decisions behind long-term strategies and business development. The organisational structure comprises the business-related activities among the employees, reporting lines and how these are organised. Management development involves planning to ensure that employees are available to operate the organisation and sustain growth. Performance management comprises the processes and methods used to motivate employees and to ensure that organisational goals are achieved (Flamholtz & Randle, 2007a).

(vi) **Corporate culture:** Corporate culture includes the development of business values, beliefs, and norms that influence the behaviour of the employees. Values are the beliefs or ideals adopted by the business and ideally shared throughout the organisation in order to enhance the business environment as it relates to its customers, co-workers and product quality (Flamholtz & Randle, 2007a). Beliefs are the expectations that employees develop about the business and their co-workers. Norms are the actions and behaviour of the employees in their day-to-day operations that will prompt high levels of customer services (Guiso *et al.*, 2015).

The following six factors presented by the Pyramid of Organisational Development, as shown in Figure 4.1, can be used as a tool to improve an organisation's strengths and opportunities that are identified systematically over time. Moreover, it can be applied to assess the level of strategic organisational development and increase the probability of sustainable success. With the focus on these six factors and improvements, maximised organisational effectiveness and efficiency will rise (Flamholtz & Randle, 2007a).

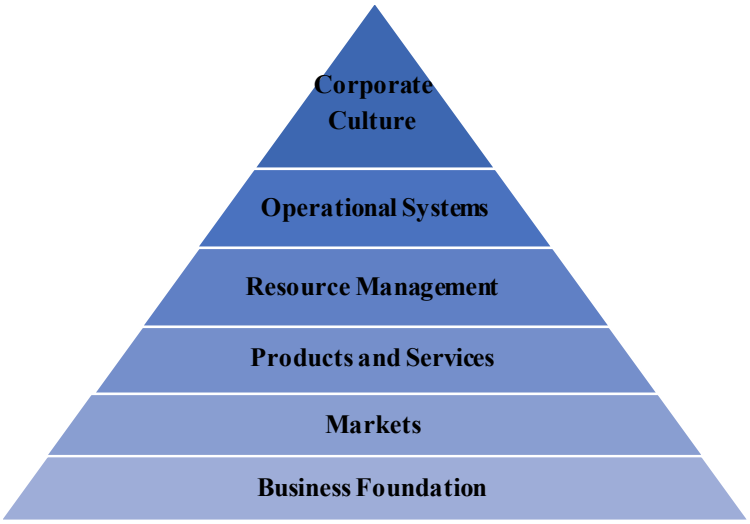

Figure 4.1: Pyramid of Organisational Development (adapted from Flamholtz & Randle (2007a)).

4.2.1.2 Organisational growth

A worthy goal for businesses to set and aim to achieve is identifying stages of growth. Organisational growth is a measurement of entrepreneurial success and deemed an important factor for economic development (Brush *et al.*, 2009). The different growth stages of an organisation are defined and examined across the different levels of the Pyramid of Organisational Development to ensure sustained growth, from the inception of a new enterprise up to the time it has reached maturity (Flamholtz & Randle, 2007d).
Figure 4.2 indicates the seven stages of growth of a business life, namely new venture, expansion, professionalism, consolidation, diversification, integration, and, lastly, decline and revitalisation. The first four stages illustrated in Figure 4.2 comprise the process from inception of a new enterprise to the realisation of the mature business. Once the business has reached maturity, the actions relating to long-term sustainability should be considered; these are indicated in the last three stages of Figure 4.2 (Flamholtz & Randle, 2007d). It is evident that management, finance and marketing have emerged as core concepts and thus have a larger probability to have an impact on the organisational growth of a business (Brush *et al.*, 2009).

(i) **New venture:** This initial stage of organisational growth involves the establishment of a new enterprise. The business should follow soon with the first two tasks of organisational development, namely defining markets and developing products and services. These tasks are of critical importance, because without customers and products or services to provide to customers, no business can exist. The goal at this

stage is to establish authentication of the business concept (Flamholtz & Randle, 2007d).

(ii) **Expansion:** Once the business has completed the tasks required for stage one, it is ready for stage two. Usually, new development problems and challenges arise at this stage when the business concept needs to proceed to the development phase. The required resources to execute the operational systems should be in place to facilitate the organisational growth needed. This stage marks the development of the new venture into a professionally managed business (Flamholtz & Randle, 2007d).

(iii) **Professionalism:** During the expansion stage, managers begin to notice the realisation of qualitative change in the business. This means the business has transitioned from a new venture to a professionally managed business. This change requires management systems throughout the business to continually support the future growth of the business. It is of critical importance to ensure that systems are clearly defined and roles are properly identified to prevent confusion and eliminate disorder (Flamholtz & Randle, 2007d).

(iv) **Consolidation:** This stage involves the processes to ensure a stronger business and willingness to act competitively in the business environment. Corporate culture must be established in a formal matter throughout the business to ensure that business functions operate cohesively (Flamholtz & Randle, 2007d).

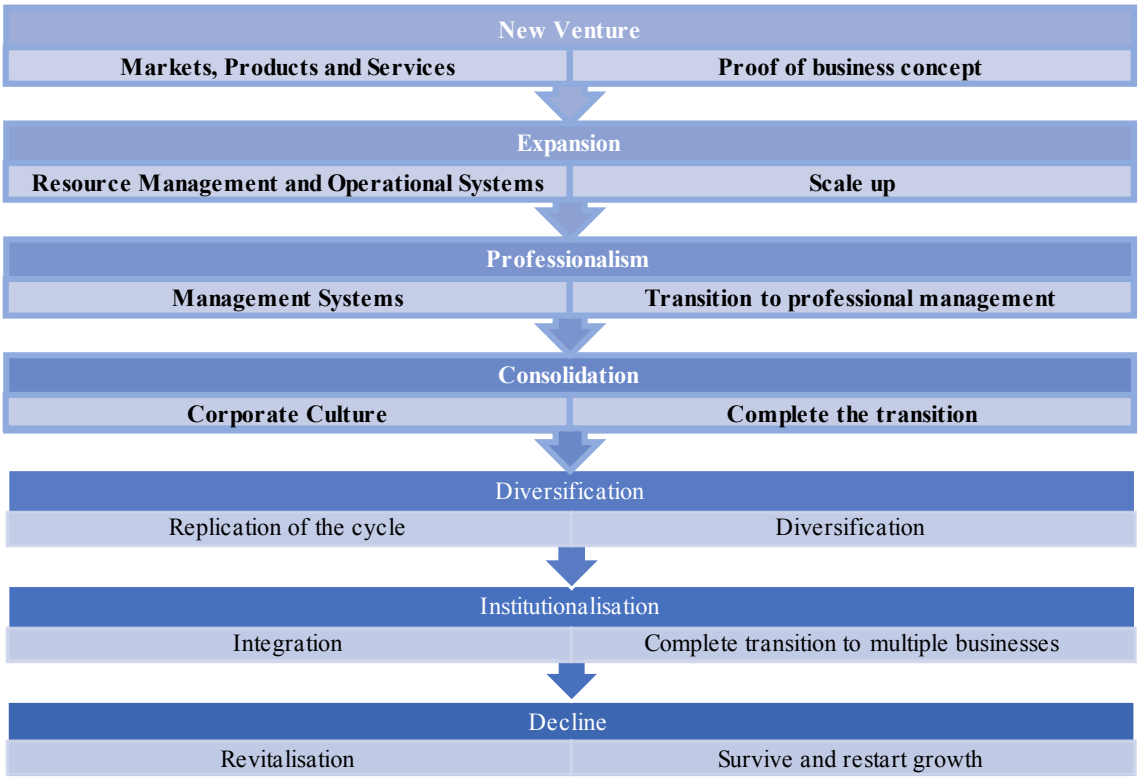

Figure 4.2: Stages of organisational growth (reproduced from Flamholtz & Randle (2007d)).

4.2.1.3 Strategic planning

Strategic planning plays an important role in the business environment in terms of planning activities for objectives and goals, performance indicators, developing targets, and allocation of resources (Spee & Jarzabkowski, 2011). Strategic planning is regarded as a communication process and requires specific activities not only to focus on market and product or service growth, but also to develop the infrastructure required in order to improve sustainable success (Spee & Jarzabkowski, 2011). Six steps have been established as being mandatory in any strategic planning process. These six steps, indicated in Figure 4.4 are known as environmental scan, organisational assessment, strategic issues, strategic business plan, the budget, and, lastly, quarterly management review (Flamholtz & Randle, 2007e) which are discussed below:

(i) **Environmental scan:** The environmental scan process includes information about the market the business proposed to address, the competitive environment, and the trends that will influence the business in the future (Flamholtz & Randle, 2007e).

(a) *Market Analysis:* The market analysis process includes all the processes of collecting and analysing the current and potential market of the business. A clear

and concise identification of the threats and opportunities that exist within this market should be part of the analysing process.

(b) *Competitive Environment:* During this process, the current and potential competitors should be identified. The business should be objective when identifying these strengths and limitations. Additionally, the business should review how their customers distinguish their competitors.

(c) *Trend Analysis:* This analysis includes the process of analysing the economic, political, social, cultural, and legal environment and its influence on the business future.

(ii) **Organisational assessment:** The organisational assessment includes identifying the strengths and limitations of the business at each level of the Pyramid of Organisational Development. The outcome of the environmental scan and organisational assessment may be expressed as strategic issues to be addressed by the business, as indicated in the next step (Flamholtz & Randle, 2007e).

(iii) **Strategic issues:** This step includes identifying and resolving the key strategic issues experienced by the business. Some of the important issues to address are the following:

(a) *What business are we in?* The platform and scope of the business are addressed through this strategic issue and involve some of the most important and critical decisions that a business will have to make.

(b) *What are our competitive strengths and limitations?* The competitive analysis and organisational assessment support the information to be considered when addressing this question. The outcome will indicate which areas are of crucial importance and require attention in order to develop a suitable business strategy.

(c) *Do we have or can we develop a true market niche?* A market niche may also be defined as a portion of a market, or a market segment, which affords the business a sustainable competitive advantage in the market. In general, a business model endorsed by an organisation can be seen as a source of sustainable advantage, indicating why the business is in business. There are two strategic reasons for this; firstly, from an 'offensive' standpoint, e.g. the price of products is greater than that of the competitors. Secondly, from a 'defensive' standpoint, e.g. during an economic crisis period the market niche holders endure less pressure than their competitors (Flamholtz & Randle, 2007e). It is evident that an understanding of market requirements is particularly important.

(d) *What do we want to become in the long term?* When addressing this key issue, the business needs to identify its organisational goals and strategic mission for the long term, which is generally three to five years.

(e) *What is our strategy for competing effectively in our chosen markets and for achieving our long-term mission?* This key issue has to do with the way the business will compete in order to achieve the desired results once the other key issues (as indicated above) have been addressed. Figure 4.3 indicates three levels of strategy that will drive the behaviour of employees toward targeted results in the identified market. The first level represents the core strategy and describes how the business will compete. An environmental scan and organisational assessment are required to develop the core strategy. The second level is known as supporting strategies. These strategies describe the actions the business needs to execute at each level of the Pyramid of Organisational Development, which then support the core strategy. The last level, namely operational strategies, illustrates how the business implements the core strategy (Flamholtz & Randle, 2007e).

(f) *What are the critical factors that will make us successful or unsuccessful in achieving this long-term mission?* The moment the business has identified its strategy, the focus point needs to be identified that will yield a maximum outcome over the long term (Flamholtz & Randle, 2007e).

(g) *What goals shall we set to improve our competitive effectiveness and organisational capabilities in each of these critical success areas?* The organisational goals form part of the strategic plan of the business and by achieving these goals, the business will have continued success in the future.

Figure 4.3: Three levels of strategy diagram (adapted from Flamholtz & Randle (2007e)).

(iv) **Strategic Business Plan:**

By now, the required information should have been set out and gathered to prepare and develop the strategic business plan. A strategic business plan is defined as a "*written statement of the future direction of a business based on the environmental scan and the organisational assessment*" (Flamholtz & Randle, 2007e). A constructive business plan consists of eight components. These components are:

(a) The *situational analysis* that provides a brief overview of the opportunities and threats identified in the current environment of the business, including the internal strengths and limitations (Flamholtz & Randle, 2007e).

(b) The *Business definition* provides a statement declaring the field in which the organisation tends to operate.

(c) The *Strategic mission* is a statement declaring what the business aims to achieve over a specific period.

(d) The *Strategy* describes how the business will compete and includes core, supporting and operational strategies in a proposed plan.

(e) The *Key result areas* are the performance areas that support the process to achieve the mission of the business.

(f) *Goals* are the specific objectives the business aims to achieve.

(g) *Action plans* describe the actions to be performed to achieve the desired goals.

(v) **Budgeting:** The budget illustrates how financial resources are allocated to each section of the business plan. The budget also provides a good indication of how the business should adjust its business plan in certain sections when unplanned events occur (Flamholtz & Randle, 2007e).

(vi) **Management Review:** The management review, which should be executed quarterly, provides feedback on the progress towards the organisational goals, discusses work-related issues that may influence business performance, mentions successes and failures, and indicates how these failures can be turned into successes (Flamholtz & Randle, 2007e).

Strategic planning can be used as a tool for organisational management and as a driving force for the transition to professional management. The strategic planning process provides a concise business plan according to which business processes can operate at a sustainable level (Spee & Jarzabkowski, 2011).

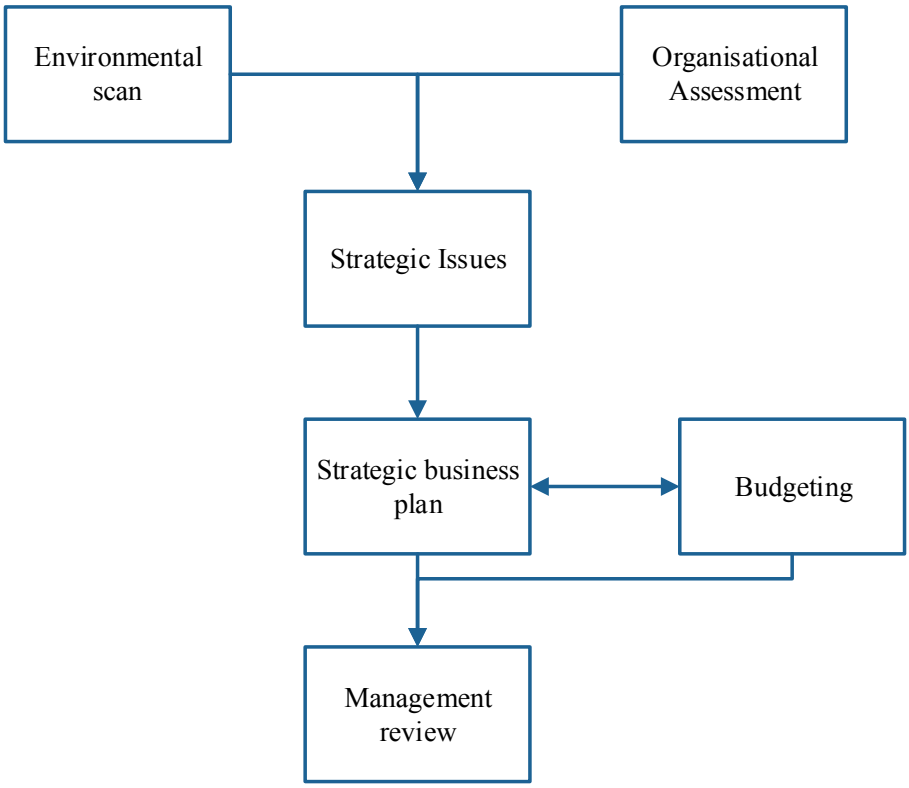

Figure 4.4: Strategic planning process (adapted from Flamholtz & Randle (2007e)).

4.2.1.4 Performance management

Performance management, also known as the organisational control system, is a mechanism designed to manage the performance of employees in the business and represents a critical aspect of business effectiveness (Gruman & Saks, 2011). The aim of this system is to motivate employees to achieve the organisational goals and to influence their behaviour in a certain way. Control systems enable the business to perform its tasks, ensuring the employees' behaviour is persistent with the organisational goals (Flamholtz & Randle, 2007b). Performance management can be used as a strategic and tactical tool, aiming to achieve several and various objectives. The strategic goals support top management to achieve strategic business objectives. The organisational goals should be linked with individual goals and enable the performance management system to continually improve the process of achieving organisational goals (Gruman & Saks, 2011). Tactical goals are designed to provide important information regarding employee decisions, including promotions, salary adjustments, retention and termination, and to identify poor performance (Gruman & Saks, 2011).

Flamholtz & Randle (2007b) developed a model that illustrates the connection between seven components that must be managed, linked and effectively designed. The Perfor-

mance Process Management model is shown in Figure 4.5 and each component is subsequently discussed.

(i) *Key Result Areas:* As mentioned earlier, key result areas are known as the success factors that form the basis of the business mission. Therefore, key result areas need to be defined at all levels of the business (corporate, strategic, department and individual).

(ii) *Objectives:* These are objective statements to be achieved in each key result area. Objectives support the organisation and employees to achieve the required results.

(iii) *Goals:* Goals are used to determine the desired performance levels and serve as a benchmark for measuring performance. Goals are set to facilitate control before, during and after performance.

(iv) *Measurement:* Measurement represents the characteristics of an object in numerical terms. Measurement serves two purposes; firstly, to provide information that can be used when evaluating performance, and secondly, to measure financial and managerial performance.

(v) *Progress review:* Information about cost reports, financial statements and performance reports serves as crucial feedback on the operations and management of the business. A scorecard is a typical output of assessed performance, and scorecards can be used at any business level.

(vi) *Performance Evaluation:* Performance evaluation is a systematic process that allows businesses, departments and individuals to monitor how effective the process of achieving goals has been over a specific period. Evaluation includes positive feedback and criticism that employees can use to understand what is required to improve performance or keep performance at an improved level.

(vii) *Rewards:* Rewards are given when the desired outcome of the various performances has been achieved. It is important to reinforce valuable performances and to encourage in order to improve poor performance.

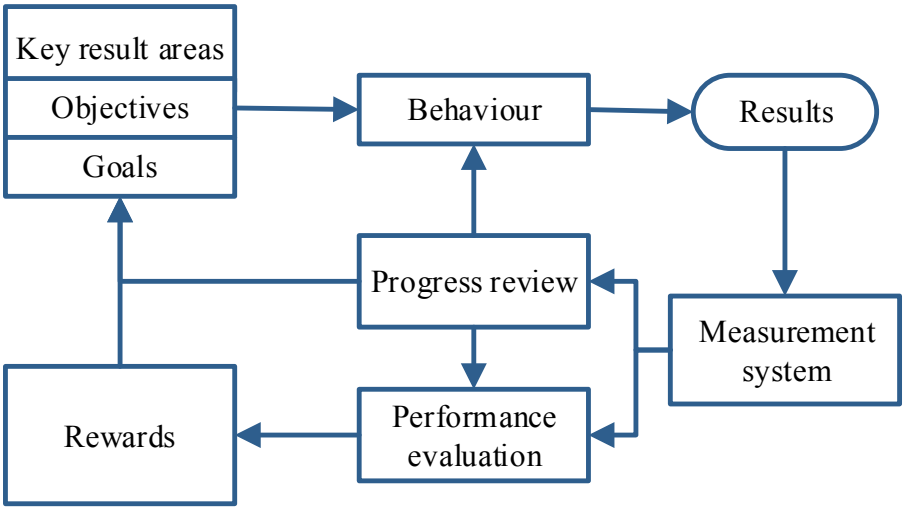

Figure 4.5: Performance Process Management (adapted from Flamholtz & Randle (2007b)).

The operational system is affected by all the components of the Performance Process Management system model. The required action to increase the probability of achieving the desired outcomes is to establish key result areas, objectives and goals. By adding measurements and feedback processes, the probability will increase to a more desired result. Improved performances may be expected by adding evaluation and rewards components.

4.2.1.5 Organisational structure

An organisational structure indicates how employees are organised in a hierarchy to perform effectively while achieving the goals and objectives of the strategic business plan. The aim of an organisational structure is to define roles that are set out in a specific pattern according to relationships with a view to achieving certain goals (Flamholtz & Randle, 2007f). These roles include responsibilities within individual tasks, departmental activities, and descriptions of what can be expected by co-workers.

The four most important aspects of organisational structures are centralisation, formalisation, complexity and integration. Centralisation describes the way decisions and evaluation activities are executed. Formalisation measures to what extent an organisation implements rules and procedures to regulate behaviour. Complexity describes to what extent the various functions are identified in terms of goals and task orientation. Lastly, integration describes the activities of individuals in the business and how these are coordinated through an appropriate coordination systems (Liao *et al.*, 2011).

A set of eight criteria mentioned and discussed below, may be used to assess the effectiveness of the current organisational structure or to design the future organisational structure.

(i) *Structure alignment:* The extent to which the structure supports the achievement of the organisational goals. The business should develop an understanding of its mission and objectives, organisational structure (in terms of macro- and micro-structure), and supporting systems, which should be evaluated to ensure that goals are achieved.

(ii) *Functional contribution:* The extent to which a function in the organisational structure has a clearly defined role that adds value to the defined structure.

(iii) *Clarity and contribution of individual roles:* Each individual role has a clearly defined function and contributes to the effectiveness and efficiency of the organisational goals.

(iv) *Clarity and structure of reporting relationships:* Reporting relationships and decision-making should be clearly structured and identified to support the underlying rationale in order to facilitate the process of achieving organisational goals.

(v) *Appropriate span of control and number of organisational levels:* The number of employees who report to a manager and how this effectively supports the process of achieving the organisational goals.

(vi) *Appropriate management/leadership and technical skills:* The skills and leadership characteristics each individual has to fulfil his/her role and responsibilities. Regular assessments are required as employees' performance improves and roles change.

(vii) *Effective coordination:* The way current employees coordinate functions between business units throughout the organisational structure.

(viii) *Appropriate supporting systems:* The way in which operational, management and culture systems support the functioning of the organisational structure.

It is of crucial importance that management considers the type of systems, structures and processes required to ensure the organisational structure is executed effectively and efficiently (Flamholtz & Randle, 2007f). The above set of eight criteria enables any business to identify the strengths and weaknesses throughout the structure and allows the business to address any findings accordingly.

4.2.1.6 Management and leadership development

Management development supports employees in developing their competencies to manage their day-to-day tasks in the business. Leadership development focuses on supporting employees in developing their competencies required to manage their business, departments

and team strategically. To ensure maximum effectiveness, a management development programme should focus on skills development as well as support to employees to understand their roles as team members, managers and leaders (Flamholtz & Randle, 2007g).
The functions of management development are to support the process of defining or redefining corporate culture, promote the desired style of leadership required by the business, and lastly, reward good managers. By applying these functions and the critical dimensions of management and leadership development, any employee will achieve success at a particular level of the organisational hierarchy. The critical dimensions are indicated in Figure 4.6, and are mentioned and discussed in greater detail below (Flamholtz & Randle, 2007g).

(i) *Role concept:* Involves the process of changing from one role to another and aiming to be successful at the new role, whilst understanding and accepting the responsibilities of the new role, and attempting to become an effective manager (Flamholtz & Randle, 2007g).

(ii) *Management/leadership skills:* "*This dimension involves a sequential pattern of behaviours performed in order to achieve a desired output*" (Cameron & Whetten, 1984). Work-related interpersonal skills, for example motivation, communication and leadership, are required to oversee employees and manage day-to-day people management problems. Additionally, administrative skills such as planning, supervising, conducting meetings, budgeting, performance evaluation and control are required to be effective in the specific roles (Flamholtz & Randle, 2007g). The Pyramid of Management and Leadership Development is a framework that consists of five levels of different skills managers require to develop their careers and be effective in their particular roles. These five levels are (Flamholtz & Randle, 2007g):

(a) *Core management skills:* Managers require all the skills at this level of the pyramid, regardless of the level at which they operate. These skills refer to the ability to use tools, procedures, and techniques in a specialised field (Viitala, 2006).

(b) *Operational management skills:* Skills to manage day-to-day operations and administrate employees are required at this level. Known skills at this level are training and coaching, motivation, performance appraisal and management of meetings. In addition to the skills required at the previous level, these are the skills required by first-line supervisors to effectively execute their roles (Flamholtz & Randle, 2007g; Viitala, 2006).

(c) *Organisational management skills* include planning, management development, financial management, organising employees, designing and effectively using control or performance management systems, and team building. Middle managers effectively use these skills (Flamholtz & Randle, 2007g; Viitala, 2006).

(d) *Organisational development skills:* These competencies include strategic perception, decision-making and board management skills. These skills require the ability to think and operate in terms of systems and to know how to lead systems, whilst providing direction, vision and focus to the business (Viitala, 2006).

(e) *Transition management skills* include understanding the need for transition and being able to manage the transition of the business and its employees. These skills are required to understand and manage the need for change (Flamholtz & Randle, 2007g; Viitala, 2006).

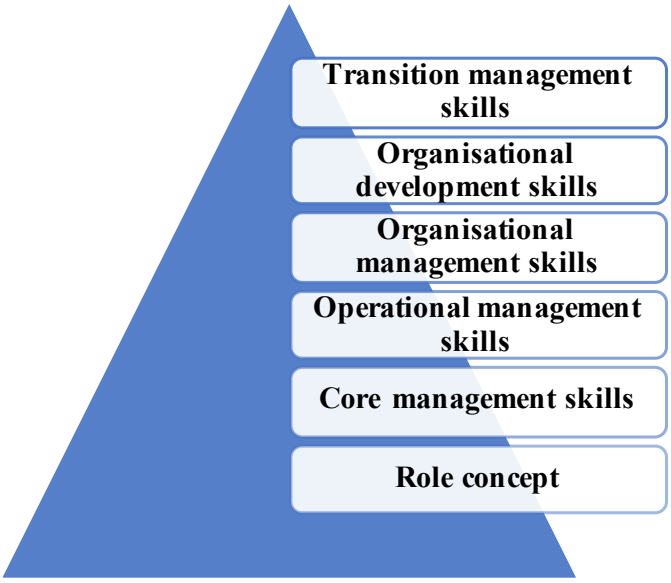

Figure 4.6: Levels of management skills (adapted from Flamholtz & Randle (2007g)).

(iii) *Attitudes or psychological factors:* This dimension includes changes in an employee's attitude from a performance-orientated psychology to a management-orientated psychology. This dimension emphasises the way managers think in order to be more effective in their role. Managers should use the specialist skills of their employees effectively to achieve the goals of the business (Flamholtz & Randle, 2007g).

The process of management development involves building on the potential performance capabilities of managers. Additionally, these functions promote a particular leadership style that shapes corporate culture and rewards managers.

4.2.1.7 Culture management

The corporate culture of an organisation includes the values, beliefs and norms that influence the behaviour of the employees. Values are those actions the business considers most valuable with respect to the employees, clients and business operations and strive to perform at its best level of professionalism at all times. Beliefs are the acceptance employees have for each other, the business and clients. Norms are the way in which employees behave and interact (Flamholtz & Randle, 2007c).

Additionally, corporate culture is defined by four areas that have a major impact on business success. These four areas are:

(i) *Customer-client orientation* is the way the business views their clients or customers. These actions involve a reflective attitude and approach to business and have an impact on how the business operates and, ultimately, on the success rate of the business (Flamholtz & Randle, 2007c).

(ii) *Orientation towards employees* is a reflection of the business's policies on the treatment and value of their employees. Job satisfaction has a bearing on employer attitudes and employer attitudes reflect in an encouraging and trusting environment (Roos & Van Eeden, 2008).

(iii) *Standards of performance* include the business's concern with the amount and quality of work that is completed, the promotion of creativity, and the customer and commercial services (Roos & Van Eeden, 2008).

(iv) *Commitment to change* involves the decision-making culture of the business that is reflected by the degree of formalisation. This is an official and productive approach that relates to satisfaction and commitment (Roos & Van Eeden, 2008).

Corporate culture is part of any business and has an impact on business success. Managers should therefore learn to manage corporate culture and make the required changes as the business grows. It is important to know the nature and the meaning behind corporate culture and how it reflects in the business environment (Flamholtz & Randle, 2007c).

4.3 Discussion

Bearing in mind the concept of SE, the contextual business environment and the ultimate aim of enabling business sustainability, the following discussion is geared towards the proposed conceptualisation of an SE approach to business sustainability. A value chain perspective is used to facilitate this.

A business value chain is described as the process of changing business inputs into outputs in such a manner that it creates value for the organisation as well as for society (Porter & Kramer, 2011). The value chain perspective is linked to the principle of shared value and allows a business to revive the business success with social progress by re-evaluating the business environment aspects, aiming to realise economic and social benefits (Porter & Kramer, 2011). Shared value opportunities can be created by a business in the three key ways, namely: (i) by reviewing products and markets; (ii) redefining productivity in the value chain; and (iii) enabling the local cluster development (Porter & Kramer, 2011). It is argued that the value of following a shared value approach to decision-making and identification of opportunities to businesses is that a greater possibility exists that the business will uncover new approaches that will benefit society, and generate greater innovation and growth (Franz *et al.*, 2015).

The value chain perspective, as conceptualised by the Franz *et al.* (2015), consists of three levels that all interact, are interrelated and influence business operation (the market chain – see Figure 4.7).

Figure 4.7 provides a schematic representation of the value chain perspective, including all three levels that constitute such a value chain. Level 1 (the market chain) defines the channels through which the business moves from addressing the new market idea to executing the business processes, thus ensuring the market idea or opportunity is addressed. Level 2 (inputs, services and finance) enables the business to include inputs, services and finance in the business processes to execute the production and delivery of products and/or services. The enabling environment (Level 3) consists of the factors that act as the 'rules of the game', shaping how level 1 (the market chain) and level 2 (inputs, services and finance) operations (should) operate (Franz *et al.*, 2015).

Bearing in mind the analysis of the various business components, as well as the overview of the value chain perspective, the business components discussed in the preceding sections are subsequently evaluated across the three levels that form part of the value chain perspective, as discussed in the Franz *et al.* (2015). Table 4.1 indicates the categorisation of the business components given the value chain perspective.

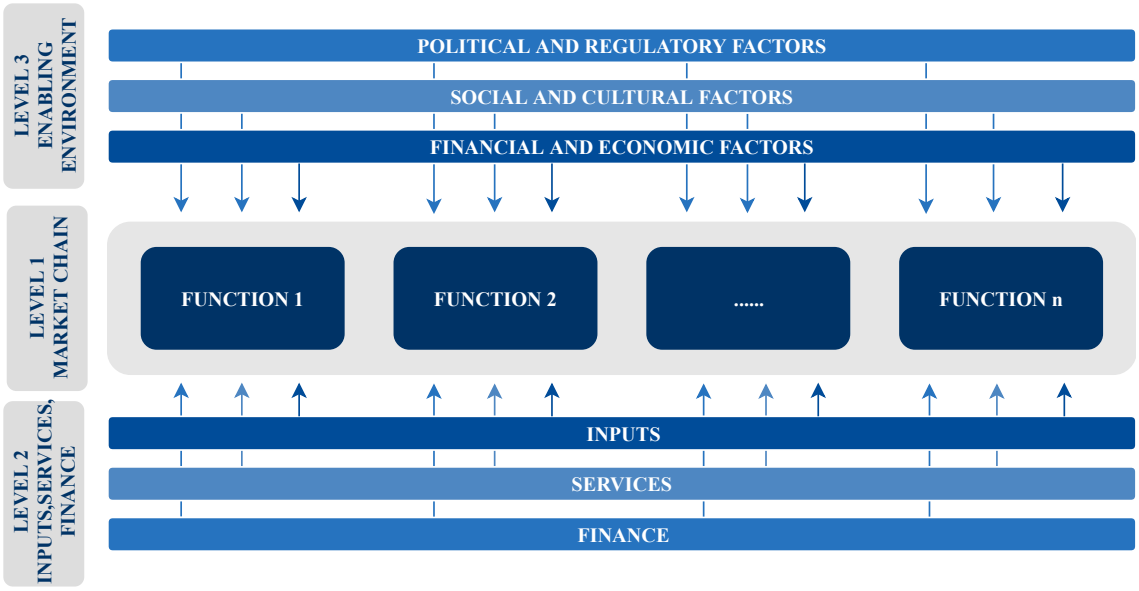

Figure 4.7: A summary of the business value chain including three levels (Franz *et al.*, 2015).

Table 4.1 illustrates the relationship between the various business components of the business environment and the business value chain system. Each individual component is indicated by an *'x'* showing the correlating level of the business value chain system, as well as the area of its influence. This study acknowledges that these business components are extensively interrelated and that complex interactions and relationships exist between the components, as well as between components and the various levels of the value chain perspective. However, conceptualising business sustainability from an SE perspective, requires the categorisation (and thus necessary simplification) of the above relationships between business components.

Table 4.1: The business components that influence the business value chain system.

Business Environment	Individual Components	Enabling environment	Market chain	Inputs, services and finance
Business development	Markets	x		
	Products and services		x	
	Resource management		x	
	Operational systems		x	
	Management systems		x	
	Corporate culture			x
Organisational growth	New venture	x	x	
	Expansion		x	x
	Professionalism			x
	Consolidation			x
Strategic planning	Environmental scan	x	x	
	Organisational assessment			x
	Strategic issues		x	
	Strategic business plan			x
	Budgeting			x
	Management review			x
Performance management	Key result areas		x	x
	Objectives		x	x
	Goals		x	x
	Measurement		x	x
	Progress review		x	x
	Performance evaluation		x	x
	Rewards		x	x
Organisational structure	Structure alignment		x	x
	Functional contribution		x	x
	Clarity and contribution of individual roles		x	x
	Clarity and structure of reporting relationships		x	x
	Appropriate span of control and number of organisational levels		x	x
	Appropriate management/leadership and technical skills		x	x
	Effective coordination		x	x
	Appropriate supporting systems		x	x
Management and leadership development	Role concept		x	x
	Management/ leadership skills		x	x
	Attitudes or psychological factors		x	x
Culture management	Customer-client orientation		x	x
	Orientation towards employees		x	x
	Standards of performance		x	x
	Commitment to change		x	x

The information contained in Table 4.1 thus informs the SE approach that it assists with the deconstruction and discovery (quadrant II) of the system problem ('black box' perspective of existing frameworks and approaches to business sustainability – quadrant I); thus, enabling the conceptualisation of business sustainability at an increased level of granularity. Subsequently, the information contained in Table 4.1 (the identification of various business components) will enable a process to develop solutions (quadrant III) for each of the identified business components in order to ultimately develop a solution (framework, approach, etc.) that will address business sustainability as a whole (quad-

rant IV). Figure 4.8 illustrates the process of the business environment components that transforms through the SE approach. In quadrant I, the 'black box' perspective is seen as the problem that requires a solution to address the challenges brought about by a 'black box' perspective to business sustainability. Quadrant II discovers the SE approach to the business environment components and business sustainability frameworks. From this, multiple solutions can be developed in quadrant III; thus, addressing sustainability for each identified business component. Lastly, quadrant IV illustrates the action of combining all the individual solutions into a holistic solution aiming to inform, govern and enable business sustainability.

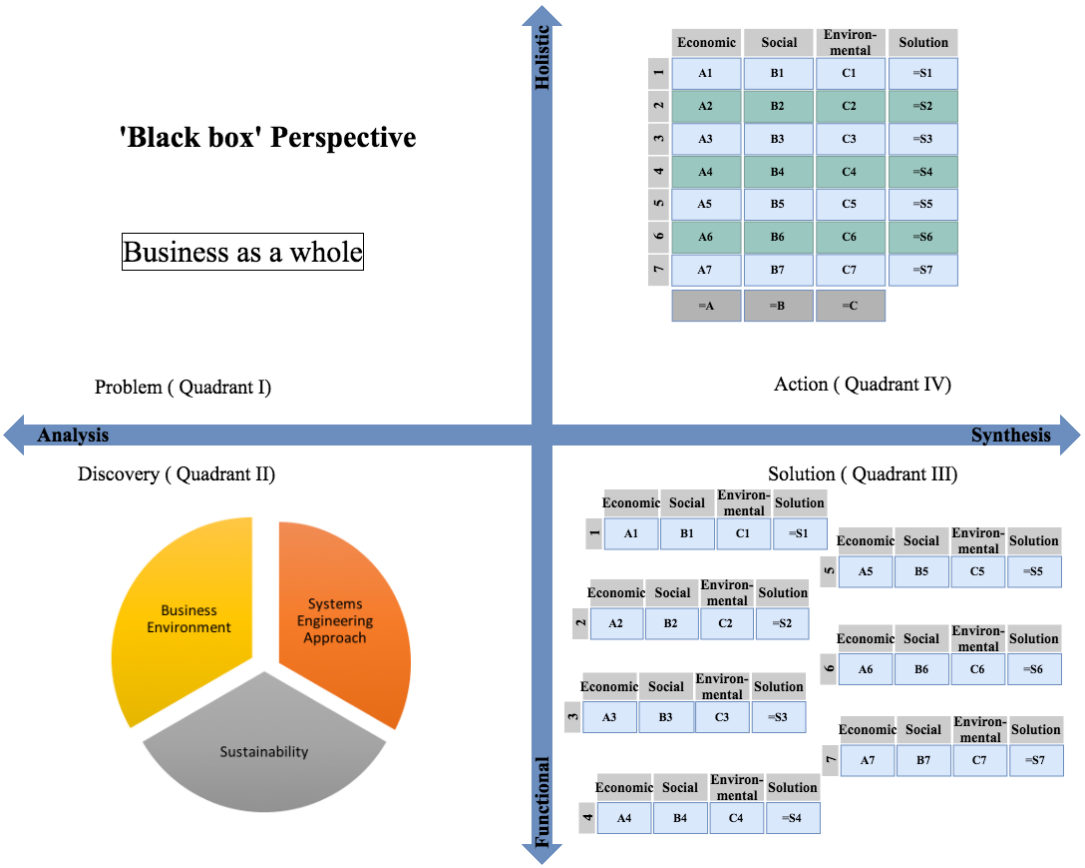

Figure 4.8: Proposed systems engineering (SE) approach to business sustainability.

Table 4.2: Legend of Figure 4.8 data.

	Solutions (Quadrant III)			Action (Quadrant IV)
Business Components	**Economic dimension**	**Social dimension**	**Environmental dimension**	**Solution**
1: Business Development	A1: Economic sustainability (Business development)	B1: Social sustainability (Business development)	C1: Environmental sustainability (Business development)	S1: Sustainability across all dimensions of the business development component
2: Organisational Growth	A2: Economic sustainability (Organisational,growth)	B2: Social sustainability (Organisational,growth)	C2: Environmental sustainability (Organisational,growth)	S2: Sustainability across all dimensions of the organisational growth component
3: Strategic Planning	A3: Economic sustainability (Strategic planning)	B3: Social sustainability (Strategic planning)	C3: Environmental sustainability (Strategic planning)	S3: Sustainability across all dimensions of the strategic planning component
4: Performance Management	A4: Economic sustainability (Performance management)	B4: Social sustainability (Performance management)	C4: Environmental sustainability (Performance management)	S4: Sustainability across all dimensions of the performance management component
5: Organisational Structure	A5: Economic sustainability (Organisational structure)	B5: Social sustainability (Organisational structure)	C5: Environmental sustainability (Organisational structure)	S5: Sustainability across all dimensions of the organisational structure component
6: Management and Leadership Development	A5: Economic sustainability (Management and Leadership development)	B6: Social sustainability (Management and Leadership development)	C6: Environmental sustainability (Management and Leadership development)	S6: Sustainability across all dimensions of the management and leadership development component
7: Culture Management	A7: Economic sustainability (Culture Management)	B7: Social sustainability (Culture Management)	C7: Environmental sustainability (Culture Management)	S7: Sustainability across all dimensions of the culture management component
	A: Composite economic sustainability measure across all business components	B: Composite social sustainability measure across all business components	C: Composite environmental sustainability measure across all business components	

4.4 Chapter 4: Conclusion

This chapter emphasises the detailed level of understanding and granularity of analysis required to address business sustainability using an SE approach. The 'black box' perspective is addressed by deconstructing the business 'as a whole' into various business components, and evaluating these components from a value chain perspective, ultimately to conceptualise an SE process that addresses business sustainability. This process facilitates the analysis of the business environment for the purpose of developing business sustainability measures across multiple business components and thus at an increased level of granularity. In this way, the challenges associated with the 'black box' perspective, as employed by various business sustainability frameworks and approaches, are addressed at least in part. Subsequent to the deconstruction phase, this approach in turn enables the conceptualising of business sustainability at an aggregate level by combining the various sustainability solutions at a granular level.

Chapter 5

Towards the development of a Business Sustainability Framework and Evaluation Tool: Conceptual framework approach

From the critical review of multidisciplinary literature pertaining to sustainability frameworks, existing frameworks are considered to lack the adequate granularity and comprehensiveness ideally required for understanding – and subsequently measuring, monitoring, evaluating and ultimately contributing towards fostering – sustainability in the business environment. Therefore, it is proposed that a conceptual framework be developed that link and amalgamate the multidisciplinary bodies of knowledge (e.g. sustainability and business sustainability concepts and frameworks, the systems engineering approach, and the business environment with increased granularity) in order to address the identified lack of adequate granularity and comprehensiveness.

From a knowledge perspective it is evident throughout literature that conceptual frameworks hold the potential to bring about an understanding of a phenomena; in the case of this research inquiry the phenomenon that is aimed to be understood with greater clarity – through the development of a conceptual framework – is that of business sustainability. The aim of the proposed framework is therefore to contribute towards business sustainability by providing a framework that substantiates business sustainability problem-solution combinations at the business component level of the business environment (as discussed in Chapter 4). The proposed framework explicitly recognises that the business environment should be, for analysis purposes, delineated into sub-components and therefore necessitated the review of the business environment literature. Ultimately, through the

development of a conceptual framework for business sustainability, businesses can evaluate and subsequently measure each business sub-component in terms of the sustainability dimensions.

The use and importance of conceptual framework development methodology is well-argued in literature; it promotes creativity which is thoughtful in conceptualising new theories and derive meaning from the theories using creative and inductive processes (Hussein *et al.*, 2014). Also, it provides structured guidelines that support the researcher to conduct qualitative research using contextual methods that ensure richness and depth of data (Hussein *et al.*, 2014; Jabareen, 2009). A conceptual framework development methodology is a systematic approach towards data analysis using inductive processes and thus it is an intuitive approach for the level of granularity of this research.

This chapter is concerned with (i) the literature pertaining to the approaches and development methodologies of conceptual frameworks, to ensure that the research design for the Business Sustainability Framework is compiled according to a conceptual framework development methodology, and (ii) the application of such methodology in order to arrive at the proposed Business Sustainability Framework. The level of granularity of the Business Sustainability Framework is described and developed by using the various phases within the conceptual framework methodology. The chapter concludes by presenting the validation strategy, validation outcomes and results, and a discussion on the refinements included in the framework based on the validation and feedback received from the participants of the validation process.

5.1 Conceptual frameworks

Conceptual frameworks are products of qualitative processes, or set of concepts, that describe an event, object or process (Meredith, 1992). Jabareen (2009) defines a conceptual framework as a group of interlinked concepts that yield a comprehensive understanding of a phenomena. To explore the process of developing conceptual frameworks, it is therefore necessary to define the terms 'concept' and 'conceptual framework' respectively. A concept is a group of meanings or characteristics associated with specific events, objects or conditions that is used for communication or understanding of such events, objects or conditions (Meredith, 1992). Components are distinct, heterogeneous and inseparable and therefore no concept exists with only one component. The following number of properties exist within the term 'concept' (Jabareen, 2009; Miles *et al.*, 1994):

(i) Every concept has an irregular outline which is defined by its components;

(ii) All concepts relate back to other components;

(iii) A concept is always created by an object; it cannot be created from nothing; and

(iv) Components from a concept originate from other concepts.

Conceptual frameworks comprise of a number of features that deem conceptual framework appropriate/ suitable to adequately describe the business sustainability approach that will address the identified lack of adequate granularity and comprehensiveness in existing business sustainability frameworks. These features are:

(i) A conceptual framework can be developed and constructed through a process of qualitative analysis (Guba & Lincoln, 1994; Jabareen, 2009);

(ii) A conceptual framework is not only a collection of concepts but an assembly in which a single concept plays an integrated role (Jabareen, 2009; Miles *et al.*, 1994);

(iii) A conceptual framework provides an interpretative approach to social reality and a more understandable meaning (Jabareen, 2009);
and

(iv) A conceptual framework provides 'soft interpretation of intentions' and is indeterministic in nature and thus it is not possible to predict an outcome (Levering, 2002).

In summary, the features of conceptual frameworks illustrate qualitative processes of theorisation and conceptual frameworks provide structured guidelines to support researchers on the process of conducting qualitative research. The following subsection introduces an approach and development methodology of conceptual frameworks and will serve as a guideline when developing the business sustainability framework.

As stated above, and in particular to the findings of Jabareen (2009), a conceptual framework should be built from existing multidisciplinary literature which uses grounded theory methodology rather than a description of the data. Theory uses concepts and these concepts are related by means of statements of relationships. Descriptions are data that are classified according to themes. Therefore, qualitative studies aim to explain a pattern of relationships, with the support of a set of conceptually selected categories (Jabareen, 2009). Grounded theory is the foundation of the developing process of a conceptual framework because of its specific paradigm of inquiry that has a distinct number of features that aim to generate, identify, and trace the major concepts, which together create the theoretical framework (Jabareen, 2009).

The conceptual framework approach set out by Jabareen (2009) will see the use of the literature that has been reviewed in the previous chapters as the basis from which the business sustainability framework will be developed; the literature that has been analysed has certain relationships, features and concepts. Jabareen's (2009) approach allows to create, identify and pursue the major concepts identified in various sustainability, business sustainability, systems engineering, and business environment literature, and to develop key components, with its own attributes and well-defined perspectives within the proposed conceptual framework.

Additionally, Jabareen's conceptual framework methodology clarifies and justifies methodological decisions by providing a coherence for the research, a schematic method for selecting and prioritising concepts that are of interest, and explicitly introducing research processes. This methodology addresses the problem and associated concepts which aim to improve and introduce additional insights into the business sustainability phenomenon.

5.1.1 Description of conceptual framework development methodology

As stated above, the conceptual framework development methodology of Jabareen (2009) will be used to describe the overarching methodology to propose a qualitative systems engineering approach to business sustainability. This method includes three sections, namely:

(i) **The data of the conceptual framework analysis.**

Data should be selected text that effectively represents the relevant social, cultural, political, and environmental phenomena, and the multidisciplinary literature that focuses on the phenomena. The data should also represent practices that are related to the phenomena and once the multidisciplinary approach is used, these discipline-oriented theories become the empirical data of the framework analysis (Jabareen, 2009).

(ii) **The process of the conceptual framework analysis.**

The process is iterative (the steady movement between concept and data), as well as comparative (constant comparison across types of evidence) and thus continuous interactions between data collection and analysis are required (Jabareen, 2009).

(iii) **The procedure of the conceptual framework analysis.**

The procedure consist of eight phases namely: (i) mapping the selected data; (ii) extensive reading and categorising the selected data; (iii) identifying and naming concepts; (iv) deconstructing and categorising the concepts; (v) integrating concepts;

(vi) synthesise concepts into a conceptual framework; (vii) validating the conceptual framework; and (viii) rethinking the conceptual framework.

The framework development process is iterative (the steady movement between concept and data), as well as comparative (constant comparison across types of evidence) and thus continuous interactions between data collection and analysis are required (Jabareen, 2009). The procedure of the conceptual framework development proposed by Jabareen (2009) consists of eight phases and these phases will be discussed below and executed in the following section.

Phase 1: Mapping the selected data: This phase requires the extensive review of multidisciplinary literature, identifying data sources and text types. A comprehensive data collection should be undertaken to ensure validity.

Phase 2: Extensive reading and categorising the selected data: The aim in this phase is to review the selected data and categorise the data in terms of the discipline and the level of importance.

Phase 3: Identifying and naming concepts: This phase requires a second review process in order to identify and discover concepts. This is followed by the identification of core principles and processes.

Phase 4: Deconstructing and categorising the concepts: During this phase each concept is deconstructed according to its main attributes, characteristics, assumptions, and role. Thereafter, these concepts are organised and categorised according to their features.

Phase 5: Integrating concepts: The aim of this phase is to integrate and group similar concepts together that will form new concepts based on their similarities.

Phase 6: Synthesise concepts into a conceptual framework: During this phase the conceptual framework will be developed on an iterative process using the integrated concepts.

Phase 7: Validating the conceptual framework: During this phase the conceptual framework is validated by ensuring it makes sense and illustrates a reasonable theory to not only the researcher but other practitioners as well.

Phase 8: Rethinking the conceptual framework: This phase requires the necessary adjustments in order to ensure the feedback from the validation is applied.

The eight phases are considered as an applicable approach because of its in-depth connections and elements of knowledge of multidisciplinary literature, given the coherence and direction to match existing literature. With conceptual framework development being an inductive methodology that fosters creativity, the phases will be used as guidelines for the development of a generic framework.

5.2 Business sustainability framework and tool development

This section is concerned with the development phases of the generic business sustainability framework based on the eight phases described above. The findings from Chapter 2, 3 and 4 are discussed in the different framework development phases, respectively. Table 5.1 provides an overview of the conceptual framework development phase outline of the respective phases. The remainder of this section is dedicated to a detailed explanation of each phase.

Table 5.1: Conceptual framework phases outline.

Phase	Phase methodology
Phase 1: Mapping the selected data	Chapter 2: Systematic review pertaining sustainability frameworks
	Chapter 3: Systems engineering approach
	Chapter 4: Business environment with its business components
Phase 2: Extensive reading and categorising the selected data	Chapter 2: Assessment of the sustainability frameworks, the 'black box' argument and the challenges faced by sustainability frameworks
	Chapter 3: Applying systems engineering approach to address the challenges faced by sustainability frameworks
	Chapter 4: The business value chain supports the systems engineering approach to the challenges faced by sustainability frameworks
Phase 3: Identifying and naming concepts	Chapter 2: Sustainability system boundaries (economic-, social-, environmental dimension)
	Chapter 3: SE approach (from a whole perspective, and from a functional unit perspective)
	Chapter 4: Business components within the business environment
Phase 4: Deconstructing and categorising the concepts	Understanding the complex nature of the concepts
	Concepts are divided into categories for the development of the framework and tool
Phase 5: Integrating concepts	Integrating concepts into a conceptual framework and understanding the integration between the concept categories
Phase 6: Synthesise concepts	Integrated concepts are synthesised into an evaluation tool development
Phase 7: Validating the framework and tool	Chapter 5: Validation of framework and tool to ensure the content makes sense
	Re-synthesise the framework and tool after validation feedback
Phase 8: Rethinking the conceptual framework and tool	Chapter 6: Rethink the framework and tool and apply them to a case study

5.2.1 Phase 1: Mapping the selected data

A systematic review of literature pertaining to sustainability frameworks was conducted and presented in Chapter 2 to identify publication types and other sources of data pertaining to business sustainability. In order to identify and extract the relevant data, a keyword search was conducted that resulted in 42 articles that were subsequently evaluated and discussed in a literature analysis. During the literature analysis various dimensions were identified according to which the sustainability frameworks were evaluated and compared. The dimensions, along which the business sustainability frameworks were evaluated, are system boundaries (economic-, social-, and environmental dimension), actors and networks, and lastly the discipline or industry such frameworks are developed for or applicable to.

During the investigation into the business sustainability frameworks, two key concerns emerged; (i) that sustainability is not explicitly considered at the level of business components, and (ii) that not all sustainability dimensions are considered in equal levels of detail. From these perspectives, four key business sustainability challenges are noted;

(i) The notion that these frameworks consider the business as a whole, and not as a number of sub-components; therefore, the lack of integration of business components and sustainability actions arises. This view of business sustainability at an aggregate level creates what this research inquiry refers to as a 'black box' perspective (see Section 2.5).

(ii) In addition, the concern that all dimensions of sustainability are not uniformly considered, meaning businesses adapt their processes to a recommended framework that does not consider all elements of sustainability. This would result in the business not addressing sustainability across all levels of a business or across the various business components.

(iii) Differentiation across sustainability elements arises, meaning that measuring the three elements of sustainability is not similar across the business components, therefore the focus and defined greater level of detail are required to address this differentiation.

(iv) Lastly, monitoring and evaluation process is required to address the shortcomings associated with sustainability frameworks to enable businesses to achieve their full potential in terms of sustainability.

The above results in, subsequent to using such business sustainability framework(s), to adapt their business processes to a recommended framework that considers sustainability (only) at an aggregated level or does not explicitly consider all the dimensions of sustainability – and thus it is argued that by considering sustainability at an increasingly granular level, and also ensuring that all sustainability dimensions for each business component are considered, will contribute to an improved understanding of business sustainability, the evaluation thereof, and ultimately to provide guidance on the actions required to continuously improve the sustainability of businesses. These challenges highlighted with regards to business sustainability, and the frameworks that aim to guide business sustainability, enable the proposition of using the systems engineering approach to address these challenges.

Following on the findings in Chapter 2, in Chapter 3 the systems engineering (SE) approach is discussed. This approach enabled the process to address the business sustainability framework challenges that were identified in Chapter 2 and mentioned above. The SE approach consists of four phases that are presented in four quadrants; each relating to a specific, sequential component of the problem solving approach. The first quadrant is the complex problem as a whole. This problem is then broken down into smaller sub-problems in quadrant II. Subsequently, in quadrant III these sub-problems are analysed and sub-solutions are identified for each sub-problem identified in quadrant III. In conclusion, these sub-solutions are pieced together in quadrant IV, to ultimately aim to provide a solution for the whole, thus for the problem defined in quadrant I. Therefore, it is argued that the SE approach allows for the motivation to analyse and unpack the business environment and its business components.

Given the above outline, in Chapter 4 the business environment has been evaluated through the lens of (Brush *et al.*, 2009; Flamholtz & Randle, 2007a,d; Gruman & Saks, 2011; Guiso *et al.*, 2015; Liao *et al.*, 2011; Miller, 2010; Spee & Jarzabkowski, 2011; Viitala, 2006). Here the business environment is considered and discussed in terms of its various business components. The business components completely support the business environment to gain a better understanding on how the different components operate and contribute to the performance of the business as a whole. These components include from business development to organisational growth, strategic planning, performance management, organisational structure, management and leadership development, and lastly culture management.

Given the mapping of the selected data outlined above, extensive reading and categorising of the selected data follow.

5.2.2 Phase 2: Extensive reading and categorising the selected data

Phase 2 is concerned with extensive reading and categorising of the selected data, and also sees the SE approach being used as the overarching approach for the categorisation of the selected data for the development of the Business Sustainability Framework. By now it is evident that the SE approach has been used as an overarching problem solving approach (see Chapter 4) and secondly identified as a guiding principle to conceptualise the business sustainability framework.

The first quadrant of the SE approach considers the system as a 'whole'. This implies that the challenges faced by the businesses, the 'black box' perspective as mentioned above can be considered as a complex system. This complex system is further broken down in quadrant II, with the motivation to unpack and discover the complex system as functional units. The identified 'functional units' are the sustainability frameworks that address the three system boundaries of sustainability based on the assessment in Chapter 2; the business environment and its sub-components as discussed in Chapter 3; and lastly, the gap which is the SE approach that links these two functional units as discussed in Chapter 3.

Subsequently, in quadrant III sub-solutions are found for the sub-components of the business environment in terms of the sustainability system boundaries (economic-, social-, and environmental dimension). Lastly, these sub-solutions are pieced together in quadrant IV with the objective of this quadrant to define sustainability across all the system boundaries of each individual business component as well as the business environment.

The value chain perspective, as discussed in Chapter 4, is geared towards the principle of shared value which allows the business to revive the business success towards social progress by re-evaluating the business environment, aiming to realise economic and social benefits. Subsequently, the business environment has been evaluated across the three levels of the value chain perspective. The relationships between the business components and the three levels of the value chain create the categorisation and the necessary simplification for addressing the sustainability challenges experienced by businesses. Thus, these categories and simplification of complex interactions and the conceptualising of business sustainability using the SE approach guide the monitoring and evaluation stage, which in turn evaluates the business value creation for the business as well as for society, from one period to the next.
In conclusion, the above-mentioned allows for the identification and naming of concepts that are discussed in Section 5.2.3 which is concerned with phase three of the conceptual framework development approach.

5.2.3 Phase 3: Identifying and naming concepts

Phase 3 introduces the identification and naming of concepts and elements that ultimately contribute to the discussion of core principles and processes throughout the conceptual framework methodology. From the discussion in Section 5.2.2, and as shown in Table 5.2, the main concepts identified are the SE approach with its four quadrants.

Table 5.2: Concepts and elements identified.

Concept	Supplementary concepts and elements
Systems engineering approach	**Define:**
	From perspective of the whole
	From perspective of the functional units
	Measure:
	From perspective of the whole
	From perspective of the functional units
Sustainability context	**System boundaries:**
	Economic dimension
	Social dimension
	Environmental dimension
Quadrant elements	Business sustainability context
	Business strategy
	Tactics
	Forms of value creation:
	Absolute forms of value creation
	Relative forms of value creation
Translation between quadrants	**quadrant I to quadrant II:** The translation between quadrants I and II requires the defining of the functional units in terms of business sustainability and the business sustainability dimensions.
	quadrant III to quadrant IV: The translation between quadrants III and IV requires the measurement of these business sustainability and sustainability dimensions- functional units.

The SE approach with its four quadrants allows for the identification of defining and measuring the system from the perspective of the 'whole' and defining and measuring the system from the perspective of the 'functional units'. The defining and measuring perspectives at an increased level of granularity should be done at the hand of the following two concepts: (i) sustainability context e.g. system boundaries (economic-, social-, and environmental dimension); and (iii) elements within each quadrant. Subsequently, the elements that are defined within each quadrant are: (i) the business sustainability context; (ii) the business strategy, and tactics tools; and (iii) forms of value creation (absolute or relative form of value creation). Subsequently, the SE approach creates a translation between quadrants I and II, and quadrants III and IV.

The following phase will provide a clearly defined definition of the different concepts and elements identified below, together with the categorisation of concepts.

5.2.4 Phase 4: Deconstructing and categorising the concepts

Phase 4 is concerned with deconstructing and categorising of the concepts identified in phase 3. These concepts are categorised according to their features, thus the distinctive

attribute of the concepts that deem as the functionality of the concept. As mentioned in the preceding section, the SE approach consists of four phases that are translated to four quadrants; each relating to a specific, sequential component of the problem-solving approach. The first quadrant considers the system as a whole, which can be broken down into 'smaller functional units' – such units are defined, presented in quadrant II. This implies a process of delineating the functional units that ultimately, when considered together, constitute the system as a whole. This inevitably means that a translation exercise is required between quadrants I and II. In quadrant II, each functional unit, and by implication the problem(s) at this increased level of granularity of the 'bigger' system-wide problem, is defined. Subsequently, in quadrant III, a solution can then be developed for the individual functional units, given that the problem is now clearly defined for each such unit. And lastly, the solutions developed for the individual functional units in quadrant III can be formed together as a solution for the system as a whole in quadrant IV. This as well means that a translation exercise is required between quadrants III and IV.

With regards to this research inquiry, concerned with business sustainability, the use of SE approach, where the four phases are translated to four quadrants will support the concept of defining and measuring business sustainability from the perspective of the system as a whole and from the perspective of functional units respectively, which ultimately contributes towards business sustainability.

Given the above outline of the proposed SE approach to address business sustainability, Figure 5.1 aims to conceptualise this in a schematic diagram, and is discussed in more depth below. Each quadrant is discussed in terms of three elements of the identified quadrant elements, e.g. business sustainability 'context', the business strategy, and tactics tools, and the forms of value creation (absolute-, and relative form), together with the respective translation between quadrants I and II, and quadrants III and IV.

Business sustainability 'context' defines and measures the sustainability actions (economic-, social-, and environmental dimension)s the business incorporates into its business actions with the aim to achieve and sustain sustainable vision over the short, medium and long-term respectively.

Simon Sinek's[1] golden circle enables actions to be inspired rather than manipulated and therefore the purpose, strategy and tactics should be explained first (Sinek, 2009). The purpose or belief is why a certain thing is done in that way. This follows with the strategy which is the remarkable factor that sets the framework apart from others. Lastly, the

[1] Video of Simon Sinek's golden circle

tactics are the actual actions that will be used to answer the purpose and strategy (Sinek, 2009). For this research enquiry the purpose and strategy will be considered as one concept as business strategy.

The business strategy from a business perspective aims to contribute towards business sustainability through defining and measuring business goals with a sustainable vision. Additionally, a business sustainability philosophy is defined and measured with a transparent orientation to contribute towards business sustainability while defining and achieving business goals. The tactics are the aspects that will be needed to achieve the business strategy. This requires the defining and measuring of business goals which form part of the business vision, and indicators for the perspective of the system as a 'whole' and for the perspective of the system as 'functional units'.

Business sustainability from a system as a 'whole', together with the discussion of the three elements, contributes to the absolute forms of value creation which are measured as the effectiveness across the business. Effectiveness represents the three dimensions of sustainability that contribute to the overall goal of the business sustainability vision. Business sustainability vision is the motivation to create and identify business sustainability opportunities to integrate these opportunities within the business success while advancing social and environmental surroundings. The functional units aim to achieve the compliance (e.g. business principles, codes of conduct and laws) of the business. Subsequently, the relative measures of the tactics indicate efficiency across the functional units and form part of the relative forms of value creation. These efficiency measures describe the relationship between the absolute value creation (effectiveness) in the different system boundaries of business sustainability.

Given the above outline of the various concepts identified and discussed allows for the integration of these concepts which ultimately will support the development of the Business Sustainability Framework.

5.2.5 Phase 5: Concept integration into a Business Sustainability Framework

Phase 5 allows for the integration and grouping of similar concepts as mentioned previously. Figure 5.1 which introduces the concept integration of the four quadrants of the Business Sustainability Framework illustrates a holistic solution of the concepts, supplementary concepts and elements identified throughout the previous phases.

The concepts, supplementary concepts and elements are defined from the perspective of a system as a 'whole' and from the perspective of the system as 'functional units' respectively.

This is discussed in quadrant I and quadrant II, which is followed by the measurement of the concepts, supplementary concepts and elements from the perspective of a system as a 'whole' and from the perspective of the system as 'functional units', in quadrant III and quadrant IV, respectively.

Referring to Figure 5.1, the perspective of the system as a 'whole' (quadrant I and quadrant IV) and the perspective of the system as 'functional units' (quadrant II and quadrant III) are illustrated on the y-axis, covering the horizontal area of the framework. These two perspectives can be considered as the business inputs, also known as the business environment and its respective business components. The defining and measuring perspectives are illustrated on the x-axis, where defining (quadrant I and quadrant II) and measuring (quadrant III and quadrant IV) cover the vertical area moving downwards in the framework.

Each quadrant and its concepts, supplementary concepts and elements are discussed in Tables 5.3 to 5.6. The discussion includes the collaboration of the business environment and its business components with the three dimensions of sustainability (economic, social, and environmental). Additionally, the effective and efficiency measures of the business environment and business components are expressed and discussed as the forms of value creation of the respective quadrants. Lastly, the translation action that is required from one quadrant to another is discussed. These quadrant discussions are used to synthesise the Business Sustainability Framework into a Business Sustainability Evaluation Tool, and is discussed in Section 5.2.6.

The aim of the Business Sustainability Framework (see Figure 5.1) is to serve as a generic and holistic guiding principle to contribute towards business sustainability, and thus for a business to adopt its business sustainability strategy to this guiding principle. The Business Sustainability Framework will guide the business to define its business sustainability context, the business strategy of its business sustainability purpose and aim, and lastly the tactics that will be used in order to achieve its purpose and strategy.

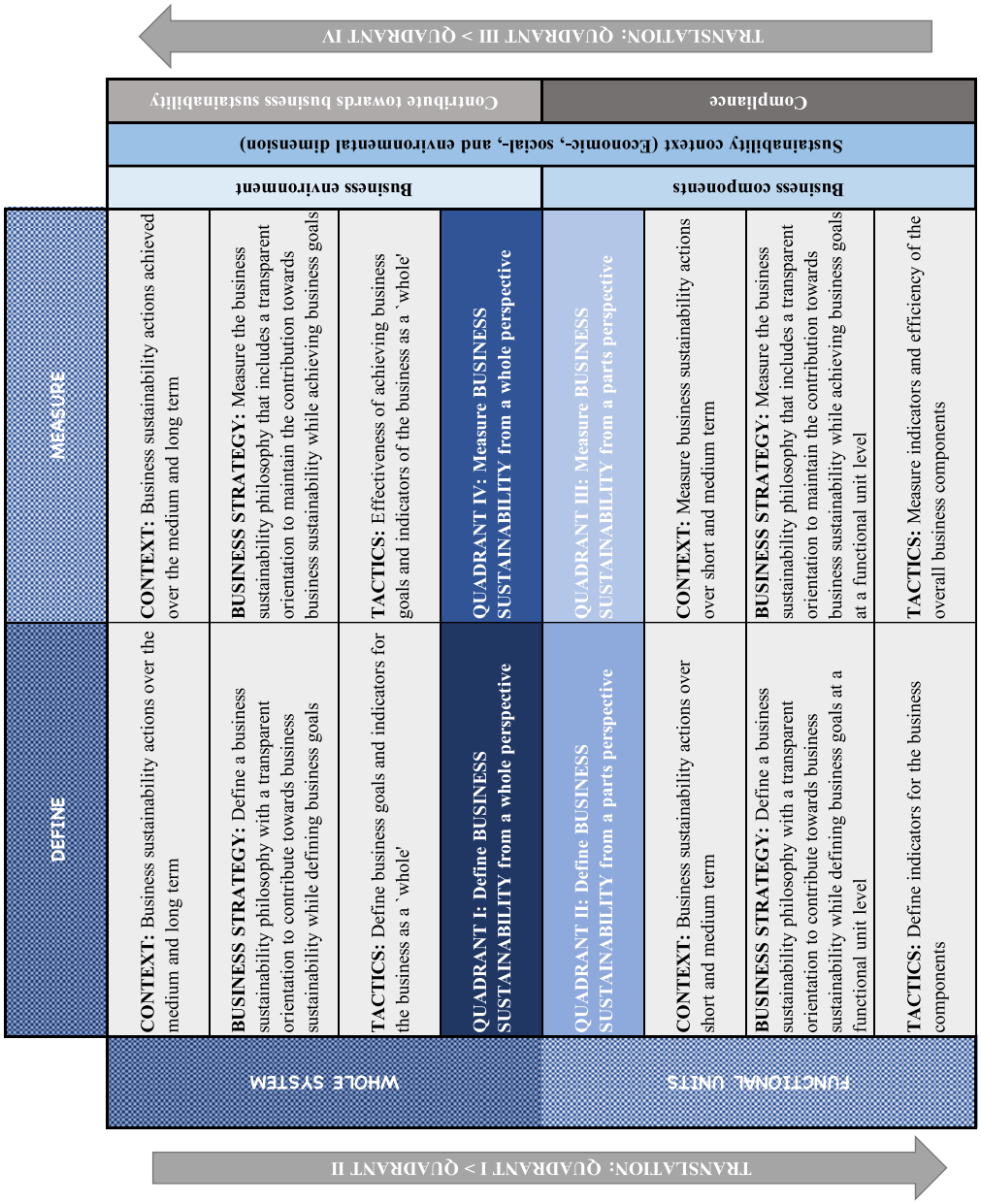

Figure 5.1: Business Sustainability Framework.

Table 5.3: Quadrant I: Define business sustainability from the perspective of the 'whole'.

Concept or element	Description
Quadrant I definition	Business sustainability from the perspective of a system as a 'whole' defines business sustainability as value created to its clients and stakeholders through creating and contributing towards a sustainable vision, while capturing economic value and maintaining, protecting and/or reproducing economic, social, and natural resources.
Context	The context considered in quadrant I is the business sustainability actions over the medium and long term. Business sustainability from the perspective of the 'whole' aims to include sustainability actions (including the economic, social, and environmental dimensions) into its business actions. Subsequently, it aims to be a functional and sustainable business over the medium and long term.
Business Strategy	The business strategy from a business perspective aims to contribute towards business sustainability through defining business goals with a sustainable vision. Defining a business sustainability philosophy from the perspective of a 'whole', with a transparent orientation to contribute towards business sustainability while defining business goals.
Tactics	The tactics explain the actions that will be used to achieve the business strategy. Business sustainability from the perspective of the 'whole' requires the defining of business goals and indicators for the business including the sustainability context and business strategy.
Forms of value creation	Business sustainability from the perspective of the 'whole' demonstrates absolute form of value creation. This quadrant allows to define business sustainability aspects in order to measure effectiveness across the organisation which ultimately will contribute to sustainable shared value creation.
Translation	Defining business sustainability from the perspective of the 'whole' creates the action for a translation to defining business sustainability from the perspective of the 'functional units'. This translation requires the business environment to be broken down into functional business components, which requires the defining of these functional business components in terms of sustainability.

Table 5.4: Quadrant II: Define business sustainability from the perspective of the 'functional units'.

Concept or element	Description
Quadrant II definition	Business sustainability from the perspective of a system as 'functional units' defines business sustainability as creating and contributing towards a sustainable vision while capturing economic value and maintaining or reproducing economic, social, and natural resources at the various 'functional units'– identified as business components.
Context	The context is the business sustainability actions over the short and medium term. Business sustainability from the perspective of the 'functional business components' aims to include sustainability actions (including the economic, social, and environmental dimensions) into its business functional units. Subsequently, it aims to define functional and sustainable functional units of the business over the short and medium term.
Business Strategy	The business strategy from a business perspective aims to contribute towards business sustainability through defining business goals with a sustainable vision. Defining a business sustainability philosophy from the perspective of a 'functional units', with a transparent orientation to contribute towards business sustainability while defining business goals.
Tactics	The tactics explain the actions that will be used to achieve the business strategy. Business sustainability from the perspective of the 'functional units' requires the defining of indicators for the respective 'functional units'.
Forms of value creation	Business sustainability from the perspective of the 'functional units' demonstrates relative forms of value creation. This quadrant allows to define business sustainability aspects and compliances at the various functional units which ultimately creates efficiency measurement which will contribute to sustainable shared value creation.
Translation	The translation between these quadrants is where the functional business components are defined in terms of the sustainability dimensions e.g. economic, social, and environmental.

Table 5.5: Quadrant III: Measure business sustainability from the perspective of the 'functional units'.

Concept or element	Description
Quadrant III definition	Business sustainability from the 'functional units' perspective measures the business sustainability value outcome of the business perspective from the 'functional units' that created and maintain shared value contribution, ensuring economic value is captured and economic, social, and natural resources are maintained or reproduced at the various 'functional units'– identified as business components.
Context	The context is the business sustainability actions over the medium and long term. Business sustainability from the perspective of the 'functional business components' aims to measure the sustainability actions (including the economic, social, and environmental dimensions) that were included in the business functional units. Subsequently, the measurement aims to be functional and sustainable at the functional units of the business over the short and medium term.
Business Strategy	The business strategy from a business perspective aims to contribute towards business sustainability through measuring business goals with a sustainable vision. Measuring a business sustainability philosophy from the perspective of a 'functional units', with a transparent orientation to maintain the contribution towards business sustainability while achieving business goals at a functional unit level.
Tactics	The tactics explain the actions that will be used to achieve the business strategy. Business sustainability from the perspective of the 'functional units' requires the measuring of indicators and the efficiency of the overall business components.
Forms of value creation	Business sustainability from the perspective of the 'functional units' demonstrates relative forms of value creation. This quadrant allows to measure business sustainability aspects and compliances which were defined at the various functional units which ultimately measure efficiency that will contribute to sustainable shared value creation.
Translation	Measuring business sustainability from the perspective of the 'functional units' creates the action for a translation to defining business sustainability from the perspective of the 'whole'. This translation requires the use of a suitable measuring method of the functional business components against the system boundaries of sustainability.

Table 5.6: Quadrant IV: Measure business sustainability from the perspective of the 'whole'.

Concept or element	Description
Quadrant IV definition	Measured business sustainability from a system as a 'whole' is the solution of the business sustainability value outcome of the measured business perspective from the 'functional units' that created and delivered shared value, ensuring economic value is captured and economic, social, and natural resources are maintained or reproduced at the various 'functional units'.
Context	The context is the business sustainability actions over the medium and long term. Business sustainability from the perspective of the 'whole' measured the business sustainability outcome of the functional and sustainable business actions (including the economic, social, and environmental dimensions) that were achieved over the medium and long term.
Business Strategy	The business strategy from a business perspective aims to contribute towards business sustainability through measuring and maintaining business goals with a sustainable vision. Measuring the business sustainability philosophy that includes a transparent orientation to maintain the contribution towards business sustainability while achieving business goals from the perspective of a 'whole'.
Tactics	The tactics explain the actions that will be used to achieve the business strategy. Business sustainability from the perspective of a 'whole' measures the effectiveness of whether the business goals and functional units achieved the desired sustainable vision.
Forms of value creation	Business sustainability from the perspective of a 'whole' demonstrates absolute form of value creation. This quadrant allows to measure the effectiveness of business sustainability aspects across the organisation which ultimately contribute to sustainability shared value creation.
Translation	The measuring method used in the translation exercise enables the business to govern, inform and measure a holistic solution for the sustainability from the perspective of a 'whole'.

5.2.6 Phase 6: Synthesise concepts into a Business Sustainability Evaluation Tool

Phase 6 synthesises the integrated concept discussion of the Business Sustainability Framework from phase 5 into the development of the Business Sustainability Evaluation Tool. The development consists of three stages with each stage discussing the identified quadrants and its associated elements as shown in the Business Sustainability Evaluation Tool, Figure 5.2. The three stages (define, measure, and monitoring and evaluation) with its respective quadrant discussion and translation, as illustrated in the Business Sustainability Evaluation Tool will be discussed in-depth below. The completed seven business

components with its integrated three stages can be seen in Appendix C.

5.2.6.1 Stage one: Define

This stage, as shown in Figure 5.2, is primarily concerned with the development of quadrant I and quadrant II, thus defining business sustainability in terms of the seven business components. In addition, it also deals with the translation of concepts defined in quadrant I to the concepts in quadrant II; thus implying that the concepts in quadrant II are defined at the hand of the concepts in quadrant I.

Quadrant I: Define business sustainability from the perspective of the 'whole'.

Lüdeke-Freund *et al.* (2016), proposed a typology from a methodological point of view, which ultimately serves to envision that the seven business components aim to adopt and contribute towards business sustainability.

The business environment envisions economic effectiveness through the process of re-purposing the business for society and the environment while seeking for inclusive creation which ultimately develops sustainable scale-up solutions. The business environment enhances the legitimacy of social effectiveness by delivering functionality rather than ownership while adopting stewardship roles and encouraging sufficiency. Improving the state of environmental effectiveness requires the business environment to maximise material and energy efficiency by closing resource loops and substituting them with renewable and natural processes (Lüdeke-freund et al.*, 2018).*

At this level, the individual business components are defined in terms of sustainability and how it contributes to the holistic view of business sustainability from the perspective of the 'whole'. Subsequently, it is the process of re-purposing the business for society and the environment while seeking for inclusive creation which ultimately develops sustainable scale-up solutions. The sustainability definitions of the seven business components against sustainability are shown in Table 5.7.

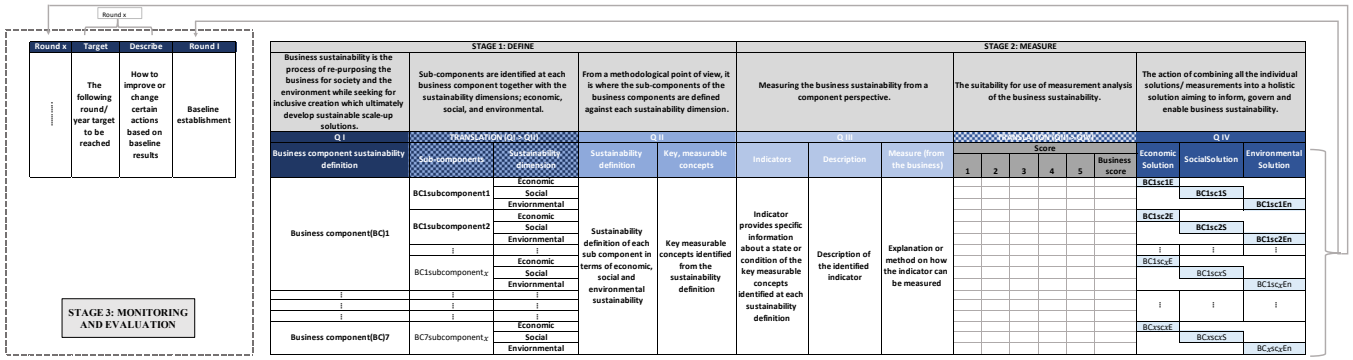

Figure 5.2: Business Sustainability Evaluation Tool.

Table 5.7: Quadrant I: Business component sustainability definition.

Business component	Business component sustainability definition
Business development	Business development that considers sustainable practices as the cornerstone of the business's survival. The implementation of economic, social and environmental sustainable actions within the business's development can become a source of competitive advantage (Giannoni *et al.*, 2017).
Organisational growth	Organisational growth includes the concepts from sustainability and synthesises those with the concepts of organisational management, which is central to realising the corporate value, corporate evolutionary growth, and corporate internal adjustment (Zhang *et al.*, 2016).
Strategic planning	Strategic planning that includes sustainable strategies reflects a business's awareness of the social, economic, and environmental effects of its activities. These strategies are implemented in the short, medium, and long term by developing capabilities and skills that ensure sustainable competitive advantages (Giannoni *et al.*, 2017).
Performance management	The inner organisation of sustainability is integrated with the organisation's business strategy so that the value generated through sustainability initiatives has direct impact on the organisation's overall performance (Zhang *et al.*, 2016).
Organisational structure	The intention of the organisational structure emerging sustainability actions is to enable a diverse set of roles, occupied by employees with divergent interests, to accomplish organisational objectives. The emerging role of sustainability matters interplays extensive forces between the top-down and bottom-up influences (Sandhu & Kulik, 2018).
Management and leadership development	The internal management growth is a process of working with people and resources within purpose, structure, rewards, support mechanism, and leadership to complete organisational change for sustainability (Zhang *et al.*, 2016).
Culture management	Culture management and change management strategies include the balance and application of environmental, social, and economic elements (Bernardo *et al.*, 2013). Incorporating sustainability as part of corporate culture, the shared value transforms from hard to soft (i.e. attention on human values). Result in higher probability of sustainable initiatives (Gupta & Kumar, 2013).

Translation: quadrant I to quadrant II

The translation of concepts defined in quadrant I to the concepts in quadrant II implies the identification of sub-components of the business component that is defined in quadrant I, which requires the alignment at the hand of the identification of the sustainability system boundaries (economic-, social-, and environmental dimension).

Quadrant II: Define business sustainability from the perspective of 'functional units'.

The identified sub-components from the translation of concepts defined in quadrant I, are individually defined against the three system boundaries of sustainability (economic-, social-, and environmental dimension). Within these individual sub-component sustainability definitions, various key, measurable concepts are identified which provide specific measurable guidelines for the selection of indicators, which is prior to the measuring of business sustainability concepts in the following stage. The sustainability definitions and key, measurable concepts of the seven business components and its sub-components are defined in Table 5.8 to 5.14.

Table 5.8: Quadrant II: Business sustainability defined from Business development functional units.

Sub-component	Sustainability dimension	Definition	Key, measurable concepts
Market	Economic	The business that includes local economic impacts, generate economic value, and promotes economic growth without compromising social and environmental actions (Global Reporting Initiative, 2016; Searcy, 2016).	Local economic impact
			Generate economic value
			Promote economic growth
	Social	The market in which the business operate should include local community interactions, operations within local communities and identified market niches (Global Reporting Initiative, 2016; United Nations Global Compact, 2017).	Local community interactions
			Operations within local communities
			Identified market niches
	Environmental	The responsible business decisions the business makes to reduce business' negative impact on the environment. These actions include the trend towards investing in environmentally sustainable markets, and acting responsible towards the community by choosing the preferred markets (Failte Ireland, 2018).	Investing in environmentally sustainable markets
			Market analysis
			Business environmental impact
Products and services	Economic	Changing the way of business by addressing local communities, and including local suppliers into the products and services business actions (Nasiri *et al.*, 2018).	Local community interactions
			Local economic impact
	Social	The social responsibility of the products and services is the commitment to be responsible for the quality of life within the local community that will ensure customer satisfaction, by using local suppliers (Labuschagne *et al.*, 2005).	Local suppliers
			Quality of product and service
			Safety of product and service
	Environmental	Monitoring the materials, transport and energy usage of the products and services ensuring the product and service provide value for customers (Failte Ireland, 2018).	Materials identified
			Energy consumption
			Transport environmental impact

Table 5.8 continued from previous page

Sub-component	Sustainability dimension	Definition	Key, measurable concepts
Resource management	Economic	Resource efficiency that creates long-term, sustainable value for all stakeholders, local community engagement and understanding and adhering to customer needs (Lexicon, 2018; Moore & Manring, 2008).	Generate economic value
			Local community engagement
			Indirect economic impacts
	Social	The involvement that resources have on society in terms of job creation, training and educating programmes to employees operating within the local community (Global Reporting Initiative, 2016; Labuschagne *et al.*, 2005).	Job creation
			Training programmes
			Local community interactions
	Environmental	Environmental resource management provides a structured system that supports environmental efficiency into the business's culture and mitigate risks (Lexicon, 2018).	Business environmental impact
Operational systems	Economic	The monitoring of the economical targets and impacts on the operational systems of the business, ensuring the operational systems are quantifiable (Chouinard *et al.*, 2011; Gunasekaran & Irani, 2014).	Operational economic impacts
	Social	Operational systems should include the basic values of equity, social justice, and community engagement ensuring human needs are satisfied (Ajmal *et al.*, 2017).	Equity values
			Human rights
	Environmental	Operational systems should fully comply with environmental regulations with regards to operational sites owned/leased and environmental protection expenditures and investments (Ajmal *et al.*, 2017).	Operational sites
			Environmental protection
Management systems	Economic	Management systems should create awareness of economical sustainability throughout the business functions by supporting local suppliers, resource efficiency improvements due to market related wage regulations (Ajmal *et al.*, 2017).	Local suppliers
			Wage regulations
	Social	Management systems should ensure stakeholder engagement occurs in local communities and equity plays an important role across the business actions (Lexicon, 2018).	Stakeholder engagement
	Environmental	Management systems monitor, file, address, and resolve the environmental actions of the business functions (Ajmal *et al.*, 2017).	Environmental impact
Corporate culture	Economic	Corporate culture of the business should create and integrate economical sustainability awareness throughout the business strategies and beliefs (Ttruanu *et al.*, 2013).	Economic awareness
			Economic strategies
	Social	The social sustainability impact on corporate culture is the common space where the business and its community share a mutual belief about social equity and responsibility (Ttruanu *et al.*, 2013).	Social equity
	Environmental	Corporate culture of the business includes efforts to support a healthy environment and to improve others' lives, operating with success on long-term (Ttruanu *et al.*, 2013).	Environmental awareness

Table 5.9: Quadrant II: Business sustainability defined from Organisational growth functional units.

sub-component	Sustainability dimension	Definition	Key, measurable concepts
New venture	Economic	The new venture should be sustainably orientated from the start-up by creating opportunities and intentions to create value from an economic perspective. The new venture should state the various infrastructure investments and how local communities will be supported (Criado-Gomis *et al.*, 2017).	Create economic value
			Infrastructure investments
			Local communities
	Social	The discovery and exploitation of social opportunities through the generation of local markets and communities. The focus will be on preservation of community interactions, equity and job creation (Criado-Gomis *et al.*, 2017).	Local communities
			Local suppliers
			Local workforce
	Environmental	The ability to illustrate responsible creativity environmental development and management natural resources usage (Criado-Gomis *et al.*, 2017).	Environmental impact
Expansion	Economic	Economic development becomes part of the core values of the business operations. These values include long-term financial sustainability, economic drivers and growth through partnerships (Moorhouse and Associates, 2016).	Long-term economic drivers
			Economic partnerships
	Social	Expansion should focus on the importance of a balanced workforce, public relations efforts and ensuring health and safety towards employees and the community (Sustainability Edge Solutions, 2017).	Balanced workforce
			Health and safety
			Employee rate
	Environmental	Well established environmental plans and the continuing commitment from the business to behave ethically and contribute to the established environmental policies (Criado-Gomis *et al.*, 2017).	Environmental plan
			Environmental policies
Professionalism	Economic	Economic perspective of the professionalism perspective of the business should prioritise and plan for future development initiatives and support inter-governmental efforts to promote economic development (Elzinga *et al.*, 2011).	Future development initiatives
			Inter-governmental efforts
	Social	Professionalism of a business should by now have a well executable human rights and labour relations plan in the workforce (Aho, 2013).	Labour relations
			Human rights relations
			Workforce environment
	Environmental	Environmental plans should be consistent and executed with integrity on a continuous level (Ganescu, 2012).	Environmental plan
Consolidation	Economic	Ensuring the economic business strategies deliver services and infrastructure on a sustainable basis (Elzinga *et al.*, 2011).	Economic strategies
	Social	Social capital is used to obtain a strategic advantage, the effects of the community are taken into consideration and integrated into the business strategy (Aho, 2013).	Social strategies
	Environmental	Proactive environmental strategies are valued as sources of strategic business opportunities (Ganescu, 2012).	Environmental strategies

Table 5.10: Quadrant II: Business sustainability defined from Strategic planning functional units.

Sub-component	Sustainability dimension	Definition	Key, measurable concepts
Environmental scan	Economic	The environmental scan evaluate all the trends of potential sources of revenue, operational and resource efficiencies (Hopkins *et al.*, 2009).	Operational efficiency
			Revenue sources
	Social	The environmental scan should evaluate the current and competitive market whether the social plans are acceptable and up to date with the latest social sustainable activities (Sarkis *et al.*, 2010)	Competitive market
			Social plans
			Social market activities
	Environmental	The acknowledgement of current environmental initiatives and evaluating the initiatives within the market and identifying any improvements (Walsh & Dodds, 2017).	Environmental initiatives
			Environmental plans
Organisational assessment	Economic	Assessing the current economic performance of the organisation which enables the process to identify threats and opportunities (Sala *et al.*, 2015).	Economic opportunities
			Economic threats
	Social	Assessing whether the social sustainability plans contribute optimal sustainable development to the community and employees (Sala *et al.*, 2015).	Community contribution
			Employee contribution
	Environmental	Assessing the environmental sustainability strategies, identifying the threats and opportunities which can be improved (Sala *et al.*, 2015).	Environmental strategy
			Environmental laws
Strategic issues	Economic	The strategic issues evaluate whether all the business functions perform according to the desired economic sustainable outcome (Singh *et al.*, 2009).	Economic strategy
			Sustainability goals
	Social	Strategic issues identify whether the appropriate strategic objectives and initiatives for social sustainability is executed throughout the business functions (Figge *et al.*, 2002).	Social strategy
			Sustainability goals
	Environmental	The strategic issues evaluate whether the environmental aspects of the business functions are integrated according to the identified sustainability strategy (Figge *et al.*, 2002).	Environmental strategy
			Sustainability goals
Strategic business plan	Economic	The strategic business plan compiles all the required improvements of economic sustainability actions and develop a new and updated sustainability plan (Moore & Manring, 2008).	Economic sustainability actions
			Sustainability plan
	Social	The intent of the strategic business plan is to ensure a policy structure and strategies are in place to anticipate and respond to changing social needs in a rapidly growing community (Moorhouse and Associates, 2016).	Policy structure
			Social needs for community
	Environmental	Strategic business plan align the environmental strategy with the business strategy to maintain a dynamic balance to optimise the rate of sustainable change (Moore & Manring, 2008).	Environmental strategy
			Sustainable change
Budgeting	Economic	The annual budget should include long-term economic projections. The projections would be baselines, as it would assume the current revenue and spending policies and it would include the estimated impact of fiscal trends (Schick, 2005).	Long-term economic goals
			Economic projections
	Social	Social budget work focuses on building long-term projections for social sustainability actions. Continuously improving society's goals and workforce environment (Schick, 2005).	Long-term social goals
			Social workforce environment
	Environmental	The environmental management processes that can be significant activities affecting the environmental budget (Burritt & Schaltegger, 2001).	Environmental budget and expenditures
Management review	Economic	Management review reports should include feedback and improvements of the quarterly economic sustainability performances (Szekely & Knirsch, 2005).	Economic performances
	Social	Management review reports should include feedback and improvements of the quarterly social sustainability performances (Szekely & Knirsch, 2005).	Social performances
	Environmental	Management review reports should include feedback and improvements of the quarterly environmental sustainability performances (Szekely & Knirsch, 2005).	Environmental performances

Table 5.11: Quadrant II: Business sustainability defined from Performance management functional units.

Sub-component	Sustainability dimension	Definition	Key, measurable concepts
Key result areas	Economic	Key result areas measure the success of the economic sustainability performances at all business levels. This success factor provides an indication if the economic plans are executed correctly (Umble *et al.*, 2003).	Economic sustainability performances
			Economic plans
	Social	The key result areas of the social activities can be measured as the success of a corporate sustainability strategy (Raudelinien *et al.*, 2014).	Social sustainability strategy
	Environmental	Key result areas illustrate the long-term impact of its products or services and processes on the environment (Moldan *et al.*, 2012).	Environmental impact of products and services
Objectives	Economic	The economic sustainability objectives support the business to assess the extent to which the implementation of a proposal contributes to the sustainability vision (Pope *et al.*, 2004).	Sustainability vision
			Sustainability mission
	Social	The social sustainability objectives support the business to assess the extent which the implementation of a proposal contributes to the sustainability vision (Pope *et al.*, 2004).	Sustainability vision
			Sustainability mission
	Environmental	The environmental sustainability objectives which are regeneration, substitutability and assimilation that should be aligned against the business objectives (Moldan *et al.*, 2012).	Sustainability vision
			Sustainability mission
Goals	Economic	The economic sustainability goals are used as a measurement of the performance levels of the business sustainability performance (Journeault, 2016).	Sustainability goals
			Business performance
	Social	The social sustainability goals serve as a measuring method of the business sustainability performance (Pope *et al.*, 2004).	Sustainability goals
			Local community
	Environmental	The environmental sustainability goals are used as a measurement of the performance levels of the business sustainability performance (Moldan *et al.*, 2012).	Sustainability goals
			Environmental impact
Measurement	Economic	Measurement of economic sustainability illustrates the business performance against the identified benchmark year (Pope *et al.*, 2004).	Business performance
	Social	Measurement of social sustainability illustrates the business performance against the identified benchmark year (Pope *et al.*, 2004).	Business performance
	Environmental	Measurement of environmental sustainability illustrates the business performance against the identified benchmark year (Moldan *et al.*, 2012).	Business performance
Progress review	Economic	Report the economic performance of the business using the goals, objectives and measurement as supporting guidance (Pope *et al.*, 2004).	Economic performance with supporting guidance
	Social	Report the social performance of the business using the goals, objectives and measurement as supporting guidance (Pope *et al.*, 2004).	Social performance with supporting guidance
	Environmental	Report the environmental performance of the business using the goals, objectives and measurement as supporting guidance (Moldan *et al.*, 2012).	Environmental performance with supporting guidance
Performance evaluation	Economic	Using the progress review to evaluate the performance of economic sustainability actions of the business (Dias-Sardinha & Reijnders, 2001).	Progress review
	Social	Using the progress review to evaluate the performance of social sustainability actions of the business (Dias-Sardinha & Reijnders, 2001).	Progress review
	Environmental	Using the progress review to evaluate the performance of environmental sustainability actions of the business (Dias-Sardinha & Reijnders, 2001).	Progress review
Rewards	Economic	Internal business rewards are given to the various business departments, sustainability managers and teams that succeed in their economic sustainability performance (Epstein & Roy, 2001).	Business rewards
	Social	Internal business rewards are given to the various business departments, sustainability managers and teams that succeed in their social sustainability performance (Epstein & Roy, 2001).	Business rewards
	Environmental	Internal business rewards are given to the various business departments, sustainability managers and teams that succeed in their environmental sustainability performance (Epstein & Roy, 2001).	Business rewards

Table 5.12: Quadrant II: Business sustainability defined from Organisational structure functional units.

Sub-component	Sustainability dimension	Definition	Key, measurable concepts
Structure alignment	Economic	Economic sustainability roles should be aligned with the business structure together with business supporting roles (Rodriguez *et al.*, 2018).	Economic sustainability roles
	Social	Social sustainability roles should be aligned with the business structure together with business supporting roles (Rodriguez *et al.*, 2018).	Social sustainability roles
	Environmental	Environmental sustainability roles should be aligned with the business structure together with business supporting roles (Rodriguez *et al.*, 2018).	Environmental sustainability roles
Functional contribution	Economic	Economic sustainability roles aligned with the business and employee roles will contribute to a functional sustainable objective and goal (Latyshova *et al.*, 2015).	Employee roles
			Objectives and goals
	Social	Social sustainability roles aligned with the business and employee roles will contribute to a functional sustainable objective and goal (Latyshova *et al.*, 2015).	Employee roles
			Objectives and goals
	Environmental	Environmental sustainability roles aligned with the business and employee roles will contribute to a functional sustainable objective and goal (Latyshova *et al.*, 2015).	Employee roles
			Objectives and goals
Clarity and contribution of individual roles	Economic	Clarify if the economic sustainability roles are aligned with a clear defined function towards the business roles (Bridgstock, 2009).	Sustainability roles have a function within the business roles
	Social	Clarify if the social sustainability roles are aligned with a clear defined function towards the business roles (Bridgstock, 2009).	Sustainability roles have a function within the business roles
	Environmental	Clarify if the environmental sustainability roles are aligned with a clear defined function towards the business roles (Bridgstock, 2009).	Sustainability roles have a function within the business roles
Clarity and structure of reporting relationships	Economic	Economic sustainability structure reports should support the outline and requirements of progress review of the business (Bridgstock, 2009).	Economic sustainability structure report
	Social	Social sustainability structure reports should support the outline and requirements of progress review of the business (Bridgstock, 2009).	Social sustainability structure report
	Environmental	Environmental sustainability structure reports should support the outline and requirements of progress review of the business (Bridgstock, 2009).	Environmental sustainability structure report
Appropriate span of control and number of organisational levels	Economic	A number of employees who are assigned to a dedicated economic sustainability role (Szekely & Knirsch, 2005).	Employee roles
	Social	A number of employees who are assigned to a dedicated social sustainability role (Szekely & Knirsch, 2005).	Employee roles
	Environmental	A number of employees who are assigned to a dedicated environmental sustainability role (Szekely & Knirsch, 2005).	Employee roles
Appropriate management/ leadership and technical skills	Economic	Ensure employees have the required skills to execute the required economic sustainability role (Wagner & Schaltegger, 2003).	Employee skills
	Social	Ensure employees have the required skills to execute the required social sustainability role (Wagner & Schaltegger, 2003).	Employee skills
	Environmental	Ensure employees have the required skills to execute the required environmental sustainability role (Wagner & Schaltegger, 2003).	Employee skills
Effective coordination	Economic	Employees should effectively coordinate the economic sustainability roles among co-employees (Bianchi, 2012).	Diversity of sustainability roles
	Social	Employees should effectively coordinate the social sustainability roles among co-employees (Bianchi, 2012).	Diversity of sustainability roles
	Environmental	Employees should effectively coordinate the environmental sustainability roles among co-employees (Bianchi, 2012).	Diversity of sustainability roles
Appropriate supporting systems	Economic	Managing of all the economic sustainability systems and functions and how they interact with one another (Bianchi, 2012).	Economic sustainability systems
	Social	Managing of all the social sustainability systems and functions and how they interact with one another (Bianchi, 2012).	Social sustainability systems
	Environmental	Managing of all the environmental sustainability systems and functions and how they interact with one another (Bianchi, 2012).	Environmental sustainability systems

Table 5.13: Quadrant II: Business sustainability defined from Management and leadership development functional units.

Sub-component	Sustainability dimension	Definition	Key, measurable concepts
Role concept	Economic	Economic sustainability role outline should be extensively defined so that any employee can take over roles without any constraints (Figge *et al.*, 2002).	Sustainability role outline
	Social	Social sustainability role outline should be extensively defined so that any employee can take over roles without any constraints (Figge *et al.*, 2002).	Sustainability role outline
	Environmental	Environmental sustainability role outline should be extensively defined so that any employee can take over roles without any constraints (Figge *et al.*, 2002).	Sustainability role outline
Management/ leadership skills	Economic	Management and leadership skills support economic sustainability roles to better execute their sustainability functions and to cohesively work together as teams (Bridgstock, 2009).	Management and leadership skills
	Social	Management and leadership skills support social sustainability roles to better execute their sustainability functions and to cohesively work together as teams (Bridgstock, 2009).	Management and leadership skills
	Environmental	Management and leadership skills support environmental sustainability roles to better execute their sustainability functions and to cohesively work together as teams (Bridgstock, 2009).	Management and leadership skills
Attitudes/ psychological factors	Economic	In order to execute a successive economic sustainability role one should have self-belief and continuously improve one's capabilities and thus rewards will follow (Bridgstock, 2009).	Self-belief
			Individual's capabilities
	Social	In order to execute a successive social sustainability role one should have self-belief and continuously improve one's capabilities and thus rewards will follow (Bridgstock, 2009).	Self-belief
			Individual's capabilities
	Environmental	In order to execute a successive environmental sustainability role one should have self-belief and continuously improve one's capabilities and thus rewards will follow (Bridgstock, 2009).	Self-belief
			Individual's capabilities

Table 5.14: Quadrant II: Business sustainability defined from Culture management functional units.

Sub-component	Sustainability dimension	Definition	Key, measurable concepts
Customer-client orientation	Economic	Economic sustainability interactions with clients should be built on a reliable and responsive relationship assuring high quality of products and services (Trivellas & Dargenidou, 2009).	Client interaction
			Quality of products and services
	Social	Social sustainability interactions with clients should be built on a reliable and responsive relationship assuring high quality of products and services (Latyshova *et al.*, 2015; Trivellas & Dargenidou, 2009).	Client interaction
			Quality of products and services
	Environmental	Environmental sustainability interactions with clients should be built on a reliable and responsive relationship assuring high quality of products and services (Trivellas & Dargenidou, 2009).	Client interaction
			Quality of products and services
Orientation towards employees	Economic	Economic sustainability culture is associated with employee in-role and extra-role behaviours (Latyshova *et al.*, 2015).	Employee roles and behaviour
	Social	Social sustainability culture is associated with employee in-role and extra-role behaviours (Latyshova *et al.*, 2015).	Employee roles and behaviour
	Environmental	Environmental sustainability culture is associated with employee in-role and extra-role behaviours (Latyshova *et al.*, 2015).	Employee roles and behaviour
Standards of performance	Economic	Each employee should perform his/her role at a high standard, ensuring economic sustainability actions are executed at a high level of quality (Rodriguez *et al.*, 2018).	Employee performance
			Quality of performance
	Social	Each employee should perform his/her role at a high standard, ensuring social sustainability actions are executed at a high level of quality (Rodriguez *et al.*, 2018).	Employee performance
			Quality of performance
	Environmental	Each employee should perform his/her role at a high standard, ensuring environmental sustainability actions are executed at a high level of quality (Rodriguez *et al.*, 2018).	Employee performance
			Quality of performance
Commitment to change	Economic	Any changes that are executed in the business should not have an immediate effect on the economic sustainability policies, if so, the policies should be adjusted without any disruption (Rodriguez *et al.*, 2018).	Business changes
			Addressing changes
	Social	Any changes that are executed in the business should not have an immediate effect on the social sustainability policies, if so, the policies should be adjusted without any disruption (Rodriguez *et al.*, 2018).	Business changes
			Addressing changes
	Environmental	Any changes that are executed in the business should not have an immediate effect on the environmental sustainability policies, if so, the policies should be adjusted without any disruption (Rodriguez *et al.*, 2018).	Business changes
			Addressing changes

5.2.6.2 Stage two: Measure

This stage, as shown in Figure 5.2, is primarily concerned with the development of quadrant III and quadrant IV, thus measuring business sustainability in terms of the seven business components. In addition, it also deals with the translation of concepts defined in quadrant III to the concepts in quadrant IV; thus implying that the concepts in quadrant IV are the business sustainability solution of the concepts measured in quadrant III.

Quadrant III: Measure business sustainability from the perspective of 'functional units'.

For each sub-component defined in quadrant II, a number of indicators are selected that address the key, measurable concepts identified. The indicators are selected from a 'pool' of indicators which is compiled from literature (See Table 5.15). For each such indicator, a description is given. The description of the indicators provides explanatory information about the selected indicators. A measure is subsequently defined for each indicator that outlines how a business should measure the selected indicators at the various sub-component levels of the seven business components. The function of this measure is to define the correlated indicator in their business term, meaning that it should be defined from their view of business. These indicators with their descriptions and measurement of the seven business components are shown in Table 5.16 to 5.22.

Table 5.15: References of 'pool' of indicators.

Pool of indicators: References		
Global Reporting Initiative (2016)	Sarkis *et al.* (2010)	Bridgstock (2009)
Raudelinien *et al.* (2014)	Searcy (2016)	Walsh & Dodds (2017)
United Nations Global Compact (2017)	Sala *et al.* (2015)	Ajmal *et al.* (2017)
Failte Ireland (2018)	Singh *et al.* (2009)	Latyshova *et al.* (2015)
Sustainability Edge Solutions (2017)	Figge *et al.* (2002)	Ganescu (2012)
Labuschagne *et al.* (2005)	Wagner & Schaltegger (2003)	Aho (2013)
Moore & Manring (2008)	Schick (2005)	Rodriguez *et al.* (2018)
Lexicon (2018)	Burritt & Schaltegger (2001)	Epstein & Roy (2001)
Gunasekaran & Irani (2014)	Szekely & Knirsch (2005)	Journeault (2016)
Chouinard *et al.* (2011)	Umble *et al.* (2003)	Nasiri *et al.* (2018)
Dias-Sardinha & Reijnders (2001)	Moldan *et al.* (2012)	Elzinga *et al.* (2011)
Moorhouse and Associates (2016)	Bianchi (2012)	Pope *et al.* (2004)
Criado-Gomis *et al.* (2017)	Ttruanu *et al.* (2013)	Hopkins *et al.* (2009)

Table 5.16: Quadrant III: Business sustainability measured from Business development functional units.

Indicators	Description	Measure (from the business)
Direct economic value generated (EVG)* [1]	Revenues	Percentage of annual revenue
Economic value distributed(EVD)*	Operating costs	Percentage of total EVD
	Community investments	Percentage of total EVD
	Payments to providers of capital	Percentage of total EVD
Asses local economic impacts at market level*	Economic value generated and distributed	Ratio between generated and distributed
Operations with actual and potential negative impacts on local communities*	Location of operations and impacts of operations	Radius from business location
Report the identified markets for selling of products or services	Number of identified markets	Number of markets
Percentage of operations with implemented local community engagement*	Percentage operations engagement	Percentage of local community engagement
Total environmental protection expenditures and investments by type*	Prevention and environmental management costs	Percentage out of total environmental costs
	Waste disposal	Percentage out of total environmental costs
	Emissions treatment	Percentage out of total environmental costs
Preferred market's environmental plan	Addressing own environmental plan against market's plan	Impact of environmental plan
Proportion of spending on local suppliers at significant locations of operation*	Percentage of budget used for locations of operation spent on suppliers local to that operation	Percentage budget value of local suppliers
Significant indirect economic impacts*	Economic impact of the use of products and services	Harm/risk test
Percentage of new suppliers from local sources*	Percentage of new suppliers	Percentage of new suppliers from total suppliers
Type of product and service information required by the business's procedures for product and service information and labelling*	Sourcing of components of the product or service	Components description document
	Safe use of the product or service	Safety compliance document
Percentage of significant product and service categories for which health and safety impacts are assessed for improvement*	Health and safety impacts	Harm/risk test
Materials used by weight or volume*	Total weight or volume of materials	Percentage materials used of total materials against benchmark value
Energy consumption within the business*	Total fuel, joules, watt-hours, consumption	Percentage energy consumption against benchmark value
Significant environmental impacts of transporting products and other goods and materials for the organisation's operations*	Impact of transporting products and other goods	Harm/risk test
Economic value distributed(EVD)*	Employee wages and benefits	Percentage of total EVD
	Community investments	Percentage of total EVD
Proportion of senior management hired from local community*	Percentage of senior management hired	Percentage of senior management of local community
Significant indirect economic impacts*	Jobs supported in the supply chain	Job aligned with supply chain requirement document
	Changing the productivity of sectors	Percentage productivity

Table 5.16 continued from previous page

Indicators	Description	Measure (from the business)
Total number and rates of new employee hires and employee turnover*	Total number and rate of new employee hires	Percentage of new employees
	Total number and rate of employee turnover	Percentage of employee turnover
Average hours of training per year per employee by gender, and by employee category*	Hours of training	Percentage of hours from total hours available
Percentage of new suppliers from local sources*	Percentage of new suppliers	Percentage of new suppliers
Total environmental protection expenditures and investments by type*	Prevention and environmental management costs	Percentage out of total environmental costs
	Waste disposal	Percentage out of total environmental costs
	Emissions treatment	Percentage out of total environmental costs
Significant indirect economic impacts*	Economic impact of change in location of operations and activities	Percentage of economic change/ growth
Equal opportunities	Identified opportunities	Opportunities of equal rights
Total number and percentage of operations that have been subject of human rights reviews	Number of operations	Number of operations under review
	Percentage of operations	Percentage of operations under review
Report information of operational sites owned/manage	Geographic location	List of specified business action document
	Type of operation	List of specified business action document
Total environmental protection expenditures and investments by type*	Prevention and environmental management costs	Percentage out of total environmental costs
	Waste disposal	Percentage out of total environmental costs
	Emissions treatment	Percentage out of total environmental costs
Proportion of spending on local suppliers at significant locations of operation*	Percentage of budget used for locations of operation spent on suppliers local to that operation	Percentage budget value of local suppliers
Ratios of standard entry level wage to local minimum wage	Ratio of entry level wage at location of operation	Ratio expressed as percentage
	Ratio of wage in terms of market related and experience level	Ratio expressed as percentage
Joint decision making of involving stakeholders	Report stakeholder engagement interactions	Engagement interaction plan
Number of incidents of discrimination and corrective actions taken*	Report the number and status of incidents	Number of incidents
Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms*	Number of environmental impacts filed	Number of impacts files
Concern for cost reduction	Cost reduction plans	Cost reduction plan document
Long-term sustainable orientation	Innovative plans	Innovative plan document
High ethical standards and responsibility	Ethical procurement in place	Ethical procurement procedures document
Respect for fundamental human rights	Human rights policy plan	Human rights policy plan document
Support for community development by monitoring waste	Total waste by type and method	Waste category plan document

Table 5.17: Quadrant III: Business sustainability measured from Organisational growth functional units.

Indicators	Description	Measure (from the business)
Development and impact of infrastructure investments and services supported*	Report the development of infrastructure investments	Infrastructure investment document
	Report current/expected impacts on communities and local economies	Percentage of economic impact change
Proportion of spending on local suppliers at significant locations of operation*	Percentage of budget used for locations of operation spent on suppliers local to that operation	Percentage budget value of local suppliers
Operations with local community engagement*	Report local community development programmes	Development programme document
	Social impact assessments based on participatory processes	Social impact assessment
Percentage of new suppliers from local community*	Percentage of new suppliers	Percentage of new suppliers against previous year
Percentage of workforce from local community	Percentage of employees from local community	Percentage of employees (local) against total employees
Environmental impacts of products and services*	Report environmental impacts of products and services used	Harm/ risk test
Long-term financial plan aligned with business goals and objectives	Develop/ update long term sustainable financial plan	Sustainable financial plan document
Pursue the economic objectives in the financial plan	Create opportunities of these economic objectives	Prospective business actions document
Ensure effective economic development partnerships	Satisfying measurement with partnerships	Partnership satisfaction
Diversity in the workplace	Change/ addressing employment norm	Employment norm satisfaction
Customer health and safety*	Assessment of health and safety impacts of products and services	Harm/risk test
Employee turnover*	Total number and rate of employee turnover	Employee turnover rate
Total environmental protection expenditures and investments by type*	Prevention and environmental management costs	Percentage environmental prevention costs of total prevention costs
	Emissions treatment	Percentage completion of preventative plan
Create policies for environmental plans	Develop baseline information for current environmental areas	Environmental policy plan document
	Establish waste, emissions, transport management policies	Environmental policy plan document
Enhance and strengthen the economy	A number of management practices creating economic sustainability awareness	Number of management practices
Growth through partnerships	Develop/ update community partnerships to encourage economic development	Community partnership document
Labour management relations	Report notice periods regarding operational changes	Notice period plan document
Local community interactions	Number of the local community interaction plans	Number of interaction plans with community
Working conditions and job security	Job security plans agreement	Job safety and security plan document
Total environmental protection expenditures and investments by type*	Prevention and environmental management costs	Percentage environmental prevention costs of total prevention costs
	Emissions treatment	Percentage completion of preventative plan execution
Maintain and implement new economic sustainable strategies	Identify and report number of current economic sustainable strategies	Economic sustainability strategies documented
	Identify and report number of new economic sustainable strategies	Number of new strategies identified

Table 5.17 continued from previous page

Indicators	Description	Measure (from the business)
Maintain and implement new social sustainable strategies	Identify and report number of current social sustainable strategies	Social sustainability strategies documented
	Identify and report number of new social sustainable strategies	Number of new strategies identified
Maintain and implement new environmental sustainable strategies	Identify and report number of current environmental sustainable strategies	Environmental sustainability strategies documented
	Identify and report of new environmental sustainable strategies	Number of new strategies identified

Table 5.18: Quadrant III: Business sustainability measured from Strategic planning functional units.

Indicators	Description	Measure (from the business)
Evaluate economic efficiency of operational processes	Rate of process efficiency	Percentage process work time of total time (active + idle)
	Percentage of market demand analysis	Percentage of market demand
Revenue evaluation	Cost-benefit analysis	Percentage change from benchmark analysis
Evaluate behaviour-change campaigns	Report the influence of acceptability of social ideas	Social acceptability document
Health and safety impacts*	Health and safety impacts of products and services assessed	Harm/risk test
Customer satisfaction*	Report the results of customer satisfaction surveys	Customer satisfaction feedback document
Evaluate environmental plans	Report the effectiveness of environmental plans	Percentage of environmental plan implementation of identified plans
Evaluate market related environmental plans	Improve environmental plans	Percentage execution of improvement plan document
Identify economic performance opportunities	Report the complexity to improve the performance opportunities	Percentage execution of improvement plan document
Identify economic performance threats	Report the complexity to solve the performance threats	Percentage execution of improvement plan document
Local community impact assessment	Report the impact of the community of organisational actions	Percentage execution of improvement plan document
Evaluate employee health and safety	Report employee health plans	Health plan document
	Report employee safety plans	Safety plan document
Assessment of the environmental sustainability strategy	Report the effectiveness and completeness of the strategy	Percentage completeness of environmental strategy execution
Report non-compliance environmental laws	Report the strategy against the environmental laws and regulations	Percentage implementation of environmental laws in business processes
Evaluate business functions against the required sustainability goals	Report on the business functions and whether improvements should be commenced	Relation document between business functions and sustainability goals
Identify business functions with little to no sustainability indicators	Identify sustainability indicators for the identified business functions	Relation document between business functions and indicators
Evaluate business functions against the required sustainability goals	Report on the business functions and whether improvements should be commenced	Relation document between business functions and sustainability goals
Identify business functions with little to no sustainability indicators	Identify sustainability indicators for the identified business functions	Relation document between business functions and indicators
Evaluate business functions against the required sustainability goals	Report on the business functions and whether improvements should be commenced	Relation document between business functions and sustainability goals

Table 5.18 continued from previous page

Indicators	Description	Measure (from the business)
Identify business functions with little to no sustainability indicators	Identify sustainability indicators for the identified business functions	Relation document between business functions and indicators
Identify new sustainability strategies	Compile new sustainability strategies for the individual business functions	Percentage new sustainability strategies enrolled
Educate the sustainability managers about the new sustainability strategies	Create education/ training days to inform workforce about the new sustainability strategies	Number of education/training days
The plan should be policy and evidence based	Identify potential actions to address social issues	Social issue identification plan document
	Identify potential actions to address social opportunities	Social issue identification plan document
Create social sustainability through community engagement	Develop an integrated engagement strategy	Document business strategy with engagement strategy
	Create education opportunities	Number of education opportunities
	Create awareness events within the workforce	Number of events
Pollution prevention	Minimise waste and emissions from operations	Percentage waste reductions
Environmental sustainability vision	Create a roadmap for meeting unmet needs	Document improvement plan
Clean technology	Develop the sustainable competencies of the future	Satisfactory level of sustainable competencies
Develop a budget that presents spending proposals and revenues	Identify specific amount/ estimates for each revenue	Percentage of budget item out of total item
	Identify specific amount/ estimates for spending items	Percentage of budget item out of total item
Update economical sustainability policy	Verify the alignment between the budget and policy	Document budget against policies
Determine baseline projections	Use current budget positions as baseline and use to estimate or predict the trends	Percentage of budget items that followed the predicted trend
Improve society goals and priorities	Update and implement social goals	Alignment of social goals with business actions
Enhancing social inclusion and participation	Include social participation in the workforce	Social participation document
Estimating and capturing value added from environmental improvements	Percentage efficient use of materials	Percentage use of materials against total purchased materials
	Percentage efficient use of energy management	Percentage of energy usage
Environmental protection expenditures*	Report prevention and environmental management costs	Percentage of environmental costs of total costs
Economic performance evaluation	Feedback report on economic performance	Economic performance improvement from previous year
Update economic policies/plans	Improve and execute economic policy adjustments	Document improvement plan
Social performance evaluation	Feedback report on social performance	Social performance improvement from previous year
Update social policies/plans	Improve and execute social policy adjustments	Document improvement plan
Environmental performance evaluation	Feedback report on environmental performance	Environmental performance improvement from previous year
Update environmental policies/-plans	Improve and execute environmental policy adjustments	Document improvement plan

Table 5.19: Quadrant III: Business sustainability measured from Performance management functional units.

Indicators	Description	Measure (from the business)
Create a clear vision of how economic sustainability should operate	Clear understanding of strategic goals	Strategy execution document
Commitment by top management	Strong leadership skills lead to successful implementations	Leadership agreement by team leaders
A great implementation team	Responsible for detailed plan and ensures executed correctly	Execution document
Management of social regulations	Measure the success of the return of social expectations	Percentage successful social expectations
A better understanding of social issues	A positive social impact of the business activities	Impact assessment of the social activities
Allocation of resources	Measuring whether the certain allocation of resources is sustainable within its business function	Percentage efficient performance of resources
Impact of operations	Impact assessment of the operations towards the environment	Impact assessment of the environmental activities
Identify the economic sustainability vision	Define/measure the success of the economic sustainability vision	Sustainability vision policy/ document
Identify the economic sustainability mission	Define/measure the success of the economic sustainability mission	Sustainability mission policy/ document
Customer engagement	Objectives are aligned with customer requirements	Align customer requirements with objectives document
Contribution to social sustainability	Satisfaction of basic needs	Satisfactory level of needs
Social resources	Average time spent for community work	Percentage time spent on community work based on estimated time
Identify the social sustainability vision	Define/measure the success of the social sustainability vision	Sustainability vision policy/ document
Identify the social sustainability mission	Define/measure the success of the social sustainability mission	Sustainability mission policy/ document
Identify the environmental sustainability vision	Define/measure the success of the environmental sustainability vision	Sustainability vision policy/ document
Identify the environmental sustainability mission	Define/measure the success of the environmental sustainability mission	Sustainability mission policy/ document
Substitution of resources	Resource evaluation that will have a long-term perspective	Percentage efficient performance of resources
Assimilation capacity	Measure the percentage of polluting substances against the maximum capacity	Percentage usage of maximum capacity
Define economic sustainability goals	Align business performance against economic goals	Align performance against goals
Increase sales	Percentage of increase in sales	Percentage of increase sales based on benchmark value
Reduce costs	Percentage of operating costs	Percentage of operating costs based on benchmark value
Define social sustainability goals	Align business performance against social goals	Align performance against goals
Increase donations to local community	Amount of donations to local community	Percentage of donations of indirect costs
Improve employee health and safety	Number of lost- time days due to injuries	Number of days
Define environmental sustainability goals	Align business performance against environmental goals	Align performance against goals
Reduce toxic materials consumption	Percentage of toxic products used	Percentage of toxic products from total products
Increase recycled materials	Percentage of packaging materials made from recycled	Percentage of recycled materials
Define measurement benchmark per economic sustainability indicator	Measure business performance indicator against the defined benchmark indicator	Percentage change of performance and indicator

Table 5.19 continued from previous page

Indicators	Description	Measure (from the business)
Define measurement benchmark per social sustainability indicator	Measure business performance indicator against the defined benchmark indicator	Percentage change of performance and indicator
Define measurement benchmark per environmental sustainability indicator	Measure business performance indicator against the defined benchmark indicator	Percentage change of performance and indicator
Develop the performance report	Scorecard measurement	Performance report aligned with supporting guidance
Develop the performance report	Scorecard measurement	Performance report aligned with supporting guidance
Develop the performance report	Scorecard measurement	Performance report aligned with supporting guidance
Evaluate the effectiveness and efficiency of the business performance at various business levels	Discussion and feedback session of the performance evaluation discussing the positive results as well as where improvements can be made	Agreement and feedback of discussion session
Evaluate the effectiveness and efficiency of the business performance at various business levels	Discussion and feedback session of the performance evaluation discussing the positive results as well as where improvements can be made	Agreement and feedback of discussion session
Evaluate the effectiveness and efficiency of the business performance at various business levels	Discussion and feedback session of the performance evaluation discussing the positive results as well as where improvements can be made	Agreement and feedback of discussion session
Develop a rewards benefit plan for departments, managers and teams	Increase in engagement of employees and motivation to perform at a more sustainable manner	Satisfying level of employee performance
Develop a rewards benefit plan for departments, managers and teams	Increase in engagement of employees and motivation to perform at a more sustainable manner	Satisfying level of employee performance
Develop a rewards benefit plan for departments, managers and teams	Increase in engagement of employees and motivation to perform at a more sustainable manner	Satisfying level of employee performance

Table 5.20: Quadrant III: Business sustainability measured from Organisational structure functional units.

Indicators	Description	Measure (from the business)
Define economic sustainability roles	Align the sustainability roles with the business structure	Roles and structure document
Define social sustainability roles	Align the sustainability roles with the business structure	Roles and structure document
Define environmental sustainability roles	Align the sustainability roles with the business structure	Roles and structure document
Align economic sustainability roles with employee roles	Measure the combined role with the business goals and objectives	Roles and goals and objectives document
Align economic sustainability roles with key result areas	Measure the contribution of the aligned key result areas	Roles and key result areas document
Align social sustainability roles with employee roles	Measure the combined role with the business goals and objectives	Roles and goals and objectives document

Table 5.20 continued from previous page

Indicators	Description	Measure (from the business)
Align social sustainability roles with key result areas	Measure the contribution of the aligned key result areas	Roles and key result areas document
Align environmental sustainability roles with employee roles	Measure the combined role with the business goals and objectives	Roles and goals and objectives document
Align environmental sustainability roles with key result areas	Measure the contribution of the aligned key result areas	Roles and key result areas document
Define a function for each economic sustainability role	Measure the effectiveness of the function towards the business goals	Effectiveness of business functions and goals execution
	Measure the efficiency of the function towards the business goals	Efficiency of business functions and goals execution
Define a function for each social sustainability role	Measure the effectiveness of the function towards the business goals	Effectiveness of business functions and goals execution
	Measure the efficiency of the function towards the business goals	Efficiency of business functions and goals execution
Define a function for each environmental sustainability role	Measure the effectiveness of the function towards the business goals	Effectiveness of business functions and goals execution
	Measure the efficiency of the function towards the business goals	Efficiency of business functions and goals execution
Define economic sustainability structure report	Align the structure report with the progress review report	Relationship between report and progress review report
	Align the structure report with goals and objectives	Relationship between report and goals and objectives
	Align the structure report with the strategic business plan	Relationship between report and business plan
Define social sustainability report	Align the structure report with the progress review report	Relationship between report and progress review report
	Align the structure report with goals and objectives	Relationship between report and goals and objectives
	Align the structure report with the strategic business plan	Relationship between report and business plan
Define environmental sustainability report	Align the structure report with the progress review report	Relationship between report and progress review report
	Align the structure report with goals and objectives	Relationship between report and goals and objectives
	Align the structure report with the strategic business plan	Relationship between report and business plan
Assign employees to economic roles	Measure whether these roles align with the business goals and objectives	Document with aligned economic roles with goals and objectives
Assign employees to social roles	Measure whether these roles align with the business goals and objectives	Document with aligned social roles with goals and objectives
Assign employees to environmental roles	Measure whether these roles align with the business goals and objectives	Document with align environmental roles with goals and objectives
Training and education for employees	Average hours of training per employee and by employee category	Percentage of training per employee and category based on benchmark value
Training and education for employees	Average hours of training per employee and by employee category	Percentage of training per employee and category based on benchmark value
Training and education for employees	Average hours of training per employee and by employee category	Percentage of training per employee and category based on benchmark value
Equal economic sustainability functions among employees	Measure the performance of the responsibilities of the employees	Document stating role allocation among teams
	Link a reward system on best performance	Percentage of successful role responsibility execution per employee
Equal social sustainability functions among employees	Measure the performance of the responsibilities of the employees	Document stating role allocation among teams
	Link a reward system on best performance	Percentage of successful role responsibility execution per employee

Table 5.20 continued from previous page

Indicators	Description	Measure (from the business)
Equal environmental sustainability functions among employees	Measure the performance of the responsibilities of the employees	Document stating role allocation among teams
	Link a reward system on best performance	Percentage of successful role responsibility execution per employee
Report the support functions and systems at each business function	Reflection report about the economic sustainability systems	Satisfying level of reflection report
Report the support functions and systems at each business function	Reflection report about the social sustainability systems	Satisfying level of reflection report
Report the support functions and systems at each business function	Reflection report about the environmental sustainability systems	Satisfying level of reflection report

Table 5.21: Quadrant III: Business sustainability measured from Management and leadership development functional units.

Indicators	Description	Measure (from the business)
Description document	Clearly define role description	Level of document completion
Stakeholder engagement within each role*	List of stakeholder engagement groups within roles	Document explaining stakeholder and role engagement
Changes in report*	Report changes from previous reporting periods	Level of document completion
Description document	Clearly define role description	Level of document completion
Stakeholder engagement within each role*	List of stakeholder engagement groups within roles	Document explaining stakeholder and role engagement
Changes in report*	Report changes from previous reporting periods	Level of document completion
Description document	Clearly define role description	Level of document completion
Stakeholder engagement within each role*	List of stakeholder engagement groups within roles	Document explaining stakeholder and role engagement
Changes in report*	Report changes from previous reporting periods	Level of document completion
Self-management skills	Appraisal and knowledge of self-values, abilities, aptitudes, interests, work/life balance	Level of satisfied performance of employee
Discipline skills	Skills necessary to perform at work	Number of skills required and how they will be achieved
Career building skills	Skills required for learning opportunities	Number of skills required and how they will be achieved
Self-management skills	Appraisal and knowledge of self-values, abilities, aptitudes, interests, work/life balance	Level of satisfied performance of employee
Discipline skills	Skills necessary to perform at work	Number of skills required and how they will be achieved
Career building skills	Skills required for learning opportunities	Number of skills required and how they will be achieved
Self-management skills	Appraisal and knowledge of self-values, abilities, aptitudes, interests, work/life balance	Level of satisfied performance of employee
Discipline skills	Skills necessary to perform at work	Number of skills required and how they will be achieved
Career building skills	Skills required for learning opportunities	Number of skills required and how they will be achieved
Identify and choose opportunities	Advance in projects and roles with the identified opportunities	List and describe how opportunities will be executed
Create social capital	Creating strategic personal and professional relationships with those who create opportunities	Established relationships within business functions

Table 5.22: Quadrant III: Business sustainability measured from Culture management functional units.

Indicators	Description	Measure (from the business)
Economic client policy	After sale maintenance and service period	Maintenance and service time period
Consumer engagement and client cost	Spreading of marketing resources in proportion to every client's cost	Percentage of marketing resources used of total resources
Long-term relationship	Aim to create long-term relations with client	Time/ year period
Product and service development	Product and service aim to have a competitive edge	Market share of total market
Social customer-client policy	Customer satisfaction	Customer- client satisfaction
Operations policy	Product or service will not cause harm to end user's environment	Harm/ risk test
Embedding sustainability in performance evaluation	Reward employees when a positive result is shown of performance evaluation	Performance evaluation
	Improve the business's economic performances	Improvement plan (time period)
Embedding sustainability in performance evaluation	Reward employees when a positive result is shown of performance evaluation	Performance evaluation
	Improve the business's social performances	Improvement plan (time period)
Embedding sustainability in performance evaluation	Reward employees when a positive result is shown of performance evaluation	Performance evaluation
	Improve the business's environmental performances	Improvement plan (time period)
Production rate	Percentage of completed products	Completed products from total products and work-in-progress products
Performance rate	Quality of performance will deliver high performance rate	Performance time from performance and idle time
Economic performance	Customer satisfaction	Customer- client satisfaction
Participative decision-making	Cohesion of employees	Cohesion of employee rate
Goal-setting and planning	Efficient and productive processes	Efficient and effective rates of production of total time
Production rate	Percentage of completed products	Completed products from total products and work-in-progress products
Performance rate	Quality of performance will deliver high performance rate	Performance time from performance and idle time
Environmental performance	Customer satisfaction	Customer- client satisfaction
Clear and strong ethical practices	Ensure economic equity	Equity plan
Active promoter of sustainability values	Maintain sustainable future	Performing sustainable values in day-to-day tasks
Clear and strong ethical practices	Ensure social equity	Equity plan
Active promoter of sustainability values	Maintain sustainable future	Performing sustainable values in day-to-day tasks
Clear and strong ethical practices	Ensure environmental equity	Equity plan
Active promoter of sustainability values	Maintain sustainable future	Performing sustainable values in day-to-day tasks

Translation: quadrant III to quadrant IV

The translation of concepts defined in quadrant III to the concepts in quadrant IV implies that each sub-component of the seven business components is measured using the selected indicators from quadrant III, which ultimately results in a measurable solution of business sustainability of the seven business components in quadrant IV.

Initially, the business measures its performance based on the description of the indicators

and the measuring indication defined in quadrant III. The measurement is set out on a 5-point scale, and each scale point is allocated to either 1, 2, 3, 4, or 5 points. Secondly, the outcome of the performance measurement of the individual indicators and the scale which the outcome relates to, are identified and shown in the 'Business score' column. Table 5.23 shows the various measuring possibilities for the translation that are used across the seven business components.

Table 5.23: A number of measuring possibilities.

	Score				
Description	**1**	**2**	**3**	**4**	**5**
Percentage	0-20%	21-40%	41-60%	61-80%	81-100%
Radius (km)	0-5 km	5-10 km	10-15 km	15-20 km	20 >km
Number	0-5	5-10	10-15	15-20	20 >
Risk impact	No risk impact	Low risk impact	Medium risk impact	High risk impact	Very high risk impact
Documentation	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information
Agreement	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
Satisfaction	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied
Number of days	<1 days	1-2 days	2-3 days	3-4 days	4 >days
Alignment	Not aligned	Somewhat aligned	Partially aligned	Somewhat more aligned	Fully aligned
Effectiveness	Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective
Efficiency	Very inefficient	Somewhat inefficient	Neutral	Somewhat efficient	Very efficient
Time/ year period	<1 year	1-2 years	2-3 years	3-4 years	4 >years
Time/ month period	3 months	6 months	12 months	24 months	36 months

Quadrant IV: Measure business sustainability from the perspective of the 'whole'.

Quadrant IV is the action of combining all the individual measurements of the business components into a holistic solution aiming to inform, govern and enable business sustainability from a 'whole' perspective. The solution in quadrant IV from Figure 4.8 is used to support the solution in quadrant IV from Figure 5.2. Each individual sub-component of a business component has a solution for the economic, social and environmental system boundary of sustainability. The individual composite score of each solution of a sub-component is the combined score from all the indicators at the corresponding sub-component. The sum of all the composite scores, given the individual system boundaries

of sustainability illustrates the three business component sustainability formulas below. The total number of sub-components (SC) are illustrated by n. Additionally, business component sustainability solution is illustrated as 'S1' to 'S7' in Figure 4.8. Subsequently, the sum of all the business components for economic sustainability is illustrated as 'A1' to 'A7', for social sustainability it is illustrated as 'B1' to 'B7', and for environmental sustainability it is illustrated as 'C1' to 'C7'.

In conclusion, these three system boundaries of sustainability are demonstrated in the second equation as business sustainability, which is the sum of all the business components (BC) solution of economic sustainability (As), social sustainability (Bs), and environmental sustainability (Cs).

As mentioned previously, the equations contribute to the discussion of the absolute- and relative forms of value creation (see Section 5.2.4 and Figure 1.2). Subsequently, the business component sustainability formula emphasises the relative forms of value creation which in turn measures the efficiency across the functional units of the business as a whole. The business sustainability formula emphasises the absolute forms of value creation which in turn measures the effectiveness of the business as a whole.

$$Business\ component_i = \sum_{i=1}^{n} Economic_{SC_i}$$

$$Business\ component_i = \sum_{i=1}^{n} Social_{SC_i}$$

$$Business\ component_i = \sum_{i=1}^{n} Environmental_{SC_i}$$

$$Business\ sustainability = \sum_{i=1}^{7} Economic_{BC_i}; \sum_{i=1}^{7} Social_{BC_i}; \sum_{i=1}^{7} Environmental_{BC_i}$$

5.2.6.3 Stage three: Monitoring and evaluation

The monitoring and evaluation stage is the overarching linkage and evaluation between the define and measure stage, illustrated in Figure 5.2. From the above-mentioned formulas and results gained from economic-, social-, and environmental sustainability for all business components (see Table 4.2) a baseline measurement/ target can be defined after initial execution of the conceptual framework. These baseline values can be used to set specific organisational targets within the alignment of industry-specific targets for a similar business environment. The business constructs the results of the baseline and targets and then, in partnership with the value chain perspective, the business recommends improvements as well as evaluates whether the shared value opportunities are created through

three key ways, namely: (i) products and markets; (ii) productivity in the value chain is redefined; and (iii) local cluster development is enabled. Subsequently, summarising the monitoring and evaluation stage in a profile review report, allows for the identification of newly addressed approaches that benefit society, and generate greater innovation and growth.

In conclusion this stage is an iterative and continuous process and illustrates the linkages between the various quadrants as shown in Figure 5.3. The Business Sustainability Framework, including the seven business components, is developed using the above mentioned phases of the conceptual framework methodology. The completed seven business components are shown in Appendix C.

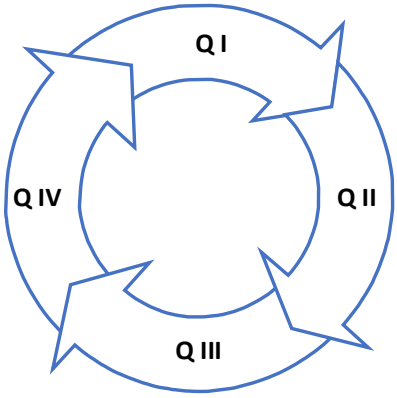

Figure 5.3: Monitoring and evaluation stage.

5.2.7 Phase 7: Validating the Business Sustainability Framework and Evaluation Tool

Phase 7 is concerned with the validation of the Business Sustainability Framework and Evaluation Tool. As stated in Section 1.5, the research study aims to formulate a framework and subsequently, an evaluation tool that will address and include various guidelines towards the development and operationalisation of business sustainability in a business environment. External validation is required in order to validate the developed Business Sustainability Framework and Evaluation Tool in order to assess the correctness, meaningfulness and applicability of the developed framework and evaluation tool.

5.2.7.1 Validation strategy

The validation of the Business Sustainability Framework and Evaluation Tool is an initiative that is built on clarifying and advancing arguments that ultimately deduce reasoning and evidence in order to reach specific conclusions (Bouabidi *et al.*, 2010). The validation process is designed to gather data through qualitative approaches, where qualitative

approaches are the understanding and motivation phenomenon within a specific context (Bouabidi *et al.*, 2010). The validation process make use of two methods namely; (i) semi-structured interviews with subject matter experts; and (ii) a case study application in the healthcare industry.

Semi-structured interviews allow for the explanation of the key concepts of the research as well as the methodology that was used to guide the development of the Business Sustainability Framework and Evaluation Tool. A set of questionnaires pertaining information about theoretical and practical perspectives regarding the developed framework and evaluation tool is included in the semi-structured interviews, requesting the subject matter expert to use this qualitative method to answer the pre-determined set of closed-ended questions. A case study application illustrates a retrospective evaluation of the research used to develop the Business Sustainability Framework and Evaluation Tool. Additionally, the case study allows for exploration and discussion of practical applications of the Business Sustainability Framework and Evaluation Tool (refer to Chapter 6 for the case study).

In the following section, the validation methodology and guidelines, including the questionnaires used during the validation process, are discussed.

5.2.7.2 Validation methodology

The Business Sustainability Framework and Evaluation Tool's validity has been evaluated by means of a set of questions, and each set of questions aims to achieve a desired outcome. Figure 5.4 illustrates the validation process, and the identified inputs contributing towards the validation questions. The theoretical foundations and the conceptualisation of the Business Sustainability Framework, and subsequent Evaluation Tool, from preceding chapters serve as inputs to the validation questions.

There are essentially two sets of questions; the first set (questions A1 − A4) is geared towards the Business Sustainability Framework, the second set (questions B1 − B4) is geared towards the Business Sustainability Evaluation Tool. The validation questions request a remark on a 5-point scale, which ranges from strongly agree to strongly disagree, and an option to provide any comments or suggestions throughout the questionnaire.

Validation questions A1 – A4.

The content of the questions under A1 is related to the design specifications defined given the specific business sustainability challenges identified. The expected outcome of the Business Sustainability Framework validation under the design specifications and validation questions related to this is evaluated to determine how plausible and certifiable the developed framework is.

The questions under A2 relate to the concepts and elements defined given the literature analysis of the SE approach and conceptual framework analysis. The expected outcome of the Business Sustainability Framework validation under the concepts and elements and validation questions related to this is to evaluate the applicability and appropriateness of the developed framework given the literature analysis.

The questions under A3 relate to the implementation capability of the conceptualised Business Sustainability Framework. The expected outcome of the Business Sustainability Framework validation under the implementation capability and validation questions related to this is to evaluate the suitability and validity of the applicability and interpreted meaning of the framework.

The questions under A4 relate to the theoretical contribution of the Business Sustainability Framework towards the field of business sustainability. The expected outcome of the Business Sustainability Framework validation under the theoretical contribution and validation questions related to this is to evaluate the relevance and usefulness of the developed framework to the field of business sustainability.

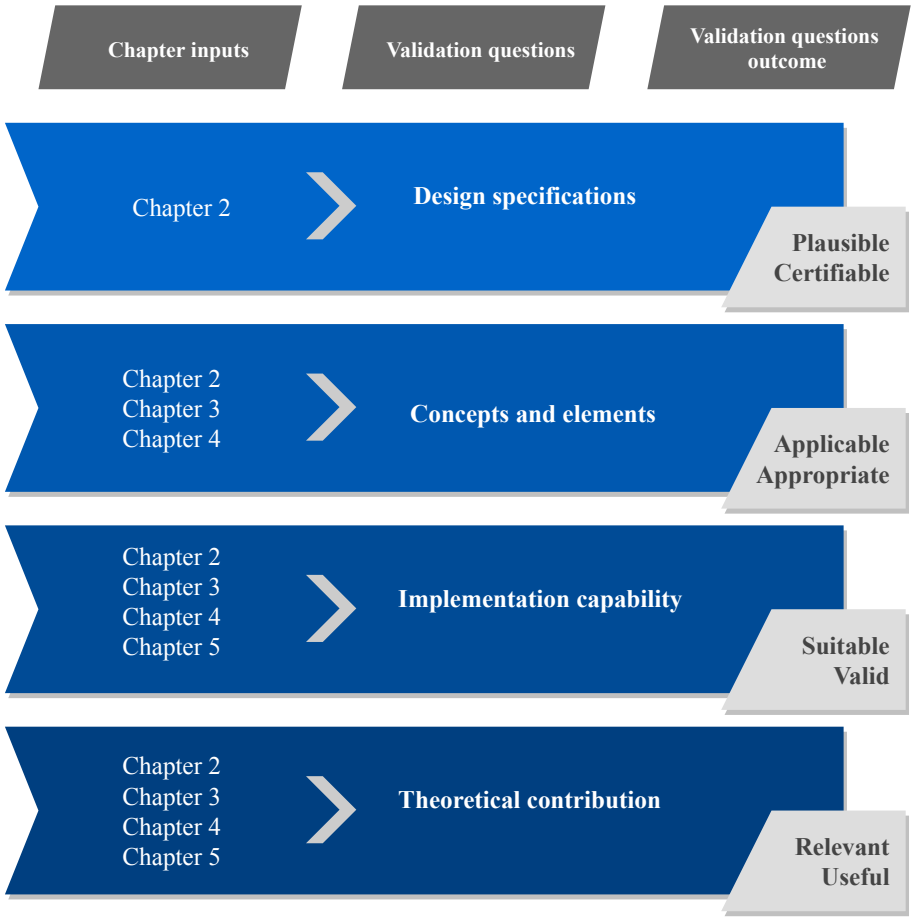

Figure 5.4: Inputs and outcomes of the validation process.

Validation questions B1 – B4.

The questions are similar to those posed in the above-mentioned set of questions, but here the questions relate specifically to the developed Business Sustainability Evaluation Tool. The content of the questions under B1 is related to the design specifications defined given the specific business sustainability challenges identified. The questions under B2 relate to the concepts derived given the Business Sustainability Evaluation Tool concepts and elements discussed for the individual quadrants. The questions under B3 relate to the implementation capability of the Business Sustainability Evaluation Tool and its applicability to any industry, thus how generic the tool is perceived to be. The questions under B4 relate to the theoretical contribution of the Business Sustainability Evaluation Tool towards the field of business sustainability.

5.2.7.3 Validation process and results

This section introduces the subject matter experts[1] that served as the participants in the validation process. Table 5.24 provides an overview of the participating subject matter experts and their relevant roles and experience that are aligned with the criteria used to select subject matter experts. Additionally to this section is the discussion of the feedback received from the two set of questions for the Business Sustainability Framework and Evaluation Tool respectively. The results of the two set of questions will be discussed separately. Three subject matter experts answered their validation results on the validation document provided, the other two subject matter experts requested an excel format of the questions to ease the process of providing the validation results.

Table 5.24: Occupation and affiliation of the subject matter experts.

Subject matter expert	Occupation and affiliation
Subject matter expert 1	Industrial Engineer with research and practical experience in the field of beneficiation.
Subject matter expert 2	Industrial Engineer with practical and research experience in the field of antifragility and business finance. Currently an Investment associate at a private debt managing company.
Subject matter expert 3	Chief Strategic Officer of a company.
Subject matter expert 4	Industrial Engineer with practical and research experience in the field of business consultation. Currently an Operations Manager of an innovation platform for start-ups and corporate organisations.
Subject matter expert 5	Head of the Chair for Corporate Sustainability at an International Business School.

The validation results of the subject matter experts were analysed and summarised into eight individual graphs (see Figures 5.5 to 5.12); of the two sets of questions and each set of questions consists of four questions. In general positive feedback was received from all the subject matter experts concerning the two sets of questions. However, a number of concerns were raised by the subject matter experts, and these concerns are discussed at each question and this has now been addressed in the research, and incorporated into the Business Sustainability Framework and Evaluation Tool. As mentioned earlier, the Business Sustainability Framework and Evaluation Tool presented in Sections 5.2.5 and 5.2.6 are the refined and updated framework and tool based on the feedback received during the validation process.

Feedback on validation questions A1 – A4.

The feedback on validation questions A1 – A4 is geared towards the Business Sustainability Framework. The questions relate to the following four sets of questions: design

[1]See Section 1.5 in Chapter 1 for the criteria used to select the identified subject matter experts.

specifications defined given the specific business sustainability challenges identified; concepts and elements defined given the literature analysis of the SE approach and conceptual framework analysis; the implementation capability of the Business Sustainability Framework; and lastly, the theoretical contribution towards the field of business sustainability.

Any comments and suggestions that were raised by the subject matter experts in terms of disagreements of specific questions were taken into consideration to determine if it would be feasible to address these changes that would ultimately enhance the practicality and understanding of the Business Sustainability Framework. Additionally, if a subject matter experts selected unsure and supported it with a comment it was included in the criteria and considered as an option to address the changes.

Question A1. Design Specifications

The responses from the subject matter experts for the individual questions pertaining to design specifications are shown in Figure 5.5.

Three concerns regarding the design specifications questions were raised by subject matter expert 4. The first concern relates to the question of whether all three dimensions of sustainability are considered across all levels of consideration. This was not explicitly defined or easily identified in the framework, but after the validation process, it was considered and the necessary adjustments were made. The three dimensions of sustainability (economic, social, and environmental sustainability) are included in the Business Sustainability Framework's sustainability context, together with the discussion of the individual quadrants of the framework (see Section 5.2.5). However, it is also acknowledged that the evaluation tool allows for the in-depth consideration of all the sustainability dimensions; however, as mentioned above, the framework was refined to also include the three dimensions of sustainability more explicitly.

The second concern relates to the question whether sustainability is considered in the same level of detail for each identified business component. subject matter expert 4 mentioned that they are unsure whether framework addresses this aspect. This concern is addressed by slightly adjusting the definitions of the different concepts and elements of the four quadrants ensuring this concern is clearly addressed and that each quadrant states the inclusion of sustainability at the respective level (see Section 5.2.5).

The last concern highlighted by subject matter expert 4 relates to the question of whether a combination of the sustainability dimensions with a detailed level and unit of analysis allows for the definition and measurement of sustainability at an adequately aggregated level. This concern is firstly addressed through the concepts and elements of the quadrants,

and how these concepts and elements contribute towards the overall business sustainability aim of the respective quadrant. It is thus argued that the combination of the explanation of the concepts and elements allows for sustainability to be defined and measured at an aggregated level.

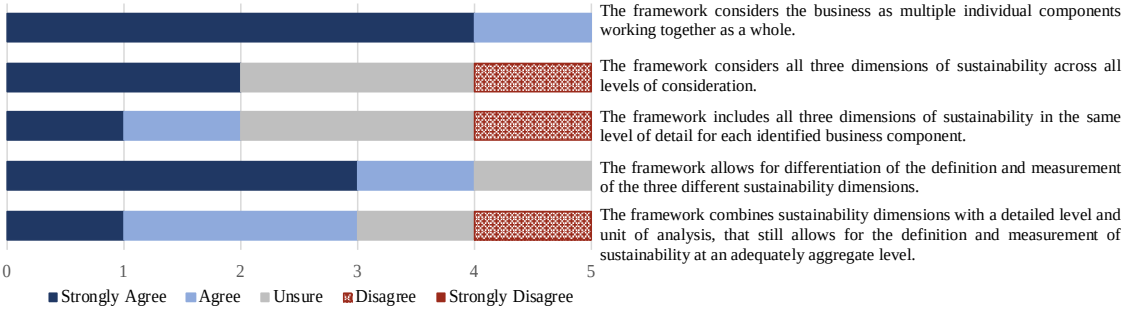

Figure 5.5: Validation results of design specifications of the Business Sustainability Framework.

A2. Concepts and elements

The responses from the subject matter experts for the individual questions pertaining to concepts and elements are shown in Figure 5.6.

The concern that was raised regarding this question about the concepts and elements of the framework, was a combination of the purpose and strategy question. subject matter expert 5 explained from a business management perspective – strategy means to define goals which have an underlying purpose and then the means of measuring these defined goals to determine whether they are reached. Therefore to address this concern, the purpose and strategy elements were integrated and form one strategy from a business management perspective.

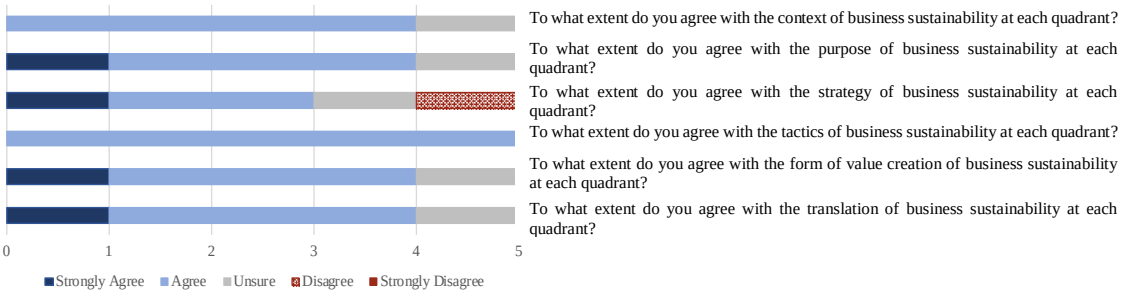

Figure 5.6: Validation results of concepts and elements of the Business Sustainability Framework.

A3. Implementation capability

The responses from the subject matter experts for the individual questions pertaining to implementation capability are shown in Figure 5.7.

One concern that was raised under the implementation capability question regarding whether the framework is intuitive to understand and the ease of use is the fact that the framework is at an adequate level of complexity. Additionally, subject matter expert 5 stated that the implementation capability is clearer for the tool. By implication, and also the intention of the framework and tool, is that the framework and tool should be considered together, and thus the combination of both means that it is applicable to contribute towards business sustainability. Admitting that the framework and tool has a deviation space to be simplified implies that the framework is acknowledged given the context of business sustainability being complex by nature and it is therefore argued that the complexity is adequate given the aim to address business sustainability.

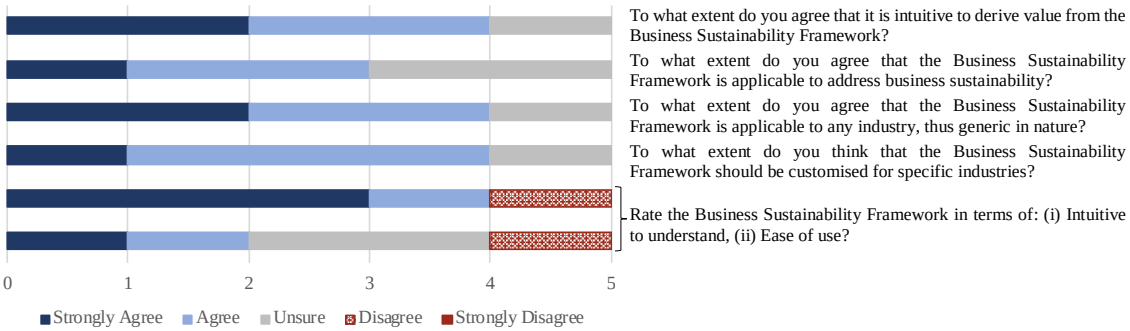

Figure 5.7: Validation results of implementation capability of the Business Sustainability Framework.

A4. Theoretical contribution

The responses from the subject matter experts for the individual questions pertaining to theoretical contribution are shown in Figure 5.8. Please refer to Appendix C for the detailed individual responses received from the subject matter experts.

Two contributions regarding the theoretical contribution of the Business Sustainability Framework are used to further refine the framework. The one suggestion from subject matter expert 3 is that the framework should be open to alternative parameters. This is considered a possibility, as this Business Sustainability Framework is developed as a generic framework, and has the ability to include and redefine concepts and elements once it is been implemented. The second suggestion subject matter expert 2 suggested was to implement the framework and then re-evaluating the framework from different sets, i.e. usability, the accuracy of deliverability, quality (expected outcome is what initially expected), and predictability.

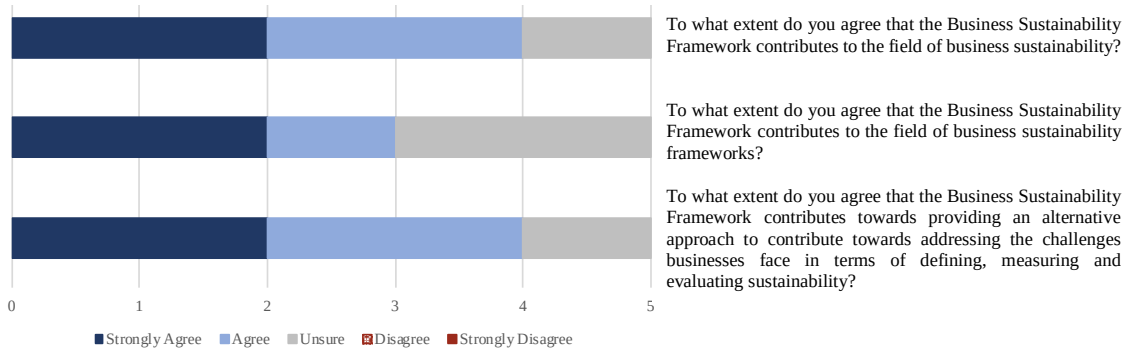

Figure 5.8: Validation results of theoretical contribution of the Business Sustainability Framework.

Validation questions B1 – B4.

The feedback on validation questions B1 – B4 is geared towards the Business Sustainability Evaluation Tool. The questions relate to the following four sets of questions: design specifications defined given the specific business sustainability challenges identified; concepts derived given the Business Sustainability Framework concepts and elements discussed; the implementation capability of the Business Sustainability Evaluation Tool; and lastly, the theoretical contribution towards the field of business sustainability.

Any comments and suggestions that were raised by the subject matter experts in terms of disagreements of specific questions were taken into consideration to determine if it would be feasible to address these changes that would ultimately enhance the practicality and understanding of the Business Sustainability Evaluation Tool. Additionally, if a subject matter expert selected unsure and supported it with a comment it was included in the criteria and considered as an option to address the changes.

B1. Design Specifications

The responses from the subject matter experts for the individual questions pertaining to design specifications are shown in Figure 5.9.

Subject matter expert 2 only raised one concern regarding the design specifications with regards to the question of whether sustainability is considered at an increased level of detail in the evaluation tool. The subject matter expert expressed a hesitant concern whether the tool considers the business as multiple components, meaning the tool does deliver multiple individual components working together as a whole but only in the hands of the user for whom it was designed, and thus more from a practical perspective. The tool includes all three dimensions of sustainability in the same level of detail at each identified business component, where each business component and its respective sub-components are defined and measured against all three dimensions of sustainability respectively (see

Section 5.2.6). It is not considered to be within the scope of this research inquiry to elaborate on these parameters in order to include all such possibilities, but as mentioned earlier, the tool / framework does allow for alternative inclusions and/or exclusions of other business components.

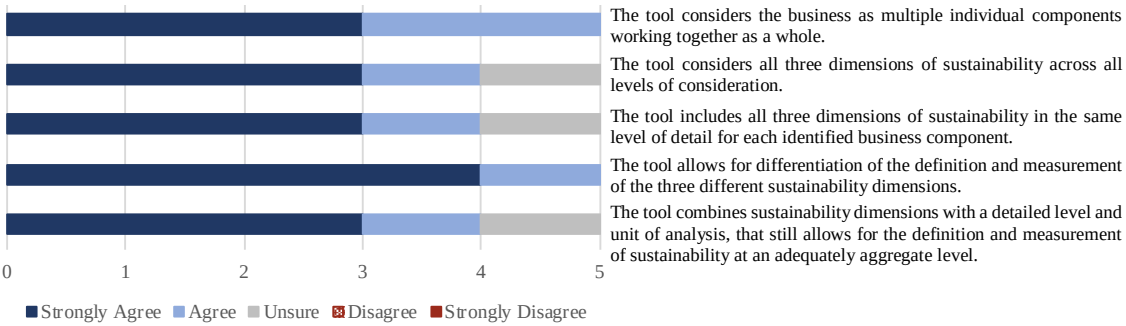

Figure 5.9: Validation results of design specifications of the Business Sustainability Evaluation Tool.

B2. Concepts (considering all seven business components)

The responses from the subject matter experts for the individual questions pertaining to concepts (considering all seven business components) are shown in Figure 5.10.

Three concerns regarding the key measurable concepts, identified indicators, and the appropriateness of the indicators were raised by subject matter expert 1 and 5 regarding the tool. Subject matter expert 1 had an overarching concern with the theoretical rigour of these three concepts. In Section 5.2.5 the literature findings and references are provided for the theoretical findings of these concepts.

A second concern was raised by subject matter expert 5 regarding the definitions of some of the concepts that seem to be of different complexity or some were too vague. To address this concern, the definitions and theoretical findings within the tool were revised and refined to eliminate any abstract and complex language ensuring the complexity of sustainability definition is fully considered.

The last concern raised the inconsistency of the translation between the key measurable concepts into indicators. This was addressed by redefining the indicators and updating them in the discussion of the concepts in Section 5.2.6.

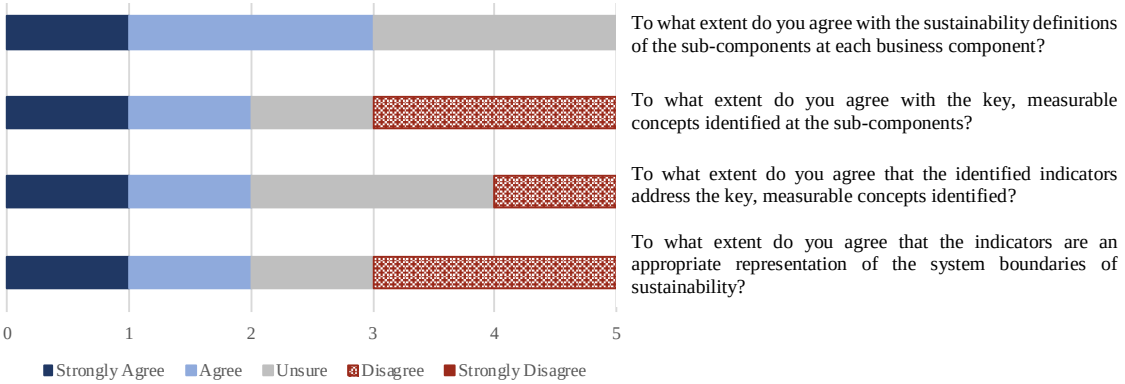

Figure 5.10: Validation results of concepts of the Business Sustainability Evaluation Tool.

B3. Implementation capability

The responses from the subject matter experts for the individual questions pertaining to implementation capability are shown in Figure 5.11.

One concern that was raised by subject matter expert 5 under the implementation capability question regarding whether the tool is intuitive to understand and the ease of use is the fact that it takes a lot of time to understand the tool. Even though the tool is at an adequate level of complexity, being complex and complicated it argues to address and measure business sustainability. By implication, and also the intention of the framework and tool, is that the framework and tool should be considered together, and thus the combination of both means that it is applicable to contribute towards business sustainability. Admitting that the framework and tool has a deviation space to be simplified implies that the evaluation tool is acknowledged given the context of business sustainability being complex by nature and it is therefore argued that the complexity is adequate given the aim to address business sustainability.

Additionally, a positive contribution was made by subject matter expert 2 stating that *'measurement in itself is already half the battle won'*. Understanding business sustainability, and how it can be defined and measured explicitly accelerates the underlying meaning and intuitive understanding of the Business Sustainability Framework and Evaluation Tool.

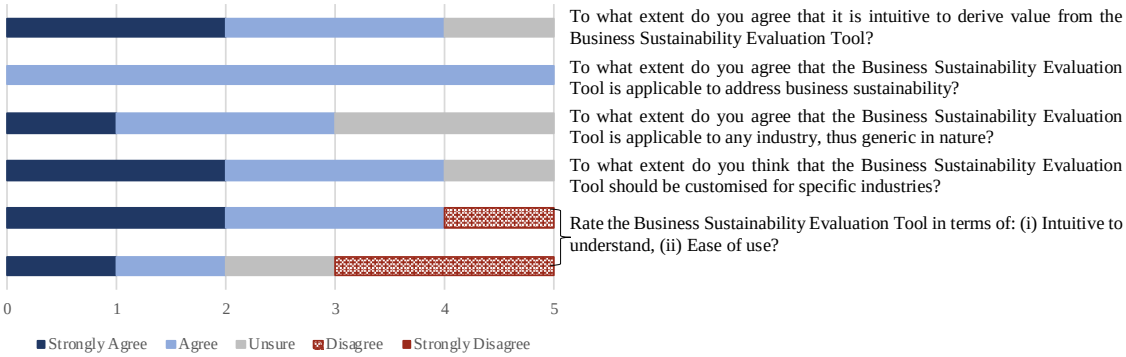

Figure 5.11: Validation results of implementation capability of the Business Sustainability Evaluation Tool.

B4. Theoretical contribution

The responses from the subject matter experts for the individual questions pertaining to theoretical contribution are shown in Figure 5.12.

The feedback of the theoretical contribution of the Business Sustainability Evaluation Tool is similar to the feedback at the Business Sustainability Framework. The only suggestion that was made by subject matter expert 2 was to implement the tool and then re-evaluating the tool from different sets, i.e. usability, the accuracy of deliverability, quality (expected outcome is what initially expected), and predictability.

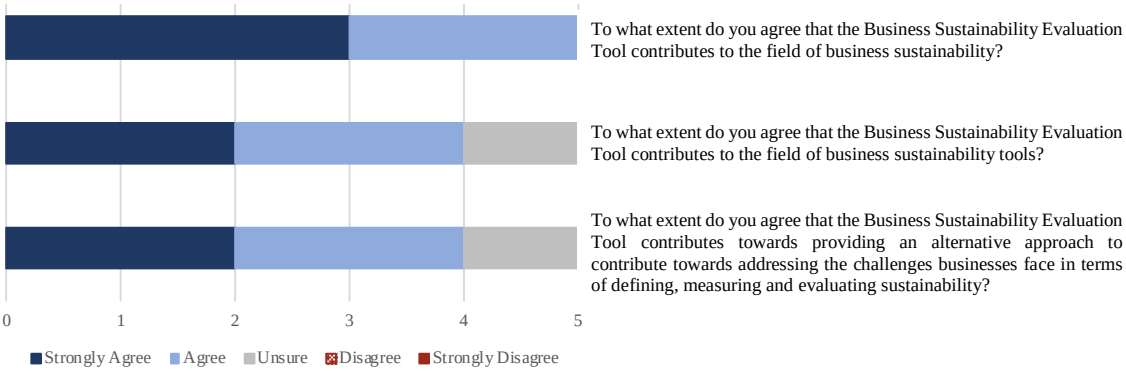

Figure 5.12: Validation results of theoretical contribution of the Business Sustainability Evaluation Tool.

5.2.7.4 Validation results summary

The validation results of the subject matter experts indicated the Business Sustainability Framework and Evaluation Tool are plausible and certifiable by agreeing with the inclusion of the design specifications. Given the outcomes of the design specifications, the concepts and elements both for the Business Sustainability Framework and Evaluation Tool are applicable and appropriate for the identified content. Considering the implementation

capability, the outcome can be agreed on being suitable and valid for both the Business Sustainability Framework and Evaluation Tool. Lastly, the theoretical contribution for both the Business Sustainability Framework and Evaluation Tool is relevant and useful and therefore serve as a comprehensive framework and tool that can be used in practice.

5.3 Chapter 5: Conclusion

The foundation of this chapter is the conceptual framework methodology of Jabareen (2009), and how this methodology was used to develop the Business Sustainability Framework and Evaluation Tool. The framework development was discussed throughout the seven phases where each phase was discussed in terms of literature findings from the previous chapters and how these findings contributed to the development of the discussed phase. Phase six discussed and explained the concepts and quadrant elements of the developed Business Sustainability Framework. Additionally, the Business Sustainability Evaluation Tool was discussed and explained in terms of its three-stage execution. The last phase was the validation process of the Business Sustainability Framework and Evaluation Tool. The subject matter experts provided an overall positive feedback on the Business Sustainability Framework and Evaluation Tool. Although the subject matter experts raised a small number of concerns and suggestions that required attention, these concerns and suggestions were discussed and addressed throughout this research.

Chapter 6

Business Sustainability in a Healthcare system: A case study

This chapter aims to investigate the applicability of the developed framework and evaluation tool to the healthcare sector, and to infer to what extent the developed framework should be customised for the healthcare industry. The applicability of the framework and evaluation tool that have purposefully been developed from an industry-neutral perspective are thus evaluated. This chapter consists of three key sections: (i) a review of literature pertaining to sustainability in a healthcare context is discussed; this aims to provide context in terms of healthcare and is concerned with the challenges faced by the healthcare system regarding sustainability matters; (ii) an illustration of the application of the developed Business Sustainability Framework and Evaluation Tool in the context of healthcare organisation environment; and (iii) a section that concludes the discussion on the applicability of the developed framework and evaluation tool within the healthcare environment. And lastly, any proposed changes to the developed framework and evaluation tool are included in order for this to align with the healthcare environment.

In this chapter the concept of sustainability matters within healthcare systems and the identification and discussion of the different sustainability dimensions within healthcare systems are introduced. From these emerging concepts of sustainability, a discussion regarding the various approaches and strategies on the inclusion of sustainability within a healthcare system follows; subsequently, a number of challenges are identified and discussed. This allows for this chapter to include a case study discussion presented as a linear-analytic structure. In order for this chapter to serve as a case study, it requires at least three sources of evidence (Yin, 2014). These sources are: (i) publically available documents of a business; (ii) personal observations; (iii) and a discussion with the business sustainability officer. Ultimately the case study aims to give the reader a feel for a theo-

retical argument by providing a real-life example of the developed Business Sustainability Framework and Evaluation Tool.

6.1 Business sustainability in a healthcare environment

Over the past decade, sustainability within the healthcare system has emphasised the desired attention to sustainability issues as well as the rising challenges experienced within the healthcare system. Initially, healthcare sustainability was more focused on a project-based approach with aspects emphasising the progression of healthcare programs (Baskaran *et al.*, 2009). This approach has led to being one of the many challenges which resulted in an inaccurate reflection of the true nature of healthcare sustainability (Baskaran *et al.*, 2009). The aim of a healthcare system is to continuously improve health and well-being while delivering high-quality care. Subsequently, the challenge is how to achieve the above currently and for future generations within the available economic, social, and environmental resources. To understand these challenges faced by a healthcare system and additionally the developing plans aiming to achieve improved health and well-being, and continuous delivery of high-quality care, has become the fundamental essence of understanding sustainable development within the healthcare system (Fleiszer *et al.*, 2015b).

6.1.1 Sustainability within a healthcare system

The demand for businesses to incorporate sustainability within their business processes and actions has increased over the past decade. However, the demand for healthcare systems to stay competitive in terms of delivering high quality of services requires continuous implementation of long-term sustainable strategies within their business strategies (Yih Goh & Marimuthu, 2016). Subsequently, sustainability has become a necessity in a healthcare system but over the years the lack of literature pertaining to sustainability in healthcare made it difficult for healthcare systems to achieve sustainable practices (Fleiszer *et al.*, 2015b).

In order to understand the important role of sustainability within healthcare systems, various definitions in the literature of sustainability in healthcare exist and should be fully defined. Baskaran *et al.* (2009); Yih Goh & Marimuthu (2016) defined sustainability as the implementation and continuous use of new practices that result in an expected outcome over a period of time. The primary objective of a successful sustainable healthcare system is not to solely rationalise the current rate of spending, but rather to take into account the various aspects of sustainability (Gelderman *et al.*, 2017).

Additionally, sustainable paradigms for healthcare systems require a universal guide that enables a development process. This process relies on component improvements that address the key components of sustainability and provide support to one another (Gelderman *et al.*, 2017). Thus bearing in mind, sustainability in healthcare is the continuous implementation of successful strategies which aim to satisfy the various stakeholders of the healthcare domain based on the sustainability dimensions; economic development, social and human resources, and environmental development (Yih Goh & Marimuthu, 2016).

Machado *et al.* (2015) argue that the business actions of healthcare institutions generate an impact on society when incorporating the three dimensions of sustainability; economic-, social-, and environmental dimension. Additionally, sustainability includes a number of stakeholders (e.g. businesses, governments, society, and individuals). Thus sustainability in healthcare systems should be understood as a systematic approach with elements influencing other elements (Machado *et al.*, 2015). Given the previous definition, sustainability in healthcare systems will serve as an improvement in the continuous process of reassessment of the relationships between economic growth, society, and the environment (Machado *et al.*, 2015).

Given the above outline of the various definitions of sustainability in healthcare systems identified from the literature, requires a discussion of system boundaries (economic-, social- and environmental dimension) of sustainability within healthcare systems.

6.1.1.1 Economic sustainability in healthcare

As mentioned previously, it is known that sustainable archetypes for healthcare systems require a universal guide to enable a development process that addresses the key components of sustainability. Economic sustainability in a healthcare context refers to processes which are related to activities which emphasise benchmarking processes and well-established metrics (Baskaran *et al.*, 2009). Buffoli *et al.* (2013) argue that the critical concerning factors have an effect on the economic macro environment. Additionally, the factors can have an effect on and be influenced by the different criteria included in the macro areas of an organisation. Machado *et al.* (2015) argue the statement of economic sustainability as the development in economic growth which allows for justice and opportunities for all human beings, without the privilege of some species or human beings, nor destroying natural resources, nor exceeding the carrying capacity of the system.

6.1.1.2 Social sustainability in healthcare

The social facet of sustainability refers to all the stakeholders (e.g. patients, clinical and administrative staff, government, and the general public) within the healthcare sys-

tem aiming to serve as a professional service provider that delivers high quality of care (Baskaran *et al.*, 2009). The long-term perspective of social sustainability in healthcare is to serve as an inductive role in social improvement, where society would benefit from the development and well-being (Machado *et al.*, 2015). Therefore, the social dimension is shaped on a criterion regarding humanisation, and comfort and space distribution with an undeniable orientation towards the promotion of equality, especially when provided universally (Borgonovi & Compagni, 2013; Buffoli *et al.*, 2013). In conclusion, this leads to the existence of a growing movement towards adopting social sustainability practices in a healthcare system (Hussain *et al.*, 2018).

6.1.1.3 Environmental sustainability in healthcare

The environmental facet of sustainability includes areas that deal with themes like energy, water, waste materials, and urban planning (Buffoli *et al.*, 2013). Environmental sustainability especially focuses on the quality of the life of a society, and the reuse of the environmental themes that are not only a time constraint but seeking to improve environmental actions to ultimately gain strength in the business environment context (Machado *et al.*, 2015). Subsequently, environmental issues in the healthcare system and business environment are interchangeably related to one another (Baskaran *et al.*, 2009). A healthcare system should adopt environmental sustainability policies and principles with the aim to achieve significant performance improvements. A decrease in costs of environmental themes, such as waste recycling and disposal is one of the many results of performance improvements within environmental sustainability (Chiarini & Vagnoni, 2016; Pasqualini Blass *et al.*, 2016).

6.1.2 Sustainability approaches in a healthcare system

Given sustainability definitions and the three dimensions of sustainability in a healthcare system outlined in Section 6.1.1, highlight a number of strategies to incorporate sustainability matters into a healthcare system. The sustainability matters aim to solve existing problems by suggesting an effective strategic sustainable solution through a multidisciplinary approach (Buffoli *et al.*, 2013). This multidisciplinary approach from literature emphasises various sustainability structures or strategies that can be easily maintained and can be functional from an economical, social, and environmental point of view, which comply with diverse interests and needs for all stakeholders (Buffoli *et al.*, 2013).

Sustainability is a widely spread multidisciplinary holistic concept which is compiled from a number of elements that are tightly entangled (Gelderman *et al.*, 2017). This objective cannot be reached without understanding and analysing the complex concept as a whole

and the individual elements of this concept (Buffoli *et al.*, 2013). This approach allows for a global insight into sustainability and identifying the three dimensions of sustainability serving as the three macro areas for evaluation. This evaluation serves as a mechanism to reach an in-depth understanding of sustainability in relation to healthcare (Buffoli *et al.*, 2013).

Fischer & Heinrichs (2018) argued a design thinking approach to address sustainability within the healthcare system. Design thinking has been used to open a broad solution space of different approaches to the sustainability field. Design thinking is a systems solution-based approach which addresses unknown problems and finds suitable solutions to these unknown problems similar to the systems engineering approach mentioned in Chapter 3 (Dym *et al.*, 2005). The collaboration between design thinking, systems engineering approach and sustainability strives for a disruptive breakthrough solution to make a difference in a theoretical context and especially in sustainable healthcare systems (Fischer & Heinrichs, 2018).

Strategic planning has become an essential part of the business environment and has become another way to include sustainability in a healthcare system (Machado *et al.*, 2015). Strategic planning requires the defining of goals and objectives, and guidelines as the coordination of pre-established plans to define and identify healthcare activities and indicators (Machado *et al.*, 2015). The indicators allow specifying a certain criterion, practical, and measurable standards and solutions which entail an established and clear linkage between a theoretical, and philosophical point of view (Buffoli *et al.*, 2013).

Given the above outline, healthcare organisation's policy and strategic plans require the inclusion of sustainability dimensions aiming to achieve economic unity and social and environmental protection processes (Machado *et al.*, 2015; Popescu *et al.*, 2018).
From these different approaches of sustainability within a healthcare system, a sustainable healthcare system can be seen as an adaptive system. Economic, social, and environmental contexts change regularly and these sustainability resources should be used efficiently and effectively to permanently improve or maintain the health of each individual as well as the population (Popescu *et al.*, 2018). Subsequently, sustainable healthcare systems should provide access to individuals, mutual acceptance between patients and staff, and adaptability (Popescu *et al.*, 2018). Consequently, healthcare systems should be willing to adapt to socio-economic and demographic changes, dynamic technologies, new illnesses, and scientific discoveries, to remain operational (Popescu *et al.*, 2018).

Sustainability within healthcare systems has become the centre of analysis and desirable assets in order to be fit for the future. These assets explicitly aim to be a long-term

strategic perspective, promoting innovativeness, preventing diseases and promoting health, are quality-driven within each business action, covering environmental concerns as well as broader health determinants, and individual responsibility and institutional accountability (Fischer & Heinrichs, 2018).

A number of daunting challenges from the various sustainability healthcare approaches prevent business processes to fully integrate and deliver economic, social, and environmental strategies. These challenges result from a wider growth of needs and little to zero sufficient resources within an organisation (Braithwaite *et al.*, 2017; Khan *et al.*, 2018). In conclusion, healthcare literature related to sustainability lacks the evidence-informed practice improvement strategies for long-term sustainability (Fleiszer *et al.*, 2015a). This allows for the discussion of challenges within healthcare systems.

6.1.3 Challenges in a sustainability healthcare system

Buffoli *et al.* (2013) argue that one of the main sustainability challenges facing healthcare systems is when sustainability approaches focus on either one or two sustainability dimension(s) primarily, while neglecting the other dimension(s). Borgonovi & Compagni (2013) argue that sustainable systems should be diverse, equitable, connected and democratic, and provide a good quality of life. Subsequently, the increased level of humanisation within healthcare systems cannot exclude effective treatment from comfortable spaces and a positive working environment (Buffoli *et al.*, 2013). Therefore, the high-energy-demanding structure requires an increased level of attention to available resources which are finite and limited to time (Fleiszer *et al.*, 2015b).

The formal and informal processes, relationships and structures within the sustainable systems should ensure that the systems are durable over time so that current and future generations can benefit from these features. Parallel to this argument, Borgonovi & Compagni (2013) argue that social and political sustainability are equally desirable features of healthcare systems and no interrelationship between these sustainable systems and healthcare systems exists.

Another challenge in realising sustainable healthcare systems is the fact that healthcare systems exclusively deal with the derailment of sustainability efforts (Baskaran *et al.*, 2009). The derailment leads to a heightened concern about the increase in healthcare expenditures and its potential to obstruct economic growth. Subsequently, healthcare spending is not merely economically unsustainable but rather poorly allocated without producing health (Borgonovi & Compagni, 2013). Thus, economic sustainability within healthcare systems has become the current driver for the long-standing debate about the

relationship between healthcare spending, health, and wealth (Borgonovi & Compagni, 2013; Gelderman *et al.*, 2017).

Subsequently, the availability of sustainable healthcare approaches has limited to no information about the classification and reassembling of sustainable healthcare information. Sustainable healthcare systems thus aim to operate through an organisational system that is strengthened with sufficient resources and activities in order to meet the needs of individuals (Khan *et al.*, 2018). This requires the assessment of sustainable healthcare systems to associate healthcare business factors with sustainable design elements (stakeholder engagement), organisational setting (organisational culture), and environmental features (community engagement) (Braithwaite *et al.*, 2017).
The discussion of the challenges of sustainability within healthcare systems enables the process of structuring these challenges to the systems boundaries (economic, social, and environmental dimensions) of sustainability. The discussion of Figure 6.1 is based on the principle challenges of business sustainability and the aim of contributing towards business sustainability, as illustrated in Figure 1.2 in Section 5.2.4, Chapter 5. Figure 6.1 summarises the challenges of sustainability within healthcare systems and defines their integration as the aim to contribute towards business sustainability within healthcare systems.

The economic dimension relates to a number of process-related activities within the healthcare system. These processes include a wide range of activities from continuous care with continuous improvement plans to delivering end quality care (Baskaran *et al.*, 2009). These improvements and processes are developed from benchmarking- and established indicators that address all related factors of economic sustainability within healthcare systems.

The social dimension includes all the stakeholders within a healthcare system. Stakeholder's empathy towards patients plays an important role and provides a unique humanistic perspective of delivered quality care of the healthcare system. Professionalism has become essential in the care delivery process, ensuring the care is of high quality (Baskaran *et al.*, 2009). Healthcare training and education should be considered as continuous activities that enhance the healthcare resources' self-interests, education, and knowledge of the latest medicine.

The environmental dimension is, directly and indirectly, related to the healthcare system. Physical healthcare structures are viewed from a technologically green perspective and energy-sustaining initiatives are incorporated into existing and new structures (Baskaran *et al.*, 2009). It is thus vital to not only implement environmental initiatives but enforce environmental motives throughout the business actions of the healthcare system.

Fundamental to the system boundaries of sustainability, three qualities related to sustainability should be fostered within the healthcare system. *Equitable* quality is the orientation of social and economic dimensions of sustainability. Accessibility and quality of care should not be compromised when aiming for sustainability and should rather serve as the absolute form of value creation (Baskaran *et al.*, 2009; Lüdeke-Freund *et al.*, 2016).

The *endurance* of quality relates to the social and environmental dimensions of sustainability. Absolute form of value creation can be achieved by approaching resources and considering their ability to influence current and future generations (Baskaran *et al.*, 2009; Lüdeke-Freund *et al.*, 2016). Resilience and flexibility serve as fundamentals to address environmental challenges.

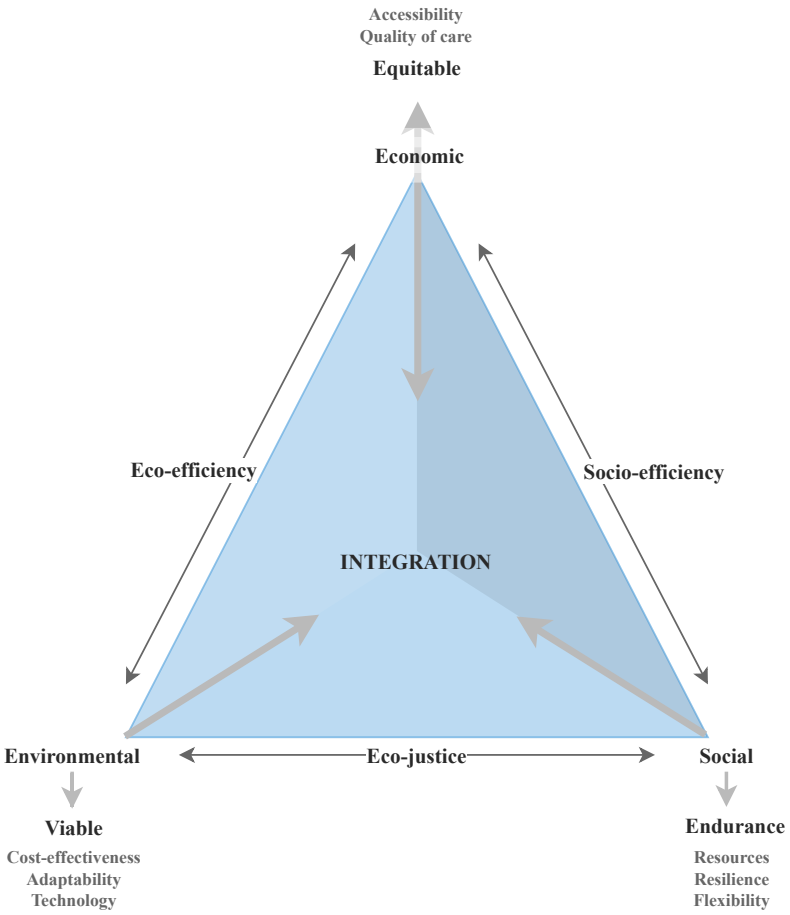

Figure 6.1: Integration of challenges of sustainability in healthcare systems (reproduced from Baskaran *et al.* (2009)).

Viability quality relates to the economic and environmental dimensions of sustainability. Cost-effectiveness should not be jeopardised when implementing sustainability-driven action plans. Adaptability will increase the ease to create and deliver an absolute form

of value creation (Baskaran *et al.*, 2009; Lüdeke-Freund *et al.*, 2016). Lastly, technology should not deplete nature and rather conserve limited resources.
Sustainability objectives should align with the existing strategies of the healthcare system and should complement each other. However, the challenges discussed of sustainability in healthcare systems, the strategies and approaches often incorporate sustainability from a bottom-up approach, meaning at an operational and technological level. Thus, implying that sustainability should rather be incorporated from a top-down approach at the business environment level and be concerned with the components within this business environment.

In line with the argument set out in this section, it is argued that at this increased level of granularity it is essential to enable healthcare systems to achieve their full potential in terms of business sustainability. Given the Business Sustainability Framework and Evaluation Tool that evaluates business sustainability at the individual business components that make up the system, as well as the relationships between the respective components, it is argued that the developed framework and evaluation tool would be able to contribute towards addressing the shortcomings associated with sustainability in healthcare systems.

6.2 Case study

This section introduces a short overview of literature pertaining to a case study. Followed by the literature overview, the case study selection includes the background discussion about the approach towards the inclusion of business sustainability measurements within the business processes of the case study. Lastly, the case study concludes a comparative discussion between the developed framework and evaluation tool and the case study's 'framework' and 'evaluation tool' to business sustainability.

6.2.1 Case study selection

A single case study allows the process to research a case and utilise informative and contextual data to interpret findings of the business sustainability phenomenon (Brown, 2008). The applicability of a case study requires at least three sources of evidence (Yin, 2014). These sources are (i) publically available documents of a business; (ii) personal observations; (iii) and a discussion with the business sustainability officer. This single case study comprises of a linear-analytic structure which has a number of rationales that are related to theoretical propositions. A single case study represents a significant contribution to knowledge and theory by confirming, challenging, or extending the developed concepts,

theory, and methods. (Yin, 2014). The single case study allows for reviewing relevant literature where sub-topics deem to identify methods used, the data collected, and the data analysed to conclude with a discussion on findings (Yin, 2014).

In line with the aforementioned theory, the case study is designed to illustrate how the Business Sustainability Framework and Evaluation Tool compares to the approach followed by an international private hospital group in consideration of business sustainability as part of their day-to-day business operations. To gain the greatest value from the case study it is important to understand the following: (i) the business sustainability framework of the case study, which serves as a guiding principle of knowledge; and (ii) the business sustainability evaluation tool of the case study, which serves as a set of logical assumptions or plans to achieve certain objectives. Thereafter a comparison application will deem as a real-life example between the Business Sustainability Framework and Evaluation Tool, from Chapter 5, and the business sustainability framework and tool of the international private hospital group. Lastly, the validity of the comparison between the Business Sustainability Framework and Evaluation Tool and the case study approach will be validated with the business sustainability officer of the international private hospital group in order to determine the applicability of the Business Sustainability Framework and Evaluation Tool within a real-life environment.

6.2.1.1 Background

Mediclinic, an international private hospital group, is chosen as the subject of the case study. Mediclinic publishes their annual sustainability reports, and therefore all data used in the case study are publically available. The background presented below is essentially extracted from three reports published by Mediclinic: (i) Financial review report; (ii) Clinical service report; and (iii) Sustainable development report.

Mediclinic takes a long-term view on delivering growth and creating long-term value in all its business operations. Being an international private hospital group has enabled the group to unlock value, share skills and best practices, and to establish valuable synergies and cost-efficiencies, internationally (Mediclinic International, 2017). Growth, profitability and creating shareholder value have become integral strategic drivers in ensuring the sustainability of the private hospital group (Mediclinic International, 2017). Additionally, the private hospital group is committed to delivering efficient, effective, appropriate and evidence-based clinical services to its patients; incorporate ethical business practices and fair labour practices; providing remuneration, training and development opportunities; respectable community interactions; contribute towards the well-being of the society; and manage the impact on the environment (Mediclinic International, 2017).

Mediclinic's vision is to be respected internationally and preferred locally. This means they will be respected for delivering measurable quality clinical outcomes; continuing to grow as a successful international healthcare group; enforcing good corporate governance, and acting as a responsible corporate citizen (Mediclinic International, 2017). Additionally, to be preferred locally, the group should deliver excellent patient care; ensuring aligned relationships with doctor communities; being an employer of choice, appointing and retaining competent staff; building constructive relationships with all stakeholders; and being a valued member of the community (Mediclinic International, 2017).

Mediclinic's business model or framework consists of a number of business inputs that generate value in order to deliver a set of business outcomes. Within this framework, additional approaches substantiate the business model process with regard to quality service delivery, manageable risks, sustainable growth, and value creation for its stakeholders. The following sections discuss the business sustainability framework of Mediclinic.

6.2.1.2 Sustainability framework

Mediclinic's sustainability framework consists of a number of inputs that generate value in order to deliver a set of business outcomes (Mediclinic International, 2017). The business inputs also known as the six capitals[1] serve as the cornerstones of discussion of the business sustainability report. The following are the business inputs that serve as the various forms of capital for their success (Mediclinic International, 2017):

I *Financial:* Mediclinic has a strong financial profile with an extensive property portfolio. The group invests for growth in order to generate a positive cash flow and indicate good returns on capital investments.

II *Manufactured:* Mediclinic has a leading position in the key markets; it operates with 74 hospitals, 37 clinics and provides over *10400* beds across the three platforms.

III *Human:* Mediclinic employs over *32600* employees across its three platforms. The group has invested 3.2% of the South African's platform payroll in training and extensively in formal nurse training.

IV *Intellectual:* The Board and management team of Mediclinic have deep industry knowledge and therefore have the ability to provide accurate knowledge and guidance across the business functions.

[1] International Integrated Reporting Council (2013) defines capitals as the various forms of an organisation's success. The capitals are the stocks of value which are increased, decreased or transformed through activities and outputs of an organisation.

V *Social and relationships:* Mediclinic has respectful and trustworthy relationships with suppliers, funders, key stakeholders, employees, patients, governments, communities, and supporting doctors that ensure high standard of ethics and transparency.

VI *Natural:* Efficient energy use, and continuously striving to reduce water usage and carbon emissions form part Mediclinic's commitment to reduce environmental impacts.

Subsequently, a transformation process is required to transform the above-mentioned business inputs into business outcomes whilst generating value. This process is discussed in terms of the following three value generating processes (Mediclinic International, 2017):

I. Investing in:

(i) *Growth and expansion of the group's world class facilities:* Mediclinic has growing record of investing in selected capital projects that deliver satisfactory returns and has the integrity to extract value from acquisitions and expansions.

(ii) *High qualified staff:* Mediclinic illustrates continuous investment in training and development of staff which creates a highly-trained working environment. Together with the highly-trained working environment, optimal remuneration practices are in place across the group.

(iii) *Improving efficiencies:* The key business processes will deliver efficiencies when resources are used effectively and cost savings and synergies are driven across Mediclinic's processes.

II. Providing:

(i) The main focus of Mediclinic is to provide care to patients through high-quality nursing care that delivers a seamless patient experience using operational expertise.

III. Delivering value to:

(i) *Patients:* Value is delivered through the process of clinical performance in a safe clinical environment that provides the best possible patient experience.

(ii) *Shareholders:* Value is delivered to shareholders through growth in capitalisation and shareholders' return.

The following six business outcomes are the result of the business inputs that are generated through value creation process(Mediclinic International, 2017).

I *Shareholder value:* The focus is on cost management and improving efficiencies that deliver growth in revenue.

II *Quality healthcare services:* Mediclinic has shown extensive increase in improvement of inpatient admissions, who benefit from clinical performance through a skilled workforce.

III *Highly skilled workforce:* High quality of work ensures employees are rewarded with remuneration and other benefits. Additional investments in training and well-being of staff deliver a motivated and engaged workforce in both clinical and business services.

IV *Government:* Mediclinic contributes to local authority levies and taxes during the financial year.

V *Society:* Mediclinic contributes at an economic and social level within the communities it operates.

VI *Environment:* Mediclinic focuses on actions in mitigating climate change.

6.2.1.3 Sustainability evaluation tool

Mediclinic takes a sustainable and long-term approach to business sustainability by putting patients first at the heart of all business operations and ensuring high-quality services are constantly delivered (Mediclinic International, 2017). For Mediclinic to uphold the highest standards of clinical governance and ethical behaviour it requires significant time and resources to recruit and retain skilled staff (Mediclinic International, 2017).

Mediclinic's approach or evaluation tool to business sustainability is to report on five material issues identified across its operations. Additionally, the group reports the process of how these issues are managed namely; the performance of these issues throughout the year; and the proposed initiatives for the following year (Mediclinic International, 2017). Mediclinic's sustainable development report is aligned with the standard disclosures of the Global Reporting Initiative.

Mediclinic has five material issues which are a result of the economic, social, and environmental impacts of Mediclinic's business processes. These impacts include the creating of employment opportunities, the availability of training and development for employees, investing in local communities and responsible use of natural resources (Mediclinic International, 2017). The aim of Mediclinic's materiality assessment is to identify sustainable development matters which are most important to the business, and which in turn affect the group's ability to contribute towards business sustainability as well value creation for its key stakeholders (Mediclinic International, 2017).

The following discussion will provide a brief summary of the five material issues, which serve as the focus of the group's sustainable development report and as well the correlation between these material issues and the standard disclosures of GRI.

1. Provide quality healthcare services:

The important factors to ensure quality healthcare services are provided to hold a strong clinical governance programme, continuing with capital investments across Mediclinic's platforms, and to gain momentum to achieve cost savings from procurement initiatives (Mediclinic International, 2017). These material issues consist of six key performance indicators (see Table 6.1) on which the group reports its performance.

These key performance indicators link to Mediclinic's strategy which is to improve safety, quality clinical care, improve patient experience and deliver integrated and coordinated care (Mediclinic International, 2017). These performance indicators are measured with the guidance of three aspects within the economic and organisational profile categories of the GRI standards.

Table 6.1: Material issue 1: Key performance indicators (Mediclinic International, 2017).

Key performance indicators	Description
Patient safety, quality care and clinical outcomes	Mediclinic's clinical performance programme focusses on clinical performance to ensure optimal value. Managing the clinical information enables the clinical measurement performance to deal with newly developed care models, technologies, and to deal with systems to support the clinical care processes.
Patient satisfaction and experience	Mediclinic created a standardised Patient Experience Index with the main objective to accomplish incremental and sustainable improvements of patient experience over time.
Provide and maintain high-quality hospital infrastructure	The focus of this indicator is to maintain facilities and optimise the use of facilities to ensure a safe and user-friendly environment to not only the patients but employees as well.
Procurement and supply chain management	Procurement practices focus on building long-term relationships with suppliers interchangeably and illustrate mutual trust and respect. The compliance requires the group to comply to international and local quality standards and specifications.
Cost of healthcare	Mediclinic's main focus is on efficiencies and cost effectiveness which in turn affect the streamlining of procurement practices, classification of matching the products, and improving prices through the pooling of capital equipment purchases.
Accreditation	The focus of accreditation is to ensure international standards are adhered to in all processes of the group's operations.

2. Address shortage of healthcare practitioners

Material issue two highlights the exceptional progress in relation to the internationalisation of its strategy with regard to human resources. Additionally, it emphasises the continuous investments in skills and training development to ensure the delivery of quality services are

maintained and improved (Mediclinic International, 2017). Therefore, it requires suitably qualified healthcare professionals to deliver to Mediclinic's *patient first strategy*. Six key performance indicators are identified by Mediclinic which in turn support the Mediclinic's approach to addressing this material issue. Table 6.2 summarises these six key performance indicators.

Table 6.2: Material issue 2: Key performance indicators (Mediclinic International, 2017).

Key performance indicators	Description
Employee recruitment and retention	The policies overview human resources which support good protocols that provide guidelines which result in consistent practices, supporting the employee life cycle. Additionally, local challenges are addressed through exceptional human resources strategies.
Labour relations and remuneration	In order to build long-term relations with employees, employee engagement, remuneration practices, and attracting scarce skills and rewarding high level of performances form part of the group's employment conditions.
Training and skills development	Mediclinic belief that employees who take on learning initiatives reflect good quality of care which is a result of the appropriate and evolving skill sets of employees. An inter-platform development programme offers a number of secondments which have been designed for individuals to excel within the group.
Support of external training institutions	Mediclinic focuses on educational development in the different operating platforms and provides financial and other support to the healthcare education.
Employee health and safety	This indicator focuses on the health and safety policies and procedures to ensure employees, visitors and patients experience a safe working environment.
Employee satisfaction and engagement	Mediclinic has introduced an employee engagement programme which measures the level of engagement, identifying the gaps at departmental level and identifying areas of improvement where the line managers develop actions to address these shortcomings.

The key performance indicators measured in material issue two can be linked to Mediclinic's strategy which is to invest in employees, improve in the safe, quality clinical care, and to improve the overall patient experience (Mediclinic International, 2017). The measurement of these performance indicators is executed with the support of 10 aspects of the economic, social, organisational profile, and stakeholder engagement categories of the GRI standards.

3. Create and sustain shareholder value

This materiality issue focuses solely on the sustainable growth opportunities that create and sustain shareholder value over a long-term (Mediclinic International, 2017). One of the highlights is the total dividend per share, significant investments that contribute towards growth in capacity of each operating platform, and the existing combination of corporate functions (Mediclinic International, 2017). The in-depth analysis of this material issue

can be found in Mediclinic's financial review. The four key performance indicators that form part of the sustainable development report are summarised in Table 6.3.

These indicators ultimately link to Mediclinic's strategy; the improvement of safe, quality clinical care; improvement of efficiencies; continuing to grow, and lastly investing in employees. The Organisational profile category of the GRI standards serves as the guideline to report and measure these performance indicators.

Table 6.3: Material issue 3: Key performance indicators (Mediclinic International, 2017).

Key performance indicators	Description
Acceptable shareholder return	Mediclinic's dividend policy is set out in the Financial Review which discusses the dividend reflections in more depth.
Profitability	Mediclinic has a strong focus on efficiencies to ensure the required earning targets are met. This is discussed in the Financial Review.
Growing the business	Mediclinic contributed investments to deliver capacity growth across the operating platforms. The group continuously proceeds to take on opportunities and initiatives to improve its existing facilities and services.
Provide and maintain high-quality infrastructure and equipment	The focus of this indicator reflects to one of the indicators from material issue one. The main focus is to maintain facilities and optimise the use of facilities to ensure a safe and user-friendly environment.

4. Responsible use of natural resources

The focus of this material issue is mainly on Mediclinic's environmental impacts, the utilisation of resources; mainly energy, electricity consumption and water usage, and the disposal of healthcare risk waste (Mediclinic International, 2017). Mediclinic identified five key performance indicators addressing these environmental impacts. Table 6.4 summarises these five key performance indicators.

Table 6.4: Material issue 4: Key performance indicators (Mediclinic International, 2017).

Key performance indicators	Description
Environmental management	Mediclinic aims to minimise environmental impacts and as well as guide the identification and management of risks and opportunities of water use, recycling, energy use, emissions, and climate change.
Carbon emissions	This indicator requires the reporting of the three different carbon emissions; scope 1 emissions refer to emissions of anaesthetics; scope 2 emissions refer to consumption of electricity; and scope 3 emissions refer to the emissions of suppliers.
Energy efficiency	Mediclinic aims to reduce the electricity consumption through the adoption of ISO 14001 standards, as well as install energy efficient technologies.
Water usage	Mediclinic monitors water consumption which includes reclaiming of water, monitoring of hot water, and installing water meters and control sensors.
Waste management	This indicator focuses on the protocols that are followed to ensure refuse removal; Mediclinic complies with the legislations and regulations of the law.

The responsible use of natural resources links to Mediclinic's efficiency improvements and these performance indicators are measured on the hand of seven aspects of the economic, and environmental categories of the GRI standards.

5. Governance and corporate social responsibility

Governance and corporate social responsibility are integrated into Mediclinic's approach to operating as a sustainable and long-term business. Mediclinic's vision is to enforce good corporate governance standards throughout the organisation by acting as a responsible corporate citizen, building constructive relationships with local stakeholders, and acting as a valued member of the community in the region of operation (Mediclinic International, 2017). Table 6.5 summarises the concerning key performance indicators of this material issue.

These six performance indicators are not directly linked to any strategic point of the group, but are regarded as key enablers and form the basis from which the group performs business. These performance indicators are measured with the guidance of five aspects of the economic and social categories of the GRI standards.

Table 6.5: Material issue 5: Key performance indicators (Mediclinic International, 2017).

Key performance indicators	Description
Ethics and governance	Mediclinic is committed to ethical standards which are set out in the values of the group and is supported by the Group Code of Business Conduct and Ethics. The code provides a framework with standards of business and ethics that are required of all business divisions.
Effective risk management	Mediclinic follows an international policy to define risk management objectives, methodology, risk appetite, risk identification, and assessment and treatment processes and the responsibilities of the various risk management role-players. This policy framework enables the group to quantify and manage risks in a framework format.
Compliance with laws and regulations	Mediclinic enhances its existing compliance culture and approach through a monitor programme that defines and integrates relevant laws and potential risks in the risk registers.
Human rights and rights of indigenous people	Mediclinic did not experience any events with regards to discrimination, violations involving rights of indigenous people and/ or human right reviews.
Broad-based black economic empowerment	Integrating and implementing sustainable broad-based black economic empowerment initiatives in the business strategy will ensure a commitment to sustainable transformation.
Corporate social investment	Mediclinic contributes to the well-being of the communities within operation by investing in ongoing initiatives. Mediclinic also enhances its existing approach through training and education, sponsorships, public private initiatives, and joint ventures.

The above-mentioned discussion emphasises that the definition of the material issues is aligned with the six business inputs and that the key performance indicators of each material issue either measure one or two of the sustainability dimensions and do not

consider all three dimensions. The reason for this observation is the view Mediclinic supports, which is to measure business sustainability from an operational level. This allows for the following section to discuss a comparison application between the case study and the developed framework and evaluation tool.

6.2.2 Case study discussion

This section discusses the investigation into the application of the developed framework and evaluation tool. This investigation entails both an independent evaluation of the business sustainability framework and evaluation tool of this research enquiry as well as a consultation with the business sustainability officer of Mediclinic. Essentially, the approach consists of three steps: (i) comparing both frameworks used in both the research enquiry and Mediclinic; (ii) comparing both evaluation tools in both the research enquiry and Mediclinic; and (iii) comparing the outcome of both the research enquiry and Mediclinic. The differences and similarities between these three perspectives are discussed below.

6.2.2.1 Comparing both frameworks

Firstly, both frameworks are used as a guiding principle to align the strategies and aims of its business actions towards business sustainability. The purpose of each quadrant (see Section 5.2.5 in Chapter 5) in the Business Sustainability Framework can be compared with the 'providing' action of Mediclinic's framework (see Section 6.2.1.2). This is the reason why Mediclinic is doing business, meaning the group wants to provide care for patients and ensure a high quality patient experience. The strategy of each quadrant can be compared to the 'delivering value to' from Mediclinic's framework. The strategy of Mediclinic is to deliver value to patients through superior clinical performance and ensure the best possible patient experience and to shareholders, through growth in capitalisation and shareholder returns. Lastly, Mediclinic's tactics to achieve the purpose and strategy are the action of what they are 'investing in'. To achieve the purpose and strategy they invest in growth and expansion of world-class facilities, highly qualified staff, and improving efficiencies.

6.2.2.2 Comparing both evaluation tools

Both evaluation tools used different views and pathways to contribute towards business sustainability, but to some extent differences and similarities between these two evaluation tools exist. To start with the differences, Mediclinic measures its business sustainability from an operational level. This means that Mediclinic measures business sustainability at day-to-day operations, aiming to achieve its short-term goals. Figure 6.2 illustrates the operational level at the bottom of the triangle which implies that Mediclinic's approach

towards business sustainability is a bottom-up approach. Subsequently, the Business Sustainability Evaluation Tool (see Section 5.2.6 in Chapter 5) measures from a strategic level (see Figure 6.2), which means the business components identified have a strategic view towards business sustainability. Additionally, the developed evaluation tool adopts a top-down approach, by viewing business sustainability at the strategic level, and thus considering it as a long-term approach. Additionally, the strategic view advances to operational level with the inclusion of the operational sub-components with business sustainability actions at the short and medium term of the business components.

Another observation is a combination of a difference and a similarity which relates to the inclusion of indicators used. Mediclinic fully includes GRI standards as their indicators or measuring method upon business sustainability performances within the business. Additionally, this is then a similarity with the Business Sustainability Evaluation Tool where some of the indicators used are identified in the GRI standards and other indicators are extracted from literature. Therefore, the developed evaluation tool considers sustainability at an increased level of detail against Mediclinic's tool.

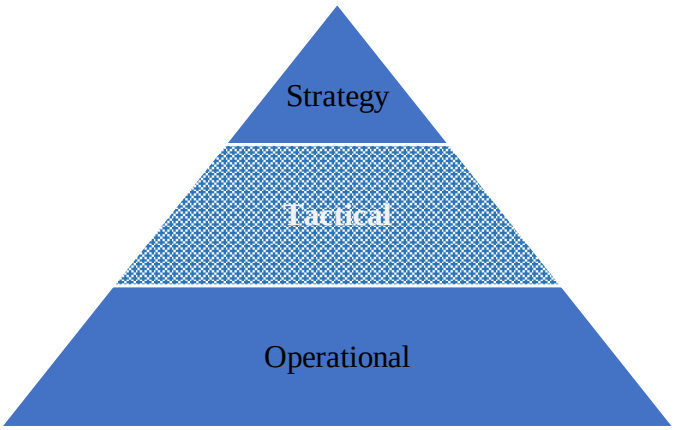

Figure 6.2: Business management levels.

Another observation of the business sustainable development report of Mediclinic is the reporting of a number of indices based on the result of its annual reports. Two of these indices are the FTSE index [1] and the RobecoSam index. These indices request Mediclinic to complete a check-list to determine if certain deliverables throughout Mediclinic's annual performance were conducted. The FTSE index refers to investing tools which support businesses to manage their investment profiles. RobecoSam index supports businesses to monitor its stock performance in terms of economic, social, and environmental criteria (Robeco Sam, 2018). These indices support the business to identify focus points within

[1] A venture between the Financial Times and the London Stock Exchange (FTSE International Limited, 2018).

the business which either requires additional attention in terms of changes or reporting or measuring criteria.

6.2.2.3 Comparing both outcomes

The last point of discussion was the expected outcomes from the two evaluation tools. The outcome of the Business Sustainability Evaluation Tool is the monitoring and evaluation stage (known as stage three), and targets/baseline measurements are identified. These targets relate back to the business as specific organisational targets which are aligned with industry-specific targets. The business uses these targets and in partnership with the value chain perspective to recommend any improvements or adjustments that are required for the following measurement time period.

On the other hand, Mediclinic's outcome of its business sustainability evaluation tool consists of a number of actions. Firstly, Mediclinic does not determine targets, they rather report the following year on any changes or improvements and the reason for these adjustments. Mediclinic consists of a number of committees which are responsible for the six capitals of the business sustainability development report. Once the legal team reviewed the different questions of the indices and identified concerns, the respective committees and outsourcing businesses are informed of the required areas of attention. The different committees and outsourcing businesses work on proposals stating their actions to address these identified concerns.

Additionally, the legal team continuously stays up to date with the latest and newly introduced measurements which they then report to the respective committees and outsourcing businesses where they start with proposals on how these measurements can be implemented. These new measurements create awareness under the committees and outsourcing businesses to incorporate new and innovative technologies that will contribute towards business sustainability performances and to stay competitive in the market.

Lastly, the legal team reports back to the shareholders and these shareholders discuss the annual results and set out any desires that require changes or additional points of discussion. In conclusion, the expert emphasises the importance of linking business strategies with environmental, social, and governance targets. Investors consider these targets as the main factors with regards to a business's ethical impact and sustainable matters.

6.3 Summary of case study

This section concludes on a discussion of the recommended changes for the Business Sustainability Framework and Evaluation Tool which resulted from the case study discussion.

Using the Business Sustainability Framework for a healthcare system, requires the customisation of the concepts and elements of the generic framework into a sustainability healthcare system context. The generic business sustainability definition/aim of each concept and element should serve as a guideline for each customised concept and element definition. The overall theme of business sustainability is maintained throughout this customisation process.

The concepts and elements have been redefined to ensure the importance of a healthcare system is included in the business sustainability definition of each individual concept and element. The SE approach with its four quadrants allows for the identification of defining and measuring the system from the perspective of the 'whole' and defining and measuring the system from the perspective of the 'functional units' (see Section 5.2.5 in Chapter 5). Subsequently, this means that the two perspectives should define and measure business sustainability in a healthcare system.

Figure 6.3 illustrates the explanation of the four quadrants and its elements of the Business Sustainability Framework for a healthcare system. The definitions of the elements are defined in such a way that it includes healthcare aspects that contribute to the overall business sustainability aim.

This observation of the two evaluation tools has identified two similar concepts: (i) a number of sub-components of the developed evaluation tool are identified as business inputs of Mediclinic's evaluation tool; and (ii) measuring similar indicators (similarity between some of the identified GRI indicators) at the business functional units. Additionally, the Business Sustainability Evaluation Tool considers the inclusion of reporting to a number of indices as part of stage three, monitoring and evaluation stage. This reporting will allow a business to compare its performance to industry peers, as well as the provision of valuable insights into sustainability trends to ensure the latest trends can be implemented into business actions.

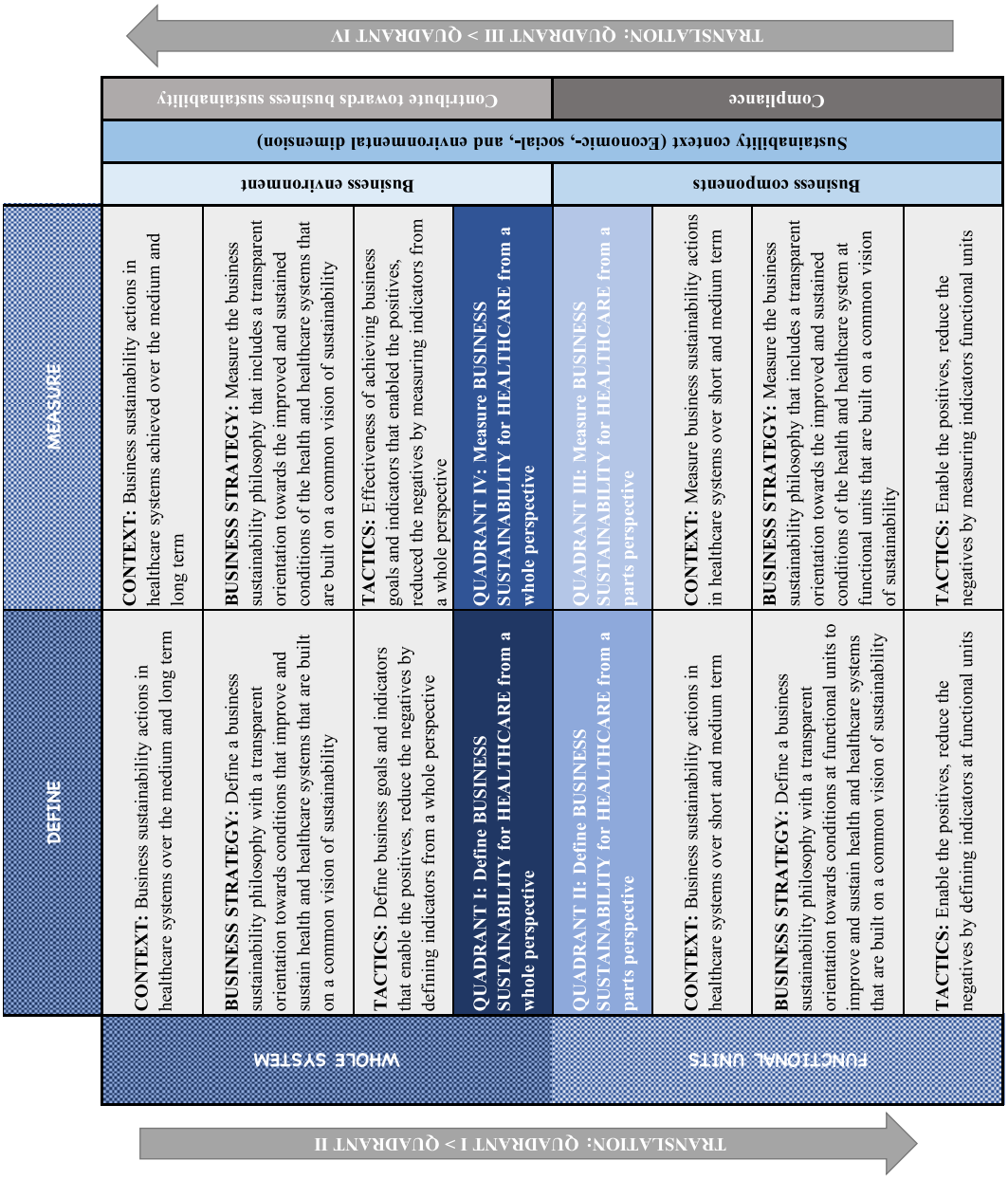

Figure 6.3: Business Sustainability Framework for a Healthcare System.

The last observation made by the expert is that The Business Sustainability Evaluation Tool considers sustainability at an increased level of detail, meaning that the tool is tremendously comprehensive and considers to some extent additional aspects of the detailed level of sustainability against Mediclinic's evaluation tool. Therefore, this tool is applicable and an appropriate tool for a start-up business or a business that considers business sustainability as the starting point in order to define and measure business sustainability from the two perspectives of a business. Additionally, the tool will provide support and guidance for top management to understand the broad and comprehensive context around business sustainability, which then, in turn, ease the process of explaining the concept of business sustainability within a business moving down the business management level.

6.4 Chapter 6: Conclusion

This chapter emphasised the detailed literature pertaining to business sustainability within a healthcare context. The concept concerning the three dimensions of sustainability within healthcare, sustainability approaches within healthcare, and existing sustainability challenges faced by a healthcare system, was discussed. Following the literature discussion was the case study application that served as a linear-analytic structure between the developed framework and evaluation tool and Mediclinic's approach. The discussion concluded on a comparison between both frameworks, tools, and expected outcomes of Mediclinic and the Business Sustainability Framework and Evaluation Tool. It is thus valid to say that both had similarities such as indicators and measurements, and differences in the sense of approaching business sustainability from different viewpoints. In conclusion, the developed framework is customised into a healthcare context while considering business sustainability and the evaluation tool can include the reporting of certain indices. It is evident that the Business Sustainability Framework and Evaluation Tool satisfies the applicability to an identified industry, and would, therefore, be a good tool to provide guidance for a business of any industry to be able to contribute to business sustainability.

Chapter 7

Conclusion and future work

The purpose of this chapter is to conclude the research and findings of this research project. This chapter provides an overview of the project and includes a summary of how the research objectives were satisfied and then ends with a discussion of the research limitations and recommendations of future work.

7.1 Overview

The research study proposes a Business Sustainability Framework and Evaluation Tool that addresses the shortcomings identified in existing business sustainability frameworks. The purpose of this framework and evaluation tool is to provide an evaluation and measuring mechanism for businesses to measure and evalaute its business sustainability performances at an increased level of detail considering all functional business components. An introduction to this research study is discussed in Chapter 1.

An introduction to this research study is discussed in In Chapter 1; in Chapter 1 the background and outline of the research study are discussed and the problem statement is established that serves as the research focus. The research objectives and methodology are stated, used to guide the study, and to address the problem statement. Lastly, an outline of the seven chapters in this document, which aim to achieve the research objectives and problem statement, is provided.

Chapter 2 serves as a systematic literature review that elaborated on eight sustainability frameworks. The sustainability frameworks focuses on the economic, social, and environmental aspects of sustainability which have integrated and interrelations with one another. The aim of the frameworks is to generate a better understanding of sustainability information and to integrate these sustainability matters into the business decision efforts. However, a number of challenges were noted that emerged from two key concerns regarding the sustainability frameworks namely; (i) sustainability is not considered at the level

of business components, and (ii) that not all sustainability dimensions are considered in equal levels of detail. These challenges and merging concerns highlighted the use of the systems engineering approach to address these challenges as a proposed approach.

Chapter 3 is concerned with the discussion of the systems engineering approach and how this approach firstly served as a problem-solving approach (addressing the challenges of the sustainability frameworks) and secondly, as a guiding principle for the development of the conceptual framework. The systems engineering approach allows for an increased level of granularity that is essential to enable businesses to evaluate and ultimately aim to achieve their full potential in terms of sustainability by unpacking the business environment into business components and measure sustainability performances at these business components across all sustainability dimensions at the adequate level of detail.

The systems engineering approach consists of four phases that are translated to four quadrants. The first quadrant considers the system as a 'whole', which can be broken down into 'smaller functional units' – such units are defined and presented in quadrant II. This implies a process of delineating the functional units. In quadrant II, each functional unit, and by implication the problem(s) at this increased level of granularity of the 'bigger' system-wide problem, is defined. Subsequently, in quadrant III, a solution can then be developed for the individual functional units, given that the problem is now clearly defined for each such unit. And lastly, the solutions developed for the individual functional units in quadrant III can be formed together as a solution for the system as a whole in quadrant IV.

In Chapter 4, the literature pertaining to the business environment and the various business components within the business environment is evaluated using the systems engineering approach. The applicability of these business components is the result of their extensive publications and contribution towards management theory and practice and approach on organisational growth and development. Additionally, these business components support the businesses to understand their own business's strengths and limitations and the potential to address these strengths and limitations. This chapter is concluded with a discussion of the business environment and its components in terms of the business value chain that facilitated the conceptualisation of the systems engineering approach to business sustainability.

In Chapter 5, the literature pertaining to the conceptual framework methodology is discussed and is used as a guideline to describe the overarching methodology to develop a qualitative systems engineering approach to business sustainability. The conceptual framework approach enabled the use of existing literature that has been introduced in preceding

chapters. The literature has certain relationships, features and concepts with one another and therefore the discussion of interrelations within concepts creates the applicability of Jabareen's (2009) approach. In conclusion, Jabareen's approach allowed the identification and creation to pursue the major concepts identified in various literature, in order to develop key components with their unique attributes and well-defined perspectives within the conceptual framework.

The Business Sustainability Framework is developed using the partnership of the systems engineering approach (and its quadrant discussion) and the conceptual framework methodology. The framework consists of the definition of each quadrant, as well as the concepts (quadrant definition, sustainability context, business strategy, tactics, form of value creation, and translation between quadrants) that are used to define, measure and/or evaluate business sustainability from the various perspectives. This high-level conceptualisation of the Business Sustainability Framework illustrates the four quadrants, that are subsequently translated into three stages within the developed Business Sustainability Evaluation Tool. Stage one discusses quadrants I and II, stage two discusses quadrants III and IV, and stage three discusses the monitoring and evaluation stage. Each quadrant consists of a number of elements that contribute to the overall quadrant definition and explanation.

The development of the Business Sustainability Evaluation Tool consists of three stages, where each stage discusses the identified quadrants and its associated elements, as introduced and discussed in the Business Sustainability Framework. Stage one is concerned with the discussion of quadrant I and quadrant II, defining business sustainability at an aggregate level in terms of the seven business components. Stage two is primarily concerned with the discussion of quadrants III and IV, measuring business sustainability in terms of the seven business components. Stage three is the overarching linkage between the define stage and measure stage.

Lastly, the Business Sustainability Framework and Evaluation Tool are validated by subject matter experts using a set of questions to ultimately achieve the desired outcomes of each set of questions. Followed by the validation of the Business Sustainability Framework and Evaluation Tool, a case study environment is introduced.

In Chapter 6, the case study for the research is discussed to gain more in-depth and practical insight of how an international private hospital group considers business sustainability. This chapter discussed literature pertaining sustainability matters within the healthcare system and the system boundaries of sustainability within a healthcare system. Emerging

challenges of sustainability in healthcare systems are discussed and the Business Sustainability Framework and Evaluation Tool is introduced to serve as an concrete example to understand the theoretical argument. Lastly, the case study is discussed with an expert in the field of this case study and differences, similarities and expected outcomes of the two approaches were identified and discussed.

The last chapter serves as the closing chapter of the research study by providing a conclusion of the research, addressing the research objectives and as well as discussing recommendations for future research.

7.2 Addressing the research objectives

The aim of this research is to contribute towards business sustainability through the development of a business sustainability framework. This aim and the research objectives are set out in Chapter 1, and have been achieved throughout this research. The chapters, sections, and page numbers where the objectives have been achieved are shown in Table 7.1.

Table 7.1: Research objectives achieved.

Research objectives	Chapter and Section	Page number
(i) Conduct a comprehensive literature review to:		
(a) Identify a number of sustainability frameworks that address sustainable development in the business environment and explore the challenges identified within such sustainable frameworks;	Chapter 2: 2.1-2.5	11-28
(b) Determine the required design specifications in order to address the challenges identified within the sustainable frameworks;	2.5	28-30
(c) Investigate the systems engineering approach as a problem-solving approach that will address certain challenges faced by the sustainability frameworks; and	Chapter 3: 3.1-3.3	31-38
(d) Identify the business environment, the various business components within the business environment and how these components will create and deliver value.	Chapter 4: 4.1-4.2	39-55
(ii) Introduce the systems engineering approach as a guiding principle for the conceptual framework development.	Chapter 4: 4.3	55-60
(iii) Propose a framework and evaluation tool that contributes towards increased business sustainability by providing a framework that substantiates industry-specific problem-solution combinations of the business components' level of the business environment.	Chapter 5: 5.1-5.2.6	62-105
(iv) Validate the developed conceptual framework of business sustainability towards the business components' level of the business environment.	Chapter 5: 5.2.7	105-117
(v) Conduct a linear-analytic structure as a case study between a healthcare context and the developed framework and tool.	Chapter 6: 6.1-6.3	120-141

7.3 Recommendations for future research

The limitations of this research study and the recommendations from the validation results provide valuable paths for future research.

One of the most prominent recommendations for future research would be to fully implement the Business Sustainability Framework and Evaluation Tool as case studies of different industries, user-groups or businesses. These case studies will have the ability to deem as another validation process but as well expose any shortcomings that can be improved on. Performing case studies will expose the fundamental meaning and unveil additional views of the business components, concepts, definitions, measurements, and indicators of the Business Sustainability Framework and Evaluation Tool.

The systems engineering approach can be used in a similar fashion but using other known business components to develop a 'new' Business Sustainability Framework and Evaluation

Tool in order to determine similarities and differences between the different frameworks and tools.

Another opportunity for future research would be to align the business components at a strategic level with the Sustainable Development Goals that could form part of the initial contribution towards business sustainability and then followed with the Business Sustainability Framework and Evaluation Tool.

A suggestion that was made during the validation process, is to implement the Business Sustainability Framework and Evaluation Tool and re-evaluate it against a set of outcomes i.e. usability, accuracy of deliverability, quality, and predictability. In a similar context it is suggested to apply the pareto principle by focussing on 20% of the tool and then implement it at an effective level of 80%. This principle identifies another method, where the evaluation tool is broken into parts, and then start implementing the evaluation tool in terms of the parts.

7.4 Chapter 7: Conclusion

This chapter serves as the conclusion to this research. Included in this chapter is an overview of the project, chapters, sections and page numbers where the research objectives were achieved, recommendations for future research, and the research conclusion.

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Appendix A

Chapter 2 supporting content

This appendix provides the supporting content of Chapter 2. The article that was published in the SAIIE28 annual conference proceedings and produced a large section of the content in Chapter 2.

A.1 SAIIE28 annual conference article

TOWARDS A SYSTEMS-BASED CAPABILITY MATURITY MODEL TO SUPPORT SUSTAINABLE BUSINESS DEVELOPMENT

ABSTRACT

Sustainability is recognised as one of the primary challenges of modern times in an organisation. Subsequently, the pressure on businesses to incorporate all aspects of sustainability to perform in terms of social equity, economic efficiency and environmental performance, has increased over the last decades. A number of researchers have developed frameworks and approaches to incorporate these three elements of sustainability into business processes. However, we argue for the case of a system-based Industrial Engineering approach to incorporate sustainable development into organisational goals and objectives.

This paper thus evaluates existing measures of sustainability, sustainable business frameworks and definitions within business environments, as well as existing models that are aimed to improve business sustainability through shared value. The aim is to highlight the value of a systems-based business sustainability maturity model approach, and the required capabilities to support sustainable business development. The outcome of this research inquiry will facilitate the process to develop a capability maturity model aimed at evaluating the sustainability performance of businesses.

OPSOMMING

Volhoubaarheid word erken as een van die primêre uitdagings van die moderne tyd. Vervolgens, ervaar besighede spanning die afgelope dekade om alle aspekte van volhoubaarheid in terme van maatskaplike billikheid, ekonomiese doeltreffendheid en omgewingsprestasie, te inkorporeer in besigheids-aktiwiteite. Verskeie raamwerke is al reeds ontwikkel om hierdie drie elemente van volhoubaarheid in sakeprosesse op te neem. Dus volg die argument vir ‘n stelselgebaseerde Bedryfsingenieurswese-benadering om volhoubare ontwikkeling in organisatoriese doelwitte en doelstellings in te sluit.

Hierdie artikel evalueer bestaande maatstawwe van volhoubaarheid, volhoubare besigheidsraamwerke en definisies binne die sake-omgewing, sowel as bestaande modelle wat gefokus is op verbeterde volhoubare besigheid deur gedeelde waarde. Die doel is om die waarde van ń stelselgebaseerde besigheids volhoubare model benadering te beklemtoon, asook die nodige vereistes om die volhoubare besigheidsontwikkeling te ondersteun. Die uitkoms van hierdie navorsingsvraag sal die proses ondersteun om die ‘capability maturity model’ te ontwikkel met die einddoel om volhoubare prestasie van besighede te evalueer.

1. INTRODUCTION AND BACKGROUND

Sustainability was popularised in the early 1980's when *"A global agenda for change"* was formulated by the General Assembly of the United Nations. In 1987, a world-known report was established, titled "Our Common Future" by the World Commission on Environment and Development. This report is also known as the Brundtland Report which is named after the chairman of the World Commission on Environment, Gro Harlem Brundtland. Sustainability and sustainable development are two terms that are used interchangeably and is defined by the World Commission on Environment and Development (1987) [1] as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*. To date, this definition is the most commonly used definition globally [2].

Another concept of sustainable development, that the Brundtland Report highlighted, was that in essence, to become sustainable implies to not only focus on environmental aspects but also on social and economic aspects, and that these three aspects do not limit one another, but are integrated and has interrelations with one another [3]. Building on this three-way perspective of sustainability, another synonym of sustainable development, namely "*Triple Bottom Line*" (TBL), was introduced by John Elkington in 1994, and he argued that businesses should develop three different bottom lines [4]. Figure 1 demonstrates the overlap of these three bottom lines and indicates where sustainable development originates. Another important point represented by the Venn diagram is the fact that trade-offs take place between the dimensions in order to improve one or the other. Lozano [5] emphasizes that the figure shown in Figure 1 does not show change over time, which is considered a critical aspect of sustainability.

Figure 1: A Venn diagram representing triple bottom line [4].

Over the years, an extensive need for business sustainability developed, and businesses promoted the idea of sustainable business strategies. Businesses are experiencing increasing pressure to incorporate environmental and social development goals and performance measures into their strategies and business operations, and thus the dynamics that surround the term "business sustainability" should be fully understood [4].

The next section provides an overview of the approach taken in this research inquiry; a systematic review of available literature in order to address the research objective (see section 2.1), which argues for the case of a system-based Industrial Engineering approach to incorporate sustainable development to organisational goals and objectives. The article concludes with a discussion on how to measure sustainability with the aim to highlight the value of a systems-based business sustainability maturity model[1], and the required capabilities to support sustainable business development.

[1] The definition per se of a sustainable maturity model in this inquiry will be demonstrated by the maturity of an organisation's business environment that affects the ability to successfully implement process improvement by either implementation of incremental change or by totally radical novel idea.

2. SYSTEMATIC REVIEW METHODOLOGY

A systematic review is defined as *"a review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review"* [5]. A systematic review thus aims to establish existing research that has progressed towards a clarifying problem. Systematic reviews are characterised by being unbiased, methodical, transparent and replicable. It therefore involves a methodical search process to locate studies which address a particular question, as well as the findings of the results of this search. Titles, abstracts, keywords, geographical locations, and year published, are used to distinguish a large group of research to a smaller group that are used in this study. Figure 2 indicates the five steps that are executed during a systematic review, followed by an in-depth discussion to ensure the results are unbiased and transparent [6].

Figure 2: Systematic review procedure [6].

2.1 Research objective(s)

This paper analyses literature concerning sustainability assessment frameworks in a universal context with the aim of addressing the following research objective:

Review existing sustainable assessment frameworks that promote sustainable actions in order to incorporate sustainable development into organisational goals and objectives.

2.2 Search for relevant studies

The search for relevant studies was initially conducted using the known online search tools, Scopus and google scholar. The initial search included single word phrases. For sustainability, the keywords "triple bottom line", "sustainability" and "sustainable development" were used. Keywords such as "indicators", "business models", "business development" and "maturity models" were used for the capability maturity model approach. Due to a large amount of data gathered, a criterion was established to narrow down the documents. The first step in the criteria was to combine the above mentioned single word phrases with one another to narrow down the search with the focus to be on sustainable measurement frameworks. The primary focus of the documents should entail the overall theme of sustainability, methods or indication on how sustainability can be measured. The combined search terms gave a total of 543 documents that was used for further analysation. Table 1 illustrates a summary of the combined search terms.
The titles and keywords listed were evaluated to ensure this criterion correlates to the overall theme. The next filtering process included publications after the year 2000 and thus narrowed down the research data to 200 documents. These 200 documents were further analysed by changing the mode of publication and ensuring the titles and keywords are aligned with the overall theme. The titles and keywords should be aligned with the following phrases: "sustainability frameworks", "sustainability measurements", "sustainable development assessment" etc. This analysation process resulted a total of 70 documents. Thereafter the 70 documents were analysed by reviewing the abstracts and identifying sustainability measurement approaches and proposed results. A total of 35 documents were selected after the abstract reviewing process. Additionally, to the 35 documents 7 documents were handpicked which supported the sustainability theme. **Error! Reference source not found.** illustrates the narrowing down of the documents throughout the criteria process.

Table 1: Results of the combined search terms.

Combined Search terms	Results
TITLE-ABS-KEY ("triple bottom line") AND TITLE-ABS-KEY (indicators))	165
TITLE-ABS-KEY ("triple bottom line") AND TITLE-ABS-KEY ("business model"))	40
TITLE-ABS-KEY ("sustain*") AND TITLE-ABS-KEY ("business model") AND TITLE-ABS-KEY ("framework")	149
TITLE-ABS-KEY ("sustain*") AND TITLE-ABS-KEY ("maturity model")	189
	543

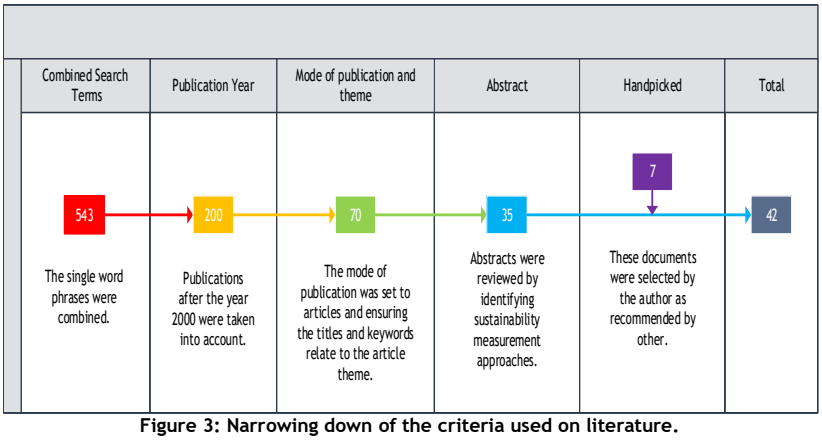

Figure 3: Narrowing down of the criteria used on literature.

2.3 Mode of publication

The document search outlined above was extensive, and ultimately resulted in a total of 42 documents being selected to use for the remainder of this research inquiry. Of these 42 documents, the majority are journal articles, and a small fraction are reports. These papers and articles address the overall literature concerning sustainability within the context of the formulated research objectives. Table 2 illustrates the search structure conducted during the systematic review. The 42 documents are compiled of 31 journal articles, four reports and seven web pages.

Table 2: Mode of publication classification.

Type of data	Results
Journal articles	31
Reports	4
Web pages	7

2.4 Synthesising the data

The documents were analysed and synthesised according to the overall theme it addresses around sustainability. In order to have a comparison between the different sustainability measurement frameworks, a criterion was identified. Firstly, throughout the review of the frameworks, dimensions were identified. These dimensions are discussed in detail in the following section. After the dimensions were identified, the key performance indexes were set out at each framework according to the sustainability factors. Table 4 and Table 5 illustrates a summary of these dimensions. Section 4 describes the assessment that was used to find the best or most suitable sustainability measurement framework for future use.

2.5 Findings

The eight measurement frameworks of sustainability, obtained from the systematic review will be discussed in section 3. These 8 frameworks are identified by the research conducted by Williams & Hickey [7] about sustainability measurement frameworks Williams & Hickey [7] is one of the 42 articles obtained throughout the systematic review, and are deemed the most prominent sustainability measurement frameworks; this research inquiry, however, builds on the work produced by Williams & Hickey [7] by means evaluating the remaining 41 articles that resulted from the systematic literature analysis outlined above.

3. MEASUREMENTS OF SUSTAINABILITY

The evaluation of sustainable development within business environments, enables businesses to identify areas which already achieved sustainable goals and objectives, as well as areas that requires improvement initiatives in terms of any of the three pillars of sustainability. Sustainability indicators are a simple instrument that allows businesses to evaluate economic, social and environmental objectives as well as the social and environmental impact of their business. An indicator that includes the necessary features of a system or show how maintenance or improvements can be done on a system is classified as a good indicator [7].

By now it should be clear that sustainability measurements are required to support the implementation process of sustainability goals in any organisation [8]. In order to understand the measurement of business sustainability, the aim of such measurements should be clearly defined. The aim of a business sustainability assessment or measurement include the following [9]:

- It generates information for better understanding of the meaning of sustainability and its contextual interpretation;
- The integration of sustainability challenges into decision-making efforts by identifying and assessing the past or current sustainability impacts; and,
- It promotes sustainability objectives throughout the organisation.

The above-mentioned aims should be considered in all sustainability enrolment decisions in any business. Several sustainability assessment frameworks exist, which include the above mentioned aims to varying extents, and can be used as guidance for the measurement of sustainability. A framework is defined in simple terms, as a structure that is composed of components which are framed together to support a subject [10]. Thus, a sustainability assessment framework, which supports sustainable development consists of elements such as indicators, models, and policies or other frameworks [10].

Waas et al. [9] identified two methodological approaches that exist in sustainability measurements. The first approach is a top-down approach and also referred to as 'reductionist' and developed by experts which uses explicit methodologies. The second approach is a bottom-up approach and also known as 'conversational' and developed by stakeholders which uses implicit methodologies. A top-down approach is distinguished by quantitative indicators and a bottom-up approach by qualitative indicators [10] [12].

Parallel with the above outline, the following dimensions which allow for a systematic comparison of various systems approaches to sustainability assessment frameworks has been gathered:

- System boundaries: The system boundaries are based on the sustainability domains the assessment framework focusses on. The sustainability domains include the economic, social and environmental dimensions. A fourth domain that contributes additionally to the system boundaries are institutional programmes that are controlled by governmental bodies [12];
- Actors and networks: Actors are the different groups that are connected to each other in a network. Actors can be humans or non-human objects. A network is the outcome of when two or more actors are connected [13]; and,
- Discipline: The discipline of the assessment framework refers to the specific academic discipline the framework is applicable to. The framework can range from a generalised framework or to a more specific discipline framework that focuses on certain commitment initiatives [14].

Table 3 illustrates the occurrence of the eight identified sustainability measurement frameworks in the 42 articles obtained from the systematic review.

Table 3: Framework findings.

Sustainability measurement Framework	References	Findings
Global Reporting Initiative G4 Sustainability Reporting Guidelines	Carter et.al. [2]; Williams et. al. [7]; Fonsenca et. al [10]; Bonini et. al.[15]; Azapagic et.al [16][17]; Elkington [18]; Singh et.al [19]; United Nations Global Compact [20]; Illankoon et. al. [21]; Labuschagne et. al [22]; Lozano [243; Joyce et. al. [24]; United Nations Global Compact [25] UNDESA [26]	15
CDP Environmental Disclosure System	Williams et. al. [7]; CDP Worldwide [28]	2
United Nations Commission on Sustainable Development	Williams et. al. [7]; Division for sustainable development [12]; Singh et. al. [19]; Illankoon et. al. [21]; Labuschagne et. al. [22]; Shrivastava et.al. [29]	6
International Union for Conservation of Nature	Williams et. al. [7]; Division for Sustainable Development [12]; Mebratu [30]; Lele [31]; Umthania [32]; IUCN [33]	6
Environmental sustainability index	Williams et. al. [7]; Waas et. al. [9]; World Economic Forum [34]	3
Global Scenario Group	Williams et. al. [7]; Global Scenario Group [35]	2
Sustainability Accounting Standards Board	Williams et. al. [7]; SASB [36]	2
United Nations Global Compact Communication on Progress	Williams et. al. [7]; Bonini et. al. [15]; United Nations Global Compact 2012 [20], United Nations Global Compact 2017 [25] United Nations Global Compact 2015 [27]; UNDESA [26]	6

Williams & Hickey discussed other frameworks as well, but due to the unavailability of data or the scope of the frameworks made it impossible to include it.

3.1 Global Reporting Initiative G4 Sustainability Reporting Guidelines

The United Nations Environment Programme (UNEP) formed a partnership with the Coalition for Environmentally Responsible Economics (CERES) and established the Global Reporting Initiative (GRI) in 1997.

The aim of the GRI is to enhance the quality, rigour and utility of sustainability reporting [19]. Sustainability reporting as mentioned by the GRI standards is an organisation's application of reporting on the organisation's economic, environmental and social impacts and contributions towards the end goal of sustainable development [37].

The fourth generation of the guidelines was launched in May 2013. The aim of G4 is to support reporters to prepare sustainability reports that are valued and to make sustainability reporting a standard practice. G4 provide guidance through a designed compatible range of different reporting formats. It supports businesses on the strategic journey and encouraging businesses to only provide information on the issues and challenges that are critical to sustainable development, in order to achieve the organisation's goals for sustainable development [37].

The G4 guideline is user-friendly and enables businesses to better inform markets and the society on sustainability matters. This guideline is designed to be universally applicable to all enterprises; small, medium and large, globally. The G4 guideline provides extensive guidance on how sustainability disclosures in different report formats should be presented. Figure 3 presents an overview structure of the G4 reporting guidelines. The second row presents the system boundary dimension (economic, environmental and social), the third row presents the subsequent categories in each subsequent system boundary and the last row presents the number of important aspects (list of subjects covered by the guidelines) that needs to be considered in the allocated categories.

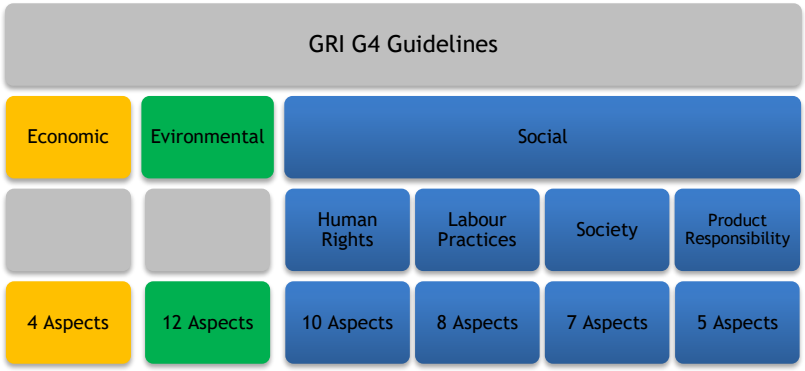

Figure 3: Overview of GRI G4 reporting guidelines [38].

The guidelines are presented in two parts, the reporting principles and standard disclosures and the implementation manual. The first part encompasses the reporting principles, standard disclosures, definitions of key terms, and the criteria which should be followed by an organisation when preparing its sustainability report. The second part, encompasses explanations of how the reporting principles should be applied, how to prepare the information to be disclosed, and how to interpret the various concepts in the guidelines [38].

GRI consists of a global network, which includes reporters, experts and advisers in sustainability reporting around the world. This global network has a multi-stakeholder approach which serve as the actors. The governance body are formed from a diverse range of experts in the sustainability reporting field. Reporters that use GRI guidelines have access to the following global strategic partnerships of GRI; Organisation for Economic Co-operation and Development, the United Nations Environment Programme and the United Nations Global Compact [38].

GRI guidelines are developed in order to be applicable to any discipline. Additionally, to this generalised guideline, GRI has developed guidance on sector-specific issues, aiming to increase the number and quality of reports and to improve sustainability performance in the sectors covered. The following sectors have additional guidelines: airport operators, food processing, construction and real estate, electric utilities, financial services, media, mining and minerals, non-governmental businesses and oil and gas sector [38].

3.2 CDP Environmental Disclosure System

The Carbon Disclosure Project (CDP), is an organisation based in the United Kingdom which enables companies, cities, states and regions to measure and manage their environmental impacts. It contains a comprehensive collection of self-reported environmental data in the world [28]. CDP asks companies, cities, states and regions for data of their environmental performances. These data are transformed into a detailed analysis about critical environmental risks, opportunities and impacts. There-after the investors, businesses and policy makers use the data and insights to improve decisions, manage risk and capitalise on opportunities. CDP focusses on

climate change, forests and water programmes, which support businesses to capture the accredited data and to submit it to the investors [28].

The Climate Disclosure Standards Board (CDSB) and CDP work together to provide a complete, reliable and verified system for climate disclosure. The CDSB has developed two frameworks for the process of reporting environmental information or natural capital and climate change-related information in corporate reports. These frameworks support investors with essential decisions about environmental information while considering capital allocation.

CDP creates a network between companies, cities, states and regions, investors, purchasers, non-governmental businesses, intergovernmental businesses and governments to exchange environmental information for any further actions. Similarly, to GRI, CDP developed a generalised guideline to support the environmental system boundary. Additionally, a supply chain programme is developed. The programme supports the in taking of a new approach to climate change, water and forest-risk management, by collaborating and encouraging transparency in the value chain, businesses can demonstrate engagement, tackle the risks, take advantage of opportunities, and ensure business continuity [28].

3.3 United Nations Commission on Sustainable Development

The United Nations Commission on Sustainable Development (CSD) was established by the UN General Assembly in 1992 to be ensured of effective follow-up of the Earth Summit. During the Earth Summit, indicators has been recognised as an important role when supporting countries to make informed decisions concerning sustainable development (social, economic and environmental) [12]. Agenda 21 specifically focus on efforts to develop sustainable development indicators at national, regional, and global levels, including the incorporation of these indicators that are in common, ensuring it is regularly updated and widely accessible.

The main objective of the CSD programme is to ensure the indicators of sustainable development are accessible to decision-makers and to clarify their methodologies and to provide training and capacity building activities within the context of business sustainability. The CSD programme consists of the following key elements [12]:

i. Information should be exchange among all interested actors on research, methodological and practical activities that are associated with the indicators; and,
ii. Methodology sheets must be developed, which describes the indicators individually and their relevance to policies that are available from governmental bodies.

Countries at national level, as well as international governmental and non-governmental businesses forms part of the network and serve as actors when methodology sheets[2] are drafted. These businesses serve as agencies to guide the overall process of the methodology sheets. Individuals whom have experience in establishing/ evaluating sustainability serve as advisories when indicator information is required. Together with these actors and networks, the CSD has developed multi-stakeholder partnerships that focus on certain initiatives.

The CSD programme is based on general sustainability programme and the following partnerships: Higher Education Sustainability Initiative, Partnerships for Small Island Developing States, Every Woman Every Child and Global Water Partnership. These programmes will increasingly be tied to their ability to manage and share knowledge and expertise about the issues, processes, and solutions that they are promoting business sustainability in all countries and all sectors [26].

3.4 International Union for Conservation of Nature

The International Union for Conservation of Nature (IUCN) was established in 1948 between the partnership of the government and civil society businesses. The purpose of the IUCN is to provide public, private and non-governmental businesses the knowledge and tools that enhances human progress, economic development and nature conservation [39]. The IUCN has developed in the world's largest and diverse environmental network with approximately 1300 member businesses and 1600 inputs from experts. IUCN's mission is to encourage and assist societies globally to safeguard the diversity of nature and to ensure the use of natural resources is sustainable.

IUCN's experts are divided into the following six assignments: species survival, environmental law, protected areas, social and economy policy, ecosystem management, and education and communication. By facilitating these assignments, IUCN supports governments and institutions at all levels to ensure universal goals are achieved. IUCN consists of a credited group of best practices, conservation tools, and international guidelines and standards to support the sustainable assessment framework [39].

The expertise network of IUCN provides a stable foundation for a large and variety portfolio of conservation projects, globally. The aim of these projects is to reverse habitat loss, restore ecosystems, and improve human wealth. To ensure this aim is accomplished, the latest science, with knowledge of local communities should be

[2] Methodology sheets contain the basic information of the indicators, the purpose and usefulness of the indicators and definitions and measurement methods [12].

gathered and incorporated in the projects on a continuous basis. The actors (governments, non-governmental businesses, scientists, businesses, local communities, indigenous people's businesses) contribute to these networks of projects and the contribution of knowledge and policies [40].

The IUCN provides a framework for planning, implementing, monitoring and evaluating the sustainable development initiative. The programme has three primary matters [40]:

i. The valuing and conserving work on biodiversity and emphasising tangible and intangible values of nature;
ii. Supporting and promoting effective and fair governance of natural resources combining IUCN's projects about people-nature relations, rights and responsibilities, and political and economic matters; and,
iii. Developing nature-orientated solutions to societal challenges which expands projects about nature contribution by addressing problems of sustainable development.

The IUCN has 15 themes or discipline areas where in-depth analysis in terms of social, environmental and environmental issues are executed. These themes include business and biodiversity, climate change, economics, ecosystem management, environmental law, forests, gender, global policy, social policy, species, water, and world heritage [39].

3.5 Environmental sustainability index

Environmental sustainability index (ESI), an initiative developed by the World Economic Forum, and is composite index published during the period between 1999 to 2005. ESI measured progress toward environmental sustainability for 142 countries. The measurements consist of 20 indicators, each with eight variables for a total of 68 data sets. The following five core components are the successes measured in the different countries: environmental systems, reducing stresses, reducing human vulnerability, social and institutional capacity, and global stewardship. [34].

ESI executes a cross-functional comparison of environmental sustainability in a systematic and quantitative manner. It therefore promotes a more analytically diligent and data driven manner to environmental decision-making. ESI therefore enables, identification of issues where national performances are below or above expectations, priority-setting among policy areas within countries and regions, the tracking of environmental trends, quantitative assessment of the success of policies and programmes, and the investigation into interactions between environmental and economic performance, and the factors that influence environmental sustainability [34].

The World Economic Forum thus forms partnership with governments, the private sector, communities and individual citizens to gather the information and data required to execute the ESI measurements. A broad overview is given by the measurements that focus on a general discipline.

3.6 Global Scenario Group

In 1995, the Global Scenario Group (GSG) was convened by the Stockholm Environment Institute. The GSG is an independent, international body which engages in the process of scenario development. The central theme around this scenario development was the identification of policies, actions and human decisions required to ensure a more sustainable and equitable future. The GSG provides a unique framework to researchers, decision-makers and the general public. A scenario method is used to clarify and understand concepts to a greater degree, in which direction the progress is headed and the flow of events towards a more desirable future. These scenarios are pursued at global, regional and national level. This in-depth analysis ensures that all sets of issues and opportunities are analysed in terms of social, economic and environmental system boundaries [35].

GSG scenarios has four discipline areas: market forces, policy reform, fortress world, and great transition. Market forces is a market-driven scenario in which demographic, economic, environmental and technological trends are discovered. World development are characterised by globalisation and convergence, which ensures that the adjustment of institutions is executed gradually without major disruptions. The integration of economic proceeds rapidly and the socio-economic structures of poor regions grow into a developed model of the rich regions. Lastly, the significant factor in global affairs is the environmental transformation which shows progress in the desired direction [35].

Policy reform emphasises on the disclosure of strong political will for taking prompt actions to ensure a successful transition to a more equitable and environmentally resilient future. This scenario is designed to achieve a set of future sustainability goals where the development pathways for reaching the goals are clearly identified. Both policy reform and market forces explores simultaneously the requirements to achieve social and environmental goals under high economic growth conditions [35].

The fortress world scenario, a variant of the barbarization scenario of GSG, manage critical natural resources. The great transition scenario evaluates solutions to the sustainability challenge, including new socio-economic

arrangements and fundamental changes in values. This scenario enhances transition to a society that preserves natural systems and provides high level of wealth through material sufficiency [35].

3.7 Sustainability Accounting Standards Board

Sustainability Accounting Standards Board (SASB), an independent standard-setting organisation was founded in 2011. SASB focusses on industry-specific sustainability factors that most likely have material impacts and maintains sustainability accounting standards for 79 industries. The standards are designed in a manner to support companies to comply with existing regulatory commitments, using the existing framework within United States laws. SASB's mission is to ensure the existence of natural evolution in corporate reporting. SASB maintains sustainability standards that support public corporations to drive value and improve sustainability outcomes [36].

What differentiates SASB standards from other initiatives is the fact that the standards are decision useful, they provide industry-specific, reliable data and comparable material. The standards are the only sustainability standards that are developed according to the 'materiality' definition, defined by security laws. To gather accurate data, SASB deepens industry participation in terms of social, environmental and economic, to ensure the market's needs are met. The transparent process of SASB consists of two phases. The provisional phase includes industry research, evaluation of the research, standards development, public comment and provisional standards release. The codification phase consists of two steps, consultation and codification of the standards. This transparent process forms the network between the partnerships and engagement with investors, regulators, accountants, the engagement with issuers, and the education of market actors [36].

SASB has developed groups based on material sustainability risks and opportunities where investors can effectively understand the impact of sustainability risks on certain disciplines and effectively analyse these sustainability issues. These groups are consumption, healthcare, infrastructure, financials, non-renewable resources, services, renewable resources and alternative energy, technology and communications, resource transformation and transportation [36].

3.8 United Nations Global Compact Communication on Progress

In 2000, the United Nations Global Compact (UNGC) was established as a policy platform and a framework which businesses can use to conduct business in a sustainable and responsible way. UNGC supports businesses that aims to have responsible business actions assuring the business strategies and operations are aligned with the ten principles of human rights, labour, environment and anti-corruption. UNGC also encourage businesses that takes strategic actions to advance broader societal goals with the emphasis on collaboration and innovation [25].

UNGC addresses environmental risks and leverage opportunities, emphasising that businesses are tied to the planet. Opportunities and impacts effecting employees, workers in the value chain, customers and local communities are managed in terms of the social aspect, UNGC addresses. UNGC supports the economic development of societies and enhances good governance and stability.

UNGC's 2030 vision, which is their new global strategy, aims to mobilise a global movement of sustainable businesses and stakeholders to create the desired world. This strategy includes existing work around the ten principles as well as enhancing new directions including driving business action in support of the sustainable development goals. The focus areas will include responsible business and leadership practices, impact analysis, measurement and performance, global to local platform and connectors, and the sustainable development goals as the 'lighthouse'.

The UNGC network consists of 12000+ businesses in 170 countries, who uses the provided framework, exchanges sustainable development information among others and ensures full commitment to their sustainability strategy. Oil and gas, chemicals, basic resources, media, retail, health care, are just a few of the many sectors these businesses operate in. The ten principles are the following disciplines: human rights, decent work, gender equality, anti-corruption, peace, humanitarian action, food and water, climate action, breakthrough innovation, sustainability reporting, supply chain, and financial innovation.

3.9 Summary of the sustainability measurement frameworks

Table 4 and Table 5 provide an overview of the dimensions; system boundaries, actors and networks and discipline of each of the eight sustainability assessment frameworks.

Table 4: A summary of the system boundaries dimension at the different assessment frameworks.

Sustainability measurement framework	Dimension			
	System boundaries			
	Economic	Environmental	Social	Institutional
Global Reporting Initiative G4 Sustainability Reporting Guidelines	x	x	x	-
CDP Environmental Disclosure System	-	x	-	-
United Nations Commission on Sustainable Development	x	x	x	x
International Union for Conservation of Nature	-	x	-	-
Environmental sustainability index	-	x	-	-
Global Scenario Group	x	x	x	-
Sustainability Accounting Standards Board	x	x	x	-
United Nations Global Compact Communication on Progress	-	x	x	-

Table 5: A summary of the actors and networks and discipline dimension at the different assessment frameworks.

Sustainability measurement framework	Dimensions	
	Actors and networks	Discipline
Global Reporting Initiative G4 Sustainability Reporting Guidelines	Business, governmental, non-governmental organisation (gold community, knowledge unit, GRI and governments).	Any discipline, and additional to the following sectors: airport operators, food processing, construction and real estate, electric utilities, financial services, media, mining and minerals, NGO, oil and gas etc.
CDP Environmental Disclosure System	Companies, cities, states and regions, investors, purchasers, non-governmental businesses, inter-governmental businesses and governments.	General and supply chain
United Nations Commission on Sustainable Development	Countries at the national level, as well as international, governmental and non-governmental businesses.	General, Higher Education Sustainability Initiative (HESI), Partnerships for Small Island Developing States, Every Woman Every Child, Global Water Partnership etc.
International Union for Conservation of Nature	Governments, NGOs, scientists, businesses, local communities, indigenous people's businesses.	Business and biodiversity, climate change, economics, ecosystem management, environmental law, forests, gender, global policy, social policy, species, water, world heritage etc.
Environmental sustainability index	Governments, the private sector, communities and individual citizens.	General
Global Scenario Group	Researchers, decision-makers, general public.	Market forces, policy reform, fortress world, great transition
Sustainability Accounting Standards Board	Public corporations, market actors, investors, accountants.	Consumption, health care, infrastructure, financials, renewable resources and alternative energy, technology and communications, resource transformation, transportation etc.
United Nations Global Compact Communication on Progress	Government groups, local networks, private working groups.	Human rights, peace, humanitarian action, food and water, climate action, breakthrough innovation, sustainability reporting, supply chain, financial innovation etc.

The eight mentioned assessment frameworks will support guidance when the capability maturity model approach is developed. The capability maturity model offers the possibility for businesses to individually assess its position regarding five sustainability maturity levels and, to incorporate sustainable development into organisational goals and objectives to progress towards higher levels of sustainability. The maturity model is based on the belief that business sustainability is a continuous process of evolution in which a business will be continuously seeking to achieve its vision of sustainable development in uninterrupted cycles of improvement, where at each new cycle the business starts the process at a higher level of business sustainability performance.

4. ASSESSMENT OF THE SUSTAINABILITY MEASUREMENT FRAMEWORKS

This section aims to evaluate the above sustainability measurements in order to find an appropriate requirement criteria to find the most appropriate sustainability measurement for future use. Analysing the sustainability measurements and setting out each assessment's type of measurements in terms of social, economic and environmental, made the identification of the requirement criteria possible. Du Plessis & Bam [41] conducted a study about a scoping phase comparison, and was used as a reference when the requirement criteria were identified.

I. Data disclosure

The required indicators that are gained from the sustainability measurement frameworks will contribute strongly to the development of the proposed sustainability framework. It would be beneficial if the accumulated data is used only in an aggregated framework [41]. The data should have a clear and concise description of what is expected of the accumulated data.

II. Flexibility

The description of the indicators should be of such a nature or generalised form that the indicators are of use in any industry. It would be beneficial if any of the sustainability measurements consist of additional documentation that explains the sustainability measurements to a more specific industry.

III. Indicators

The indicators of the different sustainability measurement frameworks should consider all aspects of sustainability. Indicators that address the equivalent opportunities should be compared to find the most prominent indicator. Frameworks that consists of standardised indicators will be beneficial when valuing the frameworks to find the most suitable framework. The description of the indicators should be clear and concise.

IV. Measuring method

Different measurement methods must be analysed in depth to eliminate confusion in the represented indicators. Each indicator must consist of clear and concise targets. Numerical values or descriptions are assigned to ensure that organisational goals are aligned. These measuring methods are represented in terms of economic use of revenue, quantity, units, risk, percentages or impact.

The sustainability measurement frameworks mentioned in Section 0 that considers all three aspects of sustainability were used in the above assessment process. Frameworks that focussed on a specific sector were eliminated due to the proposed framework that will be developed for a more generalised industry. Table 6 illustrates the outcome of the requirement criteria towards the selected sustainability measurement framework that assess all three aspects and focused on a general concept.

Table 6: Summary of the international sustainability measurement frameworks according to the requirement criteria.

	Global Reporting Initiative G4 Sustainability Reporting Guidelines	United Nations Commission on Sustainable Development	Global Scenario Group	Sustainability Accounting Standards Board
Data disclosure	Available	Available	Limited	Limited
Flexibility	Adaptive	Adaptive	Non-adaptive	Adaptive
Indicators	Comprehensive	Standardised and comprehensive	Limited to non-comprehensive	Standardised and comprehensive
Measuring method	Detailed comprehensive	Comprehensive	Non-detailed	Comprehensive

Colour key:	Strong	Acceptable	Weak

From this table, it is noticeable that none of the sustainability measurement frameworks can be considered as a strong candidate but three of the four frameworks are an acceptable to strong candidate. The GRI G4 Sustainability reporting guidelines and the United Nations Commission on Sustainable Development both performed strongly in the criteria. The depth of the detail at the measuring methods from both frameworks are inadequate, but the description of the methods is of such a matter that it is still possible to measure the accurate information.

5. CONCLUSION

The systematic review clarifies the different universal assessment frameworks that can be used when measuring sustainability. It also categorises and emphasises the different dimensions identified at the assessment frameworks. These eight assessment frameworks were primarily selected based on their international awareness and the level of understanding their vision and end goal, respectively. This paper mainly served as a high-level study, and the insights gained and learnt from the sustainability approaches will facilitate the process of developing a capability maturity model aimed at evaluating the sustainability performance of businesses.

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Appendix B

Chapter 4 supporting content

This appendix provides the supporting content of Chapter 4. The article that was published in the IAMOT2018 annual conference proceedings, produced a large section of the content in Chapter 4.

B.1 IAMOT2018 annual conference article

A SYSTEMS ENGINEERING APPROACH TO BUSINESS SUSTAINABILITY

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ABSTRACT

Sustainability is recognised as one of the key challenges of modern-day businesses. The need for, and pressure on, businesses to incorporate aspects of sustainability into all business processes that result in the delivery of products and/or services, in terms of social equity, economic efficiency and environmental performance, has increased over the past few decades. Consequently, a number of business sustainability frameworks and approaches were developed to support businesses in incorporating these three elements of sustainability into business processes. However, these frameworks present challenges on how elements of sustainability could be incorporated into business processes. One such challenge is that these business sustainability frameworks and approaches, to a large extent, regard a business as a 'black box'[i], meaning that these frameworks and approaches address the sustainability objectives of the business as a whole and do not regard the business as multiple individual components working together as a whole.

This paper investigates a systems engineering (SE) approach to business sustainability and aims to deconstruct the business environment as it relates to the internal and external factors influencing business outputs, as well as various business components. This approach makes it possible to deconstruct the challenge created by the 'black box' approach to business sustainability into a subset of business sustainability focus areas, before seeking to find a solution to the sustainability of each part of the subset. Ultimately, the paper argues the case for an SE approach to business sustainability through the conceptualisation of the process of addressing business sustainability by applying the proposed SE approach. This process, which could be applied beyond the scope of the research enquiry, would facilitate the development of a business sustainability framework that addresses sustainability at the level of individual business components.

Keywords: business environment, business sustainability, systems engineering approach

[i] The concept of a 'black box' is a metaphor for modular components of argumentative discussion that are, within a particular discussion, not open to expansion (Jackson 2008).

INTRODUCTION

Over the past decade, individual business concepts in the business environment have become well-known topics for discussion in the fields of research and professional practice (Lüdeke-Freund & Dembek 2017). At the same time, sustainability has come to be recognised as one of the key challenges facing modern-day businesses. Sustainability experts have begun to investigate how the business environment and sustainability actions can be integrated into one system or model (Lüdeke-Freund & Dembek 2017). The need for, and pressure on, businesses to incorporate aspects of sustainability into all business processes that result in the delivery of products and/or services, in terms of social equity, economic efficiency and environmental performance, has increased over the past few decades. Consequently, a number of business sustainability frameworks and approaches were developed to support businesses in incorporating these three elements of sustainability into business processes. However, these frameworks present certain challenges in terms of how they incorporate elements of sustainability into business processes (Lüdeke-Freund, Massa, Bocken, Brent & Musango 2016).

One such challenge is that these business sustainability frameworks and approaches, to a large extent, regard a business as a 'black box' (Jackson 2008), meaning that these frameworks and approaches address the sustainability objectives of the business as a whole, and do not regard the business as multiple individual components working together as a whole (Jackson 2008).

By using the systems engineering (SE) approach to address the challenge of sustainable business development, the business environment is deconstructed into a collection of business environment facets that are important to consider when developing a sustainable business, as well as a set of entities, actors, and stakeholders that influence business performance, profitability, growth and sustainability (Lüdeke-Freund et al. 2016). Examples of internal business environment facets include values, vision, mission, markets, business departments such as logistics, production, finances and corporate culture, to mention but a few. Examples of external business environment facets include both the micro and macro environments (Porter & Kramer 2011).

The environment in which a business operates is considered as the sum of all the factors and variables that influence the creation, growth and continued existence of the business, either positively or negatively; thereby promoting or hindering the achievement of its objectives (Porter & Kramer 2011). It is thus evident that business contexts and environments play a significant role in sustainable business development. However, the ever-changing nature of such contexts and environments – together with numerous elements of the business value chain that ultimately create value for customers and thus constitute the outputs of the business – has to be acknowledged and taken into account when aiming to incorporate sustainability into businesses.

This paper argues that applying an SE approach to both the business environment and business sustainability considerations will contribute towards addressing the challenge associated with the 'black box' perspective of sustainability frameworks. Sustainability is approached as it applies to each of the elements of a business, with the objective of unearthing the status quo of sustainability as it relates to each element, namely with the objective of determining how each element contributes to, influences and/or enables businesses to produce value to society. This paper therefore allows the proposal of the perspective taken on business sustainability along the multiple dimensions that may be used to consider a business.

SUSTAINABILITY FRAMEWORKS FOR THE BUSINESS ENVIRONMENT

As mentioned, sustainability is recognised as one of the primary challenges facing modern businesses. A number of frameworks and approaches have been developed to support businesses in incorporating the three elements of sustainability into business processes (Lüdeke-Freund et al. 2016). Rautenbach, De Kock and Brent (2017) evaluated the available measures of business sustainability, sustainable business frameworks and definitions of business sustainability. This evaluation by Rautenbach et al. (2017) identified and subsequently evaluated the eight most prominent business sustainability frameworks found in the literature, and concluded with frameworks that are the most comprehensive and deemed most appropriately constructed to evaluate, facilitate and guide a process of improving business sustainability. Table 1 provides an overview of the business sustainability frameworks mentioned above, the key areas of application and the focus areas of these frameworks, as well as an overview of the various indicators included in each framework.

Actors are the different groups that are connected to each other in a network. These actors may be humans or non-human objects. A network is the outcome of a process that connects two or more actors (Dankert 2011). The discipline of the assessment framework refers to the specific academic discipline covered by the framework. The framework can range from a generalised framework to a more specific discipline framework that focuses on certain commitment initiatives (Krishnan 2009).

Table 1: A summary of the dimensions at the various sustainability assessment frameworks (adapted from Rautenbach et al. (2017))

Sustainability measurement framework	Economic	Environ-mental	Social	Actors and Networks	Discipline
Global Reporting Initiative G4 Sustainability Reporting Guidelines	x	x	x	Business, governmental, non-governmental organisation (gold community, knowledge unit, GRI and governments)	Any discipline, and additional to the following sectors: airport operators, food processing, construction and real estate, electric utilities, financial services, media, mining and minerals, NGO, oil and gas, etc.
CDP Environmental Disclosure System	-	x	-	Companies, cities, states and regions, investors, purchasers, non-governmental businesses, inter-governmental businesses and governments	General and supply chain
United Nations Commission on Sustainable Development	x	x	x	Countries at the national level, as well as international, governmental and non-governmental businesses	General, Higher Education Sustainability Initiative (HESI), Partnerships for Small Island Developing States, Every Woman Every Child, Global Water Partnership, etc.
International Union for Conservation of Nature	-	x	-	Governments, NGOs, scientists, businesses, local communities, indigenous people's businesses	Business and biodiversity, climate change, economics, ecosystem management, environmental law, forests, gender, global policy, social policy, species, water, world heritage, etc.
Environmental sustainability index	-	x	-	Governments, the private sector, communities and individual citizens	General
Global Scenario Group	x	x	x	Researchers, decision-makers, general public	Market forces, policy reform, fortress world, great transition

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Sustainability measurement framework	Economic	Environ-mental	Social	Actors and Networks	Discipline
Sustainability Accounting Standards Board	x	x	x	Public corporations, market actors, investors, accountants	Consumption, health care, infrastructure, financials, renewable resources and alternative energy, technology and communications, resource transformation, transportation, etc.
United Nations Global Compact Communication on Progress	-	x	x	Government groups, local networks, private working groups	Human rights, peace, humanitarian action, food and water, climate action, breakthrough innovation, sustainability reporting, supply chain, financial innovation, etc.

From the overview of the business sustainability frameworks, it is evident that these frameworks address business sustainability aspects as an overarching approach to the business and not in terms of the individual components of a business. Even though the internalii business components are not considered in these frameworks, the external environment (non-governmental organisations, governments, communities, etc.) are considered to varying degrees. This research enquiry accordingly focuses on the 'internal' business environment. From this perspective, and considering research done by Dyllick and Muff (2015), debating business sustainability challenges thus implies that businesses within the above mentioned business sustainability frameworks are mainly considered as a whole, and not as a product of a number of parts. In other words, there is a lack of integration of different business components and sustainability actions, or a lack of integration of sustainability actions and micro-level actions for the business (Dyllick & Muff 2015). It is evident how this focus on the external environment contributes to a 'black box' (Jackson 2008). A perspective on business sustainability and the decoupling of the business environment, together with sustainability actions, are required to address the aim of business sustainability.

As indicated in the introduction, one contribution of the 'black box' perspective to challenges in business sustainability may be attributed to the fact that measures of the three elements of sustainability and potential in terms of the three elements of sustainability are not necessarily similar across different (internal) business components. Thus, the sustainability targets for individual business components differ in terms of the various sustainability elements (Dyllick & Muff 2015). Recognising this will contribute to sustainability initiatives that are more focussed and defined at a greater level of detail and are therefore more likely to be effective in achieving their full potential.

Another challenge in realising business sustainability, given the 'black box' perspective of business sustainability frameworks, could be that businesses adapt their business processes to a recommended framework that considers sustainability only at an aggregate level, or does not consider all the elements of sustainability. This would result in the business not addressing sustainability across all levels of an organisation or across the various business components and/or business functions (Dyllick & Muff 2015); or in businesses operating in a sustainable manner to a limited extent only, rather than aiming to achieve holistic sustainability (Rautenbach et al. 2017).

[ii] Internal business environment refers to internal resources and factors that affect the running of the business and fall within the control of the business (Aastha, Harsimran, Harleen, Dhanvir, Banjul and Gaurav Sharma, 2011).

Sustainable development objectives should align with the existing strategies of the business and should complement each other. However, from the 'black box' perspective, the frameworks define objectives that seek to achieve the sustainability of the business as a whole, but these are not translated into sub-objectives that would guide the various business components and/or functions to address sustainability. In line with the arguments set out in this section, it is argued that this increased level of granularity is essential to enable businesses to achieve their full potential in terms of sustainability.

If business sustainability, and thus business sustainability frameworks, were to consider the individual components that make up the system, as well as the relationships between the respective components, it would be possible to address the shortcomings associated with sustainability frameworks. The SE approach allows for deconstructing a problem into a subset of functional parts and subsequently for developing a solution for each part in every subset. Eventually, the set of solutions developed are evaluated from a collective perspective, as the set of solutions should ultimately address the original problem at an aggregate level.

SYSTEMS ENGINEERING APPROACH

SE is defined as "an approach to translate operational needs and requirements into operationally suitable blocks of systems" (Blanchard & Fabrycky 1998). The SE approach thus provides a mechanism to address the critique levelled at the 'black box' argument of sustainability frameworks by unpacking the business into subsets and understanding how each of these subsets contribute to and interact within the business environment system.

Figure 1 illustrates the SE approach as a system problem that is complex as a whole (Quadrant I), but can be broken down into smaller sub-problems (Quadrant II). In the second quadrant, the definition of the individual sub-problems facilitates a greater understanding of the problem as a whole, as the sub-problems are viewed as single components that can be analysed more easily. Sub-solutions can be found for the sub-problems (Quadrant III) and, finally, these sub-solutions can be pieced together to find an ultimate solution for the whole (Quadrant IV) (Snyman, Kennon, Schutte & Von Leipzig 2014).

Built-in feedback systems contribute to problem solving and ensure that a desired objective is achieved using the SE approach. In the real world, this feedback system is enclosed between each of the quadrants, aiming to solve the problem (Snyman et al. 2014).

The motive is to unpack the business environment in different subsets and emphasise that sustainability performance and targets differ for the various subsets. Thus, the comparison of sustainability to the different subsets is required for a more comprehensive understanding of sustainable business development.

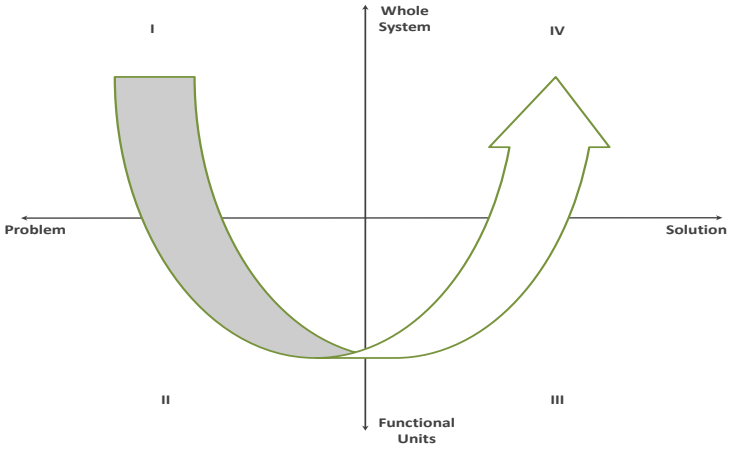

Figure 1: Flow of real-world problem solving (adapted from Porter (1991))

BUSINESS ENVIRONMENT

The environment in which a business operates should be fully understood to ensure the business is operating successfully at any given time. As the environment changes, the successes and failures of businesses are influenced by the challenges experienced, for instance rising customer expectations, increasing competition and expanding markets (Flamholtz & Aksehirli 2000).

Business development, organisational growth, strategic planning, performance management, organisational structure, management and leadership development, and culture management are all components that need to be considered when analysing the business environment. Every component is discussed in detail below, followed by a brief discussion of the business value chain system. The respective components are subsequently analysed in relation to the value chain system, and the discussion concludes with findings on the business sustainability argument.

Business components

There is an ever-increasing need to understand the business environment and organisational growth, and to discover the motive behind successes and failures over the long term (Aastha, Harsimran, Harleen, Dhanvir, Banjul & Gaurav Sharma, 2011). Thus, a business environment and the elements that constitute a business – in addition to processes, procedures, and activities – are all the external factors, forces and institutions affecting the functionality of the business enterprise (Flamholtz & Randle 2007a). Understanding this environment requires a clear picture of the various components that make up a business structure. The following paragraphs thus focus on the various business components that are discussed in the literature.

Business development

A business structure consists of six factors that are built on a business foundation, including business strategy, strategic mission and vision, and the values and principles covered under the business concept. Business strategy entails the central theme for planning how the business aims to compete in terms of achieving its strategic mission. The strategic mission defines what the business wants to

achieve over a certain period, while the business concept defines the business function and goal. According to Flamholtz and Randle (2007a), the six factors that are the key drivers of organisational success, based on the business foundation, are as follows:

i. Markets: When developing an organisation, the initial step is to identify and define the market and niches the business will address. A market is defined as the potential buyers of the products or services that a business intends to sell (Flamholtz & Randle 2007a). The market niche is a place in the market where specific customer needs and competitor challenges are addressed (Miller 2010).

ii. Products and services: This factor entails the process of analysing potential customer needs to ensure the developed product or services satisfy these needs. However, the ability to design a product or service and at the same time produce that product or service for the chosen market is equally important (Flamholtz & Randle 2007a).

iii. Resource management: Resources need to be developed for current and foreseen future operations. These resources are required to effectively develop the product or services for the identified market (Flamholtz & Randle 2007a). Among these resources are human resources, financial resources, and technological and physical resources that contribute to the design of new innovations (Miller 2010).

iv. Operational systems: Operational systems are required for developing mandatory functions for day-to-day operations. Well-known operations include accounting, billing, collections and sales (Flamholtz & Randle 2007a).

v. Management systems: Management systems are made up of all the functions required to operate a business over the long term. These systems include strategic planning, organisational structures, management development, and performance management. Strategic planning involves all the decisions behind long-term strategies and business development. The organisational structure comprises the business-related activities among the employees, reporting lines and how these are organised. Management development involves planning to ensure that employees are available to operate the organisation and sustain growth. Performance management comprises the processes and methods used to motivate employees and to ensure that organisational goals are achieved (Flamholtz & Randle 2007a).

vi. Corporate culture: Corporate culture includes the development of business values, beliefs, and norms that influence the behaviour of the employees. Values are the beliefs or ideals adopted by the business and ideally shared throughout the organisation in order to enhance the business environment as it relates to its customers, co-workers and product quality (Flamholtz & Randle 2007a). Beliefs are the expectations that employees develop about the business and their co-workers. Norms are the actions and behaviour of the employees in their day-to-day operations that will prompt high levels of customer services (Guiso, Sapienza and Zingales 2013).

The following six factors presented by the Pyramid of Organisational Development, as shown in Figure 2, can be used as a tool to improve an organisation's strengths and opportunities that are identified systematically over time. Moreover, it can be applied to assess the level of strategic organisational development and increase the probability of sustainable success. With the focus on these six factors and improvements, maximised organisational effectiveness and efficiency will rise (Flamholtz & Randle 2007e).

Figure 2: Pyramid of Organisational Development (adapted from Flamholtz & Randle (2007d))

Organisational growth

Identifying stages of growth can be a worthy goal for businesses to set and aim to achieve. Organisational growth is a measurement of entrepreneurial success and deemed an important factor for economic development (Brush, Ceru and Blackburn 2009). The different growth stages of an organisation are defined and examined across the different levels of the Pyramid of Organisational Development to ensure sustained growth, from the inception of a new enterprise up to the time it has reached maturity (Flamholtz & Randle 2007e).

Figure 3 indicates the seven stages of growth of a business life, namely new venture, expansion, professionalism, consolidation, diversification, integration, and, lastly, decline and revitalisation. The first four stages illustrated in Figure 3 comprise the process from inception of a new enterprise to the realisation of the mature business. Once the business has reached maturity, the actions relating to long-term sustainability should be considered; these are indicted in the last three stages of Figure 3 (Flamholtz & Randle 2007e). It is evident that management, finance and marketing have emerged as core concepts and thus have a larger probability to have an impact on the organisational growth of a business (Brush et al. 2009).

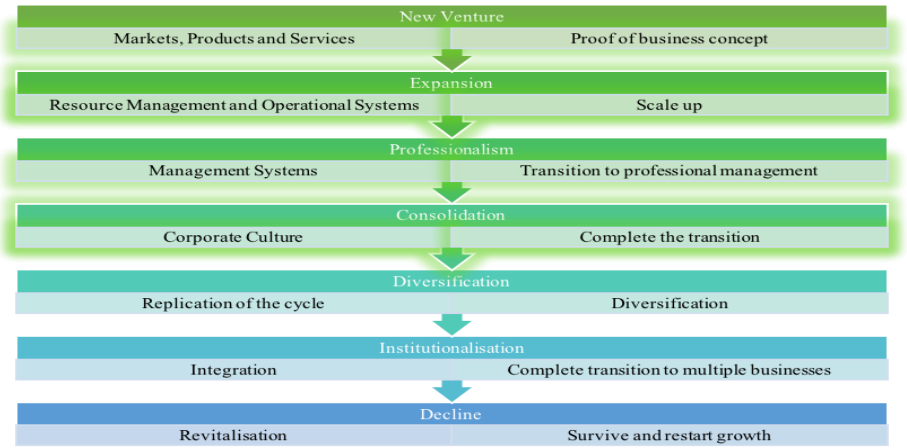

Figure 3: Stages of organisational growth (reproduced from Flamholtz & Randle(2007e))

i. New venture: This initial stage of organisational growth involves the establishment of a new enterprise. The business should follow soon with the first two tasks of organisational development, namely defining markets and developing products and services. These tasks are of critical importance, because without customers and products or services to provide to customers, no business can exist. The goal at this stage is to establish authentication of the business concept (Flamholtz & Randle 2007e).

ii. Expansion: Once the business has completed the tasks required for stage one, it is ready for stage two. Usually, new development problems and challenges arise at this stage when the business concept needs to proceed to the development phase. The required resources to execute the operational systems should be in place to facilitate the organisational growth needed. This stage marks the development of the new venture into a professionally managed business (Flamholtz & Randle 2007e).

iii. Professionalism: During the expansion stage, managers begin to notice the realisation of qualitative change in the business. This means the business has transitioned from a new venture to a professionally managed business. This change requires management systems throughout the business to continually support the future growth of the business. It is of critical importance to ensure that systems are clearly defined and roles are properly identified to prevent confusion and eliminate disorder (Flamholtz & Randle 2007e).

iv. Consolidation: This stage involves the processes to ensure a stronger business and willingness to act competitively in the business environment. Corporate culture must be established in a formal matter throughout the business to ensure that business functions operate cohesively (Flamholtz & Randle 2007f).

Strategic planning

Strategic planning plays an important role in the business environment in terms of planning activities for objectives and goals, performance indicators, developing targets, and allocation of resources (Spee & Jarzabkowski 2011). Strategic planning is regarded as a communication process and requires specific activities not only to focus on market and product or service growth, but also to develop the infrastructure required in order to improve sustainable success (Spee & Jarzabkowski 2011). Six steps have been established as being mandatory in any strategic planning process. These six steps, indicated in Figure 5, are known as environmental scan, organisational assessment, strategic issues, strategic business plan, the budget, and, lastly, quarterly management review (Flamholtz & Randle 2007g) and they are discussed below:

i. Environmental scan: The environmental scan process includes information about the market the business proposed to address, the competitive environment, and the trends that will influence the business in the future (Flamholtz & Randle 2007g).
    i. *Market analysis:* The market analysis process includes all the processes of collecting and analysing the current and potential market of the business. A clear and concise identification of the threats and opportunities that exist within this market should be part of the analysing process.

ii. *Competitive environment:* During this process, the current and potential competitors should be identified. The business should be objective when identifying these strengths and limitations. Additionally, the business should review how their customers distinguish their competitors.

iii. *Trend analysis:* This analysis includes the process of analysing the economic, political, social, culture, and legal environment and its influence on the business future.

ii. Organisational assessment: The organisational assessment includes identifying the strengths and limitations of the business at each level of the Pyramid of Organisational Development. The outcome of the environmental scan and organisational assessment may be expressed as strategic issues to be addressed by the business, as indicated in the next step (Flamholtz & Randle 2007g).

iii. Strategic issues: This step includes identifying and resolving the key strategic issues experienced by the business. Some of the important issues to address are the following:

i. *What business are we in?*

The platform and scope of the business are addressed through this strategic issue and involve some of the most important and critical decisions that a business will have to make.

ii. *What are our competitive strengths and limitations?*

The competitive analysis and organisational assessment support the information to be considered when addressing this question. The outcome will indicate which areas are of crucial importance and require attention in order to develop a suitable business strategy.

iii. *Do we have or can we develop a true market niche?*

A market niche may also be defined as a portion of a market, or a market segment, which affords the business a sustainable competitive advantage in the market. In general, a business model endorsed by an organisation can be seen as a source of sustainable advantage, indicating why the business is in business. There are two strategic reasons for this, first from an 'offensive' standpoint, e.g. the price of products is greater than that of the competitors. Secondly, from a 'defensive' standpoint, e.g. during an economic crisis period the market niche holders endure less pressure than their competitors (Flamholtz & Randle 2007g). It is evident that an understanding of market requirements is particularly important.

iv. *What do we want to become in the long term?*

When addressing this key issue, the business needs to identify their organisational goals and strategic mission for the long term, which is generally three to five years.

v. *What is our strategy for competing effectively in our chosen markets and for achieving our long-term mission?*

This key issue has to do with the way the business will compete in order to achieve the desired results once the other key issues (as indicated above) have been addressed. Figure 4 indicates three levels of strategy that will drive the behaviour of employees toward targeted results in the identified market. The first level represents the core strategy and describes how the business will compete. An environmental scan and organisational assessment are required to develop the core strategy. The second level is known as supporting strategies. These strategies describe the actions the business needs to execute

at each level of the Pyramid of Organisational Development, which then support the core strategy. The last level, namely operational strategies, illustrates how the business implements the core strategy (Flamholtz & Randle 2007g).

Figure 4: Three levels of strategy diagram (adapted from Flamholtz & Randle (2007g))

vi. *What are the critical factors that will make us successful or unsuccessful in achieving this long-term mission?*
The moment the business has identified their strategy, the focus point needs to be identified that will yield a maximum outcome over the long term (Flamholtz & Randle 2007g).

vii. *What goals shall we set to improve our competitive effectiveness and organisational capabilities in each of these critical success areas?*
The organisational goals form part of the strategic plan of the business and by achieving these goals, the business will have continued success in the future.

iv. Strategic business plan: By now, the required information should have been set out and gathered to prepare and develop the strategic business plan. A strategic business plan is defined as a "written statement of the future direction of a business based on the environmental scan and the organisational assessment" (Flamholtz & Randle 2007g). A constructive business plan consists of eight components. These components are:
   i. The situational analysis that provides a brief overview of the opportunities and threats identified in the current environment of the business, including the internal strengths and limitations (Flamholtz & Randle 2007g).
   ii. The business definition provides a statement declaring the field in which the organisation tends to operate.
   iii. The strategic mission is a statement declaring what the business aims to achieve over a specific period.
   iv. The strategy describes how the business will compete and includes core, supporting and operational strategies in a proposed plan.
   v. The key result areas are the performance areas that support the process to achieve the mission of the business.
   vi. Goals are the specific objectives the business aims to achieve.
   vii. Action plans describe the actions to be performed to achieve the desired goals.

v. Budgeting: The budget illustrates how financial resources are allocated to each section of the business plan. The budget also provides a good indication of how the business should adjust its business plan in certain sections when unplanned events occur (Flamholtz & Randle 2007g).
vi. Management review: The management review, which should be executed quarterly, provides feedback on the progress towards the organisational goals, discusses work-related issues that may influence business performance, mentions successes and failures, and indicates how these failures can be turned into successes (Flamholtz & Randle 2007g).

Strategic planning can be used as a tool for organisational management and as a driving force for the transition to professional management. The strategic planning process provides a concise business plan according to which business processes can operate at a sustainable level (Spee & Jarzabkowski 2011).

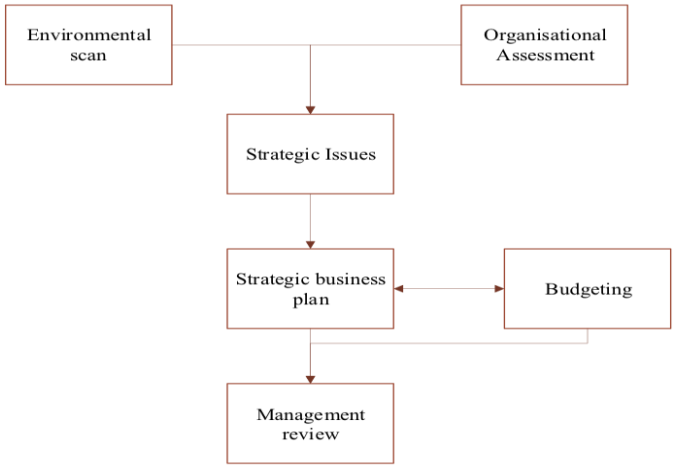

Figure 5: Strategic planning process (adapted from Flamholtz & Randle (2007f))

Performance management

Performance management, also known as the organisational control system, is a mechanism designed to manage the performance of employees in the business and represents a critical aspect of business effectiveness (Gruman & Saks 2011). The aim of this system is to motivate employees to achieve the organisational goals and to influence their behaviour in a certain way. Control systems enable the business to perform their tasks, ensuring the employees' behaviour are persistent with the organisational goals (Flamholtz & Randle 2007b).

Performance management can be used as a strategic and tactical tool, aiming to achieve several and various objectives. The strategic goals support top management to achieve strategic business objectives. The organisational goals should be linked with individual goals and enable the performance management system to continually improve the process of achieving organisational goals (Gruman & Saks 2011). Tactical goals are designed to provide important information regarding employee decisions, including promotions, salary adjustments, retention and termination, and to identify poor performance (Gruman & Saks 2011).

Flamholtz and Randle (2007h) developed a model that illustrates the connection between seven components that must be managed, linked and effectively designed. The Performance Process Management model is shown in Figure 6 and each component is subsequently discussed.

i. Key result areas: As mentioned earlier, key result areas are known as the success factors that form the basis of the business mission. Therefore, key result areas need to be defined at all levels of the business (corporate, strategic, department and individual).
ii. Objectives: These are objective statements to be achieved in each key result area. Objectives support the organisation and employees to achieve the required results.
iii. Goals: Goals are used to determine the desired performance levels and serve as a benchmark for measuring performance. Goals are set to facilitate control before, during and after performance.
iv. Measurement: Measurement represents the characteristics of an object in numerical terms. Measurement serves two purposes, first to provide information that can be used when evaluating performance, and secondly to measure financial and managerial performance.
v. Progress review: Information about cost reports, financial statements and performance reports serves as crucial feedback on the operations and management of the business. A scorecard is a typical output of assessed performance, and scorecards can be used at any business level.
vi. Performance evaluation: Performance evaluation is a systematic process that allows businesses, departments and individuals to monitor how effective the process of achieving goals has been over a specific period. Evaluation includes positive feedback and criticism that employees can use to understand what is required to improve performance or keep performance at an improved level.
vii. Rewards: Rewards are given when the desired outcome of the various performances has been achieved. It is important to reinforce valuable performances and to encourage in order to improve poor performance.

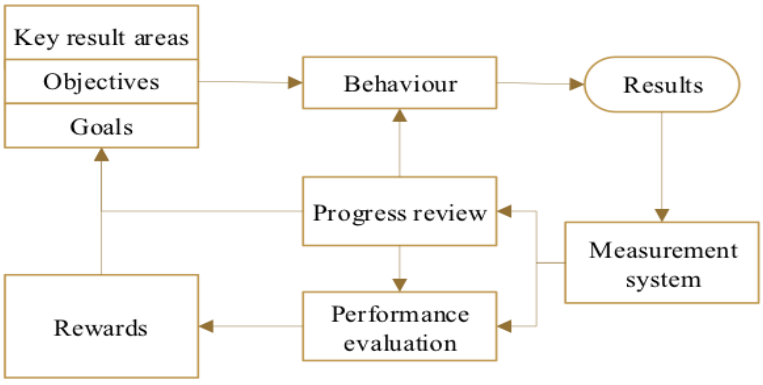

Figure 6: Performance Process Management (adapted from Flamholtz & Randle (2007g))

The operational system is affected by all the components of the Performance Process Management system model. The required action to increase the probability of achieving the desired outcomes is to establish key result areas, objectives and goals. By adding measurements and feedback processes, the probability will increase to a more desired result. Improved performances may be expected by adding evaluation and rewards components.

Organisational structure

An organisational structure indicates how employees are organised in a hierarchy to perform effectively while achieving the goals and objectives of the strategic business plan. The aim of an organisational structure is to define roles that are set out in a specific pattern according to relationships with a view to achieving certain goals (Flamholtz & Randle 2007h). These roles include responsibilities within individual tasks, departmental activities, descriptions of what can be expected by co-workers.

The four most important aspects of organisational structures are centralisation, formalisation, complexity and integration. Centralisation describes the way decisions and evaluation activities are executed. Formalisation measures to what extent an organisation implements rules and procedures to regulate behaviour. Complexity describes to what extent the various functions are identified in terms of goals and task orientation. Lastly, integration describes the activities of individuals in the business and how these are coordinated through an appropriate coordination systems (Liao, Chuang and To 2011).

A set of eight criteria mentioned and discussed below, may be used to assess the effectiveness of the current organisational structure or to design the future organisational structure.

i. Structure alignment: The extent to which the structure supports the achievement of the organisational goals. The business should develop an understanding of its mission and objectives, organisational structure (in terms of macro- and microstructure), and supporting systems, which should be evaluated to ensure that goals are achieved.
ii. Functional contribution: The extent to which a function in the organisational structure has a clearly defined role that adds value to the defined structure.
iii. Clarity and contribution of individual roles: Each individual role has a clearly defined function and contributes to the effectiveness and efficiency of the organisational goals.
iv. Clarity and structure of reporting relationships: Reporting relationships and decision-making should be clearly structured and identified to support the underlying rationale in order to facilitate the process of achieving organisational goals.
v. Appropriate span of control and number of organisational levels: The number of employees who reports to a manager and how this effectively supports the process of achieving the organisational goals.
vi. Appropriate management/leadership and technical skills: The skills and leadership characteristics each individual has to fulfil his/her role and responsibilities. Regular assessments are required as employees' performance improves and roles change.
vii. Effective coordination: The way current employees coordinate functions between business units throughout the organisational structure.
viii. Appropriate supporting systems: The way in which operational, management and culture systems support the functioning of the organisational structure.

It is of crucial importance that management considers the type of systems, structures and processes required to ensure the organisational structure is executed effectively and efficiently (Flamholtz & Randle 2007h). The above set of eight criteria enables any business to identify the strengths and weaknesses throughout the structure and allows the business to address any findings accordingly.

Management and leadership development

Management development supports employees in developing their competencies to manage their day-to-day tasks in the business. Leadership development focuses on supporting employees in developing their competencies required to manage their business, departments and team strategically. To ensure maximum effectiveness, a management development programme should focus on skills development as well as support to employees to understand their roles as team members, managers and leaders (Flamholtz & Randle 2007i).

The functions of management development are to support the process of defining or redefining corporate culture, promote the desired style of leadership required by the business, and lastly reward good managers. By applying these functions and the critical dimensions of management and leadership development, any employee will achieve success at a particular level of the organisational hierarchy. The critical dimensions are indicated in Figure 7 and are mentioned and discussed in greater detail below (Flamholtz & Randle 2007i).

i. Role concept: Involves the process of changing from one role to another and aiming to be successful at the new role, whilst understanding and accepting the responsibilities of the new role, and attempting to become an effective manager (Flamholtz & Randle 2007i).
ii. Management/leadership skills: "This dimension involves a sequential pattern of behaviours performed in order to achieve a desired output" (Cameron & Whetten 1984). Work-related interpersonal skills, for example motivation, communication and leadership, are required to oversee employees and manage day-to-day people management problems. Additionally, administrative skills such as planning, supervising, conducting meetings, budgeting, performance evaluation and control are required to be effective in the specific roles (Flamholtz & Randle 2007i). The Pyramid of Management and Leadership Development is a framework that consists of five levels of different skills managers require to develop their careers and be effective in their particular roles. These five levels are (Flamholtz & Randle 2007i):
    i. *Core management skills:* Managers require all the skills at this level of the pyramid, regardless of the level at which they operate. These skills refer to the ability to use tools, procedures, and techniques in a specialised field (Viitala 2006).
    ii. *Operational management skills*: Skills to manage day-to-day operations and administrate employees are required at this level. Known skills at this level are training and coaching, motivation, performance appraisal and management of meetings. In addition to the skills required at the previous level, these are the skills required by first-line supervisors to effectively execute their roles (Flamholtz & Randle 2007i; Viitala 2006).
    iii. *Organisational management skills* include planning, management development, financial management, organising employees, designing and effectively using control or performance management systems, and team building. Middle managers effectively use these skills (Flamholtz & Randle 2007i; Viitala 2006).
    iv. *Organisational development skills:* These competencies include strategic perception, decision-making and board management skills. These skills require the ability to think and operate in terms of systems and to know how to lead systems, whilst providing direction, vision and focus to the business (Viitala 2006).
    v. *Transition management skills* include understanding the need for transition and being able to manage the transition of the business and its employees. These skills are

required to understand and manage the need for change (Flamholtz & Randle 2007i; Viitala 2006).

iii. Attitudes or psychological factors: This dimension includes changes in an employee's attitude from a performance-orientated psychology to a management-orientated psychology. This dimension emphasises the way managers think in order to be more effective in their role. Managers should use the specialist skills of their employees effectively to achieve the goals of the business (Flamholtz & Randle 2007d).

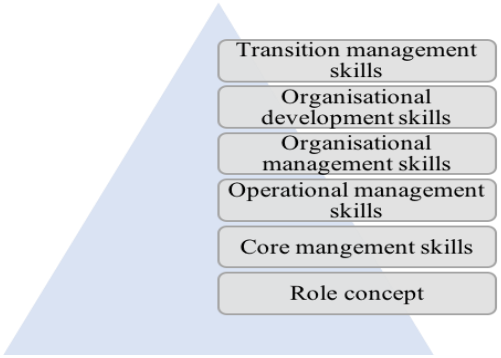

Figure 7: Levels of management skills (adapted from Flamholtz & Randle (2007c))

The process of management development involves building on the potential performance capabilities of managers. Additionally, these functions promote a particular leadership style that shapes corporate culture and rewards managers.

Culture management

The corporate culture of an organisation includes the values, beliefs and norms that influence the behaviour of the employees. Values are those actions the business considers most valuable with respect to the employees, clients and business operations and strives to perform at its best level of professionalism at all times. Beliefs are the acceptance employees have for each other, the business and clients. Norms are the way in which employees behave and interact (Flamholtz & Randle 2007d).

Additionally, corporate culture is defined by four areas that have a major impact on business success. These four areas are:

i. Customer-client orientation is the way how the business view their clients or customers. These actions involve a reflective attitude and approach to business and has an impact on how the business operates and, ultimately, on the success rate of the business (Flamholtz & Randle 2007d).

ii. Orientation towards employees is a reflection of the business's policies on the treatment and value of their employees. Job satisfaction has a bearing on employer attitudes and employer attitudes reflect in an encouraging and trusting environment (Roos & Van Eeden 2008).

iii. Standards of performance include the business's concern with the amount and quality of work that is completed, the promotion of creativity, and the customer and commercial services (Roos & Van Eeden 2008).

iv. Commitment to change involves the decision-making culture of the business that is reflected by the degree of formalisation. This is an official and productive approach that relates to satisfaction and commitment (Roos & Van Eeden 2008).

Corporate culture is part of any business and has an impact on business success. Managers should therefore learn to manage corporate culture and make the required changes as the business grows. It is important to know the nature and the meaning behind corporate culture and how it reflects in the business environment (Porter & Kramer 2011).

DISCUSSION

Bearing in mind the concept of SE, the contextual business environment and the ultimate aim of enabling business sustainability, the following discussion is geared towards the proposed conceptualisation of an SE approach to business sustainability. A value chain perspective is used to facilitate this.

A business value chain is described as the process of changing business inputs into outputs in such a manner that it creates value for the organisation as well as for society (Porter & Kramer 2011). The value chain perspective is linked to the principle of shared value and allows a business to revive the business success with social progress by re-evaluating the business environment aspects, aiming to realise economic and social benefits (Porter & Kramer 2011). Shared value opportunities can be created by a business in the three key ways, namely: (i) by reviewing products and markets; (ii) redefining productivity in the value chain; and (iii) enabling the local cluster development (Porter & Kramer 2011). It is argued that the value of following a shared value approach to decision-making and identification of opportunities to businesses is that a greater possibility exists that the business will uncover new approaches that will benefit society, and generate greater innovation and growth (European Union Energy Initiative 2015).

The value chain perspective, as conceptualised by the European Union Energy Initiative (2015), consists of three levels that all interact, are interrelated and influence business operation (the market chain – see Figure 8). Figure 8 provides a schematic representation of the value chain perspective, including all three levels that constitute such a value chain. Level 1 (the market chain) defines the channels through which the business moves from addressing the new market idea to executing the business processes, thus ensuring the market idea or opportunity is addressed. Level 2 (inputs, services and finance) enables the business to include inputs, services and finance in the business processes to execute the production and delivery of products and/or services. The enabling environment (Level 3) consists of the factors that act as the 'rules of the game', shaping how level 1 (the market chain) and level 2 (inputs, services and finance) operations (should) operate (European Union Energy Initiative 2015).

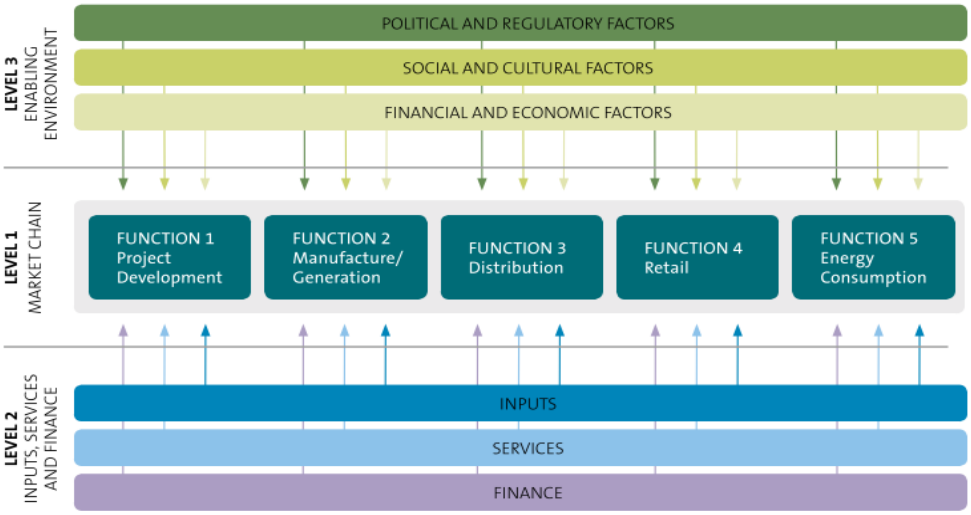

Figure 8: A summary of the business value chain including three levels (European Union Energy Initiative 2015)

Bearing in mind the analysis of the various business components, as well as the overview of the value chain perspective, the business components discussed in the preceding sections are subsequently evaluated across the three levels that form part of the value chain perspective, as discussed in the European Union Energy Initiative (2015). Table 2 indicates the categorisation of the business components given the value chain perspective.

Table 2 illustrates the relationship between the various business components of the business environment and the business value chain system. Each individual component is indicated by an 'x' showing the correlating level of the business value chain system, as well as the area of its influence. This study acknowledges that these business components are extensively interrelated and that complex interactions and relationships exist between the components, as well as between components and the various levels of the value chain perspective. However, conceptualising business sustainability from an SE perspective, requires the categorisation (and thus necessary simplification) of the above relationships between business components.

Table 2: The business components that influence the business value chain system

Business environment	Individual components	Enabling environment	Market chain	Inputs, services and finance
Business development	Markets	x		
	Products and services		x	
	Resource management		x	
	Operational systems		x	
	Management systems		x	
	Corporate culture			x
Organisational growth	New venture	x	x	
	Expansion		x	x
	Professionalism			x
	Consolidation			x

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Business environment	Individual components	Enabling environment	Market chain	Inputs, services and finance
Strategic planning	Environmental scan	x	x	
	Organisational assessment			x
	Strategic issues		x	
	Strategic business plan			x
	Budgeting			x
	Management review			X
Performance management	Key result areas		x	x
	Objectives		x	x
	Goals		x	x
	Measurement		x	x
	Progress review		x	x
	Performance evaluation		x	x
	Rewards		x	x
Organisational structure	Structure alignment		x	x
	Functional contribution		x	x
	Clarity and contribution of individual roles		x	x
	Clarity and structure of reporting relationships		x	x
	Appropriate span of control and number of organisational levels		x	x
	Appropriate management/leadership and technical skills		x	x
	Effective coordination		x	x
	Appropriate supporting systems		x	x
Management and leadership development	Role concept		x	x
	Management/leadership skills		x	x
	Attitudes or psychological factors		x	x
Culture Management	Customer-client orientation		x	x
	Orientation towards employees		x	x
	Standards of performance		x	x
	Commitment to change		x	x

The information contained in Table 2 thus informs the SE approach in that it assists with the deconstruction and discovery (Quadrant II) of the system problem ('black box' perspective of existing frameworks and approaches to business sustainability – Quadrant I); thus, enabling the conceptualisation of business sustainability at an increased level of granularity. Subsequently, the information contained in Table 2 (the identification of various business components) will enable a process to develop solutions (Quadrant III) for each of the identified business components in order to ultimately develop a solution (framework, approach, etc.) that will address business sustainability as a whole (Quadrant IV).

Figure 9 illustrates the process of the business environment components that transforms through the SE approach. In Quadrant I, the 'black box' perspective is seen as the problem that requires a solution to address the challenges brought about by a 'black box' perspective to business sustainability. Quadrant II discovers the SE approach to the business environment components and business sustainability frameworks. From this, multiple solutions can be developed in Quadrant III; thus, addressing sustainability for each identified business component. Lastly, Quadrant IV illustrates the action of combining all the individual solutions into a holistic solution aiming to inform, govern and enable business sustainability.

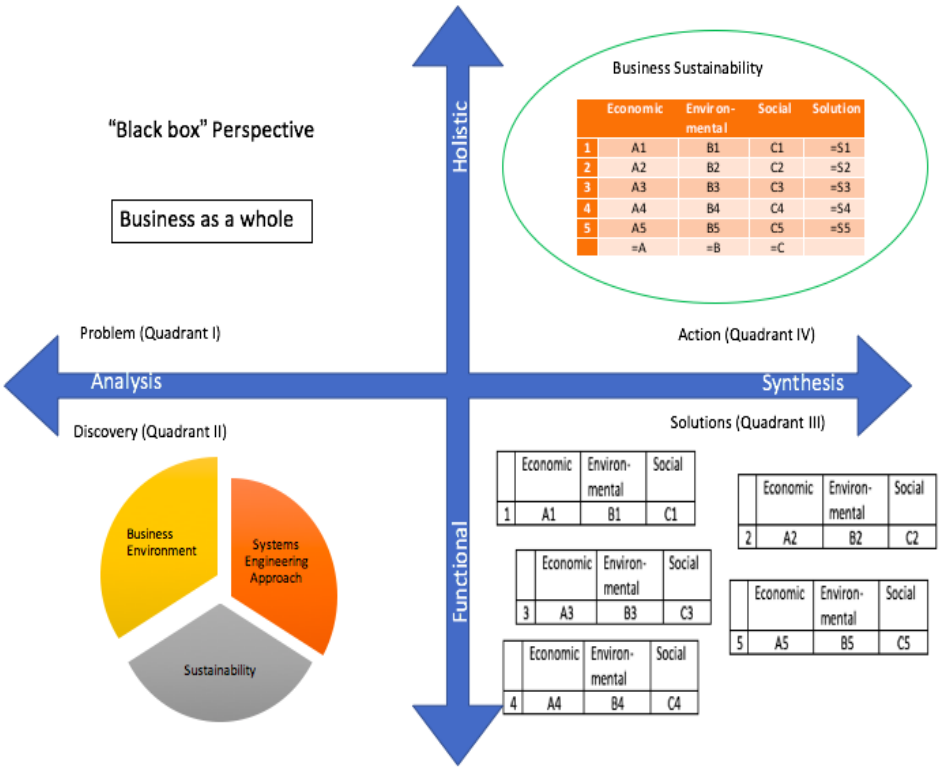

Figure 9: Proposed sustainability engineering (SE) approach to business sustainability

Table 3: Legend of Figure 8 data

	Solutions (Quadrant III)			Action (Quadrant III)
Business Components	**Economic dimension**	**Environmental dimension**	**Social dimension**	**Solution**
1: Business Development	A1: Economic sustainability (Business development)	B1: Environmental sustainability (Business development)	C1: Social sustainability (Business development)	S1: Sustainability across all dimensions for the business development component
2: Organisational Growth	A2: Economic sustainability (Organisational growth)	B2: Environmental sustainability (Organisational growth)	C2: Social sustainability (Organisational growth)	S2: Sustainability across all dimensions for the organisational growth component
3: Strategic Planning	A3: Economic sustainability (Strategic planning)	B3: Environmental sustainability (Strategic planning)	C3: Social sustainability (Strategic planning)	S3: Sustainability across all dimensions for the strategic planning component
4: Performance Management	A4: Economic sustainability (Performance management)	B4: Environmental sustainability (Performance management)	C4: Social sustainability (Performance management)	S4: Sustainability across all dimensions for the performance management component
5: Organisational Structure	A5. Economic sustainability (Organisational structure)	B5: Environmental sustainability (Organisational structure)	C5: Social sustainability (Organisational structure)	S5: Sustainability across all dimensions for the organisational structure component
	A: Composite economic sustainability measure across all business components	B: Composite environmental sustainability measure across all business components	C: Composite social sustainability measure across all business components	

CONCLUSION

This paper emphasises the detailed level of understanding and granularity of analysis required to address business sustainability using an SE approach. The 'black box' perspective is addressed by deconstructing the business 'as a whole' into various business components, and evaluating these components from a value chain perspective, ultimately to conceptualise an SE process that addresses business sustainability. This process facilitates the analysis of the business environment for the purpose of developing business sustainability measures across multiple business components and thus at an increased level of granularity. In this way, the challenges associated with the 'black box' perspective, as employed by various business sustainability frameworks and approaches, are addressed at least in part. Subsequent to the deconstruction phase, this approach in turn enables the conceptualising of business sustainability at an aggregate level by combining the various sustainability solutions at a granular level.

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Appendix C

Chapter 5 supporting content

This appendix provides the supporting content of Chapter 5. The content of this Appendix is as follows:

- Section C.1: Business Sustainability evaluation Tool – This section contains the Business Sustainability Evaluation Tool for the seven business components.
- Section C.2: Validation document of the Business Sustainability Framework and Evaluation Tool – This section contains the validation document of the Business Sustainability Framework and Evaluation Tool that was given to the validators.

C.1 Business Sustainability Evaluation Tool

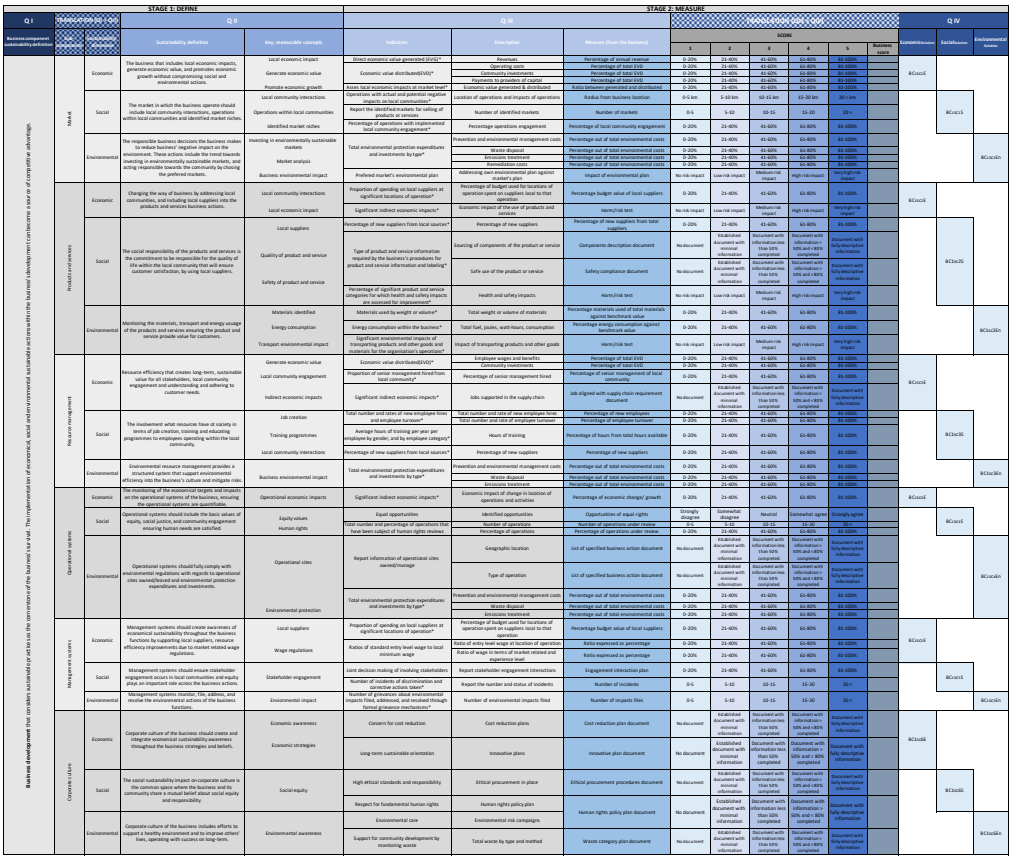

Figure C.1: Business Sustainability Evaluation Tool: Business development.

STAGE 1: DEFINE						STAGE 2: MEASURE												
Q I	TRANSLATION (Q I - Q II)		Q II			Q III			QUANTIFICATION (Q III)							Q IV		
Business component sustainability definition	Core dimensions	Sub-dimensions dimension	Sustainability definition	Key, measurable concepts	Indicators	Description	Measure (from the business)	SCORE					Business score	Economic Evolution	Social Evolution	Environmental Evolution
								1	2	3	4	5				
Organisational growth includes the concepts from sustainability and synthesises them with the concepts of organisational management, which is central to realising the corporate value, corporate evaluation, growth, and corporate internal adjustment.	New venture	Economic	The new venture should be sustainably orientated from the start-up by creating opportunities and intensions to create value from an economic perspective. The new venture should state the various infrastructure investments and how local communities will be supported.	Create economic value Infrastructure investments Local communities	Development and impact of infrastructure investments and services supported*	Report the development of infrastructure investments	Infrastructure investment document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information		BCESGE		
						Report current/expected impacts on communities and local economies	Percentage of economic impact change	0-20%	21-40%	41-60%	61-80%	81-100%				
					Proportion of spending on local suppliers at significant locations of operation*	Percentage of budget used for locations of operation spent on suppliers local to that operation	Percentage budget value of local suppliers	0-20%	21-40%	41-60%	61-80%	81-100%				
		Social	The discovery and exploitation of social opportunities through the generation of local markets and communities. The focus will be on preservation of community interactions, equity and job creation.	Local communities Local suppliers Local workforce	Operations with local community engagement*	Report local community development programmes	Development programme document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information			BCESGS	
						Social impact assessments based on participatory processes	Social impact assessment	No risk impact	Low risk impact	Medium risk impact	High risk impact	Very high risk impact				
					Percentage of new suppliers from local community*	Percentage of new suppliers	Percentage of new suppliers against previous year	0-20%	21-40%	41-60%	61-80%	81-100%				
					Percentage of workforce from local community	Percentage of employees from local community	Percentage workforce invested in local community	0-20%	21-40%	41-60%	61-80%	81-100%				
		Environmental	The ability to illustrate responsible creativity environmental development and management natural resources usage.	Environmental impact	Environmental impacts of products and services*	Report environmental impacts of products and services used	Harm/ risk test	No risk impact	Low risk impact	Medium risk impact	High risk impact	Very high risk impact				BCESGEn
	Expansion	Economic	Economic development becomes part of the core values of the business operations. These values include long-term financial sustainability, economic drivers and growth through partnerships.	Long-term economic drivers Economic partnerships	Long-term financial plan aligned with business goals and objectives	Develop/ update long term sustainable financial plan	Sustainable financial plan document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information		BCESGE		
					Pursue the economic objectives in the financial plan	Create opportunities of these economic objectives	Prospective business actions document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information				
					Ensure effective economic development partnerships	Satisfying measurement with partnerships	Partnership satisfaction	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied				
		Social	Expansion should focus on the importance of a balanced workforce, public relations efforts and ensuring health and safety towards employees and the community.	Balanced workforce Health and safety Employee rate	Diversity in the workplace	Change/ addressing employment norm	Employment norm satisfaction	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied			BCESGS	
					Customer health and safety*	Assessment of health and safety impacts of products and services	Harm/risk test	No risk impact	Low risk impact	Medium risk impact	High risk impact	Very high risk impact				
					Employee turnover*	Total number and rate of employee turnover	Employee turnover rate	0-20%	21-40%	41-60%	61-80%	81-100%				
		Environmental	Well established environmental plans and the continuing commitment from the business to behave ethically and contribute to the established environmental policies.	Environmental plan Environmental policies	Total environmental protection expenditures and investments by type*	Prevention and environmental management costs	Percentage environmental prevention costs of total prevention costs	0-20%	21-40%	41-60%	61-80%	81-100%				BCESGEn
						Emissions treatment	Percentage emissions of total protection expenditures	0-20%	21-40%	41-60%	61-80%	81-100%				
					Create policies for environmental plans	Develop baseline information for current environmental areas	Environmental policy plan document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information				
						Establish waste, emissions, transport management policies	Environmental policy plan document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information				
	Professionalism	Economic	Economic perspective of the professionalism perspective of the business should prioritise and plan for future development initiatives and support inter-governmental efforts to promote economic development.	Future development initiatives Inter-governmental efforts	Enhance and strengthen the economy	A number of management practices creating economic sustainability awareness	Number of management practices	0-5	5-10	10-15	15-20	20 >				
					Growth through partnerships	Develop/ update community partnerships to encourage economic development	Community partnership document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		BCESGE		
		Social	Professionalism of a business should by now have a well executable human rights and labour relations plan in the workforce.	Labour relations Human rights relations Workforce environment	Labour management relations	Report notice periods regarding operational changes	Notice period plan document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information			BCESGS	
					Local community interactions	Number of the local community interaction plans	Number of interaction plans with community	0-5	5-10	10-15	15-20	20 >				
					Working conditions and job security	Job security plans agreement	Job safety and security plan document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information				
		Environmental	Environmental plans should be consistent and executed with integrity on a continuous level.	Environmental plan	Total environmental protection expenditures and investments by type*	Prevention and environmental management costs	Percentage environmental prevention costs of total prevention costs	0-20%	21-40%	41-60%	61-80%	81-100%				BCESGEn
						Emissions treatment	Percentage emissions of total protection expenditures	0-20%	21-40%	41-60%	61-80%	81-100%				
	Consolidation	Economic	Ensuring the economic business strategies deliver services and infrastructure on a sustainable basis.	Economic strategies	Maintain and implement new economic sustainable strategies	Identify and report number of current economic sustainable strategies	Economic sustainability strategies documented	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information		BCESGE		
						Identify and report number of new economic sustainable strategies	Number of new strategies identified	0-5	5-10	10-15	15-20	20 >				
		Social	Social capital is used to obtain a strategic advantage, the effects of the community are taken into consideration and integrated into the business strategy.	Social strategies	Maintain and implement new social sustainable strategies	Identify and report number of current social sustainable strategies	Social sustainability strategies documented	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information			BCESGS	
						Identify and report number of new social sustainable strategies	Number of new strategies identified	0-5	5-10	10-15	15-20	20 >				
		Environmental	Proactive environmental strategies are valued as sources of strategic business opportunities.	Environmental strategies	Maintain and implement new environmental sustainable strategies	Identify and report number of current environmental sustainable strategies	Environmental sustainability strategies documented	No document	Established document with minimal information	Document with information less than 50% completed	Document with information >50% and <80% completed	Document with fully descriptive information				BCESGEn
						Identify and report of new environmental sustainable strategies	Number of new strategies identified	0-5	5-10	10-15	15-20	20 >				

Figure C.2: Business Sustainability Evaluation Tool: Organisational Growth.

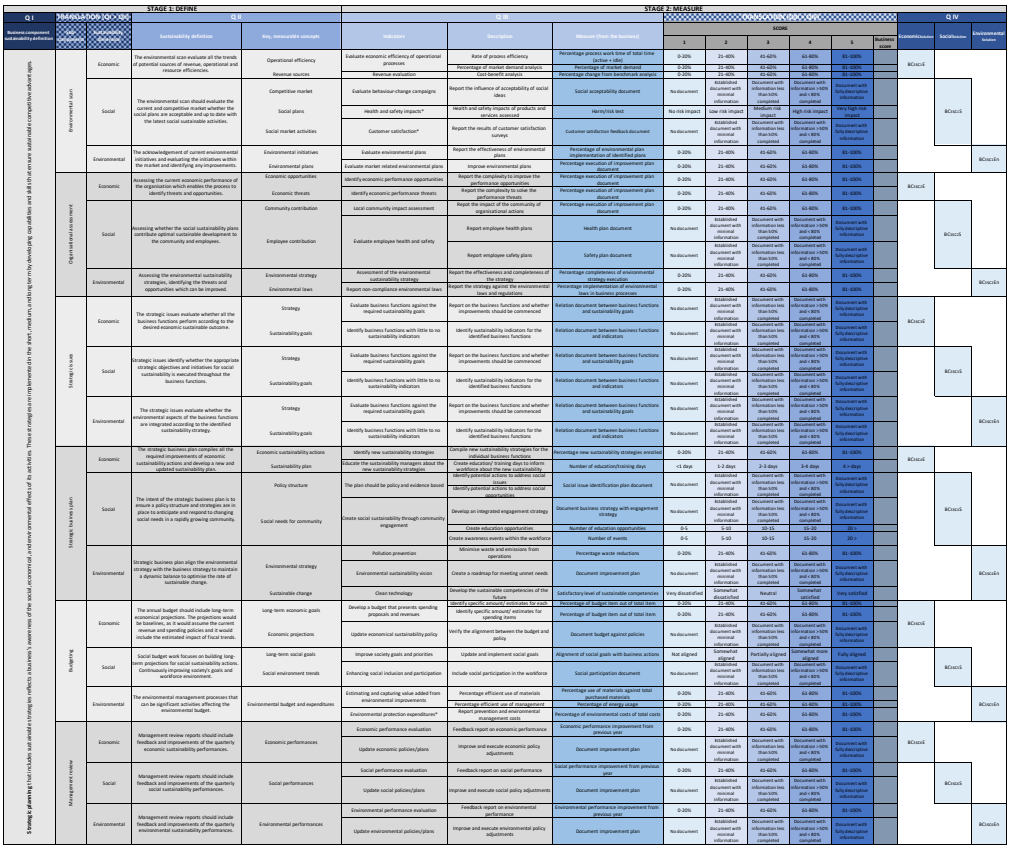

Figure C.3: Business Sustainability Evaluation Tool: Strategic planning.

STAGE 1: DEFINE					STAGE 2: MEASURE											
Q I	TRANSLATION (QI > QII)		Q II		Q III			TRANSLATION (QIII > QIV)						Q IV		
								SCORE								
Business component sustainability definition	Sub-components	Sustainability dimension	Sustainability definition	Key, measurable concepts	Indicators	Description	Measure (from the business)	1	2	3	4	5	Business score	Economic Solution	Social Solution	Environmental Solution
Performance management: The inner organisation of sustainability is integrated with the organisation's business strategy so that the value generated through sustainability initiatives has direct impact on the organisation's overall performance.	Key result areas	Economic	Key result areas measure the success of the economic sustainability performances at all business levels. This success factor provides an indication if the economic plans are executed correctly.	Economic sustainability performances	Create a clear vision of how economic sustainability should operate	Clear understanding of strategic goals	Strategy execution document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		BC4sc1E		
				Economic plans	Commitment by top management	Strong leadership skills lead to successful implementations	Leadership agreement by team leaders	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree				
					A great implementation team	Responsible for detailed plan and ensures executed correctly	Execution document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Social	The key result areas of the social activities can be measured as the success of a corporate sustainability strategy.	Social sustainability strategy	Management of social regulations	Measure the success of the return of social expectations	Percentage successful social expectations	0-20%	21-40%	41-60%	61-80%	81-100%			BC4sc1S	
					A better understanding of social issues	A positive social impact of the business activities	Impact assessment of the social activities	No risk impact	Low risk impact	Medium risk impact	High risk impact	Very high risk impact				
		Environmental	Key result areas illustrate the long-term impact of its products or services and processes on the environment.	Environmental impact of products and services	Allocation of resources	Measuring whether the certain allocation of resources is sustainable within its business function	Percentage efficient performance of resources	0-20%	21-40%	41-60%	61-80%	81-100%				BC4sc1En
					Impact of operations	Impact assessment of the operations towards the environment	Impact assessment of the environmental activities	No risk impact	Low risk impact	Medium risk impact	High risk impact	Very high risk impact				
	Objectives	Economic	The economic sustainability objectives support the business to assess the extent to which the implementation of a proposal contributes to the sustainability vision.	Sustainability vision	Identify the economic sustainability vision	Define/measure the success of the economic sustainability vision	Sustainability vision policy/ document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		BC4sc2E		
				Sustainability mission	Identify the economic sustainability mission	Define/measure the success of the economic sustainability mission	Sustainability mission policy/ document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Customer engagement	Objectives are aligned with customer requirements	Align customer requirements with objectives document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Social	The social sustainability objectives support the business to assess the extent which the implementation of a proposal contributes to the sustainability vision.	Sustainability vision	Contribution to social sustainability	Satisfaction of basic needs	Satisfactory level of needs	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied			BC4sc2S	
					Social resources	Average time spent for community work	Percentage time spent on community work based on estimated time	0-20%	21-40%	41-60%	61-80%	81-100%				
				Sustainability mission	Identify the social sustainability vision	Define/measure the success of the social sustainability vision	Sustainability vision policy/ document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Identify the social sustainability mission	Define/measure the success of the social sustainability mission	Sustainability mission policy/ document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Environmental	The environmental sustainability objectives which are regeneration, substitutability and assimilation that should be aligned against the business objectives.	Sustainability vision	Identify the environmental sustainability vision	Define/measure the success of the environmental sustainability vision	Sustainability vision policy/ document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				BC4sc2En
				Sustainability mission	Identify the environmental sustainability mission	Define/measure the success of the environmental sustainability mission	Sustainability mission policy/ document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Substitution of resources	Resource evaluation that will have a long-term perspective	Percentage efficient performance of resources	0-20%	21-40%	41-60%	61-80%	81-100%				
					Assimilation capacity	Measure the percentage of polluting substances against the maximum capacity	Percentage usage of maximum capacity	0-20%	21-40%	41-60%	61-80%	81-100%				
	Goals	Economic	The economic sustainability goals are used as a measurement of the performance levels of the business sustainability performance.	Sustainability goals	Define economic sustainability goals	Align business performance against economic goals	Align performance against goals	Not aligned	Somewhat aligned	Partially aligned	Somewhat more aligned	Fully aligned		BC4sc3E		
				Business performance	Increase sales	Percentage of increase in sales	Percentage of increase sales based on benchmark value	0-20%	21-40%	41-60%	61-80%	81-100%				
					Reduce costs	Percentage of operating costs	Percentage of operating costs based on benchmark value	0-20%	21-40%	41-60%	61-80%	81-100%				
		Social	The social sustainability goals serve as a measuring method of the business sustainability performance.	Sustainability goals	Define social sustainability goals	Align business performance against social goals	Align performance against goals	Not aligned	Somewhat aligned	Partially aligned	Somewhat more aligned	Fully aligned			BC4sc3S	
				Local community	Increase donations to local community	Amount of donations to local community	Percentage of donations of indirect costs	0-20%	21-40%	41-60%	61-80%	81-100%				
					Improve employee health and safety	Number of lost- time days due to injuries	Number of days	<1 days	1-2 days	2-3 days	3-4 days	4 > days				
		Environmental	The environmental sustainability goals are used as a measurement of the performance levels of the business sustainability performance.	Sustainability goals	Define environmental sustainability goals	Align business performance against environmental goals	Align performance against goals	Not aligned	Somewhat aligned	Partially aligned	Somewhat more aligned	Fully aligned				BC4sc3En
				Environmental impact	Reduce toxic materials consumption	Percentage of toxic products used	Percentage of toxic products from total products	0-20%	21-40%	41-60%	61-80%	81-100%				
					Increase recycled materials	Percentage of packaging materials made from recycled	Percentage of recycled materials	0-20%	21-40%	41-60%	61-80%	81-100%				
	Measurement	Economic	Measurement of economic sustainability illustrates the business performance against the identified benchmark year.	Business performance	Define measurement benchmark per economic sustainability indicator	Measure business performance indicator against the defined benchmark indicator	Percentage change of performance and indicator	0-20%	21-40%	41-60%	61-80%	81-100%		BS4sc4E		
		Social	Measurement of social sustainability illustrates the business performance against the identified benchmark year.	Business performance	Define measurement benchmark per social sustainability indicator	Measure business performance indicator against the defined benchmark indicator	Percentage change of performance and indicator	0-20%	21-40%	41-60%	61-80%	81-100%			BS4sc4S	
		Environmental	Measurement of environmental sustainability illustrates the business performance against the identified benchmark year.	Business performance	Define measurement benchmark per environmental sustainability indicator	Measure business performance indicator against the defined benchmark indicator	Percentage change of performance and indicator	0-20%	21-40%	41-60%	61-80%	81-100%				BS4sc4En
	Progress review	Economic	Report the economic performance of the business using the goals, objectives and measurement as supporting guidance.	Economic performance with supporting guidance	Develop the performance report	Scorecard measurement	Performance report aligned with supporting guidance	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		BS4sc5E		
		Social	Report the social performance of the business using the goals, objectives and measurement as supporting guidance.	Social performance with supporting guidance	Develop the performance report	Scorecard measurement	Performance report aligned with supporting guidance	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			BS4sc5S	
		Environmental	Report the environmental performance of the business using the goals, objectives and measurement as supporting guidance.	Environmental performance with supporting guidance	Develop the performance report	Scorecard measurement	Performance report aligned with supporting guidance	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				BS4sc5En
	Performance evaluation	Economic	Using the progress review to evaluate the performance of economic sustainability actions of the business.	Progress review	Evaluate the effectiveness and efficiency of the business performance at various business levels	Discussion and feedback session of the performance evaluation discussing the positive results as well as where improvements can be	Agreement and feedback of discussion session	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree		BS4sc6E		
		Social	Using the progress review to evaluate the performance of social sustainability actions of the business.	Progress review	Evaluate the effectiveness and efficiency of the business performance at various business levels	Discussion and feedback session of the performance evaluation discussing the positive results as well as where improvements can be	Agreement and feedback of discussion session	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree			BS4sc6S	
		Environmental	Using the progress review to evaluate the performance of environmental sustainability actions of the business.	Progress review	Evaluate the effectiveness and efficiency of the business performance at various business levels	Discussion and feedback session of the performance evaluation discussing the positive results as well as where improvements can be	Agreement and feedback of discussion session	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree				BS4sc6En
	Rewards	Economic	Internal business rewards are given to the various business departments, sustainability managers and teams that succeed in their economic sustainability performance.	Business rewards	Develop a rewards benefit plan for departments, managers and teams	Increase in engagement of employees and motivation to perform at a more sustainable manner	Satisfying level of employee performance	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied		BS4sc7E		
		Social	Internal business rewards are given to the various business departments, sustainability managers and teams that succeed in their social sustainability performance.	Business rewards	Develop a rewards benefit plan for departments, managers and teams	Increase in engagement of employees and motivation to perform at a more sustainable manner	Satisfying level of employee performance	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied			BS4sc7S	
		Environmental	Internal business rewards are given to the various business departments, sustainability managers and teams that succeed in their environmental sustainability performance.	Business rewards	Develop a rewards benefit plan for departments, managers and teams	Increase in engagement of employees and motivation to perform at a more sustainable manner	Satisfying level of employee performance	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied				BS4sc7En

Figure C.4: Business Sustainability Evaluation Tool: Performance management.

STAGE 1: DEFINE						STAGE 2: MEASURE										
Q I	TRANSLATION (QI > QII)		Q II		Q III			TRANSLATION (QIII > QIV)						Q IV		
								SCORE								
Business component sustainability definition	Sub-components	Sustainability dimension	Sustainability definition	Key, measurable concepts	Indicators	Description	Measure (from the business)	1	2	3	4	5	Business score	Economic solution	Social solution	Environmental solution
The intention of the **organisational structure** emerging sustainability actions is to enable a diverse set of roles, occupied by employees with divergent interests, to accomplish organisational objectives. The emerging role of sustainability matters interplays extensive forces between the top-down and bottom-up influences.	Structure alignment	Economic	Economic sustainability roles should be aligned with the business structure together with business supporting roles.	Economic sustainability roles	Define economic sustainability roles	Align the sustainability roles with the business structure	Roles and structure document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		$BC_{ssc1}E$		
		Social	Social sustainability roles should be aligned with the business structure together with business supporting roles.	Social sustainability roles	Define social sustainability roles	Align the sustainability roles with the business structure	Roles and structure document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			$BC_{ssc1}S$	
		Environmental	Environmental sustainability roles should be aligned with the business structure together with business supporting roles.	Environmental sustainability roles	Define environmental sustainability roles	Align the sustainability roles with the business structure	Roles and structure document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				$BC_{ssc1}En$
	Functional contribution	Economic	Economic sustainability roles aligned with the business and employee roles will contribute to a functional sustainable objective and goal.	Employee roles	Align economic sustainability roles with employee roles	Measure the combined role with the business goals and objectives	Roles and goals and objectives document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		$BC_{ssc2}E$		
				Objectives and goals	Align economic sustainability roles with key result areas	Measure the contribution of the aligned key result areas	Roles and key result areas document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Social	Social sustainability roles aligned with the business and employee roles will contribute to a functional sustainable objective and goal.	Employee roles	Align social sustainability roles with employee roles	Measure the combined role with the business goals and objectives	Roles and goals and objectives document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			$BC_{ssc2}S$	
				Objectives and goals	Align social sustainability roles with key result areas	Measure the contribution of the aligned key result areas	Roles and key result areas document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Environmental	Environmental sustainability roles aligned with the business and employee roles will contribute to a functional sustainable objective and goal.	Employee roles	Align environmental sustainability roles with employee roles	Measure the combined role with the business goals and objectives	Roles and goals and objectives document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				$BC_{ssc2}En$
				Objectives and goals	Align environmental sustainability roles with key result areas	Measure the contribution of the aligned key result areas	Roles and key result areas document	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
	Clarity and contribution of individual roles	Economic	Clarify if the economic sustainability roles are aligned with a clear defined function towards the business roles.	Sustainability roles have a function within the business roles	Define a function for each economic sustainability role	Measure the effectiveness of the function towards the business goals	Effectiveness of business functions and goals execution	Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective		$BC_{ssc3}E$		
						Measure the efficiency of the function towards the business goals	Efficiency of business functions and goals execution	Very inefficient	Somewhat inefficient	Neutral	Somewhat efficient	Very efficient				
		Social	Clarify if the social sustainability roles are aligned with a clear defined function towards the business roles.	Sustainability roles have a function within the business roles	Define a function for each social sustainability role	Measure the effectiveness of the function towards the business goals	Effectiveness of business functions and goals execution	Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective			$BC_{ssc3}S$	
						Measure the efficiency of the function towards the business goals	Efficiency of business functions and goals execution	Very inefficient	Somewhat inefficient	Neutral	Somewhat efficient	Very efficient				
		Environmental	Clarify if the environmental sustainability roles are aligned with a clear defined function towards the business roles.	Sustainability roles have a function within the business roles	Define a function for each environmental sustainability role	Measure the effectiveness of the function towards the business goals	Effectiveness of business functions and goals execution	Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective				$BC_{ssc3}En$
						Measure the efficiency of the function towards the business goals	Efficiency of business functions and goals execution	Very inefficient	Somewhat inefficient	Neutral	Somewhat efficient	Very efficient				
	Clarity and structure of reporting relationships	Economic	Economic sustainability structure reports should support the outline and requirements of progress review of the business.	Economic sustainability structure report	Define economic sustainability structure report	Align the structure report with the progress review report	Relationship between report and progress review report	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		$BC_{ssc4}E$		
						Align the structure report with goals and objectives	Relationship between report and goals and objectives	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
						Align the structure report with the strategic business plan	Relationship between report and business plan	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Social	Social sustainability structure reports should support the outline and requirements of progress review of the business.	Social sustainability structure report	Define social sustainability report	Align the structure report with the progress review report	Relationship between report and progress review report	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			$BC_{ssc4}S$	
						Align the structure report with goals and objectives	Relationship between report and goals and objectives	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
						Align the structure report with the strategic business plan	Relationship between report and business plan	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Environmental	Environmental sustainability structure reports should support the outline and requirements of progress review of the business.	Environmental sustainability structure report	Define environmental sustainability report	Align the structure report with the progress review report	Relationship between report and progress review report	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				$BC_{ssc4}En$
						Align the structure report with goals and objectives	Relationship between report and goals and objectives	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
						Align the structure report with the strategic business plan	Relationship between report and business plan	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
	Appropriate span of control and number of organisational levels	Economic	A number of employees who are assigned to a dedicated economic sustainability role.	Employee roles	Assign employees to economic roles	Measure whether these roles align with the business goals and objectives	Document with aligned economic roles with goals and objectives	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		$BC_{ssc5}E$		
		Social	A number of employees who are assigned to a dedicated social sustainability role.	Employee roles	Assign employees to social roles	Measure whether these roles align with the business goals and objectives	Document with aligned social roles with goals and objectives	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			$BC_{ssc5}S$	
		Environmental	A number of employees who are assigned to a dedicated environmental sustainability role.	Employee roles	Assign employees to environmental roles	Measure whether these roles align with the business goals and objectives	Document with align environmental roles with goals and objectives	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				$BC_{ssc5}En$
	Appropriate management/ leadership and technical skills	Economic	Ensure employees have the required skills to execute the required economic sustainability role.	Employee skills	Training and education for employees	Average hours of training per employee and by employee category	Percentage of training per employee and category based on benchmark value	0-20%	21-40%	41-60%	61-80%	81-100%		$BC_{ssc6}E$		
		Social	Ensure employees have the required skills to execute the required social sustainability role.	Employee skills	Training and education for employees	Average hours of training per employee and by employee category	Percentage of training per employee and category based on benchmark value	0-20%	21-40%	41-60%	61-80%	81-100%			$BC_{ssc6}S$	
		Environmental	Ensure employees have the required skills to execute the required environmental sustainability role.	Employee skills	Training and education for employees	Average hours of training per employee and by employee category	Percentage of training per employee and category based on benchmark value	0-20%	21-40%	41-60%	61-80%	81-100%				$BC_{ssc6}En$
	Effective coordination	Economic	Employees should effectively coordinate the economic sustainability roles among co-employees.	Diversity of sustainability roles	Equal economic sustainability functions among employees	Measure the performance of the responsibilities of the employees	Document stating role allocation among teams	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		$BC_{ssc7}E$		
						Link a reward system on best performance	Percentage of successful role responsibility execution per employee	0-20%	21-40%	41-60%	61-80%	81-100%				
		Social	Employees should effectively coordinate the social sustainability roles among co-employees.	Diversity of sustainability roles	Equal social sustainability functions among employees	Measure the performance of the responsibilities of the employees	Document stating role allocation among teams	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			$BC_{ssc7}S$	
						Link a reward system on best performance	Percentage of successful role responsibility execution per employee	0-20%	21-40%	41-60%	61-80%	81-100%				
		Environmental	Employees should effectively coordinate the environmental sustainability roles among co-employees.	Diversity of sustainability roles	Equal environmental sustainability functions among employees	Measure the performance of the responsibilities of the employees	Document stating role allocation among teams	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				$BC_{ssc7}En$
						Link a reward system on best performance	Percentage of successful role responsibility execution per employee	0-20%	21-40%	41-60%	61-80%	81-100%				
	Appropriate supporting systems	Economic	Managing of all the economic sustainability systems and functions and how they interact with one another.	Economic sustainability systems	Report the support functions and systems at each business function	Reflection report about the economic sustainability systems	Satisfying level of reflection report	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		$BC_{ssc8}E$		
		Social	Managing of all the social sustainability systems and functions and how they interact with one another.	Social sustainability systems	Report the support functions and systems at each business function	Reflection report about the social sustainability systems	Satisfying level of reflection report	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			$BC_{ssc8}S$	
		Environmental	Managing of all the environmental sustainability systems and functions and how they interact with one another.	Environmental sustainability systems	Report the support functions and systems at each business function	Reflection report about the environmental sustainability systems	Satisfying level of reflection report	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				$BC_{ssc8}En$

Figure C.5: Business Sustainability Evaluation Tool: Organisational structure.

STAGE 1: DEFINE					STAGE 2: MEASURE									
Q I	TRANSLATION (QI > QII)		Q II		Q III			EVALUATION (QIII > QIV)						Q IV		
Business component sustainability definition	Role connection	Role connection element	Sustainability definition	Key, measurable concepts	Indicators	Description	Measure (from the business)	SCORE						Economic Evaluation	Social Evaluation	Environmental Evaluation
								1	2	3	4	5	Business score			
Management and leadership development: The internal management growth is a process of working with people and resources within purpose, structure, rewards, support mechanism, and leadership to complete organisational change for sustainability	Role concept	Economic	Economic sustainability role outline should be extensively defined so that any employee can take over roles without any constraints.	Sustainability role outline	Description document	Clearly define role description	Level of document completion	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		BCASCE		
					Stakeholder engagement within each role*	List of stakeholder engagement groups within roles	Document explaining stakeholder and role engagement	No stakeholder/role engagement document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Changes in report*	Report changes from previous reporting periods	Level of document completion	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Social	Social sustainability role outline should be extensively defined so that any employee can take over roles without any constraints.	Sustainability role outline	Description document	Clearly define role description	Level of document completion	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			BCASCS	
					Stakeholder engagement within each role*	List of stakeholder engagement groups within roles	Document explaining stakeholder and role engagement	No stakeholder/role engagement document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Changes in report*	Report changes from previous reporting periods	Level of document completion	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Environmental	Environmental sustainability role outline should be extensively defined so that any employee can take over roles without any constraints.	Sustainability role outline	Description document	Clearly define role description	Level of document completion	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				BCASCEn
					Stakeholder engagement within each role*	List of stakeholder engagement groups within roles	Document explaining stakeholder and role engagement	No stakeholder/role engagement document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Changes in report*	Report changes from previous reporting periods	Level of document completion	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
	Management/leadership skills	Economic	Management and leadership skills support economic sustainability roles to better execute their sustainability functions and to cohesively work together as teams.	Management and leadership skills	Self management skills	Appraisal and knowledge of self values, abilities, aptitudes, interests, work/life balance	Level of satisfied performance of employee	Very unsatisfied performance	Unsatisfied performance	Unsatisfied performance but indicates small % improvement	Satisfied performance with improvements	Continuously performing at satisfying level		BCASCE		
					Discipline skills	Skills necessary to perform at work	Number of skills required and how they will be achieved	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Career building skills	Skills required for learning opportunities	Number of skills required and how they will be achieved	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Social	Management and leadership skills support social sustainability roles to better execute their sustainability functions and to cohesively work together as teams.	Management and leadership skills	Self management skills	Appraisal and knowledge of self values, abilities, aptitudes, interests, work/life balance	Level of satisfied performance of employee	Very unsatisfied performance	Unsatisfied performance	Unsatisfied performance but indicates small % improvement	Satisfied performance with improvements	Continuously performing at satisfying level			BCASCS	
					Discipline skills	Skills necessary to perform at work	Number of skills required and how they will be achieved	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Career building skills	Skills required for learning opportunities	Number of skills required and how they will be achieved	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
		Environmental	Management and leadership skills support environmental sustainability roles to better execute their sustainability functions and to cohesively work together as teams.	Management and leadership skills	Self management skills	Appraisal and knowledge of self values, abilities, aptitudes, interests, work/life balance	Level of satisfied performance of employee	Very unsatisfied performance	Unsatisfied performance	Unsatisfied performance but indicates small % improvement	Satisfied performance with improvements	Continuously performing at satisfying level				BCASCEn
					Discipline skills	Skills necessary to perform at work	Number of skills required and how they will be achieved	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
					Career building skills	Skills required for learning opportunities	Number of skills required and how they will be achieved	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				
	Attitudes/psychological factors	Economic	In order to execute a successive economic sustainability role one should have self-belief and continuously improve ones capabilities and thus rewards will follow.	Self-belief Individual's capabilities	Identify and choose opportunities	Advance in projects and roles with the identified opportunities	List and describe how opportunities will be executed	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information		BCASCE		
					Create social capital	Creating strategic personal and professional relationships with those who create opportunities	Established relationships within business functions	No relationships	Small fraction of relationships in business functions	Business functions and opportunities form relationships	Business functions and opportunities integrate	Fully integrated and executed relations				
		Social	In order to execute a successive social sustainability role one should have self-belief and continuously improve ones capabilities and thus rewards will follow.	Self-belief Individual's capabilities	Identify and choose opportunities	Advance in projects and roles with the identified opportunities	List and describe how opportunities will be executed	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information			BCASCS	
					Create social capital	Creating strategic personal and professional relationships with those who create opportunities	Established relationships within business functions	No relationships	Small fraction of relationships in business functions	Business functions and opportunities form relationships	Business functions and opportunities integrate	Fully integrated and executed relations				
		Environmental	In order to execute a successive environmental sustainability role one should have self-belief and continuously improve ones capabilities and thus rewards will follow.	Self-belief Individual's capabilities	Identify and choose opportunities	Advance in projects and roles with the identified opportunities	List and describe how opportunities will be executed	No document	Established document with minimal information	Document with information less than 50% completed	Document with information > 50% and < 80% completed	Document with fully descriptive information				BCASCEn
					Create social capital	Creating strategic personal and professional relationships with those who create opportunities	Established relationships within business functions	No relationships	Small fraction of relationships in business functions	Business functions and opportunities form relationships	Business functions and opportunities integrate	Fully integrated and executed relations				

Figure C.6: Business Sustainability Evaluation Tool: Management and leadership development.

STAGE 1: DEFINE					STAGE 2: MEASURE												
Q I	TRANSLATION (QI - QII)		Q II		Q III			TRANSLATION (QII - QIV)							Q IV		
								SCORE									
Business component sustainability definition	Sub-components	Sustainability dimension	Sustainability definition	Key, measurable concepts	Indicators	Description	Measure (from the business)	1	2	3	4	5	Business score	Economicrelation	Socialrelation	Environmentalrelation
Culture management: and change management strategies include the balance and application of environmental, social, and economic elements. Incorporating sustainability as part of corporate culture, the shared value transforms from hard to soft i.e. attention on human values. Result in higher probability of sustainable initiatives.	Customer client orientation	Economic	Economic sustainability interactions with clients should be built on a reliable and responsive relationship assuring high quality of products and services.	Client interaction Quality of products and service	Economic client policy	After sale maintenance and service period	Maintenance and service time period	3 months	6 months	12 months	24 months	36 months		BCricE		
					Consumer engagement and client cost	Spreading of marketing resources in proportion to every client's cost	Percentage of marketing resources used of total resources	0-20%	21-40%	41-60%	61-80%	81-100%				
		Social	Social sustainability interactions with clients should be built on a reliable and responsive relationship assuring high quality of products and services.	Client interaction Quality of products and service	Long-term relationship	Aim to create long-term relations with client	Time/year period	<1 year	1-2 years	2-3 years	3-4 years	4 > years			BCricSE	
					Product and service development	Product and service aim to have a competitive edge	Market share of total market	0-20%	21-40%	41-60%	61-80%	81-100%				
					Social customer-client policy	Customer satisfaction	Customer- client satisfaction	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied				
		Environmental	Environmental sustainability interactions with clients should be built on a reliable and responsive relationship assuring high quality of products and services.	Client interaction Quality of products and service	Operations policy	Product or service will not cause harm to end user's environment	Harm/risk teet	No risk impact	Low risk impact	Medium risk impact	High risk impact	Very high risk impact				BCricEE
	Orientation toward employees	Economic	Economic sustainability culture is associated with employee in-role and extra-role behaviours.	Employee roles and behaviour	Embedding sustainability in performance evaluation	Reward employees when a positive result is shown of performance evaluation	Performance evaluation	Very unsatisfied performance	Unsatisfied performance	Neutral	Satisfied performance	Very satisfied performance		BCricE		
						Improve the business's economic performances	Improvement plan (time period)	3 months	6 months	12 months	24 months	36 months				
		Social	Social sustainability culture is associated with employee in-role and extra-role behaviours.	Employee roles and behaviour	Embedding sustainability in performance evaluation	Reward employees when a positive result is shown of performance evaluation	Performance evaluation	Very unsatisfied performance	Unsatisfied performance	Neutral	Satisfied performance	Very satisfied performance			BCricS	
						Improve the business's social performances	Improvement plan (time period)	3 months	6 months	12 months	24 months	36 months				
		Environmental	Environmental sustainability culture is associated with employee in-role and extra-role behaviours.	Employee roles and behaviour	Embedding sustainability in performance evaluation	Reward employees when a positive result is shown of performance evaluation	Performance evaluation	Very unsatisfied performance	Unsatisfied performance	Neutral	Satisfied performance	Very satisfied performance				BCricEn
						Improve the business's environmental performances	Improvement plan (time period)	3 months	6 months	12 months	24 months	36 months				
	Standard performance	Economic	Each employee should perform his/her role at a high standard, ensuring economic sustainability actions are executed at a high level of quality.	Employee performance Quality of performance	Production rate	Percentage of completed products	Completed products from total products and WIP products	0-20%	21-40%	41-60%	61-80%	81-100%		BCricE		
					Performance rate	Quality of performance will deliver high performance rate	Performance time from performance and idle time	0-20%	21-40%	41-60%	61-80%	81-100%				
					Economic performance	Customer satisfaction	Customer- client satisfaction	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied				
		Social	Each employee should perform his/her role at a high standard, ensuring social sustainability actions are executed at a high level of quality.	Employee performance Quality of performance	Participative decision-making	Cohesion of employees	Cohesion of employee rate	No cohesion	Low cohesion	Medium cohesion	High cohesion	Very high cohesion			BCricS	
					Goal-setting and planning	Efficient and productive processes	Efficient and effective rates of production of total time	0-20%	21-40%	41-60%	61-80%	81-100%				
		Environmental	Each employee should perform his/her role at a high standard, ensuring environmental sustainability actions are executed at a high level of quality.	Employee performance Quality of performance	Production rate	Percentage of completed products	Completed products from total products and WIP products	0-20%	21-40%	41-60%	61-80%	81-100%				BCricEn
					Performance rate	Quality of performance will deliver high performance rate	Performance time from performance and idle time	0-20%	21-40%	41-60%	61-80%	81-100%				
					Environmental performance	Customer satisfaction	Customer- client satisfaction	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied				
	Commitment to change	Economic	Any changes that are executed in the business should not have an immediate effect on the economic sustainability policies, if so, the policies should be adjusted without any disruption.	Business changes Addressing changes	Clear and strong ethical practices	Ensure economic equity	Equity plan	0-20%	21-40%	41-60%	61-80%	81-100%		BCricE		
					Active promoter of sustainability values	Maintain sustainable future	Performing sustainable values in day-to-day tasks	Strongly disagree	Disagree	Neutral	Agree	Strongly agree				
		Social	Any changes that are executed in the business should not have an immediate effect on the social sustainability policies, if so, the policies should be adjusted without any disruption.	Business changes Addressing changes	Clear and strong ethical practices	Ensure social equity	Equity plan	0-20%	21-40%	41-60%	61-80%	81-100%			BCricS	
					Active promoter of sustainability values	Maintain sustainable future	Performing sustainable values in day-to-day tasks	Strongly disagree	Disagree	Neutral	Agree	Strongly agree				
		Environmental	Any changes that are executed in the business should not have an immediate effect on the environmental sustainability policies, if so, the policies should be adjusted without any disruption.	Business changes Addressing changes	Clear and strong ethical practices	Ensure environmental equity	Equity plan	0-20%	21-40%	41-60%	61-80%	81-100%				BCricEn
					Active promoter of sustainability values	Maintain sustainable future	Performing sustainable values in day-to-day tasks	Strongly disagree	Disagree	Neutral	Agree	Strongly agree				

Figure C.7: Business Sustainability Evaluation Tool: Culture management.

C.2 Business Sustainability Framework and Evaluation Tool: Validation document

Business Sustainability Framework and Evaluation Tool: Validation

Project Title:	A systems engineering approach to a Business Sustainability Framework
Prepared By:	Megan Rautenbach MEng (Engineering Management) Candidate
Contact details:	0728799697 16951573@sun.ac.za
Content:	Validation report Excel document (Electronically provided)

Summary of validation report:
• A brief description about the background of the research • The process that were followed to reach the validation section • The validation approach, including the strategy and validation questions

Summary of excel document
• Overview of the Business Sustainability Evaluation Tool • The seven business components illustrated in terms of the Business Sustainability Evaluation Tool

C.2 Business Sustainability Framework and Evaluation Tool: Validation document

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C.2 Business Sustainability Framework and Evaluation Tool: Validation document

1. Introduction

Sustainability is recognised as one of the key challenges of modern-day businesses. The need for, and pressure on, businesses to incorporate aspects of sustainability into all business processes that result in the delivery of products and/or services, in terms of social equity, economic efficiency, and environmental performance, has increased over the past few decades. A number of business sustainability frameworks and approaches exist that support businesses in incorporating the aspects of sustainability into business operations.

The above-mentioned concept of business sustainability was used to formulate the aim of the research project (a Masters in Engineering Management at Stellenbosch University), which is to contribute towards business sustainability through *'A Systems Engineering Approach", the* outcome of this research is a business sustainability framework, and a business sustainability evaluation tool.

The aim of this document is thus to provide information of the developed framework and evaluation tool, and a subsequent set of questions that will aid in the validation of the developed Business Sustainability Framework (see Figure 1) and the business sustainability evaluation tool (see Figure 2 and attached excel document). The framework makes use of theoretical knowledge, which has been analysed throughout the research process, and used in the development of the framework and tool; the aim is thus now to validate the developed framework and tool through the means of validation with subject matter experts. The validation is a way of progressing and clarifying the arguments and propositions made in order to reach certain conclusions in terms of the validity of the developed framework and tool as the outcome. A brief overview of the framework and tool is discussed below in order to facilitate the validation process and the expected outcome.

2. Literature overview

During the research process to date, various literature analyses were conducted that contributed to the development of the Business Sustainability Framework. The build-up to the development of said framework is summarised below.

Initially, a systematic review of literature pertaining sustainability frameworks was conducted and discussed. During the investigation into the business sustainability frameworks, two key concerns emerged; (i) that sustainability is not explicitly considered at the level of business components, and (ii) that not all sustainability dimensions are considered in equal levels of detail. From these perspectives, four key business sustainability challenges are noted;

i. The notion that these frameworks consider the business as a whole, and not as a number of sub-components, therefore, the lack of integration of business components and sustainability actions arise. This view of business sustainability at an aggregate level creates what this research inquiry refers to as a 'black box' perspective.

ii. In addition, the concern that all dimensions of sustainability are not uniformly considered, meaning businesses adapt their processes to a recommended framework that does not consider all elements of sustainability. This would result in the business not addressing sustainability across all levels of a business or across the various business components.

iii. Differentiation across sustainability elements arise, meaning that measuring the three elements of sustainability are not similar across the business components, therefore the focus and defined greater level of detail are required to address this differentiation.

iv. Lastly, monitoring and evaluation process is required to address the shortcomings associated with sustainability frameworks to enable businesses to achieve their full potential in terms of sustainability.

The above results in, subsequent to using such business sustainability framework(s) to adapt their business processes to a recommended framework, that considers sustainability (only) at an aggregated level or does not explicitly consider all the dimensions of sustainability. Thus it is argued that by considering sustainability at an increasingly granular level, and also ensuring that all sustainability dimensions for each business component is considered, will contribute to an improved understanding of business sustainability. The evaluation thereof, and ultimately to provide guidance on the actions required to continuously improve the sustainability of businesses. These challenges highlighted with regards to business sustainability, and the frameworks that aim to guide business sustainability, enables the proposition of using the systems engineering approach to address these challenges.

Using the systems engineering (SE) approach to address the challenges of sustainable business development, the business environment is deconstructed into a collection of business environment facets that are deemed important to consider when developing business processes to ultimately perform at a sustainable level.

The SE approach consists of four phases that are translated to four quadrants; each relating to a specific, sequential component of the problem solving approach. The first quadrant considers the system as a whole, which can be broken down into `smaller functional units' – such units are defined and presented in quadrant II. This implies a process of delineating the functional units that ultimately, when considered together, constitutes the system as a whole. This inevitably means that a translation exercise is required between quadrants I and II. In quadrant II, each functional unit, and by implication the problem(s) at this increased level of granularity of the `bigger' system-wide problem, are defined. Subsequently, in quadrant III, a solution can then be developed for the individual functional units, given that the problem is now clearly defined for each such unit. And lastly the solutions developed for the individual functional units in quadrant III can be formed together as a solution for the system as a whole in quadrant IV. This as well means that a translation exercise is required between quadrants III and IV.

This approach allows for an increased level of granularity that is essential to enable businesses to evaluate and ultimately aim to achieve their full potential in terms of sustainability by unpacking the business environment into business components and measure sustainability performances at these business components.

The conceptual framework development methodology described by Jabareen (2009) was used as a guide to describe the overarching methodology to propose a qualitative systems engineering approach to business sustainability. The conceptual framework approach enables the use of existing literature that has been introduced and summarised above. The literature has certain relationships,

features and concepts with one another and therefore the discussion of interrelations within concepts create the applicability of Jabareen's approach. In conclusion, Jabareen's approach allows to create, identify and pursue the major concepts identified in various literature, and to develop key components, with their unique attributes and well defined perspectives within the conceptual framework.

The following five design specifications, derived from the business challenges identified within the sustainability frameworks, needs to be addressed through the development of the Business Sustainability Framework.

Table 1: Design specifications.

Design Specifications		Description of design specifications
(i)	**Sustainability to be considered at an increased level of detail**	The business sustainability framework should focus on the multiple individual business components working together as a whole, and therefore not only consider sustainability from the perspective of the business as a whole, but at an increased level of detail in terms of the components that constitutes the business.
(ii)	**All three dimensions of sustainability should be included throughout the framework**	The business sustainability framework should incorporate all three dimensions of sustainability across all levels of consideration, thus all three dimensions of sustainability should enjoy equal consideration irrespective of the level of analysis in the business sustainability framework.
(iii)	**Sustainability dimensions should be considered in the same level of detail**	The business sustainability framework should consider all three dimensions of sustainability in the same level of detail for the specified unit of analysis; thus in the same level of detail for each identified business component in terms of each sustainability dimension.
(iv)	**Allow for differentiation in the definition and measurement of sustainability dimensions**	The business sustainability framework should allow for differentiation of the definition and measurement of the three different sustainability dimensions across the various levels and units of analysis.
(v)	**Integrated approach between business components and sustainability dimensions**	Ultimately, given requirements (i) – (iv), the business sustainability framework should take an integrated approach that combines sustainability dimensions with a detailed level and unit of analysis, that still allows for the definition and measurement of sustainability at an adequately aggregate level, without yet again imposing a 'black box' perspective on business sustainability.

The above mentioned, provides a short summary of the process that was followed throughout this research enquiry to conceptualise and subsequently develop the conceptual framework, i.e. the Business Sustainability Framework as well as the Business Sustainability Evaluation Tool. The following section provides a discussion of the Business Sustainability Framework.

3. Business Sustainability Framework: Discussion

The Business Sustainability Framework was developed using the SE approach as well as the conceptual framework methodology developed by Jabareen (2009). Table 2 to Table 5 shows the definition of each quadrant, as well as the concepts (quadrant definition, sustainability context, purpose, strategy, tactics, form of value creation, and translation between quadrants) that are used to define, measure and/or evaluate business sustainability from the various perspectives. Figure 1 shows the conceptual framework, and also illustrates the different concepts identified throughout literature (and shown in Table 2 to Table 5), and integrated using the SE approach. This high level conceptualisation illustrates the four quadrants, that are subsequently translated into three stages within the evaluation tool (discussed in section 4). Each quadrant consist of a number of elements that contribute to the overall quadrant definition and explanation.

The SE approach phases are used to conceptualise the problem in terms of the four quadrants; each relating to a specific, sequential component of the problem solving approach. The concept of the quadrants supports the idea of defining and measuring business sustainability from the perspective of a systems as a whole, and from the perspective of functional units respectively, which aims to ultimately create shared value (in quadrant IV).

Table 2: Quadrant I: Define business sustainability from the perspective of the 'whole'.

QUADRANT I	
Concept or element	**Description**
Quadrant I definition	Business sustainability from a system as `whole' defines business sustainable value to its clients and stakeholders through creating and deliver shared value, while capturing economic value and maintaining or reproducing economic, social, and natural resources.
Context	The context is the business sustainability actions over the medium and long term. Business sustainability from the perspective of the `whole' aims to include sustainability actions into its business actions. Subsequently, it aims to be a functional and sustainable business over the medium and long term.
Purpose	The purpose or belief explains a certain action. The purpose or belief for business sustainability from the perspective of the `whole' is to fundamentally create a sustainable vision.
Strategy	The strategy explains what process will be followed. Business sustainability from the perspective of the `whole' defines a value proposition strategy with a transparent orientation towards achieving sustainability goals which is beyond the current organisational boundaries.
Tactics	The tactics explains what actions will be used to achieve the purpose and strategy. Business sustainability from the perspective of the `whole' requires the defining of goals and objectives, metrics and/or indicators for the strategy, purpose and sustainability context.
Form of value creation	Business sustainability from the perspective of the `whole' demonstrates absolute form of value creation. This quadrant allows to define business sustainability aspects in order to measure effectiveness across the organisation which ultimately will contribute to sustainability shared value creation.
Translation: quadrant I to II	Defining business sustainability from the perspective of the `whole' creates the action for a translation to defining business sustainability from the perspective of the `functional units'. This translation requires the business environment to be broken down into functional business components, which requires the defining of these functional business components in terms of sustainability.

Table 3: Quadrant II: Define business sustainability from the perspective of the 'functional units'.

QUADRANT II	
Concept or element	**Description**
Quadrant II definition	Business sustainability from the 'functional units' perspective defines business sustainable value to business perspective from the `whole' by creating and deliver shared value, while capturing economic value and maintaining or reproducing economic, social, and natural resources at the various `functional units'- identified as business components.
Context	The context is the business sustainability actions over the short and medium term. Business sustainability from the perspective of the `functional units' aims to include sustainability actions into its business functional units. Subsequently, it aims to define functional and sustainable functional units of the business over the short and medium term.
Purpose	The purpose or belief explains a certain action. The purpose or belief for business sustainability from the perspective of the `functional business components' is to fundamentally define and maintain a sustainable vision at the functional business components.
Strategy	The strategy explains what process will be followed. Business sustainability from the perspective of the `functional business components' defines a value proposition strategy with a transparent orientation towards achieving sustainability goals at a functional unit level which is beyond the current organisational boundaries.
Tactics	The tactics explains what actions will be used to achieve the purpose and strategy. Business sustainability from the perspective of the `functional business components' requires the defining of goals and objectives, metrics and/or indicators for the strategy, purpose and sustainability context.
Form of value creation	Business sustainability from the perspective of the `functional units' demonstrate relative forms of value creation. This quadrant allows to define business sustainability aspects and compliances at the various functional units which ultimately creates efficiency measurement which will contribute to sustainable shared value creation.
Translation: quadrant I to II	The translation is executed where the functional business components are defined in terms of the sustainability dimensions e.g. economic, social, and environmental.

Table 4: Quadrant III: Measure business sustainability from the perspective of the 'functional units'.

QUADRANT III	
Concept or element	**Description**
Quadrant III definition	Business sustainability from the 'functional units' perspective measures the business sustainable value outcome of the business perspective from the `functional units' that created and delivered shared value, ensuring economic value are captured and economic, social, and natural resources are maintained or reproduced at the various `functional units'- identified as business components.
Context	The context is the business sustainability actions over the medium and long term. Business sustainability from the perspective of the `functional business components' aims to measure the sustainability actions that were included in the business functional units. Subsequently, the measurement aims to be functional and sustainable at the functional units of the business over the short and medium term.
Purpose	The purpose or belief explains a certain action. The purpose or belief for business sustainability from the perspective of the `functional business components' is to fundamentally measure and perform sustainable at the functional business components.
Strategy	The strategy explains what process will be followed. Business sustainability from the perspective of the `functional business components' measures the sustainable value proposition strategy defined at a functional unit level.
Tactics	The tactics explains what actions will be used to achieve the purpose and strategy. Business sustainability from the perspective of the `functional business components' requires the measuring of goals and objectives, metrics and/or indicators for the strategy, purpose and sustainability context.
Form of value creation	Business sustainability from the perspective of the `functional units' demonstrate relative forms of value creation. This quadrant allows to measure business sustainability aspects and compliances which were defined at the various functional units which ultimately measure efficiency that will contribute to

	sustainable shared value creation.
Translation: quadrant III to IV	Measuring business sustainability from the perspective of the `functional units' creates the action for a translation to defining business sustainability from the perspective of the `whole'. This translation requires the use of a suitable measuring method of the functional business components against the various sustainability dimensions.

Table 5: Quadrant IV: Measure business sustainability from the perspective of the 'whole'

QUADRANT IV	
Concept or element	**Description**
Quadrant IV definition	Measured business sustainability from a system as `whole' is the solution of the business sustainable value outcome of the measured business perspective from the `functional units' that created and delivered shared value, ensuring economic value are captured and economic, social, and natural resources are maintained or reproduced at the various `functional units'.
Context	The context is the business sustainability actions over the medium and long term. Business sustainability from the perspective of the `whole' measured the business sustainability outcome of the functional and sustainable business actions that were achieved over the medium and long term.
Purpose	The purpose or belief explains a certain action. The purpose or belief for business sustainability from the perspective of the `whole' is to fundamentally maintain the achieved sustainable vision.
Strategy	The strategy explains what process will be followed. Business sustainability from the perspective of the `whole' measures the value proposition strategy that have a transparent orientation towards continuously achieving sustainability goals and reaching the organisational boundaries.
Tactics	The tactics explains what actions will be used to achieve the purpose and strategy. Business sustainability from the perspective of the `whole' measures whether the goals and objectives, metrics and/or indicators for the strategy, purpose and sustainability context were identified and achieved.
Form of value creation	Business sustainability from the perspective of the `whole' demonstrates absolute form of value creation. This quadrant allows to measures the effectiveness of business sustainability aspects across the organisation which ultimately contribute to sustainability shared value creation.
Translation: quadrant III to IV	The measuring method used in the translation exercise enables the business to govern, inform and measure a holistic solution for the sustainability from the perspective of the `whole'.

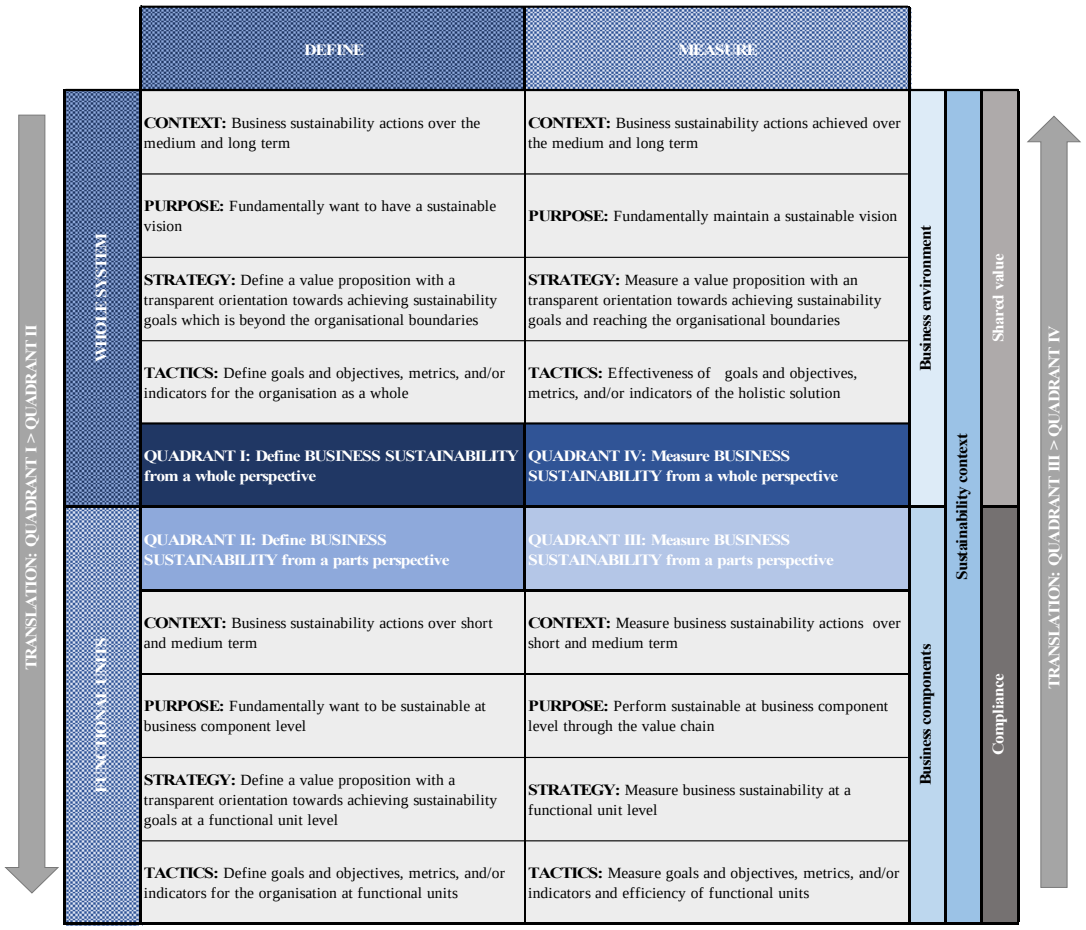

Figure 1: Business Sustainability Framework.

These quadrants, together with the identified elements that support the quadrant discussion, are subsequently portrayed in terms of three stages that contribute to the development of the Business Sustainability Evaluation Tool. The three stages includes (i) define, (ii) measure and (iii) monitoring and evaluation, and are discussed in detail below.

4. Business Sustainability Evaluation Tool: Discussion

The development of the Business Sustainability Evaluation Tool consist of three stages with each stage discussing the identified quadrants and its associated elements, as introduced and discussed in the Business Sustainability Framework.

4.1 Stage 1: Define business sustainability

This stage is primarily concerned with the discussion of quadrant I and quadrant II, thus defining business sustainability at an aggregate level in terms of the seven business components as well as a discussion on the translation from quadrant I to quadrant II. Table 6 provides a description of the concepts of stage 1 and these concepts are defined and shown in Figure 2. In addition to the concepts identified in Figure 1, Table 2 and Table 3 provides a discussion about the concept integration of quadrant I and quadrant II.

Table 6: Stage 1 discussion.

STAGE 1: DEFINE	
Stage concepts	**Description of stage concepts**
Quadrant I	The individual business components are defined in terms of business sustainability.
Business components	○ Business development ○ Organisational growth ○ Strategic planning ○ Performance management ○ Organisational structure ○ Management and leadership development ○ Culture management.
Translation	The translation from quadrant I to quadrant II, is the process where the sub-components of the identified business component are identified against the system boundaries of sustainability (economic, social, and environmental).
Quadrant II	The sustainability definitions of the identified sub-components against the system boundaries of sustainability (economic, social, and environmental dimension). Within these definitions, key, measurable concepts are identified that supports the identification of indicators in quadrant III.

4.2 Stage 2: Measure business sustainability

Stage two is primarily concerned with the discussion of quadrant III and IV, measuring business sustainability in terms of the seven business components. Additionally, the transition between these two quadrants is discussed. Table 4 and Table 5 provides a discussion about the concept integration of quadrant III and IV. These concepts are identified in Figure 1. Table 7 provides a description of the concepts of stage 2 and these stage description is shown in Figure 2.

Table 7: Stage 2 discussion.

Stage concepts	Description of stage concepts
Quadrant III	This includes the identification, description and the measuring method of the indicators identified that addresses the key, measurable concepts.
Translation	The translation between quadrant III and quadrant IV is done by means of a scoring method provide a way for businesses to measure their performance given each indicator. The measurement is set out as a 5-point scale, and each scale point is allocated to either 1, 2, 3, 4, or 5 points. The allocated point that is determined after the measurement of the indicators, is shown in the `Business score' column Figure 2.
Quadrant IV	Quadrant IV is concerned with combining all the individual measurements of the business components into a holistic solution. This quadrant consists of the business sustainability component solution, considering all the sub-components of the individual business components for economic, social, and environmental, respectively. The equations are illustrated below. $$Business\ component_i = \sum_{i=1}^{n} Economic_{sc_i}$$ $$Business\ component_i = \sum_{i=1}^{n} Social_{sc_i}$$ $$Business\ component_i = \sum_{i=1}^{n} Environmental_{sc_i}$$
	In addition to the business component sustainability, the sum of all system boundaries of sustainability that are considered for all the business components, are demonstrated in the following equation: $$Business\ sustainability = \sum_{i=1}^{n} Economic_{BC_i}; \sum_{i=1}^{n} Social_{BC_i}; \sum_{i=1}^{n} Environmental_{BC_i}$$

4.3 Stage 3: Monitoring and evaluation

The monitoring and evaluation stage is the overarching linkage and evaluation between the define and measure stage, as illustrated in Figure 2. From the above mentioned formulas and results gained from economic-, social-, and environmental sustainability for all business components (see Table 7) a baseline measurement/ target can be defined after initial execution of the conceptual framework. These baseline values can be used to set specific organisational targets within the alignment of industry-specific targets for a similar business environment. The business construct the results of the baseline and targets, and then in partnership with the value chain perspective, the business recommend improvements as well as evaluate whether the shared value opportunities are created through three key ways, namely: (i) products and markets; (ii) productivity in the value chain is redefined; and (iii) local cluster development is enabled. Subsequently, summarizing the monitoring and evaluation stage in a profile review report, allows for the identification of newly addressed approaches that benefits society, and generate greater innovation and growth.

In conclusion this stage is an iterative and continuous process and illustrates the linkages between the various quadrants as shown in Figure 2.

C.2 Business Sustainability Framework and Evaluation Tool: Validation document

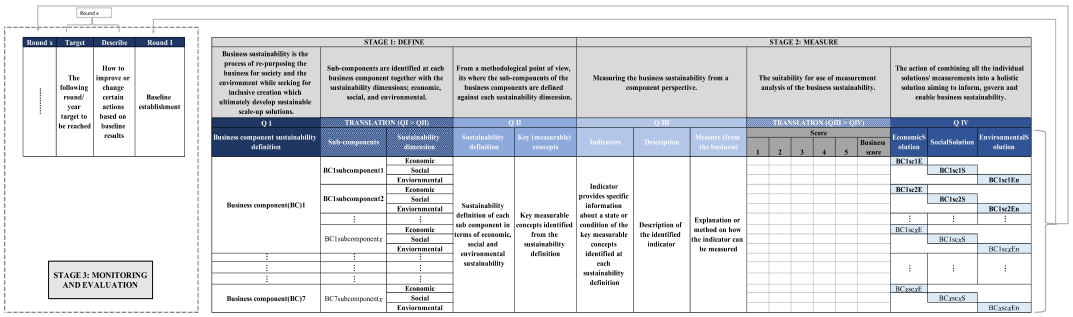

Figure 2: Business Sustainability Evaluation Tool.

5. Validation strategy and questions

The Business Sustainability Framework and Business Sustainability Evaluation Tool's validity will be tested against a set of questions and each set of questions aims to achieve a desired outcome. Figure 3 illustrates the validation process, and the identified inputs contributing towards the validation questions. The theoretical foundations and the conceptualisation of the Business Sustainability Framework, and subsequent Evaluation Tool, from preceding chapters serve as inputs to the validation questions.

There are essentially two sets of questions; the first set (questions A1 – A4, shown in Table 8 below) is geared towards the Business Sustainability Framework, the second set (questions B1 – B4, shown in Table 9 below) is geared towards the Business Sustainability Evaluation Tool. The validation questions request for a remark on a 5 point scale, which range from strongly agree to strongly disagree and an option to provide any comments or suggestions if the remark is strongly disagree.

5.1 Validation question A1 – A4.

The content of the questions under A1 are related to the design specifications defined given the specific business sustainability challenges identified. The expected outcome of the Business Sustainability Framework validation under the design specifications and validation questions related to this are plausible and certifiable.

The questions under A2 relate to the concepts and elements defined given the literature analysis of the SE approach and conceptual framework analysis. The expected outcome of the Business Sustainability Framework validation under the concepts and elements and validation questions related to this are the applicability and appropriateness of the developed framework given the literature analysis.

The questions under A3 relate to the implementation capability of the conceptualised Business Sustainability Framework. The expected outcome of the Business Sustainability Framework validation under the implementation capability and validation questions related to this are suitability and validity of the applicability and interpreted meaning of the framework.

The questions under A4 relate to the theoretical contribution of the Business Sustainability Framework towards the field of business sustainability. The expected outcome of the Business Sustainability Framework validation under the theoretical contribution and validation questions related to this are the relevance and usefulness of the developed framework to the field of business sustainability.

5.2 Validation question B1 – B4.

The content of the questions under B1 are related to the design specifications defined given the specific business sustainability challenges identified. The questions under B2 relate to the concepts

derived given the Business Sustainability Framework concept and elements discussed for the individual quadrants. The questions under B3 relate to the implementation capability of the Business Sustainability Evaluation Tool and its applicability to any industry. The questions under B4 relate to the theoretical contribution of the Business Sustainability Evaluation Tool towards the field of business sustainability.

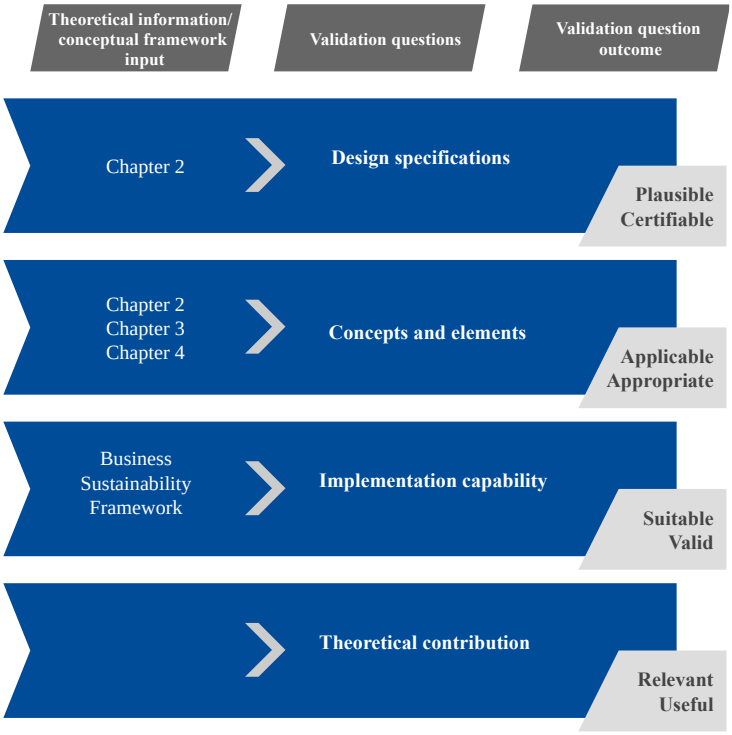

Figure 3: Inputs and outputs of validation process.

Table 8: Validation questions: A1 to A4.

Validation Questions: Business Sustainability Framework	Validator's Response					
	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree	Comments
A1. Design Specifications						
To what extent do you agree that the five stated design specifications are addressed by the Business Sustainability Framework?						
I. Sustainability to be considered at an increased level of detail						
The Framework considers the business as multiple individual components working together as a whole.						
II. All three dimensions of sustainability should be included throughout the framework						
The Framework considers all three dimensions of sustainability across all levels of consideration.						
III. Sustainability dimensions should be considered in the same level of detail						
The Framework includes all three dimensions of sustainability in the same level of detail for each identified business component.						
IV. Allow for differentiation in the definition and measurement of sustainability dimensions						
The Framework allows for differentiation of the definition and measurement of the three different sustainability dimensions.						
V. Integrated approach between business components and sustainability dimensions						
The Framework combines sustainability dimensions with a detailed level and unit of analysis, that still allows for the definition and measurement of sustainability at an adequately aggregate level.						
A2. Concepts and elements						
2.1 To what extent do you agree with						
I. The context of business sustainability at each quadrant?						
Quadrant I						
Quadrant II						
Quadrant III						
Quadrant IV						

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Validation Questions: Business Sustainability Framework	Validator's Response					
	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree	Comments
II. The purpose of business sustainability at each quadrant?						
Quadrant I						
Quadrant II						
Quadrant III						
Quadrant IV						
III. The strategy of business sustainability at each quadrant?						
Quadrant I						
Quadrant II						
Quadrant III						
Quadrant IV						
IV. The tactics of business sustainability at each quadrant?						
Quadrant I						
Quadrant II						
Quadrant III						
Quadrant IV						
V. The form of value creation of business sustainability at each quadrant?						
Quadrant I						
Quadrant II						
Quadrant III						
Quadrant IV						
VI. The translation of business sustainability at each quadrant?						
Quadrant I						
Quadrant II						
Quadrant III						
Quadrant IV						

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Validation Questions: Business Sustainability Framework	Validator's Response					
	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree	Comments
A3. Implementation Capability						
3.1 To what extent do you agree that it is intuitive to derive value from the Business Sustainability Framework?						
3.2 To what extent do you agree that the Business Sustainability Framework is applicable to address business sustainability?						
3.3 To what extent do you agree that the Business Sustainability Framework is applicable to any industry, thus generic in nature?						
3.4 To what extent do you think that the Business Sustainability Framework should be customised for specific industries?						
3.5 Rate the Business Sustainability Framework in terms of the following:						
Intuitive to understand						
Ease of use						
A4. Theoretical Contribution						
4.1 To what extent do you agree that the Business Sustainability Framework contributes to the field of business sustainability?						
4.2 To what extent do you agree that the Business Sustainability Framework contribute to the field of business sustainability frameworks?						
4.3 To what extent do you agree that the Business Sustainability Framework contributes towards providing an alternative approach to contribute towards addressing the challenges businesses face in terms of defining, measuring and evaluating sustainability?						

Table 9: Validation questions: B1 to B4.

Validation Questions: Business Sustainability Evaluation Tool	Validator's Response					
	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree	Comments
B1. Design Specifications						
To what extent do you agree that the five stated design specifications are addressed by the Business Sustainability Evaluation Tool?						
I. Sustainability to be considered at an increased level of detail						
The Tool considers the business as multiple individual components working together as a whole.						
II. All three dimensions of sustainability should be included throughout the tool						
The Tool considers all three dimensions of sustainability across all levels of consideration.						
III. Sustainability dimensions should be considered in the same level of detail						
The Tool includes all three dimensions of sustainability in the same level of detail for each identified business component.						
IV. Allow for differentiation in the definition and measurement of sustainability dimensions						
The Tool allows for differentiation of the definition and measurement of the three different sustainability dimensions.						
V. Integrated approach between business components and sustainability dimensions						
The Tool combines sustainability dimensions with a detailed level and unit of analysis, that still allows for the definition and measurement of sustainability at an adequately aggregate level.						
B2. Concepts (consider all seven business components)						
To what extent do you agree with						
2.1 The sustainability definitions of the sub-components at each business component?						
2.2 The key, measurable concepts identified at the sub-components?						
2.3 The identified indicators address the key, measurable concepts identified?						
2.4 The indicators are an appropriate representation of the system boundaries (economic, social, and environmental) of sustainability?						

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Validation Questions: Business Sustainability Evaluation Tool	Validator's Response					
	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree	Comments
B3. Implementation Capability						
3.1 To what extent do you agree that it is intuitive to derive value from the Business Sustainability Evaluation Tool?						
3.2 To what extent do you agree that the Business Sustainability Evaluation Tool is applicable to address business sustainability?						
3.3 To what extent do you agree that the Business Sustainability Evaluation Tool is applicable to any industry, thus generic in nature?						
3.4 To what extent do you think that the Business Sustainability Evaluation Tool should be customised for specific industries?						
3.5 Rate the Business Sustainability Evaluation Tool in terms of the following:						
Intuitive to understand						
Ease of use						
B4. Theoretical Contribution						
4.1 To what extent do you agree that the Business Sustainability Evaluation Tool contributes to the field of business sustainability?						
4.2 To what extent do you agree that the Business Sustainability Evaluation Tool contribute to the field of business sustainability tools?						
4.3 To what extent do you agree that the Business Sustainability Evaluation Tool contributes towards providing an alternative approach to contribute towards addressing the challenges businesses face in terms of defining, measuring and evaluating sustainability?						

6. Conclusion

This document serve as the validation of the developed Business Sustainability Framework and the Business Sustainability Evaluation Tool. The approach that was followed during the research to develop the Business Sustainability Framework and the Business Sustainability Evaluation Tool was summarised in this document.