

UNIVERSITY OF KWAZULU-NATAL

**The strategic alignment of integrated management systems and its impact on efficiencies
and effectiveness at National Chemical Products (NCP) Alcohols**

By

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of Master of Business Administration**

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Declaration

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“The people in your life are like the pillars on your porch. Sometimes they hold you up and sometimes they lean on you. Sometimes it’s enough to know they are standing by” Merle Shain.

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Abstract

Today's competitive global business environment require organisations and individuals to be resilient and adapt to change quickly and effortlessly. It is crucial for organisations to have suitable systems to help them navigate through the challenges. Management systems help guide a business through its core organisational objectives while staying financially competitive and in business. This study set out to establish if international management systems could be strategically aligned to improve efficiency and effectiveness of NCP Alcohols processes. A narrative literature review was done to identify the key performance drivers of the various individual management systems. To obtain a holistic view on the performance drivers of the various management systems, it was deemed necessary to conduct a survey on the employees of NCP Alcohols, to understand their perceptions. A quantitative research approach was selected to achieve the objectives of the study. Data collected via the survey questionnaire (n=53) was analysed by means of descriptive and inferential statistics. The results showed that the key performance drivers for quality are customer focus, continual improvement and training and awareness. Key performance drivers for environmental performance were identification of business and stakeholder needs by analyzing the context of the organization and identification of aspects and impacts of NCP Alcohols business activities. Key occupational health and safety performance drivers were identified to be risk management in regard to human capital and participation and consultation with NCP Alcohols workforce. By adopting the "line of sight" model and establishing suitable performance measures for each of the processes linked to the key performance drivers identified, NCP Alcohols can improve efficiency and effectiveness of its business processes. Further recommendations are proposed to enhance NCP Alcohols business processes to achieve business excellence, including the use of Lean Six Sigma methodology, technology, the BSC and adoption of a Value Innovation Model.

Key words: *Integrated management system, quality management system, environmental management system, health and safety management system*

Abbreviations

BSC	-	Balanced Scorecard
BSI	-	British Standards Institute
CSF	-	Critical Success Factors
CSR	-	Corporate Social Responsibility
EFQM	-	European Foundation for Quality Management
EMS	-	Environmental Management System
ILO	-	International Labour Organisation
IMS	-	Integrated Management System
ISO	-	International Organisation for Standardisation
KPI	-	Key Performance Indicators
MS	-	Management Systems
OHSAS	-	Occupational Health and Safety Assessment Standard
QMS	-	Quality Management System
ROI	-	Return on Investment
SPSS	-	Statistical Package for Social Sciences
TQM	-	Total Quality Management
WCED	-	World Council for Economic Development

Table of contents

Description	Page
Title Page	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
Abbreviations	v
Table of Contents	vi
List of Figures	viii
List of Tables	ix
Chapter One.....	1
<i>Overview of the study</i>	1
1.1 Introduction.....	1
1.2 Motivation for the study.....	2
1.3 Focus of the study.....	3
1.4 Problem statement.....	4
1.5 Research questions.....	4
1.6 Research aim and objectives.....	5
1.7 Research methodology.....	5
1.8 Assumptions of the study.....	6
1.9 Limitations of the research.....	6
1.10 Outline of the study.....	7
Chapter Two.....	9
<i>Literature review</i>	9
2.1 Introduction.....	9
2.2 Management systems.....	9
2.3 ISO 9001 - Quality Management Systems.....	12
2.4 Quality performance.....	21
2.5 Customer satisfaction.....	35
2.6 Value chain analysis.....	36
2.7 ISO 14001 – Environmental Management System.....	37
2.8 Environmental performance.....	42
2.9 Business sustainability.....	43
2.10 OHSAS 18001- Occupational Health and Safety Management System.....	47
2.11 Occupational health and safety performance.....	48

2.12	Risk management.....	50
2.13	Integrated management systems.....	52
2.14	Business strategy.....	53
2.15	Value innovation	58
Chapter 3.....		60
<i>The research methodology</i>		<i>60</i>
3.1	Introduction.....	60
3.2	Research approach and design.....	60
3.3	Research setting.....	65
3.4	Research method	65
3.5	Bias.....	72
3.6	Validity and reliability	72
3.7	Ethical considerations.....	73
3.8	Conclusion.....	74
Chapter 4.....		76
<i>Presentation, analysis and discussion of results</i>		<i>76</i>
4.1	Introduction.....	76
4.2	Analysis of questionnaire	76
4.3	Conclusion.....	103
Chapter 5.....		104
<i>Conclusions, Limitations and Recommendations.....</i>		<i>104</i>
5.1	Introduction.....	104
5.2	Key findings and conclusions.....	104
5.3	Recommendations.....	108
5.4	Limitations of the study	119
5.5	Recommendations for future studies.....	119
5.6	Conclusion.....	120
Bibliography.....		121

List of Figures

Figure 2.1	Management systems as a tool to achieve business performance	10
Figure 2.2	The ISO 9000 process approach	14
Figure 2.3	Representation of the structure of ISO 9001:2015 in the PDCA cycle	15
Figure 2.4	The three aspects of sustainable development	20
Figure 2.5	Showing the Balanced Scorecard framework	24
Figure 2.6	Showing the seven linked categories making up the Malcolm Baldrige National Quality Award criteria	29
Figure 2.7	Showing Baldrige core values and concepts	31
Figure 2.8	Showing Value Chain structure introduced by Michael Porter	36
Figure 2.9	Risk management framework	51
Figure 2.10	Showing steps to achieve line of sight	56
Figure 2.11	Showing strategic alignment model	56
Figure 2.12	Showing the concurrent quest for of low cost and differentiation	58
Figure 2.13	Showing the four-action framework used to create a new value curve	59
Figure 3.1	Showing research process steps	61
Figure 4.1	Showing distribution of participant's division of work within NCP Alcohols	79
Figure 4.2	Showing distribution of occupational levels of respondents	80
Figure 4.3	Showing distribution of respondents' departments of work within NCP Alcohols	81
Figure 4.4	Showing age distribution of participants	82
Figure 4.5	Distribution showing the period of employment of respondents	83
Figure 5.1	NCP Alcohols Value Innovation Model	111
Figure 5.2	Showing an adapted value chain for NCP Alcohols by adopting Lean Six Sigma, the Balanced Scorecard and Technology	113
Figure 5.3	Showing integration of BSC with ISO 9001:2015 system	117
Figure 5.4	Showing recommended critical success factors for NCP Alcohols on the on the four perspectives of the BSC	117
Figure 5.5	Showing the evolution of leadership	119
Figure 5.6	Showing the typical response required of a Neuroleader to a VUCA environment with practical examples for NCP Alcohols	119

List of Tables

Table 2.1	Seven quality management principles	23
Table 3.1	Showing comparison between qualitative and quantitative research approaches	63
Table 3.2	Showing the population of NCP Alcohols	67
Table 3.3	Probability and non-probability sample designs	67
Table 3.4	Showing alignment between research questions and survey questions	70
Table 4.1	Showing reliability test result of the data set	77
Table 4.2	Showing a summary of the responses received by gender	78
Table 4.3	Showing respondent feedback on statements related to Objective 1	85
Table 4.4	Showing the results of the factor analysis on Objective 1	87
Table 4.5	Showing the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Objective 1	87
Table 4.6	Showing extraction method: Principal Component analysis for objective 1	88
Table 4.7	Showing the component matrix for objective 1	88
Table 4.8	Showing respondent feedback on statements related to objective 2	90
Table 4.9	Showing factor analysis on Objective 2	91
Table 4.10	Showing Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for objective 2	92
Table 4.11	Showing extraction method: Principal Component analysis for Objective 2	92
Table 4.12	Showing component matrix for Objective 2	93
Table 4.13	Showing respondent feedback on statements related to Objective 3	94
Table 4.14	Showing Factor analysis on Objective 3	95
Table 4.15	Showing Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Objective 3	96
Table 4.16	Showing extraction method: Principal component analysis for Objective 3	96
Table 4.17	Showing component matrix for Objective 3	97
Table 4.18	Showing respondent feedback on statements related to objective 4	98
Table 4.19	Showing Factor analysis on Objective 4	100

Table 4.20	Showing Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Objective 4	101
Table 4.21	Showing extraction method: Principal component analysis for Objective 4	101
Table 4.22	Showing component matrix for Objective 4	102

Chapter One

Overview of the study

1.1 Introduction

Organisations face several challenges due to the rapidly changing and competitive business environment in which they operate. Increasing competition through globalisation, depleting resources, climate change and changing legislation are some of the challenges that businesses must deal with daily. To be competitive nationally and globally, organisations must stay abreast with changes and be aware of emerging trends in the industry and business environment.

An emerging trend in the global business environment is the implementation and use of management systems (Kaupilla, 2014). Tierweiller (2016), observes that the number of organisations that obtained accreditation offered by the International Organisation for Standardisation (ISO) has steadily increased over the years. Villar (2012) indicates that although several management systems exist, the most commonly implemented systems include ISO 9001 (Quality Management System), ISO 14001 (Environmental Management System) and OHSAS 18001 (Occupational Health and Safety Assessment Series for health and safety management systems). Carvalho, *et al.* (2015) specifies that Integrated Management Systems (IMS) comprise of safety, health, environment and quality systems that are integrated, namely, ISO 9001, ISO 14001 and OHSAS 18001. These systems give organisations impetus to have necessary control within its business processes to survive and grow in the volatile business environment.

Extensive research has been done over the years on the various management systems and their ability to improve business performance (Martin, 2016). However, according to trends in the last five years there is little to no evidence to show **how** these management systems can be aligned to improve business performance, thus highlighting a gap in literature.

This chapter provides an overview of the study including the motivation for the study, focus of the study and problem statement. The primary research questions as well as

the aim and objectives of the research are listed with a concise breakdown of the research methodology used. Assumptions and limitations of the study are highlighted and a detailed outline of the study is presented together with a chapter summary.

1.2 Motivation for the study

Tierweiller (2016) states that implementation of international management systems and conformance to the associated standards are voluntary as there is no national or international legislation currently imposing this requirement on businesses. In the years since ISO 9001, ISO 14001 and OHSAS 18001 standards were published, they were used by many organisations as guidelines in designing their own management systems to improve business processes. However, many organisations implement management systems purely on reactive basis, mainly in response to customer requirements (Balakrishnan, 2011). The value-added components and elements of international management systems are seldom realised and utilised sufficiently to gain maximum benefit, including profit.

An alternate view is that, if management system implementation is aligned to the business strategy, the response to the competitive business environment will become a proactive approach rather than a reactive one. The combination of foresight and continual improvement of its business processes enables an organisation to become more competitive and will do so on a global scale.

The motivation for the study was to identify key performance drivers within the ISO 9001, ISO 14001 and OHSAS 18001 systems and suggest how they could be aligned to NCP Alcohols business strategy to enhance performance and enable NCP Alcohols to compete more effectively in today's global market.

The positive outcome of the study will be beneficial to all stakeholders of NCP Alcohols as the improvement in efficiency and effectiveness translates directly to a cost benefit and/or an increase in value for the business.

Recommendations made can also be applied and benefit other organisations within the chemical industry as well as industries who adopt similar business strategies such as the food and beverage industry.

1.3 Focus of the study

The study was conducted at NCP Alcohols, situated in the province of KwaZulu Natal, adjacent to the Umgeni River. NCP Alcohols is a manufacturer of fermentation alcohol for the South African and international beverage, cosmetic and pharmaceutical markets. The staff complement at NCP Alcohols comprises of 92 permanent employees at the following occupational levels:

- top management
- senior management
- professionally qualified and experienced specialists and middle-management
- skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents
- semi-skilled and discretionary decision makers and
- unskilled and defined decision makers

NCP Alcohols currently have a certified ISO 9001, Quality Management System that was implemented in 1987 (30 years ago), ISO 14001, Environmental Management System implemented in 2005 (12 years ago), SANS 10330 (HACCP), Food Safety Management System implemented in 2008 (nine years ago) and OHSAS 18001, Health and Safety Management System implemented in 2011 (six years ago).

Since integrated management systems comprise ISO 9001, ISO 14001 and OHSAS 18001 Carvalho, *et al.* (2015), the study focused on these three systems only. The possibilities of using these systems as strategic tools to improve efficiency and effectiveness of NCP Alcohols processes with the goal of achieving competitive advantage in the chemical industry, was explored through this study.

1.4 Problem statement

The alignment of international management systems to achieve business efficiency and effectiveness seems to be poorly documented in literature and in practice as there are still several questions around profitability and competitiveness of companies who have implemented international management systems; that remain unanswered. Can companies really achieve the benefits they expect? This is the question that remains, despite the widespread adoption of international management systems.

The research problem was therefore to determine if international management systems, namely, ISO 9001, ISO 14001 and OHSAS 18001 could be strategically aligned to improve efficiency and effectiveness at NCP Alcohols.

1.5 Research questions

The research questions established were as follows:

- Do specific elements of an ISO 9001 system drive quality performance and customer satisfaction to enable its use as a strategic tool to gain competitive advantage in the chemical industry?
- Do specific elements of the ISO 14001 system drive environmental performance to improve business sustainability and minimise impacts in the chemical industry?
- Do specific elements of the OHSAS 18001 system drive health and safety performance to improve stakeholder value in the domain of human capital?
- Can the ISO 9001, ISO 14001 and OHSAS 18001 management systems be aligned to drive value innovation and increase profitability and/or market share within the chemical industry?

1.6 Research aim and objectives

The aim of the study was to determine if international management systems, namely, ISO 9001, ISO 14001 and OHSAS 18001 could be used as strategic tools and be aligned to improve efficiency and effectiveness at NCP Alcohols.

The following research objectives were derived from the problem statement and the research questions:

- To identify the elements of the ISO 9001 system that drives quality performance to achieve customer satisfaction.
- To identify the elements of the ISO 14001 system that drives environmental performance and business sustainability.
- To identify the elements of the OHSAS 18001 system that drives health and safety performance by minimising risk to human capital.
- To identify if the key quality performance drivers, environmental performance drivers and health and safety performance drivers could be seamlessly aligned to NCP Alcohols business strategy, to increase profitability.

1.7 Research methodology

A quantitative research approach to data collection was adopted for this study. Ethical matters considered included an authorised gatekeepers letter signed by the Managing Director of NCP Alcohols, clearance from the University of KwaZulu Natal's ethical clearance office and compliance to the universities plagiarism policy.

An online survey was prepared and administered via QuestionPro. Informed consent was obtained electronically, via the QuestionPro survey for each participant. The survey was communicated to the employees via NCP Alcohols intranet, Microsoft SharePoint. The questionnaire for the survey was divided into two sections. Section A comprised of the demographic data while section B included 20 questions aligned to the four research objectives.

The numeric data obtained from the survey was collated and converted to statistical form, for analysis. Descriptive statistical methods were used to conduct the quantitative data analysis. The data was collected using the convenience sampling method with a non-probability sampling design. The convenience sampling approach was adopted due to the size of the population (92), selected for this research study. Hundred percent sample of the population was used for the study.

The survey data from QuestionPro was transferred and analysed using the Statistical Package for the Social Sciences (SPSS) software. The reliability of the data was determined from the Chronbach Alpha score.

The results of the data analysis were summarised in line with each objective and presented in Chapter Four in the form graphs and tables.

1.8 Assumptions of the study

The feedback received from the target population assumed a certain level of knowledge and understanding of international management systems and its associated standards.

1.9 Limitations of the research

The study had a limited scope as it only covered NCP Alcohols, which is based in Durban in the province of KwaZulu Natal. It therefore provides an intrinsic view that is limited to one geographic region within South Africa.

The sample size was limited to 53, which is a small sample to draw meaningful conclusions from.

The study assumed a certain level of knowledge and understanding of the management systems from the respondents. Respondents without prior knowledge and understanding of the systems would not have been able to complete the questionnaire accurately.

The research was conducted at a specific point in time and represents the perceptions of the staff employed by NCP Alcohols at that particular time. A change in staff complement could yield results different to that obtained from the study.

1.10 Outline of the study

The systematic and structured way in which the research was carried out was done to enable a full understanding of the research topic. The research is documented into five chapters as follows:

Chapter One: Overview of the study

This chapter introduces the research topic and provides an overview of the study. The introduction provides a brief background on the study while the motivation and focus of the study is concisely described. The problem statement is defined and the research questions, aim and objectives of the research listed. A brief description of the research methodology is specified. Assumptions and limitations of the research are stipulated.

Chapter Two: Literature review

Chapter Two provides a comprehensive review of the literature. A narrative review of the literature was conducted using mainly Google and Google Scholar as the search engines. Key words contained in the dissertation title and objectives were used to search for suitable literature. Literature was selected based on their relevance and significance to the study. Literature selected for the study was not more than five years old and contained combinations of journal articles, research reports, books and internet articles. The reviewed literature is sequentially presented and forms the basis of the conceptual framework. Key concepts are defined to facilitate easy understanding of the argument. The framework of the various international management systems is defined and compared. Benefits and challenges associated with the various international management systems are highlighted. Key performance drivers associated with the individual international management systems are emphasised according to the reviewed literature.

Chapter Three: The research methodology

This chapter defines the research methods adopted for the study. The reasons for the research approach and design is briefly explained, followed by a summary on the research setting. The reasons for the selected research method is given followed by a discussion on the sampling decisions taken. Various data collection aspects are described, including the instruments used for the research. The process to confirm validity and reliability of data is described. The chapter ends with a description of the analysis that was performed as well as ethical matters considered.

Chapter Four: Presentation, analysis and discussion of results

Chapter Four encompasses the details of the data collected and analysis thereof. The demographic profile of the participants is first analysed, followed by analysis of each objective of the study in relation to the data that was collected. The results are compared to the findings from the literature reviewed.

Chapter Five: Conclusions, limitations and recommendations

This chapter summarises the results obtained from the study and conclusions drawn along with recommendations that can be made to the executive management of NCP Alcohols. The chapter concludes with recommendations for further studies.

Summary

Chapter One introduced the research topic and provided insight into the study.

An overview of the study was presented in this chapter. A brief motivation for the study was given and the problem statement described. The study focus, aim and objectives were presented. The research methodology adopted for the study was outlined along with the assumptions and limitations of the study. Finally, the structure of the study (per chapter) was outlined. A review of applicable literature on international management systems and the associated standards are summarised in the next chapter. The challenges and benefits associated with the various standards are presented together with the performance drivers for the various management systems.

Chapter Two

Literature review

2.1 Introduction

Companies today compete in a Volatile, Uncertain, Complex and Ambiguous (VUCA) business environment in pursuit of two common goals, i.e. to survive and to remain profitable (Kingsinger, 2012). Business strategies adopted, therefore, need to be robust and relevant. The optimum use of business resources is of paramount importance to remain competitive (Lieder, 2014). Having structured systems in place to manage business processes is essential for success (Bhatia, 2013). An emerging trend in the global business environment is the use of Management Systems (MS) (Villar, 2012). Companies endeavour to achieve business success through the use of management systems.

Villar (2012) explains that business success is achieved through focus on various outcomes in addition to financial results such as customer satisfaction, stakeholder satisfaction and performance of key business processes as these form key drivers for business success. For companies to achieve positive business results, it is paramount that both customer and legal or regulatory requirements are met. Strategic planning, establishment of programmes and well-defined methodologies are essential while the organisations resources and activities need to be optimally managed. Roles and responsibilities need to be explicitly defined as well. According to Villar (2012), these components form the basis of management systems, as illustrated in Figure 2.1, page 10.

2.2 Management systems

According to ISO (2016), management systems provide a framework for companies to operate in, such that a structured approach is taken towards managing their activities to achieve their objectives. This systematic way in which things are done is known as a management system.

Successful implementation of a management system can translate into several benefits for an organisation. These may include improved financial performance due to more efficient use of the company's resources; business risk reduction and value creation for customers and stakeholders through increased capability to deliver consistently good products or services (Rebelo, 2014).

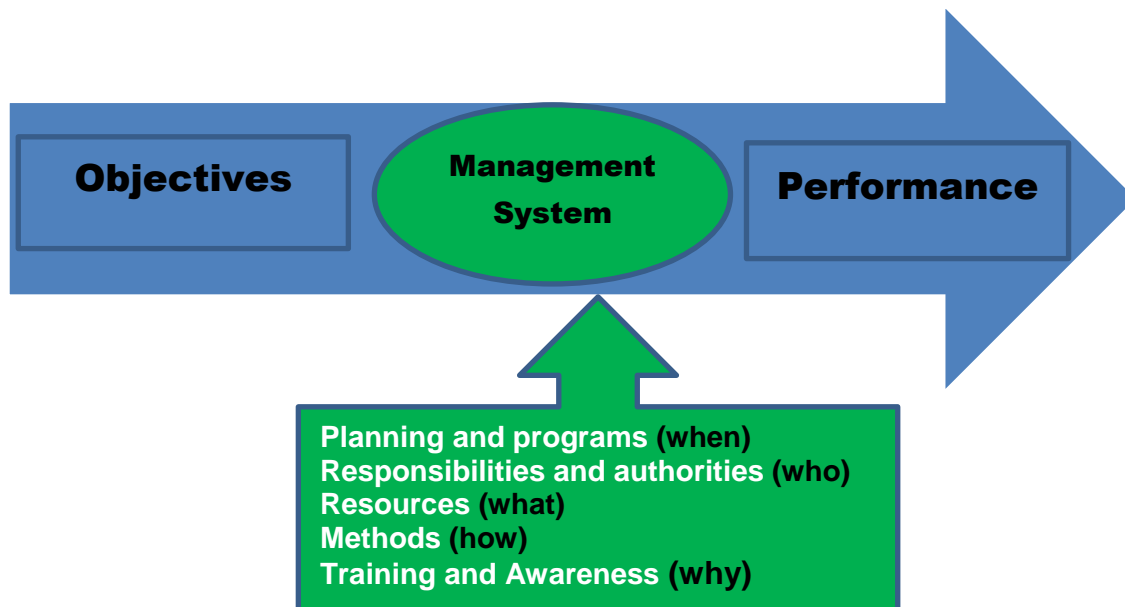


Figure 2.1: Management Systems as a tool to achieve business performance

Adapted: Villar (2012)

Organisations pursue the implementation of management systems for various reasons, be it to achieve business excellence, satisfy market demands or simply to satisfy stakeholder demands. Aimed at optimising organisational outputs as well as guiding attitudes and behaviours; management systems can be described as standardised and recognised requirements or guidelines (Bürgi, 2014). Management systems are also designed to support the concept of continuous improvement while simultaneously providing an operating framework and procedure (Kaupilla, 2014). Management system standards are used as guidelines for the development of the various management systems (ISO, 2016).

Standards are developed by an international, independent, non-governmental organisation known as ISO. These standards are documents that provide useful

information such as requirements, specifications, guidelines or characteristics that can be universally applied to products, services, materials or processes to ensure that the offering is fit for the purpose intended (ISO, 2016).

With its central secretariat based in Geneva, Switzerland and a membership of 162 national standards bodies, ISO uses a collaborative approach with various technical committees, to create a range of standards. These standards underpin the technology that is relied on by its customers, promotes the assurance of quality that is expected from goods and services and provides solutions to global challenges (ISO, 2017).

The international standards offer value to organisations in that they specify steps for companies to implement and repeat to consistently achieve their objectives. The standards are written so that the organisation continues a cycle of self-evaluation and correction, thereby improving their processes while simultaneously creating employee awareness and leadership commitment (ISO, 2016).

Over the years, ISO have published approximately 21554 international standards (ISO, 2016). The most common of these standards are ISO 9001, which sets out the criteria for Quality Management Systems (QMS) and ISO 14001 which provides guidelines for Environmental Management Systems (EMS). OHSAS 18001 is based on a British standard which defines best practice and minimum requirements for occupational health and safety management. The new ISO 45001 management system standard currently being developed by ISO will incorporate and replace the OHSAS 18001 standard requirements. According to ISO (2016), standards are maintained as a useful business tool by being reviewed every five years and revised as deemed necessary.

Organisations can certify their management systems against the relevant international standard. This process involves verification and written assurance (via a certificate) by an independent accredited body, that a company's product, service or system meets requirements stipulated in the relevant standard. Certification is not only a useful business tool but can offer organisations competitive advantage in the market place as it adds credibility and provides assurance to customers that the product or service being offered meets their expectations (ISO, 2016).

2.3 ISO 9001 - Quality Management Systems

Although implementation of an ISO 9001, QMS is voluntary, organisations have recognised that customer satisfaction, business profitability and market leadership are significantly dependent on delivering quality products and services to customers (Lushi, *et al.*, 2016). Some quality professionals even define the QMS as a system to manage customer requirements (Nassor, 2015).

McKinley (2016) states that the adoption of QMS by organisations form part of their strategic decisions to provide a sound basis for its sustainable development initiatives and improve its overall performance. Several organisations in both the public and private sectors implement formal QMS in response to customers request for assurance of quality on products or services they wish to obtain or have obtained. Furthermore McKinley (2016) debates that customers are looking for the confidence in the product or service being offered and want to be confident that products and services are produced under an effective QMS, such as one conforming to ISO 9001. However, a QMS, on its own will not solve organisational problems or improve the products, services or work processes. Implementation of a QMS steers the organisation into taking a more systematic approach to fulfilling its objectives. Through the ISO 9001 requirement for improvement, organisations can adopt the systems approach to achieve worthwhile and cost-effective improvements.

ISO (2016) indicates that the ISO 9000 series of standards were first published in 1987 by ISO and includes four different standards.

2.3.1 The ISO 9000 Standard

The generic fundamentals, vocabulary, terms and definitions used in the various ISO 9000 family of standards are captured in the ISO 9000 Standard and constitutes a useful companion document to organisations that wish to establish successful QMS (ISO, 2009).

The ISO 9000 Standard defines the basic elements of quality management, including the seven quality management principles and the continual improvement process. Details on the seven quality management principles are tabulated below (Table 2.1). Figure 2.2, page 14 illustrates the process approach through which continual improvement is achieved.

Table 2.1: Seven quality management principles (ISO, 2015e).

Customer focus	“Organisations depend on their customers and, therefore, should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.”
Leadership	“Leaders establish unity of purpose and direction of the organisation. They should create and maintain the internal environment in which people can become fully involved in achieving the organisation's objectives.”
Involvement of people	“People at all levels are the essence of an organisation and their full involvement enables their abilities to be used for the organisation's benefit.”
Process approach	“A desired result is achieved more efficiently when activities and related resources are managed as a process.”
Continual improvement	“Continual improvement of the organisation's overall performance should be a permanent objective of the organisation.”
Factual approach to decision making	“Effective decisions are based on the analysis of data and information.”
Mutually beneficial supplier relationships	“An organisation and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value.”

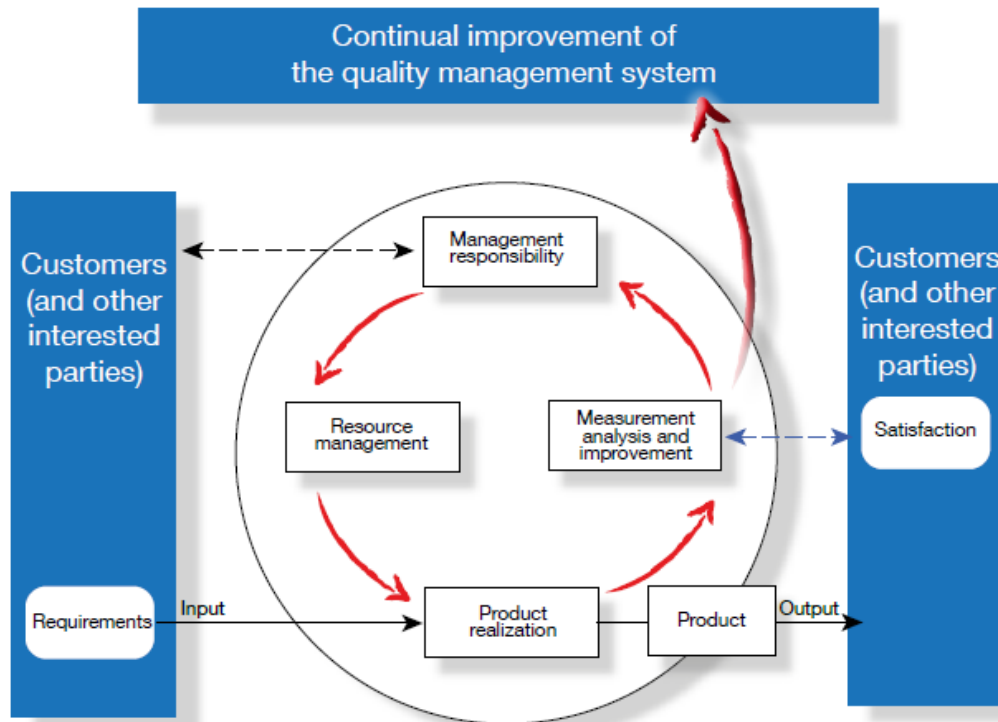


Figure 2.2: The ISO 9000 process approach (ISO, 2009).

2.3.2 The ISO 9001 Standard

The ISO 9001 Standard is used to establish the QMS and is the standard against which certification occurs. This standard provides confidence to customers of the company's ability to provide products that fulfil their needs and expectations (ISO, 2015e). Other management systems such as environmental, health and safety, information security, energy, etc. can be developed from the ISO 9001 standard, which forms a basis.

ISO 9001:2015, which is the current version of the standard comprises of various sections, commonly called "clauses". Each clause concentrates on the requirements involved in different aspects of a QMS.

- Clause 0-3 – Introduction and scope of the standard
- Clause 4 – Context of the organisation
- Clause 5 – Leadership
- Clause 6 – Planning
- Clause 7 – Support

- Clause 8 – Operation
- Clause 9 – Performance evaluation
- Clause 10 – Improvement

Fonseca (2014), citing Deming (1986) indicates that the ISO 9001 standard assumes the process approach, which incorporates the Plan-Do-Check-Act cycle (Figure 2.3). The standard also focuses strongly on risk-based thinking.

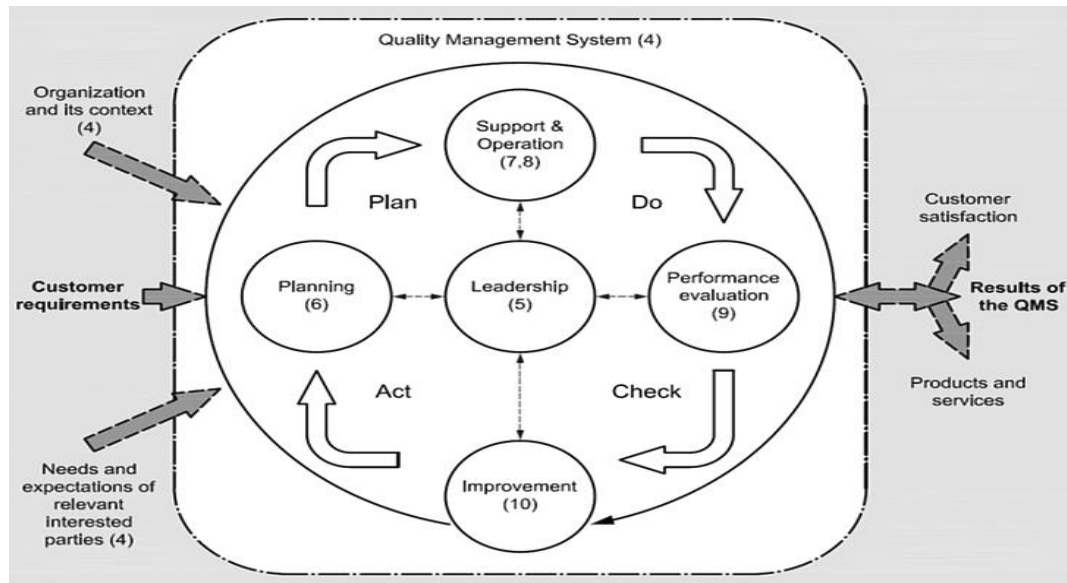


Figure 2.3: Representation of the structure of ISO 9001:2015 in the PDCA cycle
Source: (ISO, 2015c).

ISO (2015c) shows the following stages as the PDCA cycle:

Stage 1 (Plan) – The company must identify risks and opportunities and establish objectives and targets to mitigate risks and seize opportunities to meet customer requirements in line with its policies.

Stage 2 (Do) – Implement the plan.

Stage 3 (Check) – The company must monitor, measure and document its system and processes against the plan and its policies and the resultant product or service against the plan, objectives and policies.

Stage 4 (Act) – The company must take the necessary actions required to improve performance.

The ISO 9001:2015 standard adopted the concept of risk-based thinking so that organisations can identify and address the risks and opportunities applicable to the business and by doing so establishes a basis for increasing the effectiveness of the QMS with the goal of achieving improved results and preventing negative effects (ISO, 2015a).

McKinley (2016, p.13) indicated that companies use the ISO 9001 Standard to achieve various objectives including:

- instituting a customer satisfaction and continual improvement framework;
- providing assurance of product or service quality in external provider (supplier)-customer relationships;
- matching quality requirements and transferring good managerial practice
- qualifying external providers in global supply chains and encouraging the rise of services;
- providing technical support for regulators;
- giving organisations in developing countries and transition economies a framework for participating in global supply chains, export trade and business process outsourcing, thereby assisting their economic progress.

2.3.3 The ISO 9004 Standard

The ISO 9004 Standard is titled “*Managing for the sustained success of an organisation – A quality management approach*”. A wider viewpoint of quality management than ISO 9001 is provided by the ISO 9004 Standard as it is a guidance document. In pursuit of continual improvement of performance, efficiency and effectiveness and to address the needs and expectations of all interested parties and their satisfaction, the ISO 9004 Standard provides value to organisations whose top management wishes to advance beyond the requirements of ISO 9001 (or other management standards) (Manders, 2014).

To obtain a clear picture of the organisation's changing business environment and current performance the use of self-assessment to determine the maturity levels of different relevant elements is promoted through ISO 9004 (Meskovska, 2015). Improvement and innovation opportunities, weaknesses and strengths are identified through self-assessment which covers the following key elements:

- management and leadership;
- strategy and policy;
- resource management;
- process management;
- monitoring and measurement; and
- improvement, innovation and learning.

ISO 9004 can be used independently by any organisation regardless of size or industry, although it complements ISO 9001. However, it is not intended for certification or for contractual purposes.

2.3.4 The ISO 19011 Standard

According to ISO (2009), the ISO 19011 Standard provides guidelines for auditing the different management systems, for both internal and external audits. The audit process verifies that the organisation "is doing what they say they are doing" and verifies the organisations compliance against the relevant management system (Masejane, 2012). The standard contains guidance on managing an audit programme; the principles of auditing, evaluation of individuals responsible for managing the audit programmes and how to improve an audit programme systematically by ensuring the audit programme objectives are in line with the management system policies and objectives. An audit programme consists of the arrangements made to complete all the individual audits needed to achieve a specific purpose. This standard is also used to train and certify auditors and to evaluate and improve their competence (ISO, 2009).

Internal or first party audits are conducted by the organisations own auditors, to confirm if the applicable management system complies with the associated standard

or to improve the effectiveness of management systems. Good internal audits help companies to ensure that their management system delivers on promise and prepares the organisation for an external audit, should third-party certification be needed (ISO, 2009). Second party or external audits include audits by customers, audits of suppliers as well as audits by regulators or any other interested party.

2.3.5 Challenges with implementation of a quality management system

McKinley (2016) cautions that QMS should not become a financial burden or result in excessive bureaucracy, paperwork, or lack of flexibility. McKinley (2016, p.6) also indicates that many organisations face several challenges in developing a QMS. Some of these challenges, especially in small to medium-sized enterprises include:

- resources available to implement and manage the systems are minimal;
- significant costs incurred in implanting and maintaining a QMS;
- staff have trouble applying a QMS and understanding its concepts;
- a wide variety of tasks are expected to be undertaken by individuals within the organisation; and
- decision-making is usually confined to a few people (or even one).

Masejane (2012), however cautions that despite the challenges listed above, organisations need to bear in mind that the time and money spent on implementing a QMS should be looked at in the same way as any other investment made. Companies must be able to achieve a return on their employees' time and effort, through improvements in the organisation's processes and the marketability of its products and services, for the QMS implementation to be viable (Masejane, 2012).

2.3.6 Benefits of implementing a quality management system

Properly established QMS provide guidance for organisations to meet customer requirements and helps organisations to establish high and trustworthy quality-based customer-relationships as well (Sickinger-Nagorni, 2016). Organisations are compelled to put their customers first and ensure that they consistently meet their customer needs and exceed their expectations. This can lead to repeat customer purchases, new clients and an increase in sales revenue for the organisation (McKinley, 2016).

A QMS requires organisations to assess their overall context and to identify both risks and opportunities related to the business, which enables the organisation to clearly state their strategy (ISO, 2015e). By aligning processes and ensuring that the requirements are understood by everyone within the organisation, an effective QMS guides companies to work in a more efficient way. Continual improvement towards customer requirements, stakeholder interests and organisational objectives is ultimately achieved within the organisation. The increase in productivity and efficiency leads to reduced internal costs (Sickinger-Nagorni, 2016).

Other benefits include meeting the necessary statutory and regulatory requirements as well as expanding into new markets, as some sectors and customers require ISO 9001 certification before doing business (Masejane, 2012).

Sickinger-Nagorni (2016) indicates that ISO 9001 is a “business management tool” as per a Harvard Business School study. Higher economic growth and survival rate within markets, higher salaries, increased performance efficiency with simultaneous decrease in waste rates are some of the benefits for organisations implementing ISO 9001. The study compared 916 “adopters” of ISO 9001 against almost 18,000 “non-adopters” (ASQ 2016). According to Croft (2012), QMS play a pivotal role as a basis for the economic growth (Figure 2.4, page 20) as it impacts directly on production of goods and service delivery. However, this has been sadly often overlooked, with attention in recent years being focused on the more topical elements of environmental integrity and social equity.



Figure 2.4: The three aspects of sustainable development (Croft, 2012)

Mangula (2013) indicates that while the ISO 9001 Standard provides the set of guidelines for companies to establish their QMS by focusing on procedures, control and documentation; its strongest point is its relationship to TQM.

Fonseca (2014) argues that there has been an evolution on quality starting with inspection, moving to Statistical Process Control, Quality Assurance and finally the Business Excellence Models. This perspective sees quality management as a management philosophy, that has evolved from a narrow and mechanical perspective known as Statistical Quality Control to a broader and holistic one, known as TQM and Business Excellence.

2.4 Quality performance

The ISO 9000:2015 Standard, section 3.6.2, defines “quality” as “a combination of inherent characteristics which meet certain requirements”. The word “quality’ shows a concern for customer satisfaction (Nassor, 2015). Sickinger-Nagorni (2016) argues that quality is determined by a products’ purpose. Quality is a subjective term as the customer defines it through a degree of fulfilment of their requirements and expectations of the product. As opposed to its initial role of control, the quality concept has developed over the last few decades to become a broad management tool (Nassor, 2015). Quality, such as information quality, product quality, service quality, etc. needs to be managed both within and outside an organisation including its supply chain (Bhatia, 2013).

Bhatia (2013) citing Sarah (1989) indicates that there are eight critical factors of quality, based upon an empirical study, by collecting data from general managers and quality managers. These factors include:

- management leadership;
- role of the quality department;
- training;
- product / service design;
- supplier quality management;
- process management;
- quality data and reporting; and
- employee relations.

Management of companies can adopt these factors to assess quality improvement in the different areas of the business. Bhatia (2013) noted a strong correlation between factors of quality management and quality performance measure.

Customer-oriented approach, supplier-oriented approach, product-oriented approach, absolute approach and value-based approach are the various approaches to quality, according to Sickinger-Nagorni (2016). The customer-oriented approach relates to

customer needs and requirements and seeks to meet or exceed customer expectations. The supplier-oriented approach emphasises compliance to certain specification to ensure quality of the final product. The absolute approach is not connected to customers, suppliers, processes or final products or services. The overall evaluation of the term “quality” is generally classified into different levels, such as good, middle and bad, according to the absolute approach. By identifying certain attributes that can be measured to indicate superior quality, the product-oriented approach works from a customer perspective and examines how the customer assesses the product or service regarding price performance ratios. The value-based approach, which tries to combine both, quality and costs would be the most worthwhile business approach, according to Sickinger-Nagorni (2016, p.7). citing Broh (1982). Broh (1982) states in his book, "quality is the degree of excellence at an acceptable price and the control of variability at an acceptable cost." Consumers purchase decisions involves trading quality against the price, is what the value-based approach assumes. Quality product or service offers greater usefulness or satisfaction at a comparable price, according to this perspective.

Lieder (2014) argues that productivity and performance are linked to efficiency and effectiveness. Lieder (2014, p.23), citing Drucker (1964) indicates that “efficiency” can be interpreted as “doing things right” and effectiveness as “doing the right things”. Lieder explains that efficiency relates to the fact that resources need to be used with “increased productivity”, in order to meet a competitive and sustainable state.

Willar (2012, p.27), citing the British Standards Institute (2009) explains that “effectiveness” relates to the extent to which planned activities are realised and planned results are achieved. Willar (2012, p.27) further argues that “effectiveness” should really include the company’s achievement of its own requirements as well as the requirements prescribed in the principles of the relevant international standard.

How organisations conduct their operations and its management processes in order to satisfy customers by providing high-quality products and services, is what “performance” refers to (Masejane, 2012). According to Masejane (2012, p.94)

performance denotes “a progress towards goal achievement and performance management is intended to build on organisational capabilities to be more responsive, effective and sensitive to the demands of their customers, also being efficient in utilising the limited available resources to address those demands”. In order to achieve a degree of excellence, organisations are encouraged to operate within a particular framework that will optimise the organisational performance (Masejane, 2012).

Several performance management systems, similar to the ISO 9001 system, have emerged over the years. These include The Balanced Scorecard (BSC), Lean Six Sigma Methodology, the Baldrige Performance Excellence Programme, The European Foundation for Quality Management Excellence model and Total Quality Management (TQM).

2.4.1 The Balanced Scorecard

Zairi (2010) states that the application of performance measurement by an organisation is one of the critical success factors for excellence. Using performance measurement to drive improvements and by analysing performance data, excellent organisations successfully translate strategy into action. This requirement is aligned to clause 9, performance evaluation, of the ISO 9001 standard (ISO, 2015c).

BSC is a performance management system that converts strategy into a constant management and improvement process which can be used by all employees within an organisation (Jovanović, 2009). Intended to be a framework for linking strategy with operational performance measures, the BSC is a management decision tool (Masejane, 2012). In reality, it is an integrated report usually showing diverse areas of performance an institution values most.

Hough, *et al.* (2011), citing Kaplan and Norton (1992) presents BSC as a tool that companies can use to manage stakeholders' requirements and articulate strategy through a PDCA cycle structured management system. An organisation's strategic objectives is mapped into performance metrics by the system, characterised by the

following four perspectives: financial performance; internal processes; customers; and learning and growth (Hough, *et al.*, 2011) (Figure 2.5).

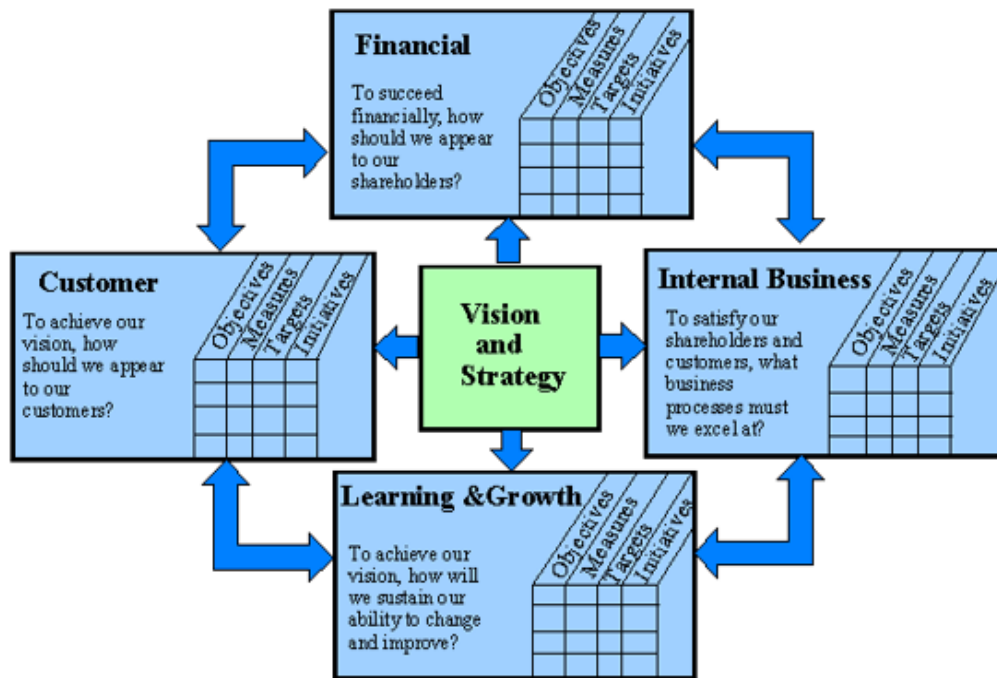


Figure 2.5: Showing the Balanced Scorecard framework.
Source: (Kaplan, 2010)

Kaplan (2010) indicates that the word “balanced” signifies that the system is balanced between short-term objectives and long-term objectives; financial measures and non-financial measures; lagging indicators and leading indicators; and internal performance and external performance perspectives while “scorecard” represents the performance measures. Hough, *et al.* (2011) describes the four perspectives as follows:

Financial perspective

This perspective addresses the question of what the organisation’s stakeholders expect in terms of finances. A key indicator of whether an organisations policies and strategy is properly executed is the bottom line or the profit margin. Clause 4 of the ISO 9001 standard is aligned to this perspective (ISO, 2015c).

Internal processes

Processes that are most critical for the organisation to excel and for satisfying customers and stakeholders are identified and monitored to give managers an indication if the requirements are being met. Clauses 6 and 9 of the ISO 9001 standard are aligned to this perspective (ISO, 2015c).

Customers

This perspective relates to how customers view the organisation on their ability to provide quality goods and services. This perspective enables management of an organisation to articulate the customer and market-based strategy that will deliver superior future financial returns. In terms of time, quality, performance, and cost is how customers generally view the organisation. Clauses 4 and 8 of the ISO 9001 standard addresses customer related processes (ISO, 2015c).

Learning and growth

Related to both individual and organisation self-improvement, this perspective addresses how an organisation should structurally develop and learn and includes employee training and corporate cultural attitudes. Mentors within the organisation, as well as ease of communication among workers that allows them to readily get help on the problem when needed, is also included. The requirement for learning and growth is aligned to clause 7 of the ISO 9001 standard (ISO, 2015c).

An information system is developed to link the top metrics to lower-level operational measures when an organisation initially introduces the BSC. The scorecard is thus integrated into the management system. In order to change operations in an institution in a structured fashion to achieve superior performance, this is done.

According to Hough, *et al.* (2011), value derived from BSC includes:

- mapping of strategy across various levels within the organisation;
- integrating strategy across the organisation;
- aligning strategy to performance' ensuring good reporting;
- creating line of sight in the organisation;
- good communication of strategic objectives;

- everyone's focus on the value proposition of the company; and
- verifying corrective action when needed and ensuring consistency in application.

2.4.2 Lean Six Sigma Methodology

Zugelder (2012) describes Lean as a combined set of tools, techniques, principles and practices that drives stream-lining of workflows and waste reduction. Jones (2006) defines Lean as a system that “gets the right things to the right place at the right time in the right quantity while helping minimise waste and being flexible and open to change”. Tikkala (2014, p.19) lists the seven types of waste (“muda” in Japanese) as overproduction, inventory, defective product, over processing, waiting, people, motion and transport. The various tools used to drive improvement in Lean include 5S (sort, set, shine, standardise and sustain), Error Proofing/Poka-Yoke, Just-In-Time (JIT), Kaizen, KanBan, Overall Equipment Effectiveness, Single Minute Exchange of Die, Takt time, Total Productive Maintenance, Value Stream Mapping, Work Cells/Cellular Manufacturing and Zero-defect. The most commonly used Lean tools in the manufacturing industry are 5S and value stream mapping (Tikkala, 2014).

To reduce the errors by reworking the product or service to meet required specifications, Six Sigma is a process quality assurance and improvement method that helps organisations to identify deviations, variations, defects and waste and take action. By eliminating waste, this approach assists organisations in improving performance (Masejane, 2012). Six Sigma's foundation is in statistical analysis and within Six Sigma, the common measurement index is 3.4 defects per million opportunities (Zugelder, 2012).

According to Morfaw (2009), to improve customer satisfaction, profitability and elimination of defects is the primary goal of Six Sigma methodology and is based on the following statistical thinking paradigm: 1) everything is a process; 2) all processes have inherent variability and 3) data is used to understand the variability and drive improvement decisions. Six Sigma methodology is based on five elements with the

acronym DMAIC, namely, **D**efine; **M**easure; **A**nalyse; **I**mprove; and **C**ontrol (Morfaw, 2009).

Customer needs are translated into separate tasks and the optimal specification for each task defined according to the Six Sigma process, depending on how each task interacts with others. The processes of Six Sigma can be used to drive the performance of products, services, and processes to breakthrough levels once the processes and tasks are defined, depending on the analysis and improvement interventions (Masejane, 2012).

According to Zugelder (2012), Lean Six Sigma is an integration of both Lean and Six Sigma methods to achieve continual improvement and comprises mainly of the DMAIC process, Value-stream mapping, 5S Analysis and Root Cause Analysis tools.

The DMAIC process includes the following:

Define : The process improvement goals that are aligned to the company's strategy and customer needs, is defined.

Measure: The current core business processes are measured and applicable data-collected for comparison.

Analyse : .The process is analysed to determine root causes of variation, poor performance (defects).

Improve : The target is process is improved by finding creative solutions to remedy and prevent problems.

Control: To ensure that before they result in defects, variances are corrected.

Value-stream mapping allows for the flow of information and material to be mapped to differentiate between value-adding and non-value adding activities. This tool can be beneficial to "value-focused" organisations.

The concept of continual improvement emphasized in Lean Six Sigma methodology is aligned to clause of the ISO 9001 standard (ISO, 2015c).

2.4.3 Baldrige Performance Excellence Programme

Intended as a standard of excellence that would help U.S. organisations achieve world-class quality, the Malcolm Baldrige National Quality Award was introduced in the early to mid-1980s. A renewed emphasis on quality for doing business in an ever expanding and more demanding, competitive world market was recognised by many industry and government leaders (Granite State Quality Council, n.d.).

Accepted widely, not only in the United States but also around the world, as the standard for performance excellence, the Malcolm Baldrige Criteria for Performance Excellence have played a major role in achieving the goals established for the Baldrige Award (Granite State Quality Council, n.d.). This system can be implemented via the Baldrige framework which empowers organisations to reach their goals, improve results, and become more competitive. The framework consists of the criteria, the core values and concepts, and the scoring guidelines (National Institute of Standards and Technology, 2015).

Business performance can be assessed on various crucial indicators such as customer, product or service, financial, human resource, and operations using the criteria. Similar to ISO 9001, Lean manufacturing, BSC and Six Sigma approaches, organisations resources can be aligned to the criteria to achieve strategic goals, regulatory compliance, improved communication, improved productivity and effectiveness (Granite State Quality Council, n.d.).

Baldrige is based on a set of beliefs and behaviours. These core values and concepts are the foundation for integrating key performance and operational requirements within (a results-oriented framework that creates a basis for action, feedback, and ongoing success).

A set of interrelated core values and concepts found in high performing organisations is what the criteria is built upon. Embodied in seven linked categories, these core values and concepts provide the foundation for an organisation to integrate key business requirements within a results-oriented framework to create a basis for action and feedback (National Institute of Standards and Technology, 2015).

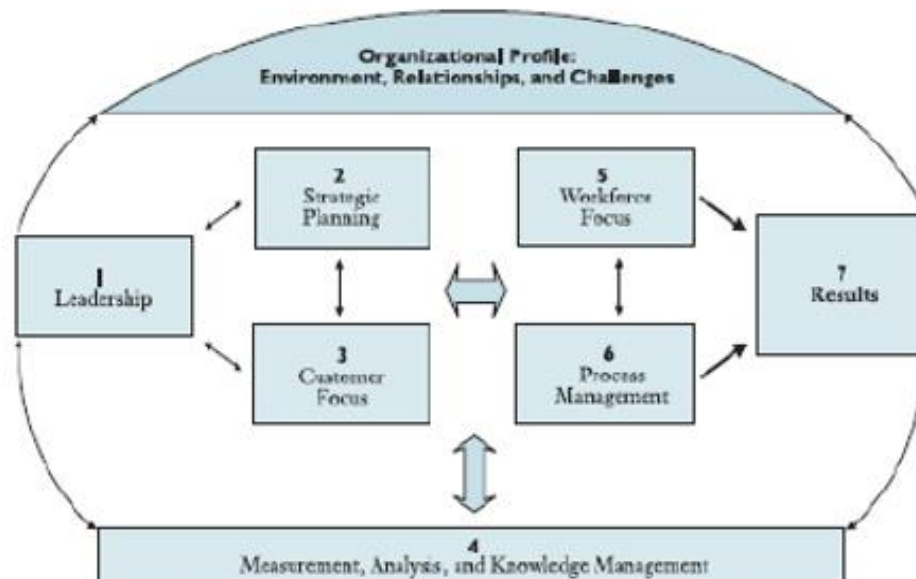


Figure 2.6 : Showing the seven linked categories making up the Malcolm Baldrige National Quality Award criteria. Source: (National Institute of Standards and Technology, 2015).

According to the National Institute of Standards and Technology (2015), there are seven categories of performance excellence which make up the award criteria. These represent seven critical aspects of managing and performing as an organisation (Figure 2.6). The criteria are as follows:

Leadership

This criterion assesses the guidance by the organisations executives in terms of sustaining the business and their approach to addressing governance, ethical, legal and community responsibilities. This requirement is aligned to clause 5 of the ISO 9001 standard (ISO 2015c).

Strategic planning

This criterion assesses how an organisation crafts and executes its strategy and is aligned to clauses 4 and 6 of the ISO 9001 standard (ISO 2015c).

Customer focus

This criterion examines how the organisation manages its customers and is aligned to clauses 4 and 8 of the ISO 9001 standard (ISO 2015c).

Measurement, analysis, and knowledge management

This criterion assesses how an organisation reviews its performance by examining its data management initiatives. This requirement is aligned to clauses 7 and 9 of the ISO 9001 standard (ISO 2015c).

Workforce focus

This criterion examines how an organisation's workforce is aligned with its objective and assesses the people development component. This requirement is aligned to clause 7 of the ISO 9001 standard (ISO 2015c).

Process management

This criterion examines how an organisation designs, manages and improves its critical processes and is aligned to clauses 8 and 10 of the ISO 9001 standard (ISO 2015c).

Results

Performance and improvement in the key business areas such as customer satisfaction, financial and marketplace performance, workforce, product/service, and operational effectiveness, and leadership is what this criterion examines an organisation's performance against. This requirement is aligned to clause 9 of the ISO 9001 standard (ISO 2015c).

Core values and concepts

A set of interrelated, embedded beliefs and behaviours found in high-performing organisations is what the criteria are built on. For integrating key business requirements within a results-oriented framework that creates a basis for action and feedback, the core values and concepts are the foundation (Figure 2.7).

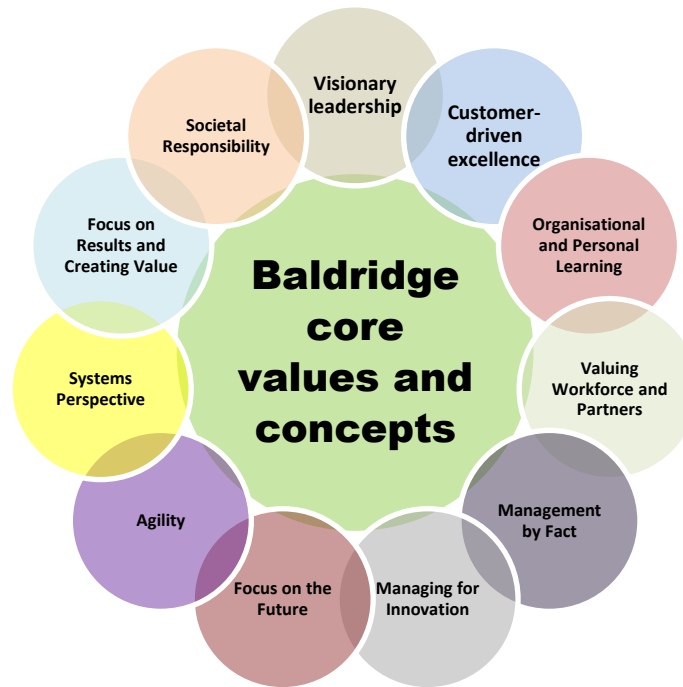


Figure 2.7: Showing Baldrige core values and concepts

Adapted: (National Institute of Standards and Technology, 2015).

To enable leaders to understand all the internal and external forces that drive their business; to prioritise, enhance, and improve what is critical to success; and to select the courses of action to achieve, increase, and sustain the best possible overall performance, the Baldrige Performance Excellence Programme offers a comprehensive management framework, similar to the ISO 9001 QMS.

2.4.4 Total Quality Management

With continuous improvement as its driving principle, TQM is a system of behaviour which embraces everyone within an organisation and which determines their relationships with the customers, suppliers, competitors, society and the environment

(Masejane, 2012). It can be defined as “an approach for continuously improving the quality of every aspect of business life and it’s never ending process of improvement of individuals, groups of people, and the whole organisation” (Masejane, 2012, p.39). TQM is an integrated management philosophy and set of practices that emphasises, among other things, continuous improvement and meeting customers’ requirements (Fonseca, 2014).

Fonseca (2014) indicates that the development of TQM can be traced to several people including Deming, Juran and Crosby.

The process of quality management can be viewed from quality inspection, to Quality Control, to Quality Assurance then to the current Total Quality Management. Although numerous quality improvement methods exist, TQM has had a strong, positive impact on organisational performance and been one of the most successful practices in helping companies to enhance competitiveness and prosperity through sustainable growth (Fonseca, 2014).

Fonseca (2014) argues that the concept of total quality management includes continuous improvement, customer’s satisfaction, and top management support, defect-free product at first attempt, and elimination of reworks, cost effectiveness training and re-training of staff. Total quality management consists of all activities that managers perform to improve their quality and policy such as quality planning, quality control, quality assurance and quality improvement. It is a process of getting rid of poor quality from production rather than getting rid of poor quality products.

In today’s volatile business environment, quality is a key requirement to gain competitive advantage, therefore several organisations have adopted TQM as one of the managerial and organisational methods to achieve long-term profitability, sustainability and competitiveness (Ismail, 2012). Based on three principles, namely customer focus; teamwork and continuous improvement, TQM is a management approach (Masejane, 2012). The TQM principles are similar to the quality management principles listed in ISO (2015e). Fundamental to TQM is the goal of

satisfying the customer and is expressed by the organisational attempt to design and deliver products and services that fulfil customer needs.

Collaboration between managers and ordinary officials, between functions, and between customers and suppliers is what the principle of teamwork is based on. Benefits in terms of synergy and loyalty is maximized when teaming with customers and suppliers.

The principle of continuous improvement means a commitment to constant examination of technical and administrative processes in search for better methods. Underlying this principle is the belief that organisations are systems of interlinked processes and by improving these processes, organisations can continue to meet the expectation of their customers. To achieve customer satisfaction continuous improvement is undertaken, and it is most effective when driven by customer needs.

Masejane (2012, p.48) citing Bowen and Dean (1994), states that "TQM has evolved from having a narrow focus on statistical process control to encompass a variety of technical and behavioural methods for improving organisational performance".

2.4.5 The European Foundation for Quality Management (EFQM) Business Excellence Model

Similar to the Malcolm Baldrige National Quality Award, The European Foundation for Quality Management (EFQM) recognises European businesses with "excellent and sustainable results" across all areas of the EFQM Excellence Model, through the application of TQM (Masejane, 2012).

According to Masejane (2012), the EFQM model comprises of a 9-point framework as follows:

Enabling factors

1. Leadership (10%)
2. Policy and strategy (8%)
3. People management (9%)
4. Resources (9%)
5. Processes (14%)

Results factors

6. People satisfaction (9%)
7. Customer satisfaction (20%)
8. Impact on society (6%)
9. Results (15%)

Fonseca (2014) indicates that the purpose of the model is to assess organisational performance to recognise areas of strength and areas for improvement based on the following elements:

- “The Fundamental Concepts of Excellence that define the underlying principles that form the foundation for achieving sustainable excellence in any organisation”.
- “The Model Criteria, based on Enablers and Results, that define the underlying principles that form the foundation for achieving sustainable excellence in any organisation”.
- “And the Radar that is a tool for driving systematic improvement in all areas of the organisation”.

The aim of the various quality models and systems is for organisations to achieve better quality management and improvement.

Research shows that key criteria from the various quality and excellence models have been aligned to the ISO 9001 standard, making it a strategic tool to achieve business excellence (Fonseca, 2014).

2.5 Customer satisfaction

According to Suchánek (2014) “customer satisfaction” can be defined in different ways - as a comparison of previously held expectations with perceived product or service performance or a measure of consumer ratings of specific attributes or alternatively as a reflection of this quality.

Suchánek (2014) explains that key factors affecting customer satisfaction, include:

- product (e.g. quality, availability, etc.);
- price (e.g. convenient payment conditions); and
- services; distribution; and image of a product.

Quality (both perceived and technical) affects customer satisfaction. Customer satisfaction is determined by the extent to which customer requirements are met while the degree of product quality is the degree to which customer requirements are met. To meet the expectations of their customers, every company should therefore struggle to reach the optimal level of quality of its products Suchánek (2014).

According to Omwenga (2016), customer satisfaction is positively related with brand and customer satisfaction will create loyalty that will subsequently lead to willingness to purchase and recommendation to others.

Differentiation is one of the American academic and economist, Michael Porter’s key business strategies, therefore when using this strategy, a company focuses its efforts on providing a unique product or service (Omwenga, 2016). Product differentiation provides a high customer loyalty satisfaction. Through product differentiation, a company can fulfil a customer need and at the same time can charge a premium price to capture market share. This strategy is only effective when the company can provide unique or superior value to the customer through product quality, features or after-sale support (Omwenga, 2016).

Omwenga (2016) argues that price fairness is concerned with a customer's assessment and associated emotions of whether the difference between the seller and competitor's prices are reasonable, justifiable and acceptable. Thus, when the customer believes that the company has increased prices to take advantage of an increase in demand or scarcity of supply, without a corresponding increase in cost, they will perceive the new higher price as unfair.

Customer service is a tangible or intangible, value increasing activity which are related to products or services, directly or indirectly to meet customer expectations and finally to provide customer satisfaction and loyalty (Kursunluoglu, 2011). According to Emel (2014), satisfying customers and having a loyal customer are very important as this creates sustainable competitive advantage for a firm and differentiates it from its rivals.

Suchánek (2014) argues that customer satisfaction is linked to productivity of a firm, while productivity is linked to performance of a company. Productivity can be calculated and analysed further as it is a realised output of a company.

The performance of a company can be evaluated using a range of approaches. Due to their simplicity and extensive information value, Comparative indicators of profitability are frequently used and include: Return on Investments (ROI); Return on Assets (ROA); and Return on Equity (ROE).

2.6 Value chain analysis

Hough, *et al.* (2011) describes value chain as the group of “buyer value creating” activities undertaken by a company in offering its product or service and includes primary activities and support activities. According to O'Neill (2013), this concept was first introduced by Michael Porter in 1985, Figure 2.8, page 37.

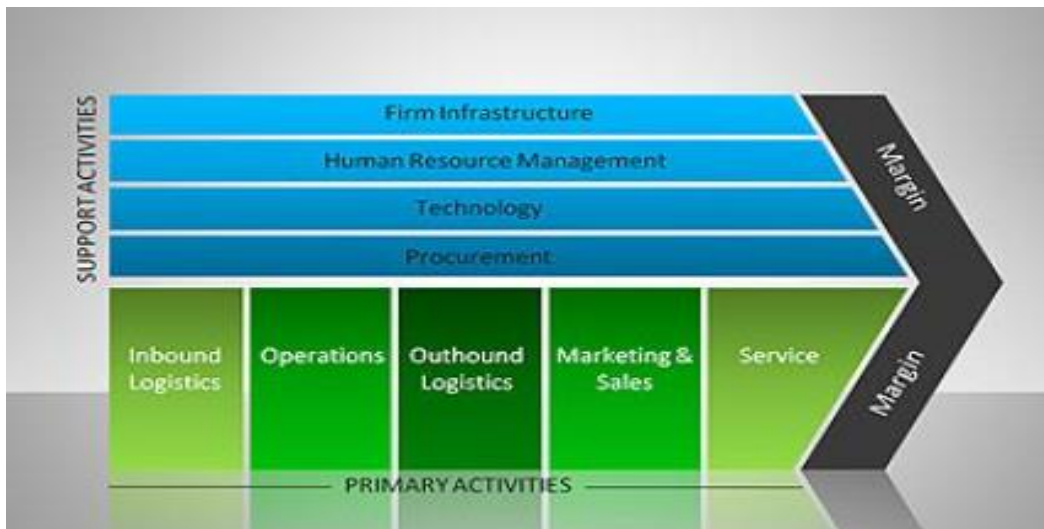


Figure 2.8: Showing Value Chain structure introduced by Michael Porter
 Source: Adapted from (Lemke, 2015).

O'Neill (2013) indicates that a company's value chain can be mapped to understand the processes at work and the costs at each stage of the chain; a process commonly known as value chain analysis. Where a process needs to be characterised from start to finish and cost proportions allocated, value chain analysis can be applied as a diagnostic tool to achieve certain outcomes such as reducing processing costs (O'Neill, 2013). Suchánek (2014) emphasizes that effective management of costs is key in creating value for both the organisation and the customer.

2.7 ISO 14001 – Environmental Management System

Kiatkulthorn and Sundstedt (2016) argues that in recent years, the pressuring movement against global warming has drawn extensive attention to every nation. Under this premise, environmental protection has been considered a pressing issue to urge corporations to comply with international standards and regulations. Industry has always been regarded as one of the causes of the environmental problem.

Management practices in today's global economy have changed unprecedentedly due to the rapid worsening of ecological environment. Under this circumstance, there is great pressure on organisations to improve environmental performance Kiatkulthorn and Sundstedt (2016).

The importance of aspiring towards a green-public image, combined with cutting possible liability cost, have been realised by many organisations who are willing to partake in the necessary efforts to reduce the impacts related to their business activities. However, organisations face many constraints during the transformation towards being environmentally aware and responsible organisations. To achieve organisational guidance when establishing, developing and reviewing their business practices towards both corporate and environmental goals, companies often strive to implement an EMS (De Joussineau, 2012).

An EMS is a structured framework for eliminating an organisation's impacts on the environment and helping in integrating the environmental initiatives into every aspect of a company's operations. Organisations can identify, manage, monitor and control their environmental issues in a "holistic" manner via an EMS (ISO, 2015d).

According to ISO (2015d), an EMS such as ISO 14001 is seen to be one of the effective solutions for eliminating the negative effects of business activities on environment and bringing improved changes to companies.

2.7.1 ISO 14000 standards

The ISO 14000 family of standards provides practical tools for various businesses that are looking to manage their environmental responsibilities. The ISO 14000 family comprises several standards that complement ISO 14001. These include the ISO 14004, ISO 14006, ISO 14064-1 and the ISO 14001 Standards.

Five EMS principles exist within ISO 14000, which include:

Commitment and policy (Principle 1): An organisation should ensure commitment to the environmental management system, define its policy and focus on what needs to be done.

Planning (PLAN) (Principle 2): A plan to fulfil its environmental policy should be formulated by an organisation.

Implementation (DO) (Principle 3): Capabilities and support mechanisms necessary to achieve its environmental policy, objectives, and targets should be developed by an organisation for effective implementation.

Measurement and evaluation (CHECK) (Principle 4): Environmental performance should be measured, monitored, and evaluated by an organisation.

Review and improvement (ACT) (Principle 5): With the objective of improving its overall environmental performance, an organisation should review and continually improve its EMS.

According to ISO (2015d), order and consistency in addressing environmental concerns is provided to an EMS following the above five principles.

2.7.2 The ISO 14004 Standard

The establishment, implementation, maintenance and improvement of an EMS and its coordination with other management systems is what this standard provides guidance on.

2.7.3 The ISO 14006 Standard

Intended to be used by those organisations that have implemented an EMS in accordance with ISO 14001, this standard can help integrate eco-design into other management systems.

2.7.4 The ISO 14064-1 Standard

Principles and requirements at the organisational level for the quantification and reporting of greenhouse gas (GHG) emissions and removal is specified in this standard.

2.7.5 The ISO 14001 Standard

The criteria for an EMS is set out in the ISO 14001:2015 Standard (ISO, 2015d). Certification can be done against this standard. An effective EMS can be set up by an organisation by following the framework that the standard maps out. Regardless of its activity or sector, this standard can be used by any organisation. ISO 14001 can be integrated easily into any existing ISO management system.

The requirements for an environmental management system is set out in the ISO 14001, which is an internationally agreed standard. Through more efficient use of resources and reduction of waste, gaining a competitive advantage and the trust of stakeholders, it helps organisations improve their environmental performance (ISO, 2015d).

Suitable for organisations of all types, ISO 14001 requires that an organisation considers all environmental issues relevant to its operations, such as air pollution, water and sewage issues, waste management, soil contamination, climate change mitigation and adaptation, and resource use and efficiency.

Like all ISO management system standards, ISO 14001 includes the need for *continual improvement* of an organisation's systems and approach to environmental concerns. The standard has recently been revised, with key improvements such as the increased prominence of environmental management within the organisation's strategic planning processes, greater input from leadership and a stronger commitment to proactive initiatives that boost environmental performance.

Assurance that environmental impacts are being measured and improved can be provided to organisations management, employees and external stakeholder with the use of an ISO 14001:2015 system.

2.7.6 The benefits of implementing an Environmental Management System

Organisations should take a strategic approach to improving environmental performance, for various reasons including:

- Exhibiting compliance with current and future **statutory and regulatory requirements**;
- Increasing leadership involvement and **engagement of employees**;
- Improving company reputation and the **confidence of stakeholders** through strategic communication;
- Achieving **strategic business aims** by incorporating environmental issues into business management;
- Providing a **competitive and financial advantage** through improved efficiencies and reduced costs;
- Encouraging better **environmental performance of suppliers** by integrating them into the organisation's business systems

According to Richard Giles at Premier Foods (UK), the company has been certified to ISO 14001 EMS since 2001. It has achieved zero waste to landfill since March 2013 by recycling 100% of their site waste (ISO, 2015d).

2.7.7 Barriers and obstacles with implementing ISO 14001 Environmental Management Systems

De Jossineau (2012) indicates that the minimum requirements for certification are highlighted in the ISO 14001 Environmental Management Standard which can create a barrier for other routes with potential performance improvements for sustainable industrial development.

Two different barriers in the environmental management process are broadly experienced by companies: i.e. industrial barriers such as; technical information, capital costs, configuration of current operations, competitive pressures and industry regulation, as well as organisational barriers such as, employee attitude, poor

communication, past practice and inadequate top management leadership (De Jossineau 2012).

Some of the obstacles in implementing ISO 14001, as highlighted by De Jossineau (2012) include:

- costs (training, auditor fees, audits) required in addition to implementation and certification of EMS and its maintenance;
- lack of support and resources available for system implementation; unclear guidelines for EMS implementation for organisations with mobile workforce, such as the construction sector;
- lack of set guidelines for setting of objectives and targets and extent of involvement of employees, suppliers and other stakeholders; and
- lack of guidelines on how to accomplish 'continuous improvement element of the standard.

2.8 Environmental performance

The 14001 series of standards introduced by ISO includes various aspects of environmental management and provides practical tools for companies to enhance their environmental performance, increase productivity and overall success (Norhasimah, *et al.*, 2016). Organisations are able to recognise, control and influence the environmental features highlighted in the ISO 14001 series.

ISO 14001 defines “environmental performance” as the affiliation between the company and the environment. According to Arafat, *et al.* (2012), environmental performance relates to: a) environmental impacts as a result of resources consumed; b) environmental impacts due to business processes; c) environmental impacts as a result of a company’s products and services; d) environmental impacts as a result of processing or recovery of products; and e) compliance to the law.

Arafat, *et al.* (2012), also stresses that environmental performance comprises of two important components: 1) measurable results of the environmental management system related to the organisation’s control of its environmental aspects relative to its

environmental policy, objectives and targets; and 2) results of an organisation's management of its environmental impacts.

The ISO 14001 series of standards do not state any specific environmental performance criteria, which makes the quantitative measurement of environmental performance a difficult task for organisations.

According to (Muhammad, 2014) environmental performance indicators can be classified into three main categories: 1) environmental impact, which includes emissions, spillages, toxicity, usage of energy, incidents and accidents such as the Bhopal carbide factory incident in India or the British Petroleum (BP) oil spill incident in the Gulf of Mexico; 2) regulatory compliance such as mandatory installation of recycling plants, treatment plants, etc, lawsuits concerning improper disposal of hazardous waste and the associated fines for its clean-up; and 3) organisational processes such as the improvement in environmental management systems, the processes of the organisational and capital expenditure initiatives such as investment in pollution control technology.

Prior research indicates that good environmental performance is associated with good economic performance (Arafat, *et al.*, 2012).

2.9 Business sustainability

The expanding global economy has brought prosperity but also environmental degradation such as climate change, ozone layer depletion, loss of biodiversity, pollution, degradation and the depletion of air, water, minerals and land (The World Bank Group, 2012). These issues have become important to firms because their stakeholders, such as regulatory authorities, customers, competitors, non-governmental organisations and employees, are increasingly demanding that firms address environmental and social sustainability in business operations.

The focus of environmental management has shifted from firm level to supply chain level. In the manufacturing industry, the concern over sustainability is greater than

ever. In addition to facing high-pressure competition, manufacturers must increasingly pay attention to resource usage, waste treatment, air emissions, water pollution and employee welfare. Failing to manage these sustainability issues can substantially damage the image of the company and thus affect its performance (Chen, 2015).

Le Roux (2012) argues that there has been a significant rise in research and discussion on the concepts of sustainability and sustainable development as all profit-driven companies aspire to achieve a “sustainable competitive advantage”. There has been an emphasis on the connection between sustainability and strategising and its connection to business profit and performance.

Business sustainability is often defined as the process by which companies manage their financial, social and environmental risks, obligations and opportunities. These three impacts are sometimes referred to as profits, people and planet (Crews, 2010:15; Elmualim et al., 2010:59), cited by Le Roux (2012). It has to do with:

- living within the limits;
- understanding the interconnections between the economy, society, and environment; and
- equitable distribution of resources and opportunities

Business sustainability requires companies to adhere to the principles of sustainable development, which are; 1) issues that either help or hinder the process of improving people’s quality of life; 2) systems that determine how resources need to improve peoples' lives are used and distributed; and 3) renewable and non-renewable natural resources that make up surroundings and help sustain and improve people’s lives. According to the World Council for Economic Development (WCED), sustainable development is development that “meets the needs of the present without compromising the ability of future generations to meet their own needs”. Sustainable development involves the simultaneous pursuit of economic prosperity, environmental quality and social equity. Companies aiming for sustainability need to perform not against a single, financial bottom line but against the triple bottom line (The World Bank Group, 2012).

Sustainability is often referred to in association with literature on responsible leadership, the use of resources and CSR. There are several best practices that foster business sustainability, and help companies. These practices include; life cycle analysis, stakeholder engagement, environmental management systems and reporting and disclosure (Le Roux, 2012).

Sustainability is said to be “shaping the business landscape” and has been labelled a “business imperative.” It has been noted that in a globalising world, corporate involvement in the elements of sustainability is now both necessary and expected. The business reality has been reshaped by three big trends associated with sustainability. These three but interconnected trends have become a major market force that is redefining the way businesses compete (Le Roux, 2012). These three trends are: declining resources, radical transparency and increasing expectations. Together these trends have become a major market force that is at its critical point, changing the rules for profit and growth in almost every sector of the economy.

The scarcity of natural resources can be a significant factor affecting organisational growth and it is this resource crunch that is turning well-established mainstream companies into recyclers and re-users of inputs. The new thinking has entered the business mind and has turned into a new business opportunity – often with positive financial returns.

Le Roux (2012) indicates that radical transparency has become the dynamic, immediate and substantive force of modern corporate life. Radical transparency has been fuelled by the number of people fighting causes and the increasing number of those willing to listen. The movement is enhanced with mass low-cost communication and the connectivity of technology. These factors make it possible for the environmental and social issues of the world to be voiced and spread. Business life in a radically transparent world is said to be a “new art to master” for business. The resource crunch has called into question the security of entire value chains while transparency opens every corporate move to instant scrutiny. The third trend invites companies to rethink the very essence of market demand (Chen, 2015).

External forces including stakeholders such as governments, customers and communities, place pressure on businesses to adopt sustainable practices. Stakeholders, including customers, employees and investors, are expecting sound social and environmental performance from the market place. Customer expectations are shifting and companies need to address the trust and perceptions topics of going beyond the final use of their products (Le Roux, 2012).

Le Roux (2012) emphasizes that ideally companies should feel compelled to act in a socially, environmentally and financially responsible manner always as a result of ethical obligations that are either internally or externally motivated. However, the reality is that irrespective of whether business leaders accept or reject the sustainability premise or its implementation, the concept merits business people's attention for its bottom line implications (Le Roux 2012). Sustainability is an unavoidable reality for businesses. This can be attributed to rising consumer and investor pressure with the knowledge of unsustainable businesses and its implications e.g.: BP oil spill

According to De Jossineau (2012), the opportunities for businesses encompass the drivers and benefits that serve as motivators for the adoption and integration of sustainability by companies. These benefits include:

- the building of a strong positive corporate brand;
- reputation;
- cost savings;
- enhanced innovation; and
- improved competitive position

Le Roux (2012) stresses that pressure is being placed on companies to adopt new techniques and technologies to endure the competition due to globalisation and the issues of competition for “environmental sustainability”. These include:

- increasing efficiency in use of materials and energy;
- minimising pollution from materials;

- minimising long-term effects on the environment by use of alternative product(s);
- taking full account of the final disposal of a product;
- ensuring environmental friendly product use through packaging and appearance;
- minimizing annoyances such as noise and smell;
- making the present business effective and its environmental impact acceptable; and
- developing new business opportunities.

2.10 OHSAS 18001- Occupational Health and Safety Management System

The International Labour Organisation (ILO) describes occupational health and safety as promoting and maintaining the highest degree of physical, mental and social well-being of employees in all occupations by protecting them from adverse health and safety risks that they may be exposed to at the workplace and by placing them in environments that are adapted to suit their physical and mental needs (Esi, 2012).

The OHSAS standard was developed to assist organisations in achieving occupational health and safety in the workplace (Tierweiller, 2016). OHSAS 18001 is an international occupational health and safety standard formulated by international certifying bodies and is based on the British Standard, BS 8800 (The British Standards Institute, 2007). This globally recognised standard provides a common specification and serves as an occupational health and safety system guideline to any type of company.

The main objective of this standard is to guide organisations into minimising OHS risks and assuring the protection of their human capital. Like the ISO 9001 standard, the requirements of the OHSAS 18001 standard are based on Plan, Do, Check, Act (PDCA) cycle, and this feature makes it more compatible and can be integrated with other international standards, e.g., ISO 9001 and ISO 14001 (Oliveira, 2013).

OHSAS 18001 establishes a framework to consistently and proactively identify and control OHS risks, decrease the probability of workplace accidents, assist compliance with applicable OHS legislations, facilitate the management of OHS risks, enhance and improve overall business performance in adopting firms (Fernández-Muñiz, 2012).

The OHSAS 18001 system is based on five core principles:

- risk management'
- resources, responsibilities, and organisation
- competence, awareness, and training
- participation and consultation; and
- emergency preparedness and control

2.11 Occupational health and safety performance

Human resources is believed to be the most important asset to a company (Yusuf, *et al.*, 2012). It is imperative that organisations pay attention to achieving and maintaining exceptional occupational health and safety systems in the workplace, for the “safe keeping” of their human capital.

As stated by Yusuf, *et al.* (2012) various studies have found that not only do properly implemented occupational safety and health systems by companies provide a sense of security to employees but they also provide a sense of satisfaction. When employees are satisfied with the safety and security of their workplace then fewer accidents tend to occur. Since incidents and accidents in the workplace hinder employee performance, fewer accidents results in improved employee and business performance (Yusuf, *et al.*, 2012).

It is paramount that occupational health and safety risks are controlled to achieve a high level of health and safety performance at the workplace. However, all stakeholders need to be visibly committed to the health and safety programmes in order to achieve the occupational health and safety objectives (Esi, 2012).

Nagy (2014) conducted a study which yielded sixteen Critical Success Factors (CSF) for implementation of occupational health and safety programmes. These include: 1) management support; 2) applicable training and development; 3) teamwork; 4) clear and realistic goals; 5) effective enforcement scheme; 6) personal attitude; 7) programme evaluation; 8) personal motivation; 9) delegation of responsibilities and authorities; 10) appropriate supervision; 11) safety equipment acquisition and maintenance; 12) positive group norms; 13) sufficient resource allocation; 14) continuing participation of employees; 15) good communication; and 16) personal competency.

Esi (2012) argues that key factors that affect employees' performance and productivity can be divided into two categories, namely: 1) management-driven factors; and 2) the work premises. Management-driven factors include allocation of roles and responsibilities, company policies, safe work procedures, training and development arrangements, employee access to management and administrative functions to complete their tasks, work patterns, shift work, break times and supply of protective equipment and clothing while requirements for work premises include office or workplace design, machinery, equipment, tools, lighting, temperature, humidity, noise, vibration, hygiene and welfare facilities.

According to Esi (2012), the economic costs related to occupational health and safety in a company is double-edged. On one hand, the costs of implementing health and safety measures to protect employees conflict with managements objective to contain costs while on the other hand, effective occupational health and safety programmes improve employee and company performance by reducing costs associated with incidents, accidents, disabilities, absenteeism and illnesses. Indirect costs associated with the latter can also be significant such as overtime payment to compensate for the lost resource, recruitment, replacement and training costs, lost revenue as well as the negative impact on morale of fellow employees which can also impact on work quality.

Organisations can achieve pre-set goals and missions by maintaining and optimising employee job performance. Optimal job performance can be achieved by maintaining

effective occupational health and safety systems that will improve health and safety performance by lowering incident rates (Du Toit, 2012).

2.12 Risk management

Risk is a consequence of uncertainty, is related to exposure to danger and is defined as “the possibility of meeting danger or suffering harm or loss”. It is the combination of probability and frequency of occurrence of a hazard and the magnitude of that occurrence (Du Toit, 2012). Khan, *et al.* (2014, p.1339) define risk as “a random event that may possibly occur and if it did occur would have a negative impact on the organisations’ goals”.

Phoya (2012) defines a hazard as “the potential for harm” and is often associated with a condition or activity that can result in an injury or illness if left uncontrolled. Hazards and risks in the workplace reduce productivity and quality of work and increase operational costs as a result of incidents. Improving productivity by focusing on occupational health and safety systems is a serious concern for most organisations Khan, *et al.*, 2014).

According to Al-Wattar (2016) risk is an inevitable aspect of life and requires careful consideration to establish if such risk is acceptable or should be avoided. In the business world, such risks play a decisive role in determining the continuity of the business. Therefore, risk management has evolved into a primary component in the decision-making process for many organisations, where the inherent perils of risk are eliminated or reduced.

Gupta (2011) argues that risk management is “a broad concept applicable to organisational losses of both financial and human resources”. Gupta (2011) further explains that the paradigm shift from being a “hazard type” to a “strategic type” that risk management had undergone can improve organisational performance as risks are no longer seen as threats but rather as opportunities. The focus of risk management has now changed from all risk to critical risks, where action plans are developed to address such risks. Risk management forms an integral component of management

and decision making at all levels and an effective risk management process should be managed by a cross-disciplinary team and should be supported by free and open communication amongst the various stakeholders (Phoya 2012).

Phoya (2012) also states that various methodologies have been developed for risk management over the years, however, the main components include work analysis, hazard identification, risk estimation, risk evaluation and risk control (Figure 2.9, page 51).

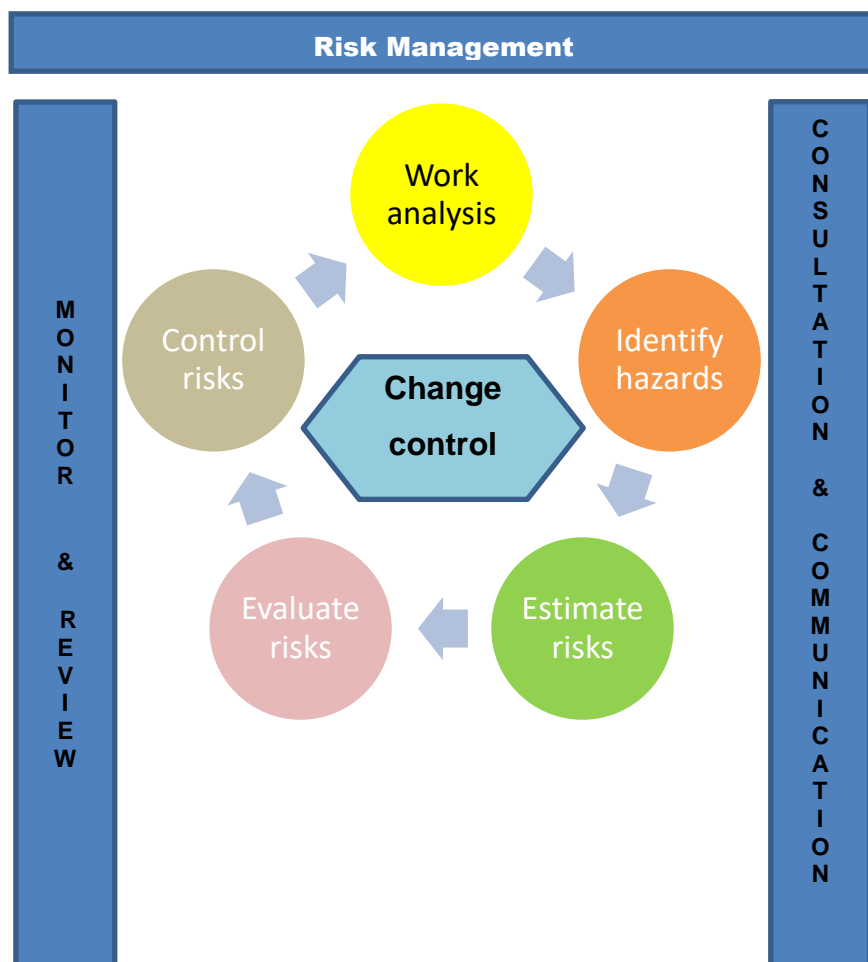


Figure 2.9: Risk management framework. Source: Adopted from Phoya (2012).

According to Ceyhan (2012), hazard identification, risk assessment and determining controls constitute a successful and pro-active occupational health and safety management system.

2.13 Integrated management systems

Abrahamsson (2010) argues that effective, efficient, flexible management systems are required for effective management in this globalised business world. Effective referring to the organisation's ability to address all stakeholder requirements in a context of Corporate Social Responsibility (CSR), Efficient, meaning the organisations ability to achieve its objectives with low resource usage and flexibility referring to the organisations agility or ease at which it can adopt to change.

The various management systems provide differing frameworks and procedures while concurrently supporting continual improvement, however, companies can face challenges such as resource allocation when running parallel systems (Kauppila, 2014).

Kauppila (2014) argues that a viable organisational approach to reduction in costs, efficient utilisation of resources, improved employee motivation and better compliance to regulatory, social and stakeholder requirements is through integration of management systems such as for quality, environmental, occupational health and safety, etc. where Integration refers to the merging of elements of the individual management systems (Villar, 2012). This allows for the tools, methodologies and resources while simultaneously complying to the individual standard requirements (Villar, 2012).

However, to properly understand IMS, one needs to adopt a systems perspective, i.e. the individual parts are related to the whole and a process approach (Min, 2015). According to Min (2015), systems thinking sees organisations as having complex interrelationships with their environments and other systems and are seen to have inputs, throughputs (process), outputs and feedback, i.e. a process approach. This is similar to the IMS approach of the Plan, Do, Check, Act (PDCA) cycle (Villar, 2012).

According to (Rebelo, 2014) the process approach enhances companies effectiveness and efficiencies in achieving its set objectives, by managing activities to create value for the customer and other interested parties.

Villar (2012) states that benefits obtained from implementing an IMS in an organisation include decreased paperwork, decreased management costs, decreased complexity of internal management, improved customer satisfaction, enhanced employee motivation, a simplified certification process and facilitated continuous improvement. Rebelo (2014) further argues that integration of management systems promotes synergies between the subject areas, cost savings and a reduction in time spent when managing the systems. Organisations' migration towards integrated management systems also include the need to document and develop optimised conformance to stakeholder requirements and business risk management in a lean and sustainable way (Rebelo, 2014). However, equally important is the need for organisations to manage difficulties associated with the implementation and maintenance of integrated management systems to prevent failure (Villar, 2012).

2.14 Business strategy

2.14.1 Company vision, mission and strategic direction

A company vision refers to; "a desirable state that an organisation wants to achieve". It's a desired ideal situation, a future state, that the company wants to achieve but don't expect to reach (Hough, *et al.*, 2011).

Company mission is more concrete, it is measurable and describes the purpose of the company, and why the company exists. It describes what the company will make and deliver, to contribute so the company's vision can be reached. Even if the company mission can be hard to reach it is tangible and measurable.

Strategic direction is a set of actions that will lead to achieve the goal of the organisation's strategy (Hough, *et al.*, 2011).

2.14.2 What is strategic alignment?

Strategy is derived from the “VMOST” concept of the organisation (Hough, *et al.*, 2011). When the direction to a particular vision is crafted by the leaders, it then becomes important for management to align organisational resources to execute this initiative. (Hough, *et al.*, 2011) confers that alignment is the method of enabling line of sight in the organisation; this is where everyone in the organisation can “see” their contribution in the achievement of the organisational strategic objectives. Baker (2011) citing Andrews, argues that alignment is a broad topic, where organisations intent should be to “match” or “fit” their resources to the competitive context in which the organisation is operating (Baker, 2011).

Parisi (2013), citing Kathuria describes strategic alignment as a “vertical linking process”. There are three levels of strategies that function in a hierarchical manner where corporate strategy sets objectives for organisational level which forms a business level strategy that is developed into a functional strategy. Strategic alignment evokes fit among strategy, organisational structure and system planning where managers at various divisions and levels of the company hierarchy are required to create a common understanding of company goals and strategy (Parisi, 2013).

Ali (2014) citing Scherpereel applying the alignment concept to organisation, defines alignment “as both a noun and a verb – a state of being and a set of actions. “Alignment” refers to the integration of key systems and responses to the external environment” (Ali, 2014).

2.14.3 The impact of strategic alignment

Baker (2011) states that empirical work has demonstrated that when strategic alignment has been achieved, business performance improves (Figure 2.11).

Ali (2014) argues that high performing companies have achieved harmony within the “three hard ss’, being strategy, structure and systems and the four soft ss’ of skill, staff, style and super-ordinate goals” (Ali, 2014). Ali (2014) argues that when

manufacturing and marketing work together for goal attainment improved business performance is achieved (Ali, 2014).

2.14.4 Strategic models and IMS

Whatever key business purpose and business strategy a company emphasises; customer intimacy, technology optimization, cost optimisation or disruptive innovation; workplace practices must reflect and actively drive behaviours to deliver on that purpose and strategy and the corresponding market positioning (National Institute of Standards and Technology, 2015).

The traditional approach of operating quality, environmental, health and safety management systems independently has given way to an integrated approach, with the increased application of ISO9001, ISO14001 and OHSAS18001. The synergy created, resulting in increased efficiency and effectiveness is the key advantage of the integration of these management systems (National Institute of Standards and Technology, 2015)..

2.14.5 The line of sight model

According to Weinstein (2012), the line of sight between the mission, goals, and core projects created by the plan of action will guide the organisation and establish measures by which individual and team actions can be evaluated, measured, and rewarded (Figure 2.10).



Figure 2.10: Showing steps to achieve line of sight
Adapted from: Weinstein (2012)

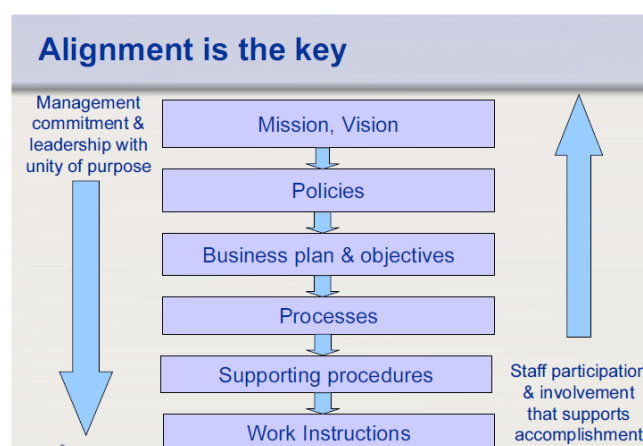


Figure 2.11: Showing strategic alignment model (Hough, *et al.*, 2011)

2.14.6 The Baldrige Model as a platform for alignment

Highlighting the complementary nature of various initiatives and the opportunity to enhance their leverage to improve strategic performance can become just the first step in the integration of ISO management systems. The lack of cross functional understanding often limits the impact of quality and, therefore, its strategic impact resulting in its perceived failure (National Institute of Standards and Technology, 2015).

Alignment with the Malcolm Baldrige National Quality Award and Criteria for Performance Excellence (Baldrige) can enhance this synergy thereby increasing the strategic impact. The emphasis is on management system professionals to play a more strategic role within their organisations and to develop organisational change, rather than simply to achieve compliance. By further linking each of these management systems under the umbrella of the Baldrige Model as a strategic infrastructure, for the coordination, monitoring, measurement and implementation of continuous improvement at a more strategic level, an enabler to this challenge can be achieved (National Institute of Standards and Technology, 2015).

Baldrige is an ideal platform to promote and support the integration of these management systems since it is based on a systems-based model, a core value and concept, and is not prescriptive.

The systems-based approach highlights crucial issues such as:

- importance of leadership;
- need to consider all elements of an organisation;
- strategic importance of scanning and analyzing the business environment;
- value of creating focus on customers and employees;
- need to use measures, indicators and organisational knowledge to identify and monitor key performance indicators; and
- methods for approach and deployment of improvement action plans.

In summary the Baldrige model enables organisations to adopt a more strategic perspective in relation to their quality efforts. When the strategic and quality processes are not interlinked, quality can be limited to continual improvement at the operational level only (National Institute of Standards and Technology, 2015).

2.15 Value innovation

Value innovation is a concept that defies the conventional “value-cost trade-off” belief, i.e. that organisations can only create value to their customers at a higher cost or create marginal value at a lower cost (Mauborgne, 2015). The value innovation notion requires that both value and innovation are considered equally as value alone will only drive value creation marginally while innovation on its own will tend towards technology. According to Mauborgne (2015) the strategic alignment of innovation with utility, price, people and cost position is what drives value innovation in companies. The favourable impact on cost structure and value proposition to its buyers as a result of a company’s action, is what creates value innovation (Figure 2.12). By reducing and eliminating the factors an industry competes on, cost savings are realised and by raising and creating elements that the industry has never offered, buyer value is realised (Figure 2.13).

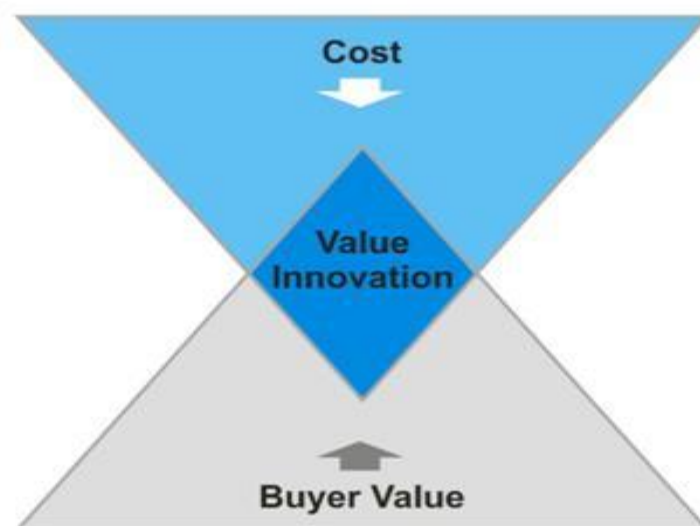


Figure 2.12: Showing the concurrent quest for of low cost and differentiation

Source: (Mauborgne, 2015)

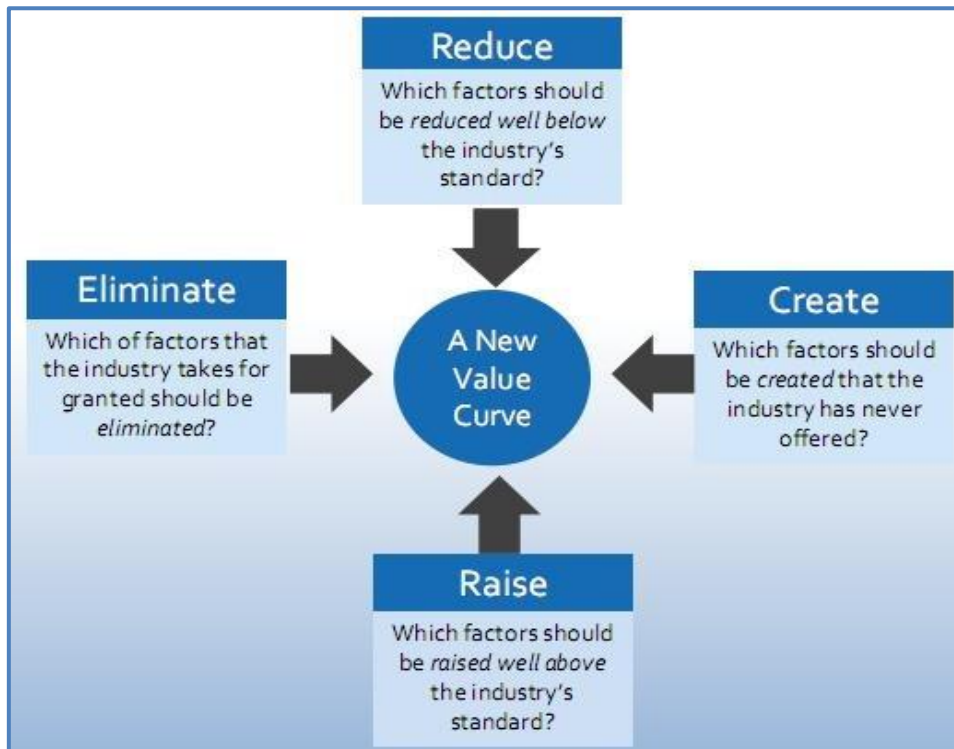


Figure 2.13: Showing the four-action framework used to create a new value curve
 Source: (Mauborgne, 2015).

2.16 Conclusion

The literature review highlighted key concepts related to the various management systems and provided the researcher with the theoretical framework upon which the study was done. Various systems and models were compared to gain a holistic view on the factors that impact on the performance of management systems, with direct impacts on business performance.

Details on the research methodology used for the study will be discussed in the next chapter.

Chapter 3

The research methodology

3.1 Introduction

The literature review in the previous chapter suggests that there is a gap in research related to the alignment of integrated management systems to achieve optimum efficiency and effectiveness in business. This study therefore focused on exploring the possible alignment of integrated management systems at NCP Alcohols to improve effectiveness and efficiency of their processes.

This chapter captures details on the research method adopted to obtain results for this study and include details on the research approach, design, setting, method, population, sampling plan, data collection and data analysis.

3.2 Research approach and design

Sekaran and Bougie (2013) describes research as a process adopted to find solutions to problems after a thorough study and analysis of the situational factors. Inquiry, investigation, examination and experimentation are processes encompassed in research and these processes need to be carried out systematically, diligently, critically, objectively and logically. Cooper and Schindler (2014) argues that good research follows the standards of the scientific method, i.e. systematic, empirically based procedures for generating replicable research. Defining characteristics of the scientific method include the requirement for the purpose to be clearly defined, the research process detailed, research design thoroughly planned, high ethical standards applied, limitations frankly revealed, adequate analysis of the data, finding presented unambiguously, conclusions justified, and the researchers experience reflected. Figure 3.1, page 61 shows a typical research process. The goals of the research process are *description*, i.e. describing the phenomena to be studied; *causation*, i.e.

identifying the cause and effect of the phenomena and *prediction*, i.e. the ability to forecast future events for additional research.

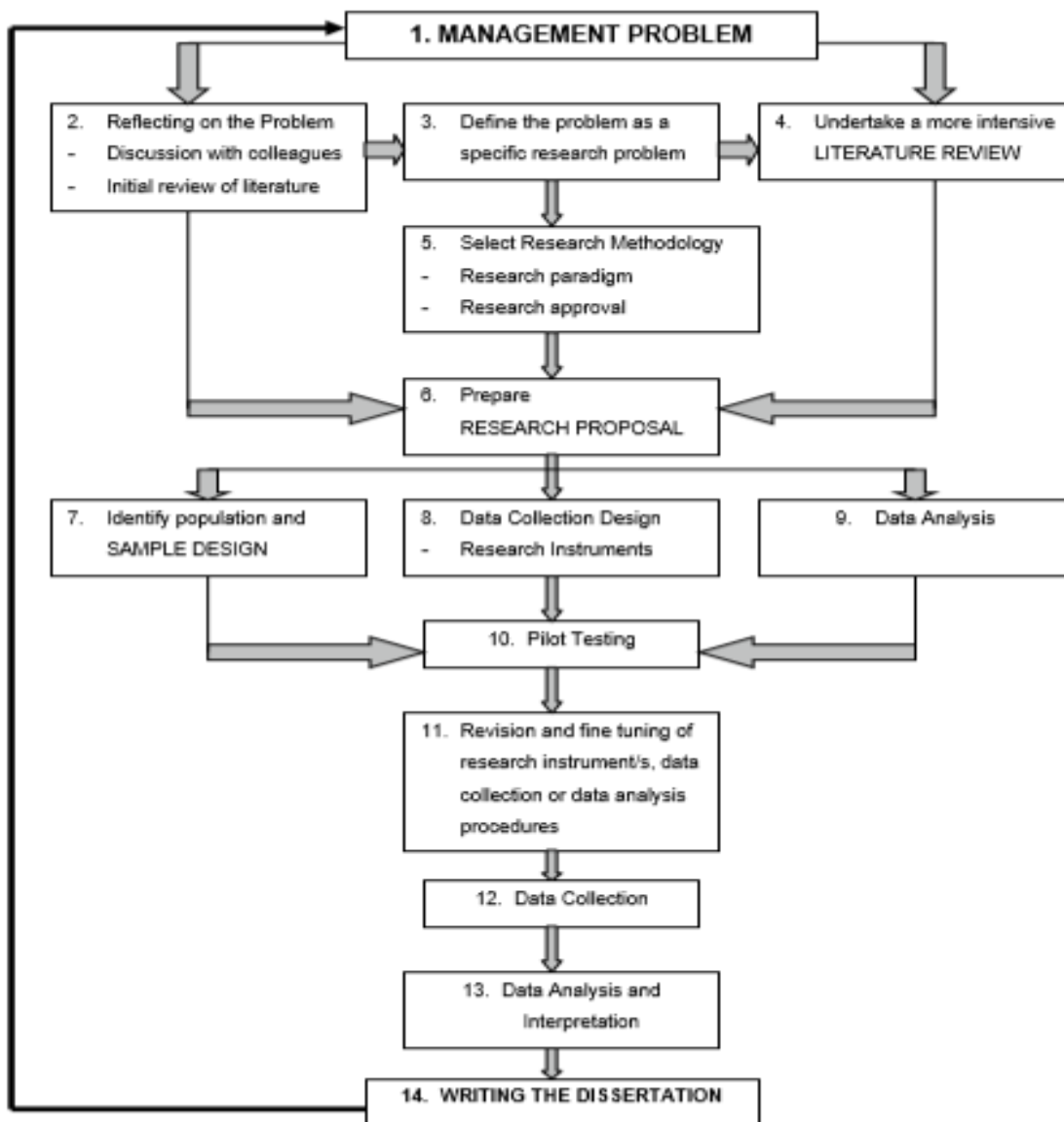


Figure 3.1: Showing research process steps. Adapted from Cooper and Schindler (2014).

Cooper and Schindler (2014) indicates that Positivism and Phenomenology are the two schools of thought related to science and knowledge.

Generally quantitative in nature, positivist research examines social phenomena using numerical measurement and statistical analysis. The view is that reality around the phenomena can be measured and observed. With this view, replication is encouraged as emphasis is placed on reliability and objectivity (Cooper and Schindler, 2014).

Phenomenological research, follows a qualitative approach and is subjective in nature, as the researcher forms part of the phenomena being observed. The view is that the world is socially constructed and human interest drive the science behind the research. The view is that the findings of this research is less artificial as observations related to the phenomena is done in the natural surroundings (Cooper and Schindler, 2014).

To increase reliability and validity of findings, researchers sometimes prefer the mixed method approach that draws on both positivism and phenomenology (Cooper and Schindler, 2014).

3.2.1 Research approach

A quantitative approach was adopted for this study. Cooper and Schindler (2014, p.167) define quantitative research as “a formal, objective, systematic process with deductive reasoning to describe and test relationships and examine cause and effect interactions among variables”. Structured instruments and procedures for statistical analysis are used (Cooper and Schindler ,2014). This quantitative research involves generation of data in quantitative or numeric form, mainly gathered through structured questions, systematic collection of numerical information, measurement of amounts of quantities, and the statistical analysis of data using quantitative procedures as quantitative research is characterised by, inter alia, deductive reasoning, objectivity, the use of a structured instrument, and statistical data analysis procedures (Creswell, 2014).

The subjective review on people’s opinions, attitudes and behaviour on the other hand is what the Qualitative research approach focuses on. The results are usually in the form of words that are gathered mainly through interviews and cannot be scrutinised using quantitative analysis (Sekaran and Bougie, 2013). Qualitative research often involves the use of the Triangulation methods where the extent to which evidence converges is established by cross-checking collection procedures and multiple data sources. Validity is increased by integrating several viewpoints (Cooper and Schindler, 2014). Cooper and Schindler (2014) makes the comparison between qualitative and quantitative research approach (Table 3.1, p.63).

Table 3.1: Showing comparison between qualitative and quantitative research approaches (Cooper and Schindler, 2014).

	Qualitative approach	Quantitative approach
Focus of research	<ul style="list-style-type: none"> • Understand and interpret 	<ul style="list-style-type: none"> • Describe, explain, and predict
Researcher involvement	<ul style="list-style-type: none"> • High—researcher is participant or catalyst 	<ul style="list-style-type: none"> • Limited; controlled to prevent bias
Research purpose	<ul style="list-style-type: none"> • In-depth understanding; theory building • 	<ul style="list-style-type: none"> • Describe or predict; build and test theory
Sample design	<ul style="list-style-type: none"> • Nonprobability; purposive 	<ul style="list-style-type: none"> • Probability
Sample size	<ul style="list-style-type: none"> • Small 	<ul style="list-style-type: none"> • Large
Research design	<ul style="list-style-type: none"> • May evolve or adjust during the project • Often uses multiple methods simultaneously or sequentially • Consistency is not expected • Involves longitudinal approach 	<ul style="list-style-type: none"> • Determined before commencing the project • Uses single method or mixed methods • Consistency is critical • Involves either a cross-sectional or a longitudinal approach
Participant preparation	<ul style="list-style-type: none"> • Pre-tasking is common 	<ul style="list-style-type: none"> • No preparation desired to avoid biasing the participant
Data type and preparation	<ul style="list-style-type: none"> • Verbal or pictorial descriptions • Reduced to verbal codes (sometimes with computer assistance) 	<ul style="list-style-type: none"> • Verbal descriptions • Reduced to numerical codes for computerized analysis
Data analysis judgments	<ul style="list-style-type: none"> • Human analysis following computer or human coding; primarily nonquantitative • Forces researcher to see the contextual framework of the phenomenon being measured—distinction between facts and judgments less clear • Always ongoing during the project 	<ul style="list-style-type: none"> • Computerized analysis—statistical and mathematical methods dominate • Analysis may be ongoing during the project • Maintains clear distinction between facts and judgments
Insights and meaning	<ul style="list-style-type: none"> • Deeper level of understanding is the norm; determined by type and quantity of free-response questions • Researcher participation in data collection allows insights to form and be tested during the process 	<ul style="list-style-type: none"> • Limited by the opportunity to probe respondents and the quality of the original data collection instrument • Insights follow data collection and data entry, with limited ability to re-interview participants
Research sponsor involvement	<ul style="list-style-type: none"> • May participate by observing research in real time or via taped interviews 	<ul style="list-style-type: none"> • Rarely has either direct or indirect contact with participant
Feedback turnaround	<ul style="list-style-type: none"> • Smaller sample sizes make data collection faster for shorter possible turnaround • Insights are developed as the research progresses, shortening data analysis 	<ul style="list-style-type: none"> • Larger sample sizes lengthen data collection; Internet methodologies are shortening turnaround but inappropriate for many studies • Insight development follows data collection and entry, lengthening research process; interviewing software permits some tallying of responses as data collection progresses
Data security	<ul style="list-style-type: none"> • More absolute given use of restricted access facilities and smaller sample sizes 	<ul style="list-style-type: none"> • Act of research in progress is often known by competitors; insights may be gleaned by competitors for some visible, field-based studies

The third approach available to researchers is the combined or mixed methods approach, which enables the use of both quantitative and qualitative research methods. This approach is adopted by researchers who wish to increase the validity and reliability of their findings from the research as the shortcomings of one method is balanced by the strength of the other (Creswell, 2014).

Based on the characteristics described in Table 3.1 above, a quantitative approach was selected for this research as it was better suited for this study in relation to researcher involvement, research design and participant preparation. The quantitative research approach was adopted primarily due to the large sample (92) selected. As the researcher is a full-time employee, researcher involvement in the large sample set, as required by qualitative research, was viewed to be impractical.

Data was collected from the employees of NCP Alcohols, via structured questions regarding the various management systems being used. Consistent with the quantitative approach, the study sought to evaluate the impact of efficiencies and effectiveness at NCP Alcohols using integrated management systems.

3.2.2 Research design

Research in business could be categorised within three main categories depending on the needs of the business or research purposes; these are exploratory, descriptive and causal research (Sekaran and Bougie, 2013). According to Cooper and Schindler (2014) planning and implementing a study with certainty towards achieving the intended goal, is guided by the research design.

Sekaran and Bougie (2013, p.96), describes exploratory research as “studies, with little or no information, in which the main purpose is to formulate a problem for detailed investigation with emphasis on discovery of new ideas”. Understanding the features of groups in specific situations is favoured by descriptive research which revolves around 'describing' the characteristics of an individual or group while causal research is described as a study where the researchers tests the hypotheses of the causal relationship between variables (Kothari ,2011).

A descriptive research design was favoured for this study as it attempted to describe the perceptions of employees at NCP Alcohols in relation to international management systems in use. Descriptive research design also provides an accurate portrayal or account of the characteristics, for example behaviour, opinions, abilities, beliefs, and knowledge of individuals, situations or groups. In this research, the opinions of employees on the various aspects of international management systems was sought. In this study, the information was collected via on-line surveys distributed through survey developing software, QuestionPro (Appendix 3).

3.3 Research setting

The research was conducted at NCP Alcohols, a global alcohol manufacturing company situated in Durban, KwaZulu Natal, South Africa. Owned by Alcofinance S.A, a Belgian based company that is part of the Alco group; NCP Alcohols produces ethanol from sugar cane molasses via a fermentation process. The ethanol produced is sold mainly to the beverage and pharmaceutical markets.

NCP Alcohols has received the Monde Grand Gold Quality Award for 53 consecutive years for the superior quality on their potable alcohol. Such an achievement cannot be attained without effective management systems.

The staff complement at NCP Alcohols comprises of 92 permanent employees.

NCP Alcohols was selected for the research as the researcher is based at the company.

3.4 Research method

Observational and survey methods are frequently used for descriptive research (Kothari, 2011). Surveys may be used for descriptive, explanatory and exploratory research and is the most widely used method for quantitative research (Cooper and Schindler, 2014). A survey is used to collect original data for describing a population too large to observe directly (Cooper and Schindler, 2014). Although the researcher

had access to the entire population during the research, the use of observational methods for the study would have been impractical due to shift work by key operational staff.

Despite being broadly applied, the disadvantages of using surveys are the low credibility of data and the lower reliability (Sekaran and Bougie, 2013). A survey obtains information from a sample of people who respond to questions posed by the researcher, however the information is done by self-report (Cooper and Schindler ,2014).

The purpose of the survey method for this study was to generate quantitative or numerical data about the perceptions of international management systems at NCP Alcohols from the employees.

3.4.1 Population

Cooper and Schindler (2014, p.345) describes “population” as the entirety of all objects, subjects or members that conform to a set of specifications. Sekaran and Bougie (2013, p.240) describes population from a research perspective as the entire group of people, things or events that the researcher would like to use for the investigation.

For this research, 92 employees were selected as the population. The population comprises of various occupational levels, including executive, senior management, middle management, junior management or technically skilled, semi-skilled and discretionary decision makers and unskilled employees.

3.4.2 Sampling plan and design

Sampling is required from both a practical and cost perspective, when research involves a large target population (Kothari, 2011). Sekaran and Bougie (2013, p.242) defines sampling as the process for selecting the correct individuals or objects as representatives of the entire population, implying that the sample is a subset of the population that is to be considered. Cooper and Schindler (2014)

indicates that sampling involves the selection of some elements in a population, used to draw conclusions about the entire population. The population can be adopted as a sample for a study (Creswell, 2014). For this study, the entire population of 92 employees was used as the sample. Table 3.2 provides an overview of the population and sample used for the research.

Table 3.2: Showing the population of NCP Alcohols

Occupational Level	Number of employees
Executive level	4
Senior Management	10
Middle Management	18
Junior Management	48
Semi-skilled and discretionary decision making level	11
Unskilled	1

Sekaran and Bougie (2013) defines sampling design as the plan by which the sample is obtained from the sampling frame. Two major categories exist in sampling design, namely; probability sampling and non-probability sampling.

In probability sampling the prospect of any one member of the population being selected is known Sekaran and Bougie (2013, p.247). Probability sampling allows for the research to make probability-based confidence estimates while non-probability sampling is a subjective approach in which the probability of an element being selected is unknown (Cooper and Schindler ,2014). Various probability and non-probability designs are listed in Table 3.3, below.

Table 3.3: Probability and non-probability designs

Selection Technique	Probability sampling	Non-probability sampling
Unrestricted sampling	Simple random sampling	Convenience sampling
Restricted sampling	Complex random sampling (systematic sampling, stratified random sampling, cluster sampling, double sampling)	Purposive sampling (Judgment Sampling, Quota sampling)

Source: Adapted from Cooper, D. R. and Schindler, P. S. 2014. Business research methods 12th Edition. New York. McGraw-Hill/Irwin. p 361.

Convenience sampling is the collection of information from the population who are available to supply it (Sekaran and Bougie, 2013). This sampling design has low generalisability but is the most convenient, time and cost-effective sampling method.

Based on the above information, a non-probability, convenience sampling design was selected for this study.

3.4.3 The method and approach for data collection

The precise, systematic method of gathering information relevant to the research purpose, or of addressing research objectives and research questions or hypotheses is referred to as data collection (Cooper and Schindler, 2014). Data collection follows once the research problem has been defined and the research design completed. According to Kothari (2011), two forms of data exist, namely, primary data – which is sourced from individuals, focus groups and specific panels, which the researcher collects to address the research problem and secondary data which already exists and is sourced from the existing records by the researcher.

Secondary data, including details on the number of employees at NCP Alcohols and employees' occupational categories was obtained from the company's human resources report. Wilson (2014) listed the following primary data collection methods:

- Interviews – where primary data is collected through includes face-to-face, telephonic and focus group interviews.
- Questionnaires – where primary data is obtained via postal, email, online or faxed questionnaires comprising of a series of questions designed to obtain information suitable for achieving the study objectives.
- Observation – where primary data is obtained by observing subjects that are part of the study. This method is used mainly for qualitative research.

A structured data collection approach was used to collect the data for this study. Since it allowed for the quantification of responses, and the statistical analysis thereof, this approach was selected. Using a structured questionnaire, a self-report method, was applied. Due to it being relatively inexpensive because no postage costs were involved and easy to administer, a questionnaire was selected for the

study. The respondents completed the questionnaires in their spare time. The benefit of using a questionnaire was that respondents were more likely to provide honest answers because each one could complete the questionnaire in private.

3.4.4 Characteristics of the instrument

Following an in-depth literature review, a research questionnaire was developed in line with the objectives of the study and the conceptual framework.

Sekaran and Bougie (2013) suggests that the general appearance of the questionnaire should:

- convey the purpose of the study and have a good introduction that conveys the purpose and instructions;
- be organised as such that the demographic or biographical questions are at the beginning with the questions following a logical sequence; and
- be simple with precise questions.

These above recommendations were followed for the questionnaire.

The questionnaire was divided into two sections. Section A contained the biographical data of the respondents while Section B incorporated the research questions based on the Likert Scale. A Likert Scale consists of a list of statements or opinions on a certain subject or issue (Cooper and Schindler, 2014). The extent to which the respondents agreed or disagreed with each statement was established from selection of the options below:

Strongly agree; Agree; Neutral; Disagree; Strongly disagree

The link between the research questions and survey questions are tabulated below (Table 3.4).

Table 3.4: Showing alignment between research questions and survey questions

Research objective	ISO clause reference	Question number
To identify the elements of the ISO 9001 system that drives quality performance to achieve customer satisfaction.	4.1 – 10.3	1, 5, 9, 13, 17
To identify the elements of the ISO 14001 system that drives environmental performance and business sustainability.	4.1 – 10.3	2, 6, 14, 18
To identify the elements of the OHSAS 18001 system that drives health and safety performance by minimising risk to human capital.	4.1 – 4.6	3, 7, 11, 15, 19
To identify if the key quality performance drivers, environmental performance drivers and health and safety performance drivers could be seamlessly aligned to NCP Alcohols business strategy, to increase profitability.	Not applicable	4, 8, 10, 12, 16, 20

3.4.5 Pre-testing of the questionnaire and the pilot study

To determine the feasibility of using the selected instrument in the study and to test its face and content validity, pre-testing of the questionnaire was done before the data collection process began. This allowed the opportunity to test the instructions for completion of the questionnaire, to identify flaws and time limitations in the process (Cooper and Schindler, 2014).

The participants who pre-tested the questionnaire was not included in the major study.

The pre-test for this study was conducted with the communications consultant at NCP Alcohols. The communications consultant was selected for the pre-test based

on her experience (~ 5 years on a management level), on management systems at NCP Alcohols as she was previously an employee of the company. Feedback was that the process was simple, quick and user friendly to cater for the skill levels of the various occupational categories at NCP Alcohols.

3.4.6 Data collection process

Data was collected in May 2017. The link to the online survey containing the questionnaire was emailed to all the respondents.

The respondents could complete the questionnaires at their convenience. A clear due date was set for the completion of the questionnaire which was communicated via the online programme.

To clarify any misunderstandings regarding the completion of the questionnaires, the researchers contact details were made available to the respondents.

3.4.7 Data analysis

Quantitative data analysis using descriptive statistical methods was performed by a statistician. Statistical tests performed included the frequencies of responses, factor analysis and the Chi-square test of association.

To test the interrelationships between many variables and to group together clusters of variables that are most closely linked, the Factor analysis was done (Cooper and Schindler, 2014). To identify a relatively small number of factors that could be used to represent the relationship among sets of many interrelated variables, Factor analysis was applied. By reducing multiple reasons for single categories, the researcher could present the research in an organised and understandable form.

To determine whether there were significant differences between the observed frequencies of responses from the different job categories of respondents, the Chi-square test, a non-parametric statistical test was done Cooper and Schindler (2014). The Chi-square test was used to determine whether reasons cited by these categories of respondents could be associated with, for instance, their age, department and occupational level.

3.5 Bias

During the sampling process, there was a possibility of sampling biases occurring. Sampling bias is consistent error that arises due to the sample selection. Sampling bias has the potential to seriously undermine the integrity of data that is collected. The researcher took the necessary steps to prevent or avoid sampling biases from affecting the study.

3.6 Validity and reliability

Validity is the extent to which an instrument measures what it is intended to measure (Cooper and Schindler, 2014). According to Creswell (2014), the validity of an instrument is the determination of the extent to which the instrument reflects the construct being examined.

Content validity is an assessment of how well the instrument represents all the different mechanisms of the variables to be measured or is an estimation of the competence with which a specific domain of content is sampled (Cooper and Schindler, 2014). It refers to the completeness with which items cover the important areas of the domain which the researcher is attempting to represent.

Content validity for this study was judged by the communications consultant in the pre-testing phase. The consultant determined whether the items represented adequately reflect the aspects associated with the evaluation of this study.

For internal consistency, the questionnaire was also tested for reliability, which is the degree to which consistent and dependable results are achieved from a data collection instrument when used by the same person or different investigators repeatedly over time, to measure that attributes that it was designed to measure Sekaran and Bougie (2013).

Reliability of the study was established through the Chronbach Alpha scores that are indicated in relevant sections of Chapter Four.

External validity, which refers to the generalisability of the research findings to other settings, was enhanced by involving the entire population in the data collection (Cooper and Schindler, 2014).

3.7 Ethical considerations

It is imperative that a researcher protects the rights of the participants of a research study and those of the institution in which the study is conducted. A researcher should also ensure that the scientific integrity of the study is maintained.

3.7.1 Protecting the rights of the respondents

Respondents participation in the study was strictly voluntary, as Cooper and Schindler (2014) indicated that one of the principles of the ethical conduct in the research was the voluntary participation by the identified sample group. Respondents were therefore informed that participation in the study was voluntary and assured that failure to participate would not result in any penalties or harm. They were also assured that they could withdraw from participating in the study at any time.

The online survey platform was used to obtain informed consent from the respondents to participate in the study. Brief instructions were given regarding the procedure to be followed when completing the survey. Respondents were informed that the recommendations of the study may contribute towards improved management systems at NCP Alcohols.

Researcher contact details were made available to the respondents if questions, complaints or comments arose during the study.

According to Sekaran and Bougie (2013), confidentiality and anonymity is of utmost importance in any study. Respondents were assured of confidentiality and anonymity throughout the study, to curb fears that the questionnaire was designed to examine their behaviour. Respondents were assured that the data was secured such that only the research has access to it.

3.7.2 Rights of the institution

The researcher received permission from the Managing Director at NCP Alcohols to conduct the research study at the company and agreed to share the research results with the company and the relevant authorities.

3.7.3 Scientific integrity

According to Sekaran and Bougie (2013), a major criterion for research use is scientific integrity, which refers to the degree to which the research is methodical and conceptually sound.

The conceptual definitions and research methods used in this study was approved by the academic supervisor. Acknowledgement of all sources in the literature review was done to maintain scientific integrity. Data collection proceeded only after approval of the instruments was done by the academic supervisor and testing of validity and reliability of the instruments was completed.

An independent statistician was used to conduct the data analysis to ensure that there was no manipulation of the statistics to support the researcher's opinions.

The researcher has ensured that the findings are supported by data collection and analysis.

3.8 Conclusion

In this chapter the research method used to obtain the results of the study was discussed. This included a discussion on the basic research design, the sampling and the data collection as well as the statistical techniques that were used to analyse the results.

To establish the contributing factors to the company's efficiencies and effectiveness, Quantitative descriptive research was conducted. A sample of 92 respondents was

used for this study. Data was collected by adopting a self-reporting method, via a structured online survey questionnaire.

Analysis of the collected data entailed the use of factor analysis, descriptive statistics and calculation of the Chi-square factor. Specific measures to enhance the external validity of study was applied by the researcher. The researcher also ensured that ethical principles were adhered to during the study.

Presentation of the research findings are covered in Chapter four.

Chapter 4

Presentation, analysis and discussion of results

4.1 Introduction

The primary data collected through the research is presented in this chapter, together with the key findings. Data was collected in accordance with the guidelines stipulated in Chapter Three. The results of this empirical study are discussed in line with the theoretical framework developed in Chapter Two of this dissertation.

The data collected from the responses to the questionnaires administered to the employees of NCP Alcohols was analysed and presented in the form of descriptive and inferential statistics. Results are presented in the form of graphs and tables to facilitate easy understanding and interpretation of the results.

The Cronbach Alpha coefficient was determined to establish the reliability of the questionnaire while correlation analysis was used to present the relationship between objectives.

Details on the analysis of the questionnaire is presented and discussed. The discussion of results follows the sequence in which the survey was conducted and is linked back to the various research objectives.

4.2 Analysis of questionnaire

The questionnaire was distributed to the targeted 92 employees at NCP Alcohols, however, only 53 respondents completed the survey, yielding a response rate of 58%. The average time taken to complete the survey was seven minutes, which was within the ten-minute time range stipulated. The received responses were validated and considered for the statistical analysis.

4.2.1 Reliability of the questionnaire

Cronbach's Alpha Value was calculated to establish the reliability of the questionnaire. According to Sekaran and Bougie (2013), Alpha index determination is commonly used to establish reliability, especially with a questionnaire and a value of 0.80 or more indicates good reliability. The Cronbach Alpha Value for this study was determined to be 0.923, which is shown in Table 4.1.

Table 4.1 Showing reliability test result of the data set

Reliability statistics	
Cronbach's Alpha Value	Number of Items
0.923	20

4.2.2 Presentation of results – Section A (Biographical data)

The biographical data on the respondents are detailed in this section. The biographical information included gender, division, occupational level in the company, department, age and current period of employment at NCP Alcohols.

4.2.3 Gender

Table 4.2: Showing a summary of the responses received by gender

Description	Frequency	Percentage
Gender		
Male	30	57%
Female	23	43%

There were slightly more male respondents (57%) as compared to female respondents (43%) as shown in Table 4.2. This is in line with the population of NCP Alcohols that has a larger male population, i.e. 70% males and 30% females. This result is also indicative of the chemical manufacturing industry which typically has more male than female employees.

4.2.4 Division

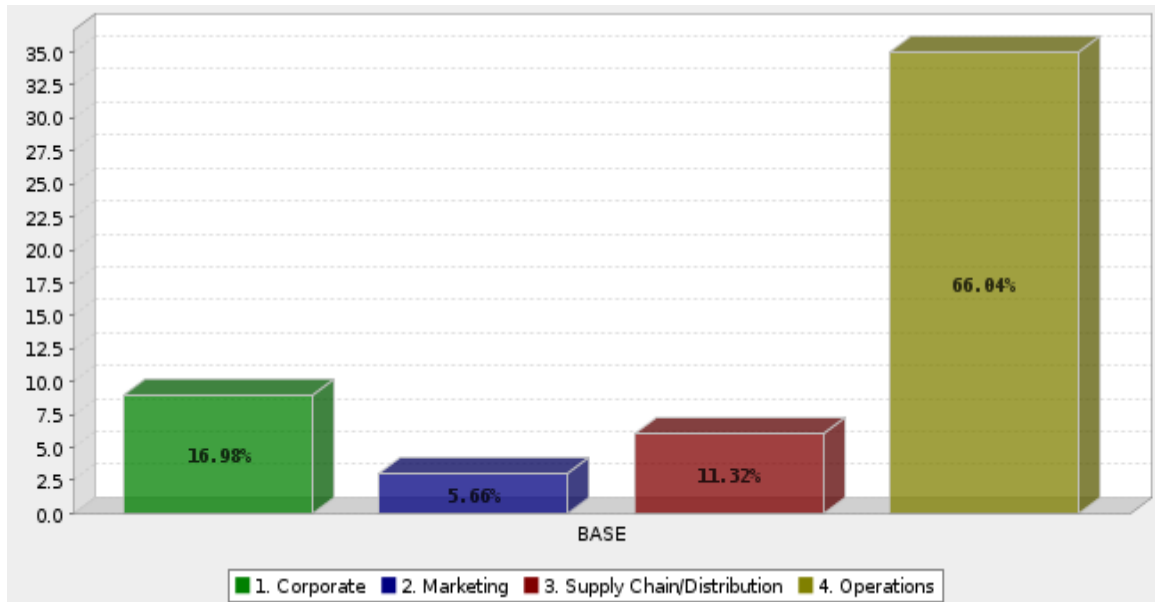


Figure 4.1: Showing distribution of participant's division of work within NCP Alcohols

Corporate, Marketing, Supply chain/Distribution and Operations are the four divisions that exist within NCP Alcohols. Figure 4.1 shows that responses were received from all four divisions, however, most of the responses were received from the Operations division, followed by Corporate, Supply Chain/Distribution and Marketing. This is in line with the current structure at NCP Alcohols where bulk of the respondents are employed within the Operations division to satisfy the manufacturing process requirements. Major changes based on the recommendations of this study will therefore apply to the Operations division.

4.2.5 Occupational level

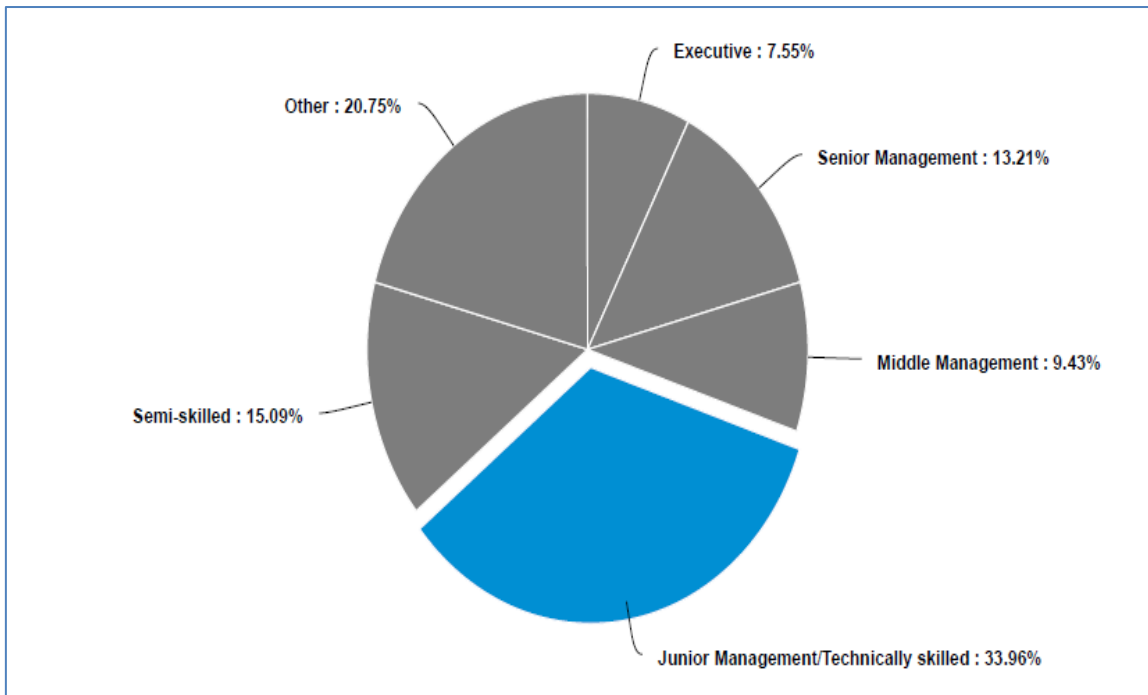


Figure 4.2: Showing distribution of occupational levels of respondents

The occupational level provides a general view of the hierarchy at NCP Alcohols. Figure 4.2 shows that most of the respondents were on a junior management level within the organisation. The feedback from the junior level respondents is crucial to this study as this group of employees, together with the middle management level are responsible for establishing, implementing and monitoring key processes required by the IMS. 21% of the respondents selected “other” for one of two reasons: 1) the respondents were unsure of their current occupational level within the company; or 2) the respondents were not willing to disclose their occupational levels for the survey due to personal reasons. 15% of the responses were from the semi-skilled level of employees within the company. The feedback from this level of employees is also vital for the study as they are responsible for following and reporting on the IMS processes and procedures established by the junior and middle management employees.

4.2.6 Department

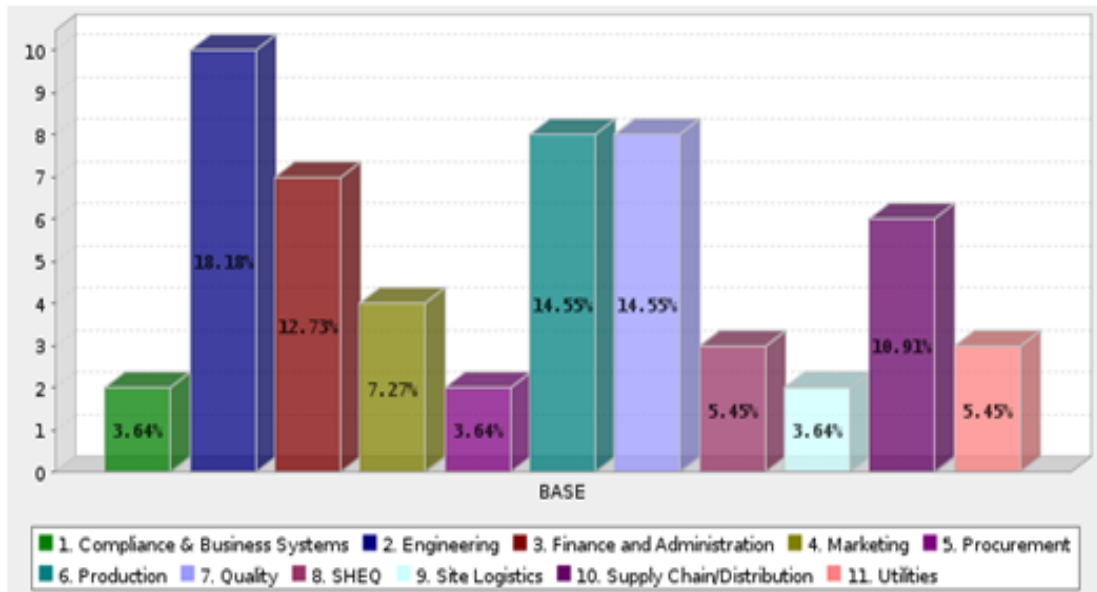


Figure 4.3: Showing distribution of respondents' departments of work within NCP Alcohols

Results show that responses were received from all the departments at NCP Alcohols, as illustrated in Figure 4.3.

The participation of employees from the various departments within NCP Alcohols allows for a holistic view into the perceptions of the integrated management systems at NCP Alcohols.

4.2.7 Age

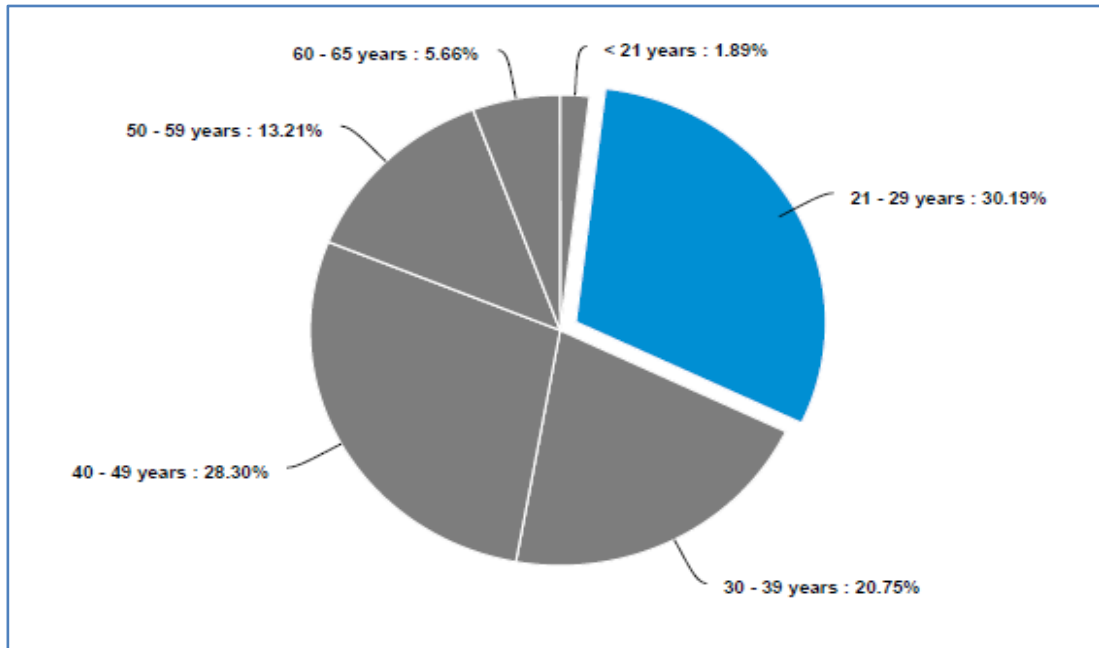


Figure 4.4: Showing age distribution of participants

Figure 4.4 illustrates that most of the participants (51%) were between the ages of 21-39 years. This group of participants are classified as Generation Y. Their comfort with technology is one of the most frequently reported characteristics of this generation (Jiri, 2016). Jiri (2016) also emphasizes that this generation adapts well to change, they seek flexibility and value training. These key characteristics were considered when making recommendations from this study.

The second largest group of respondents which comprised of 28% of the responses were between the ages of 40 – 49 years and fall into the Generation X category (Jiri, 2016). According to Jiri (2016), most Generation X employees are results driven and value continuous learning and skills development. Similar to Generation Y employees, this generation also adapts well to change.

4.2.8 Period of employment

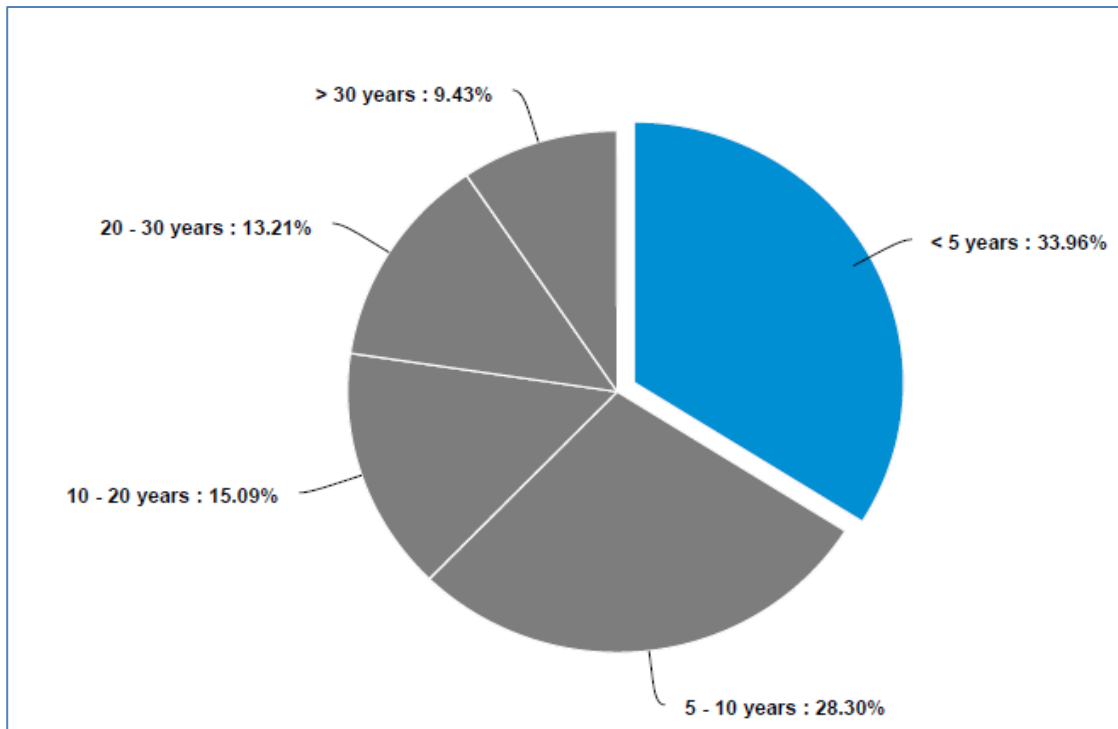


Figure 4.5: Distribution showing the period of employment of respondents

The results in Figure 4.5 show that most (34%) of the respondents were employed within the company for less than five years, 28% of the respondents were employed between 5 – 10 years, 15% employed for 10 – 20 years, 13% employed between 20 – 30 years and 9% employed for more than 30 years. The ISO 9001 Quality Management System has been in place at NCP Alcohols for 30 years, the ISO 14001 Environmental Management System for 11 years and the OHSAS 18001 System for five years. It is therefore inferred that 66% of the respondents have used and gained some experience on the international management systems.

4.2.9 Presentation of results – Section B

The objective of the study was to determine if IMS could be aligned and used as strategic tools to improve efficiency and effectiveness at NCP Alcohols. In order to meet this objective, four research questions were proposed:

Research question one

Do specific elements of an ISO 9001 system drive quality performance and customer satisfaction to enable its use as a strategic tool to gain competitive advantage in the chemical industry?

Research question two

Do specific elements of the ISO 14001 system drive environmental performance to improve business sustainability and minimise impacts in the chemical industry?

Research question three

Do specific elements of the OHSAS 18001 system drive health and safety performance to improve stakeholder value in the domain of human capital?

Research question four

Can the ISO 9001, ISO 14001 and OHSAS 18001 management systems be aligned to drive value innovation and increase profitability and/or market share within the chemical industry?

In Section B of the questionnaire, various statements were made based on each research objectives. The Likert Scale was used to assess the extent to which the respondent agreed or disagreed with the statements.

Based on the first research question, a literature review was conducted in order to acquire generic information and definitions on management systems, QMS and the associated ISO standards, quality performance and customer satisfaction.

Survey results on objective one is discussed under section 4.2.9.1.

A second literature review was conducted based on research question two, where generic information and definitions on ISO 14001 EMS and the associated ISO standards were obtained. Literature on environmental performance and business sustainability was also reviewed.

Survey results on objective two is discussed under section 4.2.9.2.

Literature review on research question three was conducted to obtain generic information and definitions on the OHSAS 18001 system, occupational health and safety performance and risk management.

Survey results on objective three is discussed under section 4.2.9.3.

Based on research question four, a literature review was conducted to obtain generic information IMS, business strategy and value innovation.

Survey results on objective four is discussed under section 4.2.9.4.

4.2.9.1 To identify the elements of the ISO 9001 that drives quality performance to achieve customer satisfaction – Questions 1, 5, 9, 13, 17

Table 4.3: Showing respondent feedback on statements related to Objective 1.

Statement		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Statement one	The company focuses on customer requirements and expectations	73%	23%	4%	0%	0%
Statement two	The company provides sufficient training and awareness related to the ISO 9001 system	31%	42%	25%	2%	0%
Statement three	Having an ISO 9001 system motivates employees to do their jobs efficiently	30%	49%	17%	4%	0%
Statement four	Continual improvement programmes are always adopted by the company	40%	51%	7%	2%	0%
Statement five	ISO 9001 Standard implementation has improved the business performance over the years	30%	59%	11%	0%	0%

To identify the elements of the ISO 9001 system that drives quality performance to achieve customer satisfaction, five Likert type statements were posed to the participants. A summary of these statements is shown in the Table 4.3 above. Results show agreement and strong agreement with the statement by most participants. For example, 73% strongly agreed that the company focuses on customer requirements and expectation, and 40% strongly agreed that continual improvement programmes are always adopted by the company. This majority agreement corresponds with the summation that many quality professionals have

the overview that ISO 9001, is a system to manage customer requirements (Nassor, 2015).

Masejane (2012) indicated that continuous improvement is undertaken to achieve customer satisfaction and it is most effective when driven by customer needs. However, the results show that 7% of the respondents remained neutral and 2% of the respondents disagreed with the statement that continual improvement programmes are always adopted by the company.

ISO (2015e) highlights customer focus and continual improvement as quality management principles, essential for a quality management system and to improve its performance.

Factor analysis was conducted to find the redundancy of the statements. Factor analysis (Table 4.4, page 86) below, illustrates the most important factors that drives quality performance to achieve customer satisfaction. The most important factors are reflected by the lowest mean values which were 1.30 for “the company focuses on customer requirements and expectations” followed by “continual improvement programmes are always adopted by the company” (mean=1.72).

This analysis is consistent with the view that by aligning processes and ensuring that the requirements are understood by everyone within the organisation, an effective quality management system guides companies to work in a more efficient way (Sickinger-Nagorni, 2016). Continual improvement towards customer requirements, stakeholder interests and organisational objectives is ultimately achieved within the organisation. The increase in productivity and efficiency leads to reduced internal costs.

4% of respondents disagreed with the statement that having an ISO 9001 system motivates employees to do their jobs efficiently. Lieder (2014) argues that productivity and performance are linked to efficiency and effectiveness. This shows that there is opportunity for the employees at NCP Alcohols to improve productivity and performance via the ISO 9001 system.

Table 4.4: Showing the results of the factor analysis on Objective 1

Factor analysis		
Statements	Mean	Std. Dev
The company focuses on customer requirements and expectations.	1.30	0.540
The company provides sufficient training and awareness related to the ISO 9001 system.	1.92	0.756
Having an ISO 9001 system motivates employees to do their jobs efficiently.	1.94	0.795
Continual improvement programmes are always adopted by the company.	1.72	0.690
ISO 9001 Standard implementation has improved the business performance over the years.	1.81	0.622

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy Test showed that the data was adequate for the factor analysis (Table 4.5).

Table 4.5: Showing the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Objective 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.732
Bartlett's Test of Sphericity	Approximate Chi-Square	57.521
	df	10
	Sig.	0

Principal Component analysis (Table 4.6) showed that there is only one component that explains 50% of the variation of the construct as having eigenvalue greater than one.

Table 4.6: Showing extraction method: Principal Component analysis for objective 1

Total variance explained						
Component	Initial Eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.515	50.305	50.305	2.515	50.305	50.305
2	0.816	16.311	66.616			
3	0.687	13.730	80.346			
4	0.630	12.603	92.949			
5	0.353	7.051	100.000			

Table 4.7: Showing the component matrix for Objective 1

Component matrix	
	Component 1
The company focuses on customer requirements and expectations.	0.530
The company provides sufficient training and awareness related to the ISO 9001 system.	0.807
Having an ISO 9001 system motivates employees to do their jobs efficiently.	0.741
Continual improvement programmes are always adopted by the company.	0.738
ISO 9001 Standard implementation has improved the business performance over the years.	0.700

The component matrix (Table 4.7) shows that the most important factor or the statement that the respondents felt strongly about, was that the company provides sufficient training and awareness related to the ISO 9001 system. Hence this statement had the highest value from the principal component analysis. This could be construed that participants at NCP Alcohols believe that the adoption of QMS by their organization forms part of their strategic decision towards sustainable development initiatives to improve their overall performance that is like the view of (McKinley, 2016).

Bhatia (2013) citing Sarah (1989), also identified training as one of the eight critical factors of quality based on an empirical study done.

Based on the survey results obtained, it can be concluded that three key drivers for quality performance is:

- customer focus;
- continual improvement and
- training and awareness

4.2.9.2 To identify the elements of the ISO 14001 system that drives environmental performance and business sustainability – Questions 2, 6, 14, 18

Table 4.8: Showing respondent feedback on statements related to Objective 2.

Statement		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Statement one	The ISO 14001 system suits the business needs	52%	43%	5%	0%	0%
Statement two	Implementation of the ISO 14001 system has enhanced the company's image/reputation.	40%	49%	9%	2%	0%
Statement three	The ISO 14001 system is a flexible environmental management tool	22%	55%	21%	2%	0%
Statement four	Implementation of the ISO 14001 system by the company has been good for the environment	43%	47%	10%	0%	0%

Four statements were posed to the respondents to identify the elements of the ISO 14001 system that drives environmental performance and business sustainability. Table 4.8 shows that 52% of the participants strongly agreed that the ISO 14001 system suits the business needs, and 43% strongly agreed that implementation of the ISO 14001 system by the company has been good for the environment. Majority agreement by the participants draw parallels with the argument of Jousineau (2012), that, to achieve organisational guidance when establishing, developing and reviewing their business practices towards both corporate and environmental goals, companies often strive to implement an EMS.

However, 2% of the respondents disagreed with the statements that “implementation of the ISO 14001 system has enhanced the company’s image/reputation” and that “the ISO 14001 system is a flexible environmental management tool”.

The factor analysis in Table 4.9, below shows that the statements “the ISO 14001 system suits the business needs”; and “implementation of the ISO 14001 system by the company has been good for the environment”, had the lowest mean value (1.53 and 1.66 respectively), indicating the most important factors.

Table 4.9: Showing factor analysis on Objective 2

Factor Analysis		
Statements	Mean	Std. Dev
The ISO 14001 system suits the business needs	1.53	0.608
Implementation of the ISO 14001 system has enhanced the company’s image/reputation.	1.74	0.711
The ISO 14001 system is a flexible environmental management tool	2.02	0.720
Implementation of the ISO 14001 system by the company has been good for the environment.	1.66	0.649

The factor analysis (Table 4.9) above reveals that the strong responses to the above two statements is an indication that the participants consider the 14001 series of standards to provide practical tools for the company to enhance its environmental performance, increase productivity and overall success as indicated by Norhasimah Md Nor (2016).

KMO and Bartlett's Test (Table 4.10), showed that the data were adequate for factor analysis.

Table 4.10: Showing Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for objective 2.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.729
Bartlett's Test of Sphericity	Approx. Chi-Square	37.805
	df	6
	Sig.	<0.01

Principal Component Analysis (Table 4.11), showed that there was only one component which explains 55% of the variability of the construct as it has eigenvalue greater than one.

Table 4.11: Showing extraction method: Principal Component analysis for Objective 2.

Total variance explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.183	54.583	54.583	2.183	54.583	54.583
2	0.675	16.874	71.457			
3	0.661	16.521	87.978			
4	0.481	12.022	100.000			

The component matrix (Table 4.12), indicated that the statement “Implementation of the ISO 14001 system by the company has been good for the environment” was the most important factor as having the highest value from the principal component analysis. This principal is aligned to the view that business sustainability is often defined as the process by which companies manage their financial, social and environmental risks, obligations and opportunities to grow (Le Roux, 2012).

Table 4.12: Showing component matrix for Objective 2

Component matrix	
	Component 1
The ISO 14001 system suits the business needs	0.753
Implementation of the ISO 14001 system has enhanced the company’s image/reputation	0.721
The ISO 14001 system is a flexible environmental management tool	0.718
Implementation of the ISO 14001 system by the company has been good for the environment	0.763

The survey results show that two key drivers for environmental performance are:

- Identifying business and stakeholder needs by analyzing the context of the organization, based on clause 4 of the ISO 14001:2015 standard and
- Identifying aspect and impacts of business activities based on clause 6 of the ISO 14001:2015.

4.2.9.3 To identify the elements of the OHSAS 18001 system that drives health and safety performance by minimising the risk to human capital – Questions 3, 7, 11, 15, 19

Table 4.13: Showing respondent feedback on statements related to Objective 3.

Statement		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Statement one	Implementation of the OHSAS 18001 system has reduced the number of injuries and illnesses on site.	45%	43%	8%	2%	2%
Statement two	I am allowed ample opportunity to participate in and contribute towards the health and safety system.	42%	45%	13%	0%	0%
Statement three	The OHSAS 18001 system is risk-based and allows for proactive rather than reactive mitigation to identified risks.	36%	53%	11%	0%	0%
Statement four	Implementation of the OHSAS 18001 system has improved employee awareness and behaviour in terms of health and safety.	34%	55%	11%	0%	0%
Statement five	Implementation of the OHSAS 18001 system has improved the company's image.	32%	55%	11%	2%	0%

A total of five statements were presented to the respondents to identify the elements of the OHSAS 18001 system that drives health and safety performance by minimising risk to human capital. Most participants agreed or strongly agreed to all the statements which is consistent with Tierweiller (2016) that ISO 18001 is an enabler to assist organisations in achieving occupational health and safety in the workplace. For example, 89% of the participants positively reported that The OHSAS 18001 system is risk-based and allows for proactive rather than reactive mitigation to identified risks, and another 89% agreed or strongly agreed that implementation of the OHSAS 18001 system has reduced the number of injuries and illnesses on site (Table 4.13).

However, 2% of the respondents disagreed with statement one and a further 2% strongly disagreed with this statement, indicating that an opportunity for improvement exist within the risk-management domain at NCP Alcohols.

The descriptive analysis (Table 4.14), showed that the following two statements “Implementation of the OHSAS 18001 system has reduced the number of injuries and illnesses on site” and “I am allowed ample opportunity to participate in and contribute towards the health and safety system” had the lowest mean value of 1.72. This analysis is equivalent to the argument that the main objective of this standard is to guide organisations into minimising OHS risks and assuring the protection of their human capital (Oliveira, 2013).

Table 4.14: Showing Factor analysis on Objective 3

Factor Analysis		
Statements	Mean	Std. Dev
Implementation of the OHSAS 18001 system has reduced the number of injuries and illnesses on site.	1.72	0.841
I am allowed ample opportunity to participate in and contribute towards the Health and Safety system.	1.72	0.690
The OHSAS 18001 system is risk-based and allows for proactive rather than reactive mitigation to identified risks.	1.75	0.648
Implementation of the OHSAS 18001 system has improved employee awareness and behaviour in terms of health and safety.	1.77	0.640
Implementation of the OHSAS 18001 system has improved the company’s image.	1.83	0.700

KMO and Bartlett's Test showed that the data were adequate for factor analysis (Table 4.15).

Table 4.15: Showing Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Objective 3.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.741
Bartlett's Test of Sphericity	Approx. Chi-Square	82.332
	df	10
	Sig.	0

Principal Component analysis showed that there was only one component which explains 54% of the variability of the construct as it has eigenvalue greater than one.

Table 4.16: Showing extraction method: Principal component analysis for Objective 3

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.711	54.222	54.222	2.711	54.222	54.222
2	0.817	16.348	70.570			
3	0.768	15.352	85.922			
4	0.464	9.272	95.193			
5	0.240	4.807	100.000			

The component matrix (Table 4.17) indicated that Implementation of the OHSAS 18001 system has improved employee awareness and behaviour in terms of health and safety was the most important factor as having the highest value from the principal component analysis.

This indication could be interpreted as NCP Alcohols shares the view that various studies have found that not only do properly implemented occupational safety and health systems by companies provide a sense of security to employees but they also provide a sense of satisfaction (Yusuf, *et al.*, 2012).

When employees are satisfied with the safety and security of their workplace then fewer accidents tend to occur. Since incidents and accidents in the workplace hinder employee performance, fewer accidents results in improved employee and business performance (Yusuf, *et al.*, 2012).

Table 4.17: Showing component matrix for Objective 3

Component Matrix	
	Component 1
Implementation of the OHSAS 18001 system has reduced the number of injuries and illnesses on site.	0.603
I am allowed ample opportunity to participate in and contribute towards the Health and Safety system.	0.565
The OHSAS 18001 system is risk-based and allows for proactive rather than reactive mitigation to identified risks.	0.805
Implementation of the OHSAS 18001 system has improved employee awareness and behaviour in terms of health and safety.	0.876
Implementation of the OHSAS 18001 system has improved the company's image.	0.782

From the survey results obtained for this objective, it can be concluded that key drivers for health and safety performance are:

- Risk management
- Participation and consultation and
- Training and awareness

4.2.9.4 To identify if the key quality performance drivers, environmental performance drivers and health and safety performance drivers could be seamlessly aligned to NCP Alcohols business strategy, to increase profitability. – Questions 4, 8, 10, 12, 16, 20

Table 4.18: Showing respondent feedback on statements related to objective 4.

Statement		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Statement one	Managements systems have aided in streamlined documentation and improved communication.	30%	59%	11%	0%	0%
Statement two	Information relevant to the management systems is readily available to the employees.	39%	41%	16%	4%	0%
Statement three	Information and communication technology are used strategically to improve processes within the integrated management system.	34%	51%	15%	0%	0%
Statement four	Management systems at NCP Alcohols have been tailored to fit the company and industry.	40%	45%	15%	0%	0%

There were six statements presented to the respondents to determine if the key quality performance drivers, environmental performance drivers and health and safety performance drivers seamlessly integrate into NCP Alcohols business strategy.

Results showed agreement or strong agreement with the statement by most of the participants which is like the opinion expressed by Osmo Kauppila (2014) who argued that a viable organisational approach to reduction in costs, efficient utilisation of resources, improved employee motivation and better compliance to regulatory, social and stakeholder requirements is through integration of management systems.

For example, 40% of the participants strongly agreed that management systems at NCP Alcohols have been tailored to fit the company and industry, and another 60% agreed that Managements systems have aided in streamlined documentation and improved communication (Table 4.18).

However, 4% of the respondents disagreed with the statement that “information relevant to the management systems is readily available to the employees”, indicating that an opportunity to improve information management exists at NCP Alcohols.

The descriptive analysis (Table 4.19) showed that the following two statements “Management systems at NCP Alcohols have been tailored to fit the company and industry” and “Managements systems have aided in streamlined documentation and improved communication” had the lowest mean score (1.75 and 1.79 respectively).

Table 4.19 Showing Factor analysis on Objective 4

Factor analysis		
Factor Analysis	Mean	Std. Deviation
Managements systems have aided in streamlined documentation and improved communication.	1.79	0.600
Information relevant to the management systems are readily available to the employees.	1.87	0.833
Information and communication technology is used strategically to improve processes within the integrated management	1.81	0.681
Management systems at NCP Alcohols have been tailored to fit the company and industry.	1.75	0.705
Management systems are flexible rather than rigid.	2.26	0.836
There is clear linkage between the company strategy and the management systems.	1.89	0.698

It can be deduced that the participants at NCP Alcohols, interpretation of these statements (table 4.19), could be related to the view that the process approach enhances companies' effectiveness and efficiencies in achieving its set objectives, by managing activities to create value for the customer and other interested parties (Rebelo, 2014).

KMO and Bartlett's Test (Table 4.20), shows that the data were adequate for factor analysis.

Table 4.20: Showing Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Objective 4.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.762
Bartlett's Test of Sphericity	Approx. Chi-Square	79.380
	df	15
	Sig.	0.000

Principal Component Analysis (Table 4.21), shows that there was only one component which explains 48% of the variability of the construct as it has eigenvalue greater than one.

Table 4.21: Showing extraction method: Principal component analysis for Objective 4

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.880	48.001	48.001	2.880	48.001	48.001
2	0.938	15.634	63.636			
3	0.771	12.856	76.492			
4	0.591	9.857	86.349			
5	0.489	8.146	94.494			
6	0.330	5.506	100.000			

The component matrix (Table 4.22, page 101), indicated that management systems at NCP Alcohols have been tailored to fit the company and industry was the most important factor as having the highest value from the principal component analysis.

This critical component analysis underpins the participants assessment that describes strategic alignment as a “vertical linking process”.

It gives impetus to the thoughts of Parisi (2013), citing Kathuria, which emphasises that there are three levels of strategies that function in a hierarchical manner where corporate strategy sets objectives for organizational level which forms a business level strategy that is developed into a functional strategy. Strategic alignment evokes fit amongst strategy, organizational structure and system planning where managers at various divisions and levels of the company hierarchy are required to create a common understanding of company goals and strategy (Parisi, 2013).

Table 4.22 Showing component matrix for Objective 4

Component matrix	
	Component 1
Managements systems have aided in streamlined documentation and improved communication.	0.663
Information relevant to the management systems are readily available to the employees.	0.721
Information and Communication Technology is used strategically to improve processes within the Integrated Management System.	0.590
Management systems at NCP Alcohols have been tailored to fit the company and industry.	0.805
Management systems are flexible rather than rigid.	0.620
There is clear linkage between the company strategy and the management systems.	0.735

It can be seen that the results obtained for the study is supported by those existing in literature.

4.3 Conclusion

The analysis and interpretation of data was discussed in this chapter. The research reliability was confirmed with the Cronbach Alpha value being 0.923. The data on the demographic profile of the participants was first presented which was followed by the highlights of the findings in relation to each objective of the study. The commentary on the findings was framed by the relevant prior literature.

The next chapter describes the conclusions that were drawn based on the findings described in this chapter. Applicable recommendations are made, limitations of the study highlighted and future research proposed.

Chapter 5

Conclusions, Limitations and Recommendations

5.1 Introduction

Implementation of IMS is becoming a common requisite for companies worldwide as not just a factor of competitiveness but for survival (Santos, 2011). The aim of the study was to determine if international management systems could be used strategically to improve efficiency and effectiveness at NCP Alcohols. Four specific objectives were investigated using a quantitative research approach. The data collected from the employees of NCP Alcohols were linked to the four objectives and was intended to obtain the perceptions of the employees on the international management systems adopted by the company and their perceived effectiveness.

In this chapter, the key findings and conclusions from the literature review and data analysis, recommendations, limitations of the study and recommendations for future studies are outlined.

5.2 Key findings and conclusions

The aim of the study was subdivided into the four objectives below and the research questions were crafted to align with the objectives of the study.

- Objective one (1) was to identify the elements of the ISO 9001 system that drives quality performance to achieve customer satisfaction to answer the research question: Do specific elements of an ISO 9001 system drive quality performance and customer satisfaction to enable its use as a strategic tool to gain competitive advantage in the chemical industry?
- Objective two (2) was to identify the elements of the ISO 14001 system that drives environmental performance and business sustainability to answer the research question: Do specific elements of the ISO 14001 system drive

environmental performance to improve business sustainability and minimize impacts in the chemical industry?

- Objective three (3) was to identify elements of the OHSAS 18001 system that drives health and safety performance by minimizing risk to human capital to answer the research question: Do specific elements of the OHSAS 18001 system drive health and safety performance to improve stakeholder value in the domain of human capital?
- Objective four (4) was to identify if the key quality performance drivers, environmental performance drivers and health and safety performance drivers could be seamlessly aligned to NCP Alcohols business strategy, to increase profitability, to answer the research question: Can the ISO 9001, ISO 14001 and OHSAS 18001 Management systems be aligned to drive value innovation and increase market share within the chemical industry?

5.2.1 Objective 1

Based on objective one, the literature review revealed that quality has evolved over the years from a mechanical perspective to a holistic one. Various quality performance management systems were reviewed against the ISO 9001 system, namely the BSC, Lean Six Sigma Methodology, the Baldrige Performance Excellence Programme, the EFQM and TQM. Quality performance is achieved in providing quality product and service to customers at a comparable price. This is supported by the view of Masejane (2012) who expresses that performance refers to the provision of high quality products and services by organisations to satisfy customers through optimal management of their operations and processes.

Based on the literature reviewed, it can be concluded that the key quality drivers are aligned to the quality principles defined in the ISO 9000 Standard:

- Customer focus
- Leadership
- People involvement
- Process approach
- Continual improvement

- Evidence-based decision making and
- relationship management

Incorporation of the quality principles into daily business operations will inadvertently improve quality performance.

The descriptive statistics from the survey results show that the employees of NCP Alcohols view 'customer focus', 'continual improvement' and 'training and awareness' as the key drivers of quality performance to achieve customer satisfaction.

Results also highlighted that opportunities to drive productivity and performance to achieve efficiency and effectiveness exist within the company. There is also further opportunity to use continual improvement to drive efficiency and effectiveness.

Objective 2

The literature review in regard to objective two (2) revealed that environmental performance is subject to the following:

- Environmental impacts because of resources consumed
- Environmental impacts due to business processes
- Environmental impacts because of a company's products and services
- Environmental impacts because of processing or recovery of products and
- Compliance to the law.

The review of literature also indicated that business sustainability can be achieved by managing financial, social and environmental risks, obligations and opportunities and focusing on sustainable development principles:

- issues that either help or hinder the process of improving people's quality of life
- systems that determine how resources needed to improve peoples' lives are used and distributed, and

- renewable and non-renewable natural resources that make up surroundings and help sustain and improve people's lives

Based on the literature review conducted, the key drivers to environmental performance to achieve business sustainability is aligned to the five environmental principles captured in the ISO 14000 standard:

- Commitment and Policy
- Planning
- Implementation
- Measurement and Evaluation
- Review and Improvement

The survey results show that two key drivers for environmental performance are:

- Identifying business and stakeholder needs by analyzing the context of the organization, based on clause 4 of the ISO 14001:2015 standard and
- Identifying aspect and impacts of business activities based on clause 6 of the ISO 14001:2015.

5.2.2 Objective 3

Objective three was to identify elements of the OHSAS 18001 system that drives health and safety performance by minimising risk to human capital.

The literature review revealed that the key drivers to health and safety performance is directly aligned to the five core principles defined in the OHSAS 18001 standard:

- Risk management
- Resources, responsibilities, and organization
- Competence, awareness, and training
- Participation and consultation
- Emergency preparedness and control

The survey results show that by assessing and controlling risks, incident rates are reduced. The reduction in incident rates results in improved health and safety performance. From the survey results obtained for this objective, it can be concluded that key drivers for health and safety performance are:

- Risk management
- Participation and consultation and
- Training and awareness

5.2.3 Objective 4

Objective four (4) was to identify if the key quality performance drivers, environmental performance drivers and health and safety performance drivers could be seamlessly aligned to NCP Alcohols business strategy, to increase profitability.

Review of the literature showed that this can be achieved by adopting the “Line of Sight” model. Survey results showed that employees of NCP Alcohols perceive “flexible” and “streamlined” management systems to be crucial in improving efficiency and effectiveness.

The recommendations below are made to enhance NCP Alcohols performance to achieve business excellence and create a competitive advantage over their rivals.

5.3 Recommendations

NCP Alcohols operates within a highly dynamic industry. The management at NCP Alcohols acknowledges that the company derives economic benefits from the application of international management systems and its standards. However, its competitors are expected to apply the same standards, indicating that NCP Alcohols gains no distinct competitive advantage over its rivals currently. Recommendations below are made to enhance NCP Alcohols performance through their existing integrated management system, to gain competitive advantage in the industry.

Based on the survey results obtained for objective one to four, it is recommended that NCP Alcohols review and streamline its business processes related to:

- Identifying and meeting customer requirements
- Continual improvement of its business processes
- Training and awareness
- Identifying business and stakeholder needs by analyzing the context of the organization
- Identifying aspects and impacts of its business activities
- Risk management in regard to human capital and
- Participation and consultation with its workforce

By adopting the “Line of sight” model and establishing suitable performance measures for each of the processes listed above, NCP Alcohols can improve efficiency and effectiveness of its business processes.

Further recommendations are proposed to enhance NCP Alcohols business processes to achieve business excellence.

5.3.1 Creation of an adapted NCP Alcohols Value Innovation Model

Customer focus is a key quality performance driver and is the first quality management principle according to (ISO, 2015e). Therefore, value must be created to gain competitive advantage.

There are three platforms on which value innovation can take place, i.e. product, service and delivery (Mauborgne, 2015). According to Mauborgne (2015), most businesses focus on the product platform and forget the other two. It's important for NCP Alcohols to note that as customers and technology changes, new possibilities surface.

The first recommendation is for NCP Alcohols to adopt the four actions framework, discussed in chapter 2, with platforms on which innovation can thrive, also discussed in chapter 2, to create a ‘Value Innovation Model’ (Figure 5.1) that can be strategically used by NCP Alcohols.

By adopting the “Value Innovation Model”, customer value elements can be reconstructed to form a new value curve, to break the trade-off between differentiation and low cost. Figure 5.1 below presents an overview of the model with practical work place examples which are detailed further.

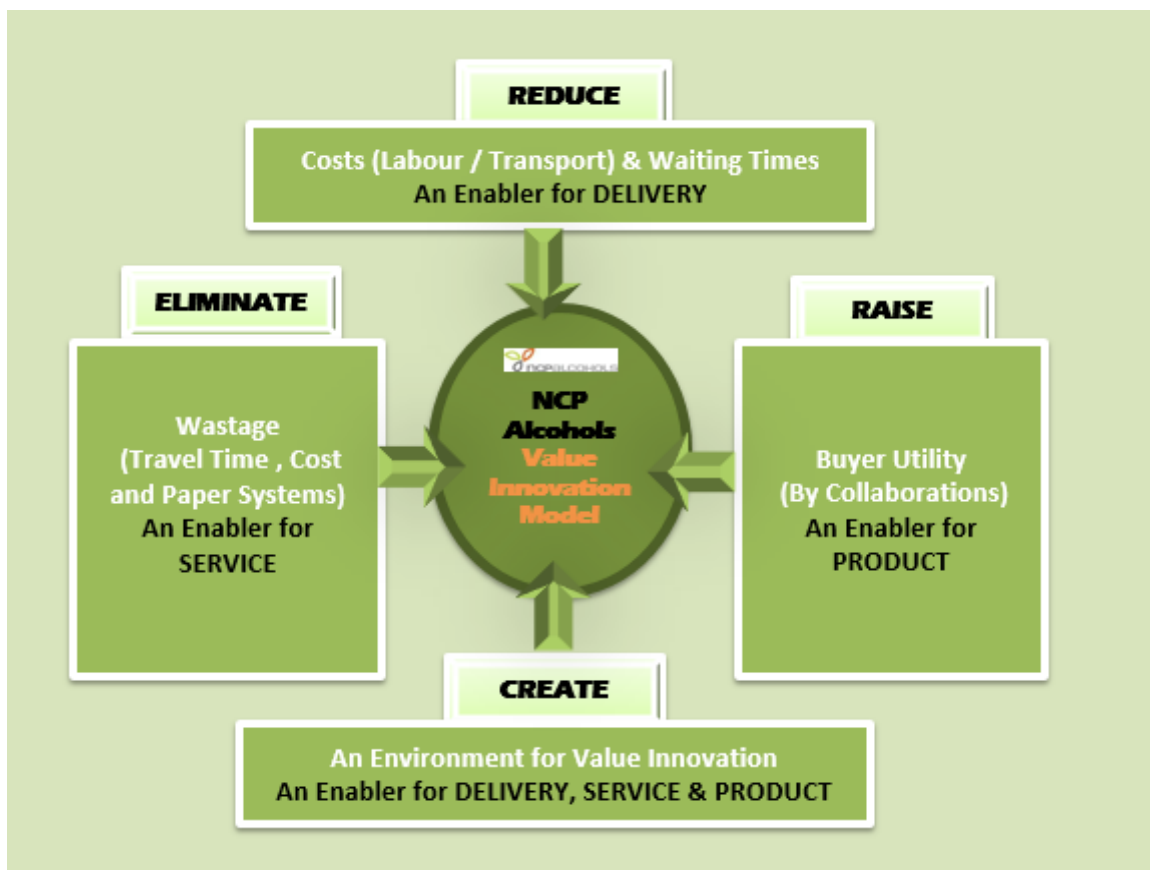


Figure 5.1: NCP Alcohols Value Innovation Model, Adapted from (Mauborgne, 2015).

The following recommendations are made for the NCP Alcohols Value Innovation model:

5.3.1.1 Reduce costs holistically: **an enabler for delivery**

- Reduce labour costs - re-evaluate working times and rosters for staff involved in packaging and handling of the product to maximize loading times and minimize overtime.

- Reduce waiting times- using value-stream mapping to detail the loading process and remove non-value adding steps to minimize extensive waiting periods.
- Reduce transport costs - by using the existing IT platform to create a supplier interface that will aid in planning and scheduling of vehicles to optimize vehicle usage.

5.3.1.2 Eliminate Wastage: **enabler for service**

- Reduce travel time and costs – use video communications to interact with customers more frequently. Travel costs such as flights and accommodation could be reduced and the frequency of engagements with customers increased using this method.
- Reduce costs of paper systems using value-stream mapping to map out the order processing steps and remove non-value adding process steps. Existing IT platforms can be adopted to create a customer interface to facilitate on-line orders. A business to business platform can be created to eliminate ordering costs.

5.3.1.3 Raise buyer utility: **enabler for product**

- NCP Alcohols should embark on a collaborative campaign with their customers to understand and identify the commonalities in the features that most customers value, leverage it and turn it into the value proposition offered to customers. This value proposition can be used to gain the core market, even if it means losing some of the smaller customers.

5.3.1.4 Create the environment for value innovation: **enabler for service, product and delivery**

- NCP Alcohols should create a “customer focused” environment with on-going communication on customer requirements and feedback on customer satisfaction. This should include electronic surveys to customers and stakeholders. Everyone within the company needs to be involved by understanding, what the customer needs and how to deliver on these needs.

Customer-driven innovation should become deeply ingrained in operations at NCP Alcohols to realize its true value from an external perspective.

- Concurrently all outstanding achievements in meeting and exceeding customer expectations should be rewarded via a suitable reward and recognition programme which will address the internal marketing of NCP Alcohols.

5.3.2 Adapting the value chain via process adoption

The second recommendation is for NCP Alcohols to adapt the current value chain by adopting business process re-engineering of certain domains within its value chain. The company has the potential to reap considerable economic benefits by analysing, re-engineering and adopting:

- Lean Six Sigma methodology
- Technology as a driver to improve efficiency and the
- Balanced Score Card

Figure 5.2 presents an overview of the process adoption with the domains of the current value chain. The narrative of certain examples and the benefits are tabled thereafter.

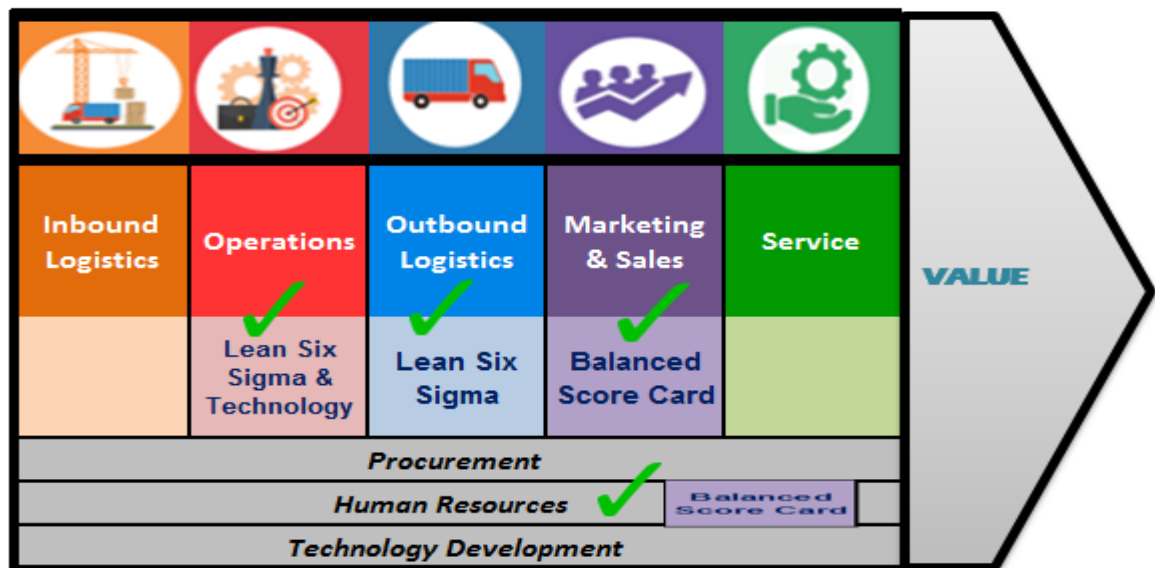


Figure 5.2: Showing an adapted value chain for NCP Alcohols by adopting Lean Six Sigma, the Balanced Scorecard and Technology

Operations

- Using technology as an enabler, processes in the Fermentation plant can be automated. The automation, together with on-line sampling and quality monitoring equipment will eliminate the need for a separate operator for the fermentation plant. This will not only reduce the head-count in the Operations division but will reduce labour costs related to overtime in the area.
- Lean Six Sigma – one of the waste streams in manufacturing according to Lean Six Sigma principles is over-production or carrying excess stock of product. This is often the result of trying to maximize plant and equipment usage and labour usage or because of non-synchronized processes. However, too much stored product can result in negative consequences, such as high carrying costs and increases risk in terms of fire, theft and injury due to excessive handling of the material. Using the Lean Six Sigma approach in the operations domain with the business to business interface discussed earlier, the holding stock can be reduced. By understanding customer demand and with careful planning, NCP Alcohols can schedule production and resources more accurately and efficiently, reducing overproduction. The DMAIC methodology can be used to determine root causes for variability. This approach will reduce cost in terms of stock days and reduce risk in terms of fire, theft and injury by excess storage or over production.
- Like overproduction, excess inventory is also a type of waste in terms of Lean Six Sigma. The Engineering department at NCP Alcohols often carry excess spares due to equipment breakdown. This results in significant amounts of funds being committed unnecessarily. Risks of theft, damage during storage, labour utilization for stock take, monitoring and control also increase costs related to this storage. Lean Six Sigma principles such as Just in time and Total Productive Maintenance (TPM) can assist in alleviating these issues to reduce storage costs and theft risks.

Outbound Logistics

- Turnaround time for vehicle loading can be improved at NCP Alcohols by mapping out the process and eliminating non-value adding process steps, such as unnecessary waiting time. Using the Lean Six Sigma DMAIC methodology, the process efficiency can be improved and the labour resources can then be used for other functions in the area.

Procurement

Molasses, the key raw material in the manufacturing process at NCP Alcohols is sourced both locally and globally. Planning and scheduling of deliveries and material quality is crucial for the successful operation of the manufacturing plant.

- Using Lean Six Sigma tools such as the DMAIC process and Value Stream Mapping for the procurement of molasses, NCP Alcohols procurement department can enhance their value proposition within the company with improved planning and scheduling of purchases that affect the currency situation and storage capabilities which will improve the timing of the financial spend and add to the bottom line.

Marketing and sales

- The BSC is a strategic tool and system to enhance track trace and review. Targets can be set to this division while KPIs are monitored. This is discussed in further detail under 5.3.3 below.

Human Resources

- The BSC pillar of growth and learning could be leverage for TPM. Generally, plant operators are not viewed as members of the maintenance team at NCP Alcohols. One suggestion in this regard is to use the BSC as a performance tool and the growth aspect must be that operators are flexible and must be trained with the with engineers to perform many daily equipment maintenance and fault-finding tasks. Operators who understand the

machinery, and can identify potential problems, can correct issues before they impact production—thus reducing downtime, production and inventory costs.

The cost savings from the recommendations above will improve the company's ROI and profit margin.

5.3.3 Adopting the Balanced Score Card as a Performance Management Tool

Some areas of the ISO 9001 standard and BSC are common in nature and content. Due to commonalities that exist between the ISO 9001 QMS and the BSC framework, it is recommended that NCP Alcohols implement the BSC as their performance management tool. The BSC will aid the alignment of the business strategy and link the company's long-term strategy with its short-term financial goals.

The BSC will assist NCP Alcohols to track financial results while monitoring progress in building the capabilities needed for growth.

The QMS contributes to productivity, competitiveness, customer satisfaction and continual improvement while the BSC translates strategy and vision into critical success factors. There is therefore the possibility of integrating the two systems as a consolidated strategic tool to serve as a "common language for strategic improvement at NCP Alcohols. Figure 5.3 below shows how the QMS and BSC can be integrated and aligned to be used as a strategic tool by NCP Alcohols, to achieve business excellence.

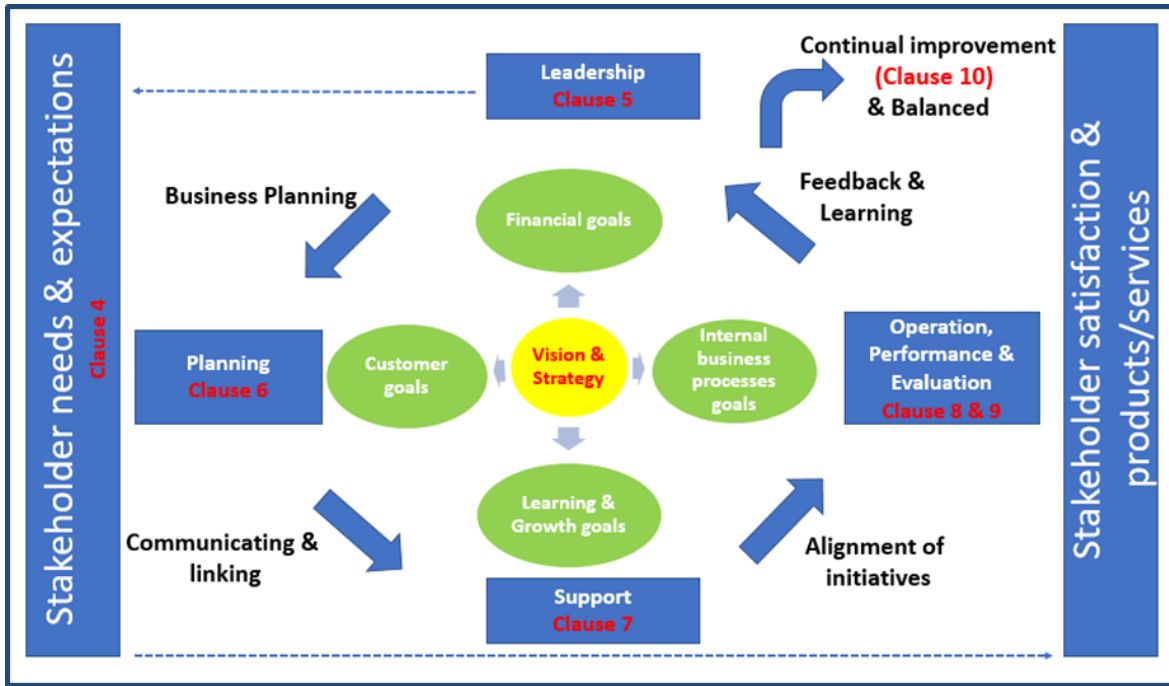


Figure 5.3: Showing integration of BSC with ISO 9001:2015 system

Recommended critical success factors on the four perspectives is illustrated in Figure 5.4 below.

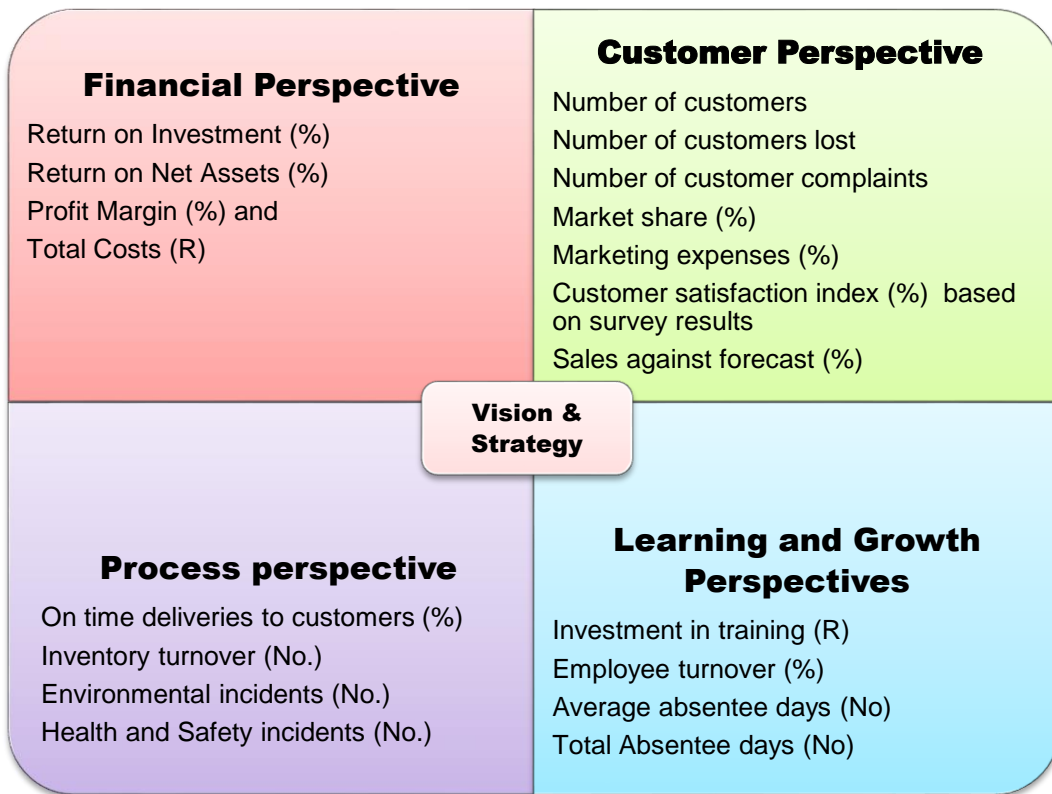


Figure 5.4 Showing recommended critical success factors for NCP Alcohols on the on the four perspectives of the BSC.

5.3.4 Change in leadership approach at all levels at NCP Alcohols

Like other businesses across the globe, NCP Alcohols must compete in a volatile, uncertain, complex and ambiguous (VUCA) business environment. NCP Alcohols management team are faced with numerous challenges including a rapidly aging workforce who must be replaced with a younger, “techno savvy” generation.

Visionary leadership is essential for survival and success in today’s VUCA business environment. To counter the volatility, NCP Alcohols executive team must have clear vision of where they want the company to be in three to five years. Decisions must be made to counter the turbulence while keeping the company’s vision in mind. Uncertainty is countered with understanding which requires the management team of NCP Alcohols to stop, look and listen and to keep the lines of communication open in all directions, i.e. with employees, customers, suppliers and other stakeholders. Teamwork and collaboration with the various stakeholders is essential. Clarity is required to counter the complexity. The management team must be able to decipher the relevant information from the chaos. Ambiguity is countered with agility which requires that ability to communicate across the company and apply solutions quickly.

Over the years, the concept of leadership has evolved from the “Industrial Age”, where the manager was relevant to the “Information Age”, where the leader was relevant. The current era where leaders must survive and thrive in has been termed “The Imagination Age” which now requires a “Neuroleader” (Figure 5.5). Neuroleadership requires developing new mindsets and behaviours and unlocking Performance, Innovation, Collaboration and Agility skills.

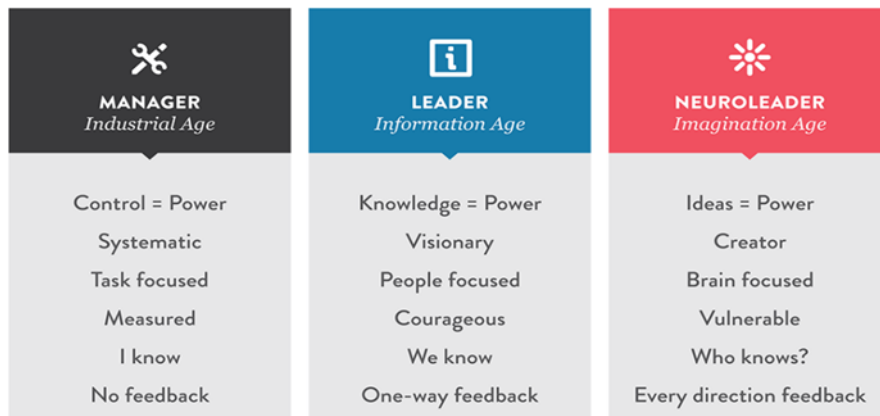


Figure 5.5: Showing the evolution of leadership

The recommendation is for a focused leadership development programme to be implemented that will transform NCP Alcohols leaders at different levels in the organisation. This formal programme should incorporate the transition to Neuro-Leadership, a critical success factor for leading in today's VUCA world.

NCP Alcohols aging workforce will be a critical challenge for continuity and succession planning. This recommendation offers integration of the newer and older generation with a whole new, contemporary set of skills required in the current business environment.

<p>Volatility <i>Nature, speed, volume, magnitude and dynamics of change</i></p> <p>Vision: Leaders need to be able to take strategic action and probe changes that will ensure business continuity</p>	<p>NCP Alcohols can use innovation to respond to the volatile business environment. E.g. The constant fluctuations in exchange rates affect revenue streams generated through local and export orders. The Sales and Marketing team can manage local and export customer orders to maximise profits.</p>	Line of Sight
<p>Uncertainty <i>The lack of predictability of issues and events</i></p> <p>Understanding : NCP Alcohols leaders must focus the resources of the business on understanding the needs of customers, the economic system around them, and the moves of the competitors.</p>	<p>Collaboration with the relevant stakeholders will enable NCP Alcohols to gain a better understanding on the requirements to be met. E.g. To improve delivery of product to customer, NCP Alcohols must collaborate with the transport service providers to understand the challenges and implement solutions together.</p>	
<p>Complexity <i>The compounding of issues and the chaos that surrounds an organisation</i></p> <p>Clarity: Creating alignment around strategy, vision, mission, goals, and objectives in a complex business environment is essential for NCP Alcohols leaders.</p>	<p>Optimal performance by the NCP Alcohols team is essential in realising the company vision and mission and achieving the goals and objectives. E.g. Customer orders need to be fulfilled right the first time.</p>	
<p>Ambiguity <i>The haziness of reality and the mixed meanings of conditions</i></p> <p>Agility: NCP Alcohols leaders must have the ability to make swift decisions that are innovative and will assist in creating an environment that is value centred.</p>	<p>Agility fuels execution and the key to achieving this is simplification of processes and systems. E.g. NCP Alcohols should be able to change it's processes to satisfy the various customer requirements with minimal down time.</p>	

Figure 5.6: Showing the typical response required of a Neuroleader to a VUCA environment with practical examples for NCP Alcohols

The previously identifiable boundaries in the business environment has now become permeable, making it difficult for businesses like NCP Alcohols to navigate their way to success. The fastest way to success is through guidance by well-equipped leaders who can create line of sight in within the organisation.

The recommendations (Figure 5.6) above will address the opportunities for improvement, that were highlighted in the research, i.e. use continual improvement to drive efficiencies, improve productivity and performance, improve risk management, improve information management and improve strategy execution through “line of sight”.

5.4 Limitations of the study

The study had a limited scope as it only covered NCP Alcohols, which is based in Durban in the province of KwaZulu Natal. It therefore provides an intrinsic view that is limited to one geographic region within South Africa.

The sample size was limited to 53, which is a small sample to draw meaningful conclusions from.

The study assumed a certain level of knowledge and understanding of the management systems from the respondents. Respondents without prior knowledge and understanding of the systems would not have been able to complete the questionnaire accurately.

The research was conducted at a specific point in time and represents the perceptions of the staff employed by NCP Alcohols at that particular time. A change in staff complement could yield results different to that obtained from the study.

5.5 Recommendations for future studies

A recommendation for future study is to determine the actual cost benefits of implementing the recommendations made in this study.

5.6 Conclusion

The study has achieved the objectives that were stated. International management systems can be strategically aligned to improve efficiencies and effectiveness at NCP Alcohols. However, business excellence can be achieved by integrating other business tools such as Lean Six Sigma, Technology, Balanced Scorecard and Value Innovation into the current integrated management system.

Bibliography

Abrahamsson, S., 2010. *Integrated Management Systems – advantages, problems*. Gotland University.

Ali, A. A., 2014. *The impact of decision makers' alignment on organisational performance*. International Journal of Academic Research, Volume 6, pp. 357-367.

Al-Wattar, O. M. A., 2016. *Enterprise risk management analysis – Case study of a Petrochemical company in Qatar*, Qatar: Lund University.

American Society for Quality. 2016. What is ISO 9001:2015-Quality Management Systems? [Online]. Available at: <http://asq.org/learn-about-quality/iso-9000/iso-9001-2015>. [Accessed: February 17th, 2017].

Arafat, M. Y., Warokka, A., and Dawi, S. R. 2012. Does Environmental Performance Really Matter? *Journal of Organizational Management Studies*, Vol. 2012.

Baker, J. D. S., 2011. Conceptualizing the dynamic strategic alignment competency. *Journal of the Association for Information Systems*, Vol. 12, pp. 299-322.

Balakrishnan, D., Durai, A. K., 2011. A study on ISO 9001 quality management system (QMS) certifications – reasons behind the failure of ISO certified organizations. *Journal of Research in International Business and Management*, Vol. 1, No.6, pp. 147-154.

Bhatia, M. S. 2013. *Assessing the Impact of Quality Management Systems on Business Performance*. MSc. Montreal: Concordia University.

Bürgi, J. F. W., 2014. *Improving Sustainable Performance of SMEs. The Dynamic Interplay of Morality and Management Systems*. Geneva: Globethics.net.

Carvalho, K. M. P., Picchi, F., Camarini, G. and Chamon, E. M. Q. O., 2015. Benefits in the Implementation of Safety, Health, Environmental and Quality Integrated System. *IACSIT International Journal of Engineering and Technology*, vol.7, no. 4, pp. 333 – 338. [Online]. Available: <http://www.ijetch.org/vol7/814-CE058.pdf>

[Accessed: April 14th, 2017]

Ceyhan, C., 2012. *Occupational Health and Safety Hazard identification, risk assessment, determining controls*, : Middle East Technical University.

Chen, L., 2015. *Sustainability and company performance*. Thesis. Linköping University. [Online]. Available: www.ceibs.edu/sites/default/files/u31/Lujie%20dissertation.pdf.

[Accessed: March 4th, 2017]

Cooper, D. R. & Schindler, P. S. 2014. *Business research methods*. 12th ed. New York: Mc-Graw Hill.

Creswell, J.W. 2014. *Research Design: Qualitative, Quantitative and Mixed Method Approaches*. 4th ed. Sage, California.

Croft, N., 2012. *ISO 9001:2015 and beyond - Preparing for the next 25 years of quality management standards*. [On-line]. Available: <https://www.iso.org/news/2012/08/Ref1633.html>. [Accessed: March 29th, 2017]

De Joussineau, H. 2012. *Obstacles when facing ISO 14001 EMS implementation for organizations in developing countries*, Thesis. Stockholm University.

Du Toit, W. J. 2012. *The relationship between health and safety and human and human risk taking behaviour in the South African Electrical Construction industry*. Thesis. Nelson Mandela Metropolitan University.

Emel, K. 2014. Shopping centre customer service: creating customer satisfaction and loyalty. *Marketing Intelligence and Planning*, vol.32, no.4, pp. 528 - 548.

Esi, Y. 2012. *The effect of health and safety standards on productivity in Ghana rubber estates limited*. MBA. University of Science and Technology.

Fernández-Muñiz, 2012. Occupational risk management under the OHSAS 18001 standard: analysis of perceptions and attitudes of certified firms. *Journal of Cleaner Production*, vol. 24, pp. 36 - 47.

Fonseca, L. M., 2014. From quality gurus and TQM to ISO 9001:2015: A review of several quality paths. *International Journal for Quality Research*, vol. 9, no.1, pp. 167 - 180.

Granite State Quality Council, n.d. *The Malcolm Baldrige Criteria for Performance Excellence*. New Hampshire : Baldrige National Quality Program.

Gupta, P. K., 2011. Risk management in Indian companies. *Journal of Risk Finance*, 12 (2), pp. 121 - 139.

Hough, J., Thompson Jr, A. A., Strickland III, A. J. and Gamble, J. E. 2011. *Crafting and Executing Strategy*. 2nd ed. McGraw-Hill Education, Berkshire.

Ismail, L. B. 2012. *An evaluation of the implementation of Total Quality Management (TQM) within the construction sector in the United Kingdom and Jordan*. Doctoral thesis. University of Huddersfield.

International Organisation for Standardisation, 2009. *Selection and use of the ISO 9000 family of standards*. [Online]. Available: <https://www.iso.org/search/x/query/selection%2520and%2520use%2520of%2520the%2520ISO%25209000%2520series%2520of%2520standards>

[Accessed 3 April 2017].

International Organisation for Standardisation, 2015a. *Debunking the myths*. [Online]. Available: <https://www.iso.org/search/x/query/ISO%25209001%2520debunking%2520the%2520myths> [Accessed 31 March 2017].

International Organisation for Standardisation, 2015b. *Introduction to ISO 14001:2015*. [Online]. Available: <https://www.iso.org/search/x/query/Introduction%2520to%2520ISO%252014001%25202015> [Accessed 3 April 2017].

International Organisation for Standardisation, 2015. *ISO 9001:2015 Quality Management System - Requirements*. Pretoria: South African Bureau of Standards.

International Organisation for Standardisation, 2015d. *Key benefits of ISO 14001*. [Online]. Available: <https://www.iso.org/search/x/query/Introduction%2520to%2520ISO%252014001%253A2015> [Accessed 3 April 2017].

International Organisation for Standardisation, 2015e. *Quality Management Principles*. [Online]. Available: <https://www.iso.org/search/x/query/quality%2520management%2520principles> [Accessed 3 April 2017].

International Organisation for Standardisation, 2016. *ISO in brief*. [Online]. Available: https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/isoinbrief_2015.pdf [Accessed 31 March 2017].

International Organisation for Standardisation, 2017. *About us*. [Online] Available: <https://www.iso.org/the-iso-story.html#24> [Accessed 31 March 2017].

Jiri, B. 2016. The employees of Baby Boomers generation, Generation X, Generation X, Generation Y and Generation Z in selected Czech corporations as conceivers of development and competitors in their corporations. *Journal of competitiveness*, vol.8, no. 4, pp. 105 – 123. [Online]. Available: <http://www.cjournal.cz/files/236.pdf>. [Accessed: May 2nd, 2017].

Jones, J. W.D. 2006. *Principles of LEAN*. 1996 ed. New York. Simon and Schuster.

Jovanović, Z. K. 2009. Using Balanced Scorecard to Improve Environmental Management System. *Journal of Mechanical Engineering*, vol. 55, no.4, pp. 262-271.

Kaplan, R. S. 2010. Conceptual Foundations of the Balanced Scorecard, Harvard Business School. [Online]. Available:

<http://www.hbs.edu/faculty/Publication%20Files/10-074.pdf>.

Accessed: April 7th, 2017].

Kaupila, O. 2014. Integrated HSEQ Management Systems: Development and trends. *International Journal for Quality Research*, Issue 9, no.2, pp. 231–242.

Khan, W. A., Mustaq, T., and Tabassum, A. 2014. Occupational Health and Safety Risk Analysis. *International Journal of Science, Environment*, vol.3, no.4, pp. 1336 - 1346.

Kiatkulthorn, K., and Sundstedt, F. 2016. *The effect of ISO 14001 implementation on SME innovation improvement and performance*. Thesis. Hogskolan. I. Gavle

Kingsinger, P., Walch, K. 2012. Living and leading in a VUCA world. *Thunderbird University*. [Online]. Available: <https://thunderbird.asu.edu/about/knowledge-network>. [Accessed: April 5th, 2017].

Kothari, C. R. 2011. *Research methodology: methods and techniques*, New Age International.

Kursunluoglu, E. 2011. Customer service effects on customer satisfaction and customer loyalty: a field research in shopping centres in Izmir city-Turkey. *International Journal of business and social science*, vol.2, no.17, pp. 52-59.

Lemke, S. W., 2015. *Inventory Optimization in Manufacturing*, : Walden University.

Le Roux, C. 2012. *Strategising for sustainability: A measurement tool*. Thesis (Masters). University of Pretoria. [Online]. Available: <https://repository.up.ac.za/handle/2263/24535>.

[Accessed: March 4th, 2017].

Lieder, M. 2014. *Integrated evaluation of resource efficiency and cost effectiveness in production systems*. Stockholm: KTH Royal Institute of Technology.

Lushi, I., Mane, A., Kapaj, I and Keco, R. 2016. A literature Review on ISO 9001 standards. *European Journal of Business, Economics and Accountancy*, Vol. 4, no. 2, pp. 81 - 85.

Manders, B., 2014. *Implementation and Impact of ISO 9001*. PhD. Erasmus Research Institute of Management.

Mangula, M. S. 2013. Effect of Quality Management Systems (ISO 9001) Certification on Organizational Performance in Tanzania: A Case of Manufacturing Industries in Morogoro. *International Journal of Technology enhancements and emerging engineering research*, vol.1, no.1, pp. 14 – 19.

Martin, A. 2016. *ISO 9001 Impact on Operational Performance*. Oman: Oman College of Management Technology. [Online]. Available: <http://www.hk5sa.com/icit/2.4~Oman-Adalia.pdf>

[Accessed: April 6th, 2017]

Masejane, T. P. 2012. *Quality Management and Organisational Performance in the Maluti-A-Phofung Municipality in the Free State Province*. MBA. University of South Africa.

Mauborgne, W. C. K. a. R., 2015. *Blue Ocean Strategy, How to create uncontested market space and make the competition irrelevant*. Expanded edition ed. Boston: Havard Business Review Press.

McKinley, K. 2016. *ISO 9001:2015 for Small Enterprises. What to do?* [Online]. International Organisation for Standardisation. Available: <https://www.iso.org/publication/PUB100406.html> [Accessed: March 29th, 2017]

Meskovska, A., 2015. *How to make your QMS successful with ISO 9004.* [On-line] Available: <https://advisera.com/9001academy/blog/2015/04/28/how-to-make-your-qms-successful-with-iso-9004/> [Accessed: April 1st, 2017]

Min, J. Z., 2015. *The alignment of integrated management systems and business objectives : a case study approach*, : Southern Cross University.

Morfaw, J. 2009. *Total Quality Management: a model for the sustainability of projects and programs in Africa.* Lanham: University Press of America.

Muhammad, N. 2014. *Corporate environmental performance and its impact on financial performance and financial risk: Evidence from Australia.* Thesis, Doctor of Philosophy (PhD). University of Waikato, Hamilton, New Zealand. [Online]. Available: <http://hdl.handle.net/10289/8859>. [Accessed: April 9th, 2017].

Nagy, A., 2014. *The Role and Responsibility of the Environmental, Health & Safety Manager in establishing an organization's commitment towards environmental stewardship and workplace safety.* Thesis. Rochester Institute of Technology.

Nassor, F. M., 2015. *The impacts of ISO 9001 Quality Management System implementation on employees' performance of pension funds.* Tanzania: Open University of Tanzania.

National Institute of Standards and Technology, 2015. *Baldrige Excellence Framework. A System's approach to improving your organisations performance,* Gaithersburg: Baldrige Performance Excellence Program. [Online]. Available: https://www.nist.gov/sites/default/files/documents/2017/04/28/2015_2016_Baldrige_Framework_BNP_Free_Sample.pdf. [Accessed: March 30th, 2017].

Norhasimah, M. N., Bahari, N. A. S., Adnan, N.A., Kamal, S. M. Q. A. S., and Ali, I. M. 2016. The Effects of Environmental Disclosure on Financial Performance in Malaysia. *Procedia Economics and Finance*. In: Department of Business Management and Accounting, 7th International Economics and Business Management Conference. 5th and 6th October 2015. *Procedia Economics and Finance*, vol.35 (2016), pp. 117 – 126. [Online]. Available:

https://ac.els-cdn.com/S2212567116000162/1-s2.0-S2212567116000162-main.pdf?_tid=82aa57c0-b2d3-11e7-9754-00000aab0f01&acdnat=1508200895_7b4c8739a562e4673a288d4f21cceb6

[Accessed: March 30th, 2017]

Oliveira, O. D. 2013. Guidelines for the integration of certifiable management systems in industrial companies. *Journal of Cleaner Production*, Vol. 57, pp. 124-133.

Omwenga, P. M. 2016. *An analysis of factors affecting customer satisfaction at Safaricom outlets in Nairobi Central Business District*. Thesis. Strathmore University. [Online]. Available: <http://su-plus.strathmore.edu/handle/11071/4788>

[Accessed: March 30th, 2017]

O'Neill, E. D. 2013. *A Value Chain Analysis of Tuna Industry in Ghana*. MSc. Universidade do Algarve.

Parisi, C., 2013. The impact of organisational alignment on the effectiveness of firms' sustainability strategic performance measurement systems: an empirical analysis. *Journal of Management & Governance*, Vol. 17, pp. 71-97.

Phoya, S. 2012. *Health and Safety risk management in building construction sites in Tanzania*. Thesis. Chalmers University of Technology.

Rebelo, M.F., Santos, G., Silva, R. 2014. A Methodology to Develop the Integration of the Environmental Management System with Other Standardized Management

Systems. *Computational Water, Energy, and Environmental Engineering*, Volume 3, pp. 170-181.

Yusuf, R. M., Eliyana. A., and Sari, O. N. 2012. The Influence of Occupational Safety and Health on Performance with Job Satisfaction as Intervening Variables. *American Journal of Economics*, Vol (special issue), pp. 136-140.

Sekaran, U. and Bougie, R. 2013. *Research methods for business: a skill-building approach*, 6th ed. Chichester, West Sussex, Wiley.

Sickinger-Nagorni, R., 2016. *The new ISO 9001:2015. Its opportunities and challenges*. Tampere University of Applied Sciences. [Online].
Available: <https://www.iso.org/about-us.html>
[Accessed: March 31st, 2017].

Suchánek, P., Richter, J., and Kralova, M. 2014. Customer Satisfaction, Product Quality and Performance of Companies. Review of Economic perspectives, Vol.14, no.4. pp. 329–344.

The British Standards Institute, 2007. OHSAS 18001:2007- *Occupational Health and Safety Management System*.

The World Bank Group. 2012. *Toward a green, clean and resilient world for all. A World Bank Group Environment Strategy 2012-2022*. [Online].
Available at:
<http://www.worldbank.org/en/topic/environment/publication/environment-strategy-toward-clean-green-resilient-world>.
[Accessed: May 1st, 2017].

Tierweiller, A. 2016. An Exploratory Survey on the topic of Integrated Management Systems, *Brazilian Journal of Operations & Production Management*, no.13, pp. 184-193.

Tikkala, S. 2014. *Lean Six Sigma in a manufacturing lead time improvement project*. MSc. Lappeenranta University of Technology. [Online] Available: <http://www.doria.fi/bitstream/handle/10024/101921/Sampsa+Tikkala+-+Lean+Six+Sigma+in+a+Manufacturing+Lead+Time+Improvement+Project.pdf;jsessionid=C8EEDD657A0A9E2BED650B12395C1178?sequence=2>
[Accessed: April 12th, 2017].

Villar, A. 2012. *An empirical analysis of Integrated Management Systems*. PhD. Universitat de Girona.

Weinstein, J., 2012. *Transforming the strategic plan into a plan of action*, s.l.: Newberry Group.

Willar, D. 2012. *Improving Quality Management System Implementation in Indonesian Construction Companies*. MEngSc. Queensland: Queensland University of Technology.

Wilson, J. 2014. *Essentials of business research: A guide to doing your research project*, Sage.

Zairi, M., and Jarrar, Y. 2010. *Best Practice for Implementing the Balanced Scorecard*. European Centre for Best practice management. [Online] Available: <http://ecbpm.com/files/Performance%20Management/Best%20Practice%20for%20Implementing%20the%20Balanced%20Scorecard.pdf>
[Accessed: April 6th, 2017]

Zugelder, T. J. 2012. *Lean Six Sigma Literature: A Review and Agenda for Future Research*. MSc. Ohio State University. [Online] Available: https://etd.ohiolink.edu/!etd.send_file?accession=osu1331160007&disposition=inline
[Accessed: April 7th, 2017]



The Ethics Committee
Graduate School of Business & Leadership
University of Kwa-Zulu Natal
Westville Campus

28th February 2017

Dear sir/madam

Re: Gatekeeper's permission letter

I, Mr. P. W. Starling, Managing Director of NCP Alcohols (Pty) Ltd hereby consent Mrs. Lorraine Mudaly, student number 215076731 to conduct research entitled "**The strategic alignment of integrated management systems and its impact on efficiencies and effectiveness at NCP Alcohols**", with the staff at the NCP Alcohols facility.

Since a quantitative research approach has been adopted for this study, I understand and consent to the administration of a suitable research questionnaire to the staff of NCP Alcohols.

Mrs. Mudaly agrees to abide by the company's policies, procedures and code of conduct whilst conducting the said research.

I can be contacted on (031) 560 1225, should you have any queries or concerns in this regard.

Yours sincerely

A handwritten signature in black ink, appearing to read "P.W. Starling", written over a horizontal line.

P.W Starling
Managing Director

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C-A PEERS DE NIEUWBURGH * (Chairman)
PWB STARLING (Managing Director)
B MEEUS *
BMA VERBRUGGEN *
* Belgium

Appendix 2 Informed Consent



15 May 2017

5-Minute International Management Systems Survey

You are invited to participate in a survey on the use of International Management Systems at NCP Alcohols as part of a study that is currently being conducted on “The strategic alignment of integrated management systems and its impact on efficiencies and effectiveness at NCP Alcohols”.

All employees and temporary employees at NCP Alcohols are requested to complete the survey which will aid in sourcing the relevant data required to conduct this study. It is very important that we understand your view on the subject for this study to be successful. It will take approximately 5 minutes of your time to complete the survey.

If you are keen to participate in the survey, please click on “[Start Survey](#)” to continue. PLEASE COMPLETE THE SURVEY ON OR BEFORE **23 May 2017**. [Start Survey](#)

PLEASE NOTE: *Your participation in this research is entirely voluntary and all information supplied will be treated in a confidential manner. Any information submitted cannot be used against you, and the collected data will be used for purposes of this research, however, your involvement is both for academic purposes as well as to improve the company's management systems. There are no financial benefits or rewards offered for participating in this survey and data collected will be stored in secure location and destroyed after 5 years. There are no foreseeable risks associated with this study, however, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. Data from this research will be reported only in the aggregate and your information will be coded to maintain confidentiality.*

Contact: Lorraine Mudaly on 0824477028 or via e-mail at lorraine@ncpalcohols.com for more information regarding the survey.

If you are keen to participate in the survey, please click on “[Start Survey](#)” to continue. PLEASE COMPLETE THE SURVEY ON OR BEFORE **23 May 2017**.

[Start Survey](#)

Questionnaire created and administered via QuestionPro

INTR
O

[Add Question](#)

Settings Copy Logic Preview ⋮

Dear employee of NCP Alcohols

Thank you very much for your time and support. Click "I agree" if you are happy to participate in the survey.
Please start with the survey by clicking on the **Next** button below.
Click "Done" when you have completed the survey.

I Agree

Q1

Section A: Biographical Data

[Add Question](#) [Page Break](#) [Separator](#)

Q2

Name

Answer text

Q3

*** Gender**

Male

Female

[Add Question](#) [Page Break](#) [Separator](#)

Q4

* Occupational Level in the company

- Executive
- Senior Management
- Middle Management
- Junior Management/Technically skilled
- Semi-skilled
- Other

Add Question

Page Break

Separator

Q5

* Division

- Corporate
- Marketing
- Supply Chain/Distribution
- Operations

Add Question

Page Break

Separator

Q6

* Department

- Compliance & Business Systems
- Engineering
- Finance and Administration
- Marketing
- Procurement
- Production
- Quality
- SHEQ
- Site Logistics
- Supply Chain/Distribution
- Utilities

Q7

* Age

- < 21 years
- 21 - 29 years
- 30 - 39 years
- 40 - 49 years
- 50 - 59 years
- 60 - 65 years

Add Question

Page Break

Separator

Q8

* Your current period of employment

- < 5 years
- 5 - 10 years
- 10 - 20 years
- 20 - 30 years
- > 30 years

Add Question

Page Break

Separator

Q9

Section B

Statements about International Management Systems at NCP Alcohols

Instruction

Kindly examine the statements below and signal, based on your experience, the degree with which you agree or disagree with the statements.

Add Question

Page Break

Separator

Q10

* The company focuses on customer requirements and expectations.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

[Add Question](#) [Page Break](#) [Separator](#)

Q11 * **The ISO 14001 system suits the business needs**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

[Add Question](#) [Page Break](#) [Separator](#)

Q12 * **Implementation of the OHSAS 18001 system has reduced the number of injuries and illnesses on site.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

[Add Question](#) [Page Break](#) [Separator](#)

Q13 * **Managements systems have aided in streamlined documentation and improved communication.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

[Add Question](#) [Page Break](#) [Separator](#)

Q14 * **The company provides sufficient training and awareness related to the ISO 9001 system.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

[Add Question](#) [Page Break](#) [Separator](#)

Q15

* Implementation of the ISO 14001 system has enhanced the company's image/reputation.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q16

* I am allowed ample opportunity to participate in and contribute towards the Health and Safety system.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q17

* Information relevant to the management systems are readily available to the employees.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q18

* Having an ISO 9001 system motivates employees to do their jobs efficiently.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q19

* Information and Communication Technology is used strategically to improve processes within the Integrated Management System.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q20

* The OHSAS 18001 system is risk-based and allows for proactive rather than reactive mitigation to identified risks.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q21

* Management systems at NCP Alcohols have been tailored to fit the company and industry.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q22

* Continual improvement programs are always adopted by the company.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q23

* The ISO 14001 system is a flexible environmental management tool

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q24

* Implementation of the OHSAS 18001 system has improved employee awareness and behaviour in terms of health and safety.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q25

* Management systems are flexible rather than rigid.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Q26

* ISO 9001 standard implementation has improved the business performance over the years.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q27

* Implementation of the ISO 14001 system by the company has been good for the environment.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q28

* Implementation of the OHSAS 18001 system has improved the company's image.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator

Q29

* There is clear linkage between the company strategy and the management systems.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Add Question

Page Break

Separator