AN INTEGRATED SAFETY, HEALTH, ENVIRONMENT AND QUALITY MANAGEMENT SYSTEM FOR A MULTI-BUSINESS PACKAGING ORGANISATION IN SOUTH AFRICA

Submitted in fulfilment of the requirements of the degree of Doctor of Philosophy in Quality Management in the Faculty of Management Sciences at the Durban University of Technology

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May 2023

DATE: 11 April 2023

Prof. M Ramchander

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Manikam Michael Nadar

DEDICATION

This thesis is dedicated to my wife, Kesri Nadar, and my son, Prean Nadar, for their support during my studies for my degree in the Doctor of Philosophy in Quality Management.

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ABSTRACT

Organisations operate in a challenging and competitive environment that are primarily driven by the markets that the organisation serves, and these organisations rely on management systems to provide strategic direction that aligns with the goals of the organisation. As such, organisations typically progressively implement independently managed safety, health, environment, and quality management systems. However, these standalone management systems work in silos that are not synergised and can achieve improved outcomes if integrated into one coherent integrated management system (IMS) that is aligned to the strategic goals of the organisation. The theoretical framework of the study was based on the systems theory that views an organisation as an open system, that consists of sub systems that are sequenced and interact to form a holistic system that contributes to a final output. The conceptual framework was based on existing researched models to gain insight on the different IMS models as well as the challenges and benefits experienced by organisations globally in implementing an IMS. The strengths, weaknesses, opportunities, and threats of the researched organisation's independent safety, and health, environment, and quality (SHEQ) management systems were researched to contextualise the organisation.

A mixed research methodology was used to gain an understanding of the current independent management systems and the challenges that the researched organisation faces towards implementing an integrated IMS. The challenges associated with the organization's independently management systems include ineffective use of resources, duplication of work, and the difficulty of managing independent systems. An IMS will address these challenges, however, implementing an IMS may pose challenges such as resistance to change and inadequate expertise. The management of change and the proposed structured IMS model together with the provision of the required skills and knowledge will aid in ensuring the successful implementation of the IMS.

An organisation must have clear IMS objectives that must be aligned to the strategic goals of the organisation, to ensure better, utilisation of the

organisation’s resources, management of cost, reduction in documentation and a change in the organisation’s SHEQ culture. The fourth industrial revolution provides an opportunity for the organisation to use a cloud-based document management system to enhance the organisation’s IMS.

Findings of the research support the notion of an IMS. Based on the researched models and the qualitative and quantitative research, a multi-dimension IMS model was formulated using the systems theory, and proposed strategies was articulated, that the researched organisation can adopt to implement an IMS. This study ascertained how the three-standalone safety, and health, environment and quality management systems can be unified into an integrated multi-dimensional model that could be possibly adopted by the metal division of the organisation across three business units located in three South African provinces.

The successful implementation of the IMS will involve reviewing the existing staff structure, integration of the existing documentation based on the proposed IMS model, conducting a SHEQ management review and auditing.

The research has extended the IMS theory by contributing knowledge on the IMS organisation structure, IMS document structure, IMS structure, proposed ISO IMS requirements and a proposed IMS model.

Keywords: ISO 45001:2018 OHSMS, ISO 14001:2015 EMS, ISO 9001:2015 QMS, industry 4.0, integrated management system, SHEQ

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
ASL	Annex Statutory Limits
BBS	Behavioural Based Safety
BSI	The British Standards Institute
COID	Compensation for Occupational Injuries and Diseases
DEFF	Department of Environmental, Forestry and Fisheries
DIS	Draft International Standard
EMS	Environmental Management System
EPR	Extended Producer Responsibility
GPD	Gross Domestic Product
HLS	High Level Structure
IEC	International Electrotechnical Commission
IPSA	Institute of Packaging South Africa
ILO	International Labour Organisation
IMS	Integrated Management System
ISO	International Organization for Standardization
JSE	Johannesburg Stock Exchange
KMO	Kaiser-Meyer-Olkin
OHSAS	Occupational Health and Safety Assessment Series
MetPac	Metal Packaging Association

MS	Management System
MSS	Management System Standard
NDP	National Development Plan
NEMA	National Environmental Management Act
NWMS	National Waste Management Strategy
OHSMS	Occupational Health and Safety Management System
PAS	Publicly Available Specification
PDCA	Plan, Do, Check and Act
PESTLE	Political, Economic, Social, Technological, Legal and Environment
PRO	Producer Responsibility Organisation
QA	Quality Assurance
QMS	Quality Management System
ROI	Return of investment
SA	South Africa
SEM	Structural Equation Modelling
SEP	Senior Engineering Personnel
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environment and Quality
SHER	Safety, Health, Environment and Risk
SHMS	Safety and Health Management System
SLR	Systematic Literature Review

SPC	Statistical Process Control
SPP	Senior Production Personnel
SQP	Senior Quality Personnel
SSHEP	Senior Safety, Health and Environment Personnel
SWOT	Strengths, Weaknesses, Opportunities and Threats

1 CHAPTER ONE: INTRODUCTION

1.1 Introduction

The management system standards of the International Organisation for Standardisation (ISO) are not compulsory but is regarded as a strategic tool for an organisation's success in a challenging global economy, hence a holistic integrated systems approach and alignment to the strategic goals of the organisation will be beneficial to the organisation in both the short and long term (Basaran 2018: 01). A management system comprises of a set of interrelated or interaction processes of an organisation that aims to achieve a specific objective (International Organisation for Standardisation 2018: 07). This study adopted the systems approach considering the management of interrelated business processes. This chapter begins with an introduction to the topic, by providing the context and background to the study and providing a justification for the study. Thereafter, the research problem is presented and the aims and objectives for the study are established. The methodology that is adopted to achieve the set objectives is alluded to and the delimitations, of the study is specified. The theoretical framework from within which the study could be explored and the conceptual framework that underpins the study is explicated. The chapter concludes with an outline of each of the chapters that comprise this thesis.

1.2 Context of the research

The metal packaging industry was valued at R5.9bn in 2018, accounting for 9.2% of the South African packaging market sector (Research and Markets report 2019:01). The researched packaging organisation is one of the five major metal packaging convertors in the country and the largest metal packaging organisation in Africa, that is listed in the Johannesburg Stock Exchange (JSE). The organisation's three metal packaging business units that are based in three provinces in South Africa forms the basis of this research study. Due to the business challenges and sensitivity of the information, the name of the organisation will remain anonymous. The three business

units of the organisation currently has independent managed safety and health, environment, and quality (SHEQ) management systems. The challenges of the organisation's independent management systems include inefficient use of resources, duplication of work and the complexity of managing the independent management systems. An IMS will overcome the challenges of the independent managed systems, however implementing an integrated SHEQ IMS possesses the challenges of resistance to change and a lack of skills and knowledge. The management of change and a structured IMS model together with the provision of the required skills and knowledge will aid in ensuring the successful implementation of the IMS.

This study seeks to research existing integrated management system (IMS) challenges, benefits and models and propose recommendations for a coherent IMS for all three business units.

1.3 Background to the research area

The South African manufacturing sector contributes 13% to the country's gross domestic product (GDP) and the sector contracted by 1.8 % during the fourth quarter of 2019 (Statistics SA 2020: 51). The case organisation's listing on the JSE has also evidenced a decline in its share price of around 90% over the past five years, hence any cost saving interventions would augur well for the organisation's long-term sustainability. Organisations often conduct business in a turbulent environment that is characterised by intense competition, changes in technology, new consumer markets and limited resources (Basaran 2018: 1). A prerequisite and key contributor to an organisation's long term profitable success in a global competitive market are management systems (Mariouryad, Golbabaei, Nasiri, Mohammadfam and Marioryad 2015: 18). Therefore, Quality Management Systems (QMS), Environmental Management Systems (EMS) and Occupational Health and Safety (OHS) have become a key factor in ensuring high-level quality products, commitment to environmental sustainability responsibility and employee's health and safety protection (de Oliveira 2013:124). However, organisations have deployed

independent SHEQ business management systems for the management of the same business processes (Mariouryad, Golbabaei, Nasiri, Mohammadfam and Marioryad 2015: 18) and quite often at the same time these organisations may duplicate costs and fail to harness opportunities for synergy that could accrue from a more integrated approach (Basaran 2018:2).

Although organisations may benefit from the traditional SHEQ business management systems that are managed independent, one coherent system will result in better resources allocation, improved organisation performance rather than independent managed systems (Talapatra, Santos, Uddin and Carvalho 2019: 1037). However, integrating multiple independent management system standards into a single IMS can be challenging (Zeng, Tam, and Le 2010: 1392). Furthermore, different business contexts present different constraints and barriers to integration (Rebelo, Santos and Silva 2015: 45). Hence a clear comprehensive understanding is required of the requirements of each management standard, the challenges and the benefits of an IMS and a supportive IMS model.

1.4 Research problem

The growth of international trade and an increase in domestic content in export is considered an important factor of a country's involvement due to a growing importance of global value chains (Bjelic and Kastratovic 2019: 394). South Africa's 2030 National Development Plan (NDP) aims to address the country's unemployment rate, poverty and inequality in order to achieve its set objectives. Therefore, South Africa (SA) needs to create jobs and improve productivity (Maluleke 2019: 03). ISO has a close relationship with the World Trade Organisation (WTO) and develops standards that are globally recognised and accepted. This supports international trade and allows South African organisations to grow, reduce unemployment and eradicate poverty (Aseeva 2016: 09). An IMS provides an organisation with a management system philosophy that enables an organisation to achieve strategic objectives (Basaran 2018: 02). Difficulties, and even failures, have been faced globally in the implementation of IMS and this is, partially, due to lack of any

formalized standard for IMS (Rebelo, Santos and Silva 2015: 45). Although the case organisation has certified SHEQ management systems, these systems are maintained and audited independently resulting in greater maintenance, resource allocation and auditing costs. These costs arise from the salaries of additional employees to audit, documentation duplication, maintenance of the independent SHEQ systems and the cost of external certification bodies to audit these systems independently. As part of the requirement of ISO certification, surveillance audits are conducted annually, and recertification audits are conducted every three years (South African National Standard ISO 9001 2015: iv). The certification for ISO is valid for three years and the typical cost per management system is R75 000 for year one certification and R40 000 per year for years two and three. This equates to R155 000 for three years and the certification cost can be reduced by auditing one IMS.

Furthermore, the researcher, who is the SHER manager for one of the three business units, has first-hand knowledge of the greater focus and higher resource allocation on product quality and insufficient resource allocation in the SHEQ management systems. For example, the employee allocation for the quality department for the KwaZulu-Natal business unit is 22 employees, whereas the safety, health and environment department only have two employees. The disproportionate allocation of resources has resulted in the organisation being unable to achieve its' one million injury free man hours and having to outsource portions of the environment management and health and safety management systems to ensure legal compliance. Morgado, Silva and Fonseca (2019: 04), contends that the ISO 45001:2018 health and safety management standard was built on the framework of ISO 9001 quality management standard and if organisations want to remain competitive, ISO 45001:2018 management system must be viewed as continual improvement initiative to existing management system that is necessary to compete globally. Jones (2018: 01) supports the notion that health and safety management systems must be driven by a continual improvement process that is supported by an organisation's quality management system. There is duplication in meeting the requirements of each independent system resulting in an inappropriate allocation of resources within the organisation (Sarkis and Dhavale 2015: 177). Hence, in an extremely competitive economic environment where a growing customer requirement

is the triple bottom line concept, it is counterproductive to allocate additional resources to manage the independent SHEQ management systems and to hold separate management review meetings for each management system with the entire management team.

Currently the organisation has unidimensional management systems for environment and quality and is in the process of implementing a unidimensional system for health and safety. These systems are managed independently requiring additional resources and the focus is not balanced amongst these systems. The organisation has therefore tasked the researcher with conducting research on an integrated management system. The hesitance of the senior management to change to an IMS stem from the researcher's discussion with the senior management, that the topic needs to be fully researched, understood and accepted before embarking on the integration process. The aim of this research is to move away from a one-dimensional management system and toward a multi-dimensional IMS, and such a shift in emphasis necessitates profound levels of knowledge, which case study research design may provide.

1.4.1 Justification for focussing on the research area.

The greatest difficulties that organisations face in integrating their multiple Management Systems (MSs), is not having an IMS model to support the integration process (Rebelo, Santos and Silva 2015: 46). Thus, the evaluation of the real situation, motivations, advantages, disadvantages, limitations, and models for implementation of stand-alone MSs versus IMS in real business context is an area where research is needed.

This research study evaluated the real existing situation, the motivations, the advantages, the disadvantages, and the limitations of stand-alone and integrated SHEQ Management Systems (MS) and developed a multi-dimensional SHEQ model in support of the integration process. It was envisaged that emanating from this research, a model could emerge to support the integration of the independent systems into one cost effective coherent integrated business management system

that would be easier to manage, that uses lesser resources to manage and that is aligned to a common strategy of the organisation. The key feature of the envisaged model focused on a multi-dimensional SHEQ model using the systems approach, thus setting it apart from current unidimensional models and this will involve using a multi-dimensional perspective that provides a holistic implementation strategy.

The three business units (divisions) of the organisation are based in three different South African provinces namely, Gauteng, Western Cape and KwaZulu-Natal. All the units are certified to ISO 9001:2015 and ISO 14001:2015 and these systems are currently managed and resourced by dedicated independent Safety, Health and Environment (SHE) and Quality Assurance (QA) departments. The three business units are currently not certified to ISO 45001:2018 OHS management system but initially intended to implement an independent managed OHS system that will be managed by the SHE department. The QA departments of each of these business units are resourced with a QA Manager, QA Technician, QA Foreman and QA Auditors. The Safety, Health, Environment and Risk (SHER) departments of each of these business units are resourced with a SHER manager and a SHER Officer. The researcher is of the view that the current human resources can be better utilised if structured into one department that manages an IMS.

Upon conducting a preliminary literature review on the topic, the researcher noted that that current discourse on IMS is limited to single dimension integration models and there are IMS implementation challenges that must be identified and actioned. The literature around findings of the empirical work already done and the limitations are presented in the context in chapter 2.

1.5 Aim of the study

The aim of this study is to ascertain the modalities for the multidimensional integration of standalone, safety, health and environment and quality management systems to be deployed in a multi-business packaging organisation.

1.6 Research objectives

The research objectives of the study are:

i. To understand the organisation's management objectives for the urgency of a multi-dimensional IMS using the qualitative interview research method.
ii. To ascertain employee's perception of the extent of leadership's commitment and the level of supporting resources, tools and techniques for an IMS, using a quantitative survey questionnaire.
iii. To ascertain the current business environment and develop strategies for the inherent risks and challenges in implementing an IMS, by conducting a systematic literature review (SLR) of research that was completed on another organisation's IMS implementations.
iv. To understand the structure and management of the current independent managed SHEQ management systems using a quantitative survey and qualitative interviews and
v. To develop a multi-dimension model to support the integration process of the independent systems into one cost effective coherent business management system.

1.7 Research questions

i. What is the urgency and benefits of implementing a multi-dimensional IMS?
ii. What is the extent of leadership's commitment and support of an IMS?
iii. What are the inherent risks and challenges of implementing an IMS and what strategies can be adopted to overcome these risks and challenges?
iv. How are the current independent SHEQ business management systems of the three business units of the corporate organisation structured and managed?
v. How can the different single dimension IMS models used globally be utilised to develop one cost effective coherent multi-dimensional IMS model?

1.8 Theoretical framework

The theoretical framework of a research study acts as a sieve or lens providing guidance on data to focus on, filters what critical data requires focus, clearly expresses the meaning or existing theory and it reveals the strength and weaknesses of the research study (Given 2012: 872). In this study, the theoretical framework was based on the process approach using the systems theory. Cornell and Jude (2015: 1), defines a system as a network of interrelated process and sub systems that interact as a link in synergy to achieve a common goal. A process is a set of interacting activities that transforms inputs into outputs (International Organisation for Standardisation 45001 2018: 6). Thus, an organisation comprises of processes that converts inputs into outputs to form sub systems and these sub systems are a linked in synergy that forms a system to achieve a set objective. The ISO standards allows an organisation to use the process approach, coupled with the PDCA cycle and risk-based thinking, to align or integrate its management systems (ISO 2015: ix). This study explores existing IMS models implemented by organisations globally in order to formulate a foundation for a conceptual framework that can be used to develop a multi-IMS.

1.9 Conceptual framework

The conceptual framework for this study outlines how the research problem was explored and provides a visual display of the research study ideas (Adom, Hussein and Agyem 2018: 439). The conceptual framework for this study is depicted in figure 1.1.

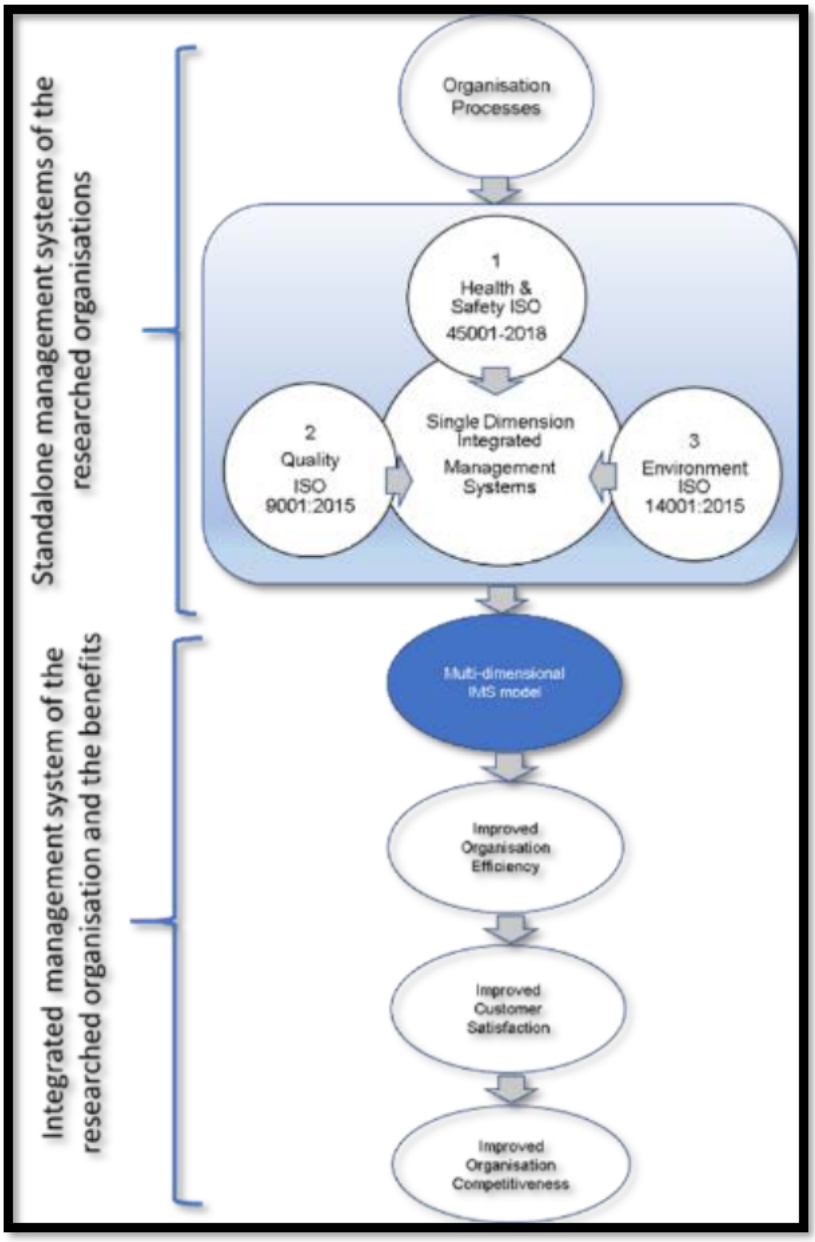

Figure 1:1 Conceptual framework

Source: Author's own construction

Although the organisation uses the process and business systems approach, these systems are not integrated into one coherent SHEQ business management system. Managing these business systems independently for the same business processes independently is counterproductive and therefore needs to be integrated into one coherent management system.

The theoretical framework and the conceptual framework of a study provides structure to the research and makes the research findings more acceptable to the theoretical constructs by assisting in the stimulation of the knowledge and the provision of an extension of knowledge (Adom, Hussein and Agyem 2018: 438).

1.10 Research methodology

Hair, Page and Brunsveld (2020: 5) states that the objective of business research is to predict and explain phenomena in an ever-changing business environment. Bairagi and Munot (2019: 2) and Saunders, Lewis and Thornhill: (2016: 5), define research as the systematic investigation to understand existing knowledge and to establish the contribution of new knowledge on the basis of continual improvement. Hence, business research can be defined as the methodical inquiry to understand an existing phenomenon to contribute to an improvement strategy. This research study adopted a mixed qualitative and quantitative method that was cross sectional in nature using the case study research design to provide a more in-depth understanding of the research problem to gain a more balanced perspective of the research.

The researcher used a representative sample for this study considering that it was not possible to get all employees in the research organisation to participate in the study. The sample size for a given population of 500 operational, middle and senior management employees of the three business units of the organisation was 217, which was considered to be representative as per Sekaran and Bougie's (2016: 294) population to sample size calculations. A 5-point Likert Scale questionnaire survey was administered to gather data from participants.

The quantitative data was analysed using the SPSS (version 27) statistical package using descriptive and inferential statistics. The descriptive statistics is presented in the form of charts and tables. The quantitative data reliability was ensured by targeting a Cronbach's alpha's recommended value of 0.700 (Gliem and Gliem 2003: 87). The ISO (Annex SL), high level structure was used as a framework to ensure data validity. Three Industry experts and the researcher's supervisor with experience in business management systems was used to test content and face validity and corrections was made based on review of the recommendations.

The qualitative part of the study was based on the outcome of the results from the quantitative phase. It comprised of nine online interviews with key safety, health, environment, quality, engineering, and production personnel. The questionnaire responses were analysed and used to refine the interview questions for the purpose of triangulation and deeper understanding of phenomena. One-to-one Skype interviews with participants was conducted. To ensure trustworthiness, notes were extracted from the interviews and confirmed with participants before commencing data analysis, Thematic data analysis was conducted using Nvivo version 12 software. Triangulation was used to ensure the trustworthiness of the study

1.11 Significance of the study

The research study will contribute to a better understanding of the structure, challenges and benefits of unidimensional and integrated management systems and will present a proposed IMS model, IMS organisation structure, IMS document structure, IMS structure, proposed ISO IMS requirements together with recommendations for an IMS.

1.12 Scope and delimitations of the study

The scope of the research was based on the organisation's metal packaging business units that produces primary packaging from tinplate and aluminium and is located in Gauteng, Cape Town and KwaZulu-Natal. The research study did not include the perception of administrative staff who do not have a direct impact on SHEQ, and the research study only represented the three metal packaging business units of the researched organisation. The data collected was used for academic purposes and the researcher has also commenced the IMS discussions with the executive management of the organisation. A copy of the thesis will be provided to the organisation's executive management for consideration of final recommendations.

1.13 Ethical protocols and research independence

Research ethical considerations are associated with matters of doing right or wrong to maximise benefits when conducting research on people or animals (Patten and Newhart 2018: 32). To ensure that the study was conducted ethically, participants anonymity and confidentiality was maintained. An "Informed Consent Letter" was given to the participants to ensure their voluntary participation in the study. The identification of participants was not disclosed in the research and the data and the information that was provided by the participants of this research was used for the sole purpose of this research. The organisation's human resource department provided approval and the general manager of the organisation provided a gate keepers' letter prior to commencement of this research study. DUT Institutional Research Ethics Committee approval was obtained prior to commencement of this study. Research independence was ensured by using a structured survey questionnaire and interview questions.

1.14 Structure of the Thesis

The thesis comprises of eight chapters and each chapter is organised as per the description below:

Chapter 1: Introduction

This chapter provides an introduction to the research topic, outlines the context of the research, introduces the research questions, provides the background of the research, justification for the research, the theoretical framework, the conceptual framework of the research and provides information on the aim of the study, specifies the objectives of the study and the research methodology.

Chapter 2: Context of the organisation and the study

This chapter undertakes a literature review of the research organisation, the strengths, weaknesses, opportunities and threats (SWOT) analysis of the three provincial business units and an overview of the study. The SWOT analysis provided the internal and external context that an organisation operates in and enabled the organisation to develop a long-term strategic plan for alignment to organisational goals.

Chapter 3: ISO 45001:2018 Occupational Health and Safety Management System, ISO 14001:2015 Environmental Management System and ISO 9001:2015 Quality Management System

This chapter provides an introduction to the fourth industrial revolution, an overview of the ISO technical committee, an overview of ISO management standards, trade effect of ISO management standards, objectives of ISO management standards, benefits of ISO management standards, and the elements of ISO 45001:2018 Occupational Health and Safety Management System, ISO 14001:2015

Environmental Management System and ISO 9001:2015 Quality Management System management standards.

Chapter 4: Integrated Management Systems

This chapter provides an extensive literature review on SHEQ IMS's. The discussion is based on extracts from relevant textbooks and prior academic research papers. The study focused on the gaps in current literature, different IMS models that are implemented by other organisations, the challenges that these organisations face, and the benefits derived in implementing an IMS.

Chapter 5: Research methodology

This chapter explains the design of the research and the rationale adopted for this study. The research methodology is presented, and the research paradigm is justified. The research population, research sampling, description of the research instruments, data analysis methodology, research validity, research trustworthy, research limitations, ethical protocols are presented.

Chapter 6: **Quantitative research findings and discussion**

This chapter presents the quantitative data analysis, sample data table, research instrument, reliability statistics, factor analysis, KMO and Bartlett's test, rotated component matrix, research questionnaire, scoring patterns, cross tabulations, structural equation modelling, summary of data analysis, and the chapter conclusion.

Chapter 7: **Qualitative research findings and discussion**

The Qualitative data analysis, thematic analysis, findings interpretation, gap analysis and the chapter conclusion are provided in this chapter.

Chapter 8: **Recommendations and conclusion**

This chapter presents the recommendations for actions to be taken to overcome IMS implementation challenges, the implementation of an IMS based on the literature review, the quantitative and the qualitative analysis, a conclusion of the research, the proposed multi-dimensional model for the organisation to implement to remain competitive and the contribution of the research. The chapter also reflects on future research work that can emanate from the research study.

1.15 Conclusion

Organisations comprise of multiple business processes, these processes make up sub-systems that comprises of a common final objective and according to the systems theory that implies that these processes, and sub systems are sequenced, linked and synchronised to form a complete system that achieves a predetermined objective. Globalisation has created challenges for South African organisations and MS's play an important role in optimising business objectives. Although independently managed business management systems may achieve objectives, greater efficiencies may be achieved if these independently management systems are integrated into one coherent management system. Hence organisations have implemented various IMS models as part of their organisation's improvement strategy and this research evaluates these IMS models, management systems integration challenges and benefits to develop a multi-dimensional IMS model but these IMS models are not multi-dimensional.

A brief overview of the researched organisation, the internal and external environment that the organisation is operating in, and the status of the organisation is provided in the context and background of the research. The justification for conducting the research provided reasons why the study needed to be conducted and formulated the research questions. The aim of the research provided the purpose of the research and provided the subsequent research problems, objectives and research methodology. The chapter also introduced the systems theoretical

framework that formed the foundation of the study and the conceptual framework that provide details on how the research was explored. The chapter concluded with the research scope, delimitations, ethical consideration and the structure of the thesis.

Chapter 2 will provide in greater detail the context of the organisation, the theoretical framework, existing IMS models and the range of debates and current discourse on IMS.

2 CHAPTER TWO: CONTEXT OF THE ORGANISATION AND THE STUDY

2.1 Introduction

This chapter provides the context of the organisation, the SHEQ internal Strengths, internal Weaknesses, external Opportunities, and external Threats (SWOT) analysis of the organisation, the theoretical framework of the study, the range of debates, and current discourse on IMS.

2.2 Context of the organisation

The organisation is the leading packaging manufacturer in Africa that operates from 18 sites in South Africa and has been listed on the Johannesburg Stock Exchange (JSE) since 1969. It specialises in packaging using different substrates comprising of paper, plastic and diversified metal packaging division (Anon 2021:1). This research is based on the independently managed SHEQ management systems of the diversified metal packaging division that produces primary packaging from tinplate and aluminium. The metal packaging division, a division of the organisation is the leading food and diversified metal can supplier in South Africa, manufacturing two piece and three-piece food cans, plain and lacquered ends, full aperture ends and easy-open and peel-off ends, polish cans, paint cans, aluminium, and tinplate aerosols cans.

This research is based on three metal packaging business units of the organisation's metal division and the product range of these three business units is presented in Table 2.1.

Table 2:1 Product range produced by the organisation's three business units

	Product range	Gauteng	Cape Town	KwaZulu-Natal
1	Food cans for the fish		✓	
2	Food cans for the fruit		✓	
3	Food cans for the meat	✓		
4	Food cans for baby milk	✓		
5	Medical ointment cans	✓		
6	Aluminium aerosol cans			✓
7	Tinplate aerosol cans	✓		
8	Shoe polish cans			✓
9	Paint cans			✓
10	Baked beans cans	✓		

***Source**: Author's own construction*

The product range as presented in table 2.1 for a diversified metal packaging market requires stringent product quality and product safety controls whilst ensuring a safe and sustainable environment for all stakeholders. A record of minutes from the organisation's Safety and Health Management Committee (2021: 7), Environment Management Committee (2021: 9), and Quality Management Committee (2021: 5) shows a strong focus on health and safety, the environment and quality as follows:

i. **Health and safety:** A safe working environment and compliance to occupational health and safety legislation and regulations is a core objective of the organisation. Minor and lost injuries are recorded, investigated, tracked and reported at plant and divisional level. The organisation has a behavioural based safety (BBS) reporting system that allows for immediate reporting and actioning of unsafe conditions and unsafe acts. The organisation has conducted a COVID 19 risk assessment and has implemented protocols to ensure compliance to COVID 19 regulatory and statutory requirements. Willis SA limited, is the organisation's risk and insurance partner that provides assurance of the organisation's group risk control standards. Annual Willis Blue health and safety audits are conducted by the organisation's risk control practitioners to facilitate compliance. Each of the organisation's branches has a dedicated Safety, Health, Environment and Risk (SHER) team that is responsible for managing

the branch's safety, health, environment and risk portfolio. Health and safety are guided by the group health and safety policy that is sanctioned by the organisation's group executives. Annual occupational health and safety legal audits are conducted to ensure alignment and compliance to any new regulatory or statutory requirements.

ii. **Environment:** The organisation recognises the challenges of producing sustainable packaging and the organisation's objective is to balance the benefit of extended product life that packaging provides and environmental sustainability. Environment sustainability is supported by the environment product life cycle assessment of the organisation. Figure 2.1 depicts the product life cycle assessment of the organisation that illustrates the measures that organisation has taken to minimise the environmental impact.

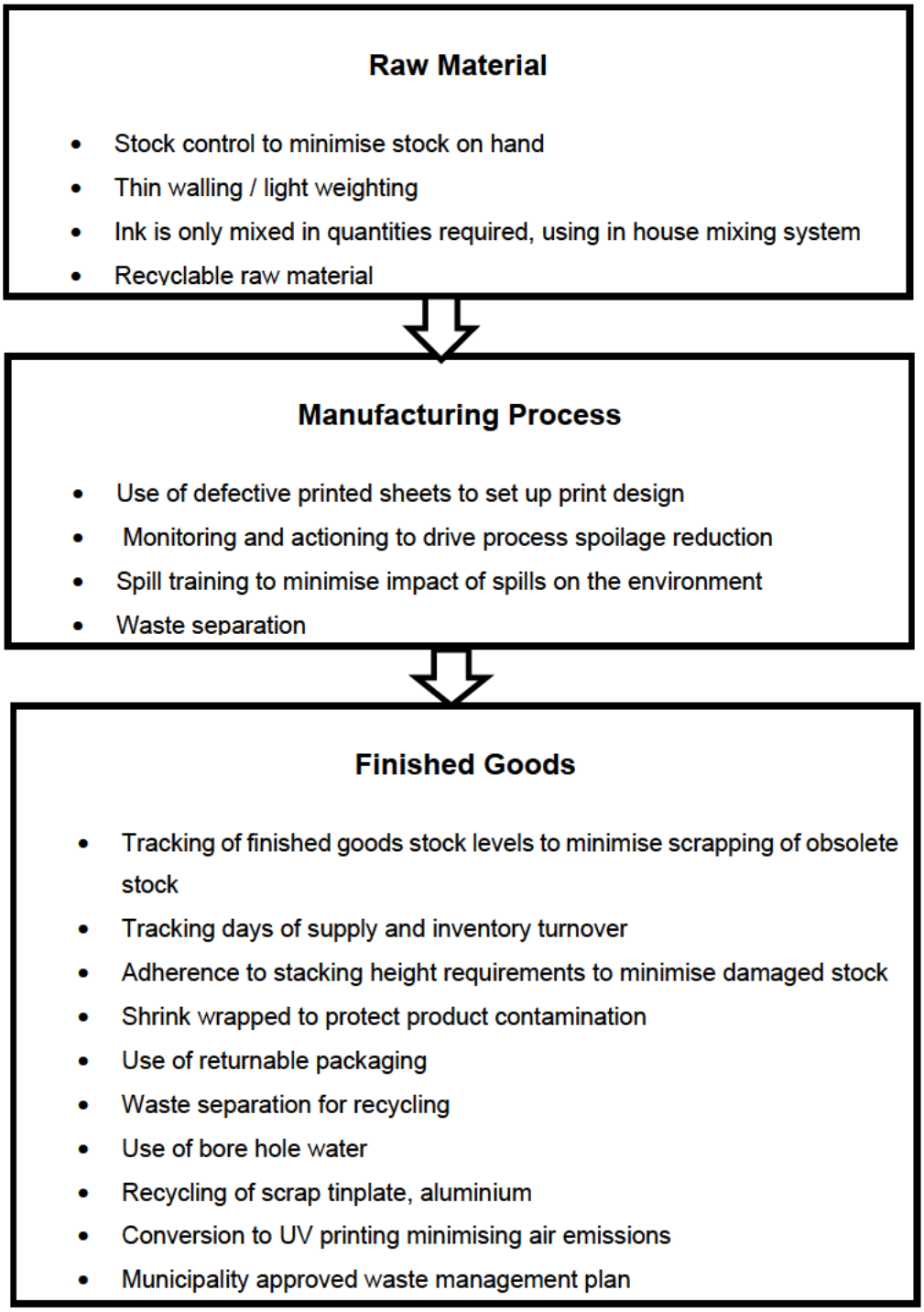

Figure 2:1 Product life cycle assessment

Source: *Environment Management Committee (2021: 7) minutes*

The organisation has an approved eThekwini municipality waste management plan and has identified and manages the different waste streams as illustrated in table 2.2.

Table 2:2 Organisation's waste streams

Waste Stream	Disposal / Recycle	Waste storage for collection
Used oil	Landfill	Stored in the hazardous bunded area
Scrap Metals	Recycled	In a 11 cubic meter waste skip
Contaminated rags	Landfill	In a 11 cubic meter waste skip
Fluorescent tubes	Recycled	Fluorescent tubes disposable container
Scrap pallets	Landfill	30 cubic meter waste skip
Tinplate (Skeleton, off-cuts, discs)	Recycled	Servitude on pallets - baled
Tinplate sheets	Recycled	Servitude on pallets - baled
Used Solvent, Lacquers, Inks	Treated and landfill	210L Drums in a hazardous bunded area
Lining compound	Treated and landfill	210L Drums in a hazardous bunded area
Copper chips	Recycled	210L drum in a locked copper wire store
Empty drums	Recycled	Servitude - area demarcated and bunded
Cardboard	Recycled	In a 30 cubic meter waste skip
Brown paper sleeve	Recycled	In a 30 cubic meter waste skip
Plastic strapping, wrapping, and netting	Recycled	In a 30 cubic meter waste skip
Office paper	Recycled	In a 30 cubic meter waste skip
General recyclables (cans, plastic)	Recycled	In a 30 cubic meter waste skip
Asbestos	Landfill	Servitude - in drums
Refuse / General waste	Landfill	In a 30 cubic meter waste skip
Builders' rubble	Landfill	In a 9 cubic meter waste skip
Sludge	Landfill	In a dedicated bunded area
Aluminium	Aluminium smelters	Waste bags and pallets
E-waste	Recycled	Outbound logistics for collection
Medical waste	Treated and landfill	The red bags are sealed and stored in special cardboard box for monthly collection
Sanitary waste	Treated and landfill	Store in sanitary bins for collection
Canteen waste fatty oil	Recycled	Stored in 210Lt drum in bunded area
Canteen used cooking oil	Recycled	Stored in 210Lt drum in bunded area

Source: *Environment Management Committee (2021: 7) minutes*

Environment sustainability is guided by the organisation's group environmental sustainability policy that is sanctioned by the organisation's group executives. Annual environment legal audits are conducted to ensure alignment and compliance to any new regulatory or statutory requirements. The organisation is certified to the ISO 14001:2015 standard and is subjected to annual surveillance and three yearly certification audits.

iii. **Quality:** The organisation has dedicated quality assurance teams that uses the process approach and real time Statistical Process Control (SPC) to manage the organisation's processes. The buy better and make better strategy supports the organisation's quality objectives to produce high quality products to satisfy the customer requirements. The organisation is a member of the Metal Producer Organization of South Africa (MetPac), that provides guidance on regulatory and statutory packaging products requirements. The organisation is certified to ISO 9001:2015 standard and is subjected to annual surveillance and three yearly certification audits.

From the foregoing discussion, it can be surmised that whilst the organisation has initiatives in place relating to matters around SHEQ, these are however, envisioned and operationalised by fully independent managed systems. Thus, the aim of this study is to develop a model to integrate the independent systems. It is worth pointing out that the integration process for this case organisation is a rather complex one, particularly so because of the diverse metal packaging market that it serves, as depicted earlier in Table 2.1.

Understanding the context of an organisation is a requirement of the ISO standards, requiring the organisation to identify, analyse and understand the internal and external environment in which it operates and supplies its products (Abuhav 2016: 39). The International organisation for standardisation, International Electrotechnical Commission (IEC) directive (2018: 22), indicates that the top management of the organisation must review the management system at planned intervals, to ensure its continuing suitability, adequacy and effectiveness and must consider the internal and external environment of the organisation. Hence the

organisation conducts annual management reviews for each of the independently managed management systems that includes the identification and analysis of interested parties and also a SWOT analysis.

As part of the organisation's normal management review processes, the needs and expectations of interested parties, SHEQ objectives and SWOT analysis are conducted and reviewed on a yearly basis. The latest SHEQ SWOT analysis for each category is presented in Table 2.5. followed by a summary of critical points which are deemed to be relevant to the pursuit of the current study.

Due to the effect or potential effect on the organisation to provide consistent service and products, the ISO management standards requires organisations to identify interested parties and determine their needs and expectations (South African National Standard 14001:2015: 1). Table 2.3 presents the needs and expectations of interested parties.

Table 2:3 Needs and expectations of interested parties

Interested Parties	Needs & Expectations	Supporting Systems
• Shareholders • Employees • Suppliers • Customers • Visitors & Contractors • Neighbours • Statutory & regulatory bodies	• Healthy and safe working environment • Compliance to Health, Safety and Environmental statutory and regulatory requirements • Satisfaction of customer quality requirements	• Willis Blue • ISO 14001:2015 • BRC 2015 • ISO 9001:2015 • Safety induction • SMETA • Behavioural Based Safety • Safety suggestion scheme • Occupational Health Centre • COVID 19 protocols

Source: *Health and safety Management Committee (2021: 7) minutes*

The ISO management standards requires organisations to set objectives that is aligned to the strategic direction of the organisation (South African National Standard 14001:2015: 1). Table 2.4 presents the organisation's SHEQ objectives.

Table 2:4 The organisation's SHEQ objectives

	Objectives	Initiatives
Safety and health	• Lost Time Injury Frequency Rate of <0.34 • Minor injuries < 3 per month • BBS Target > 140 per month • Minimise spread of COVID 19 • Achieve compliance to ergonomics regulation, • Achieve compliance to Asbestos regulation, • C19 vaccination > 75% employees • Close OHS legal findings	• BBS Participation • Safety Talks • Safety and housekeeping audits • Safety meeting • Incident reporting and investigation • Healthy Safety job observations • Risk assessment and mitigation • COVID 19 Protocols • Willis blue risk management system • Internal auditing
Environment	• Adherence to Effluent plant pH legal compliance • Reduce manufacturing process spoilage, • Reduce electricity consumption, • Reduce water consumption, • Reduce chemical spillage incident impact on the environment, • Comply to environment regulatory and statutory requirements	• Effluent plant pH levels are monitored and actioned daily by dedicated outsourced service provider, • Monitored and actioned daily and forms part of management's performance contract. There are interventions in place to reduce spoilage, • Electricity consumption is monitored and tracked monthly. Initiative to convert to LED energy saving lighting. Electric curing ovens converted to gas ovens, • Full time building maintenance crew on site to repair water leaks. Water usage awareness talk conducted to all employees, • Chemical spillage awareness safety talk conducted to all employees. Spillage control team assigned and trained on the management of chemical spillages, • Annual environment legal audit conducted to ensure compliance to regulatory and statutory requirements, • ISO 14001:2015 certification • Internal auditing

Quality	• Right first-time philosophy • Reduction in customer complaints • Reduction in hold for inspection stock • Improve non-conformance response time	• Employee quality awareness training • Root cause analysis centre • Statistical process control • Membership with MetPac • Customer visits • Internal auditing • ISO 9001:2015 certification

Source: *Health and Safety Management Committee (2021: 3) minutes*

Table 2.5 presents the Safety and Health SWOT analysis conducted by the organisation. A SWOT analysis is helpful tool that is used to understand the context that an organisation operates in and enables an organisation to develop a long-term strategic plan for alignment to organisational goals (Barbosa, Oliveira and Santos 2018: 925). Hence organisations need to conduct a SWOT analysis to determine the internal strengths, internal weaknesses, external opportunities and external threats and formulate a strategic plan based on the SWOT analysis. Table 2.5 presents the Safety and Health SWOT analysis conducted by the organisation.

Table 2:5 Safety and health SWOT analysis

Strengths	Weaknesses
• Senior management commitment to providing a safe and healthy work environment, • Initially NOSA certification thereafter Willis Blue health and safety management system, • Dedicated safety, health, environment and risk department, • Willis Blue annual and self- auditing, • Process, risk based occupational health and safety, • Divisional health and safety reporting and monitoring, • Investigation of minor and lost time injuries and implementation of preventive actions, • Onsite occupational health centre with dedicated occupational nurses and a call-in occupational doctor, • Trained first aiders, • Trained safety representatives, • Monthly health and safety departmental meetings and annual main health and safety meeting, • All meetings commence with a safety talk, • Monthly health and safety talks to employees, • Appointed COVID 19 compliance managers, • Documented emergency procedure and annual testing, • Annual health and safety legal audit by an independent legal advisor, • BBS system • Health and safety surveys conducted by independent specialists and • Outsourced annual health and safety legal audits to ensure compliance to statutory and regulatory requirements.	• Absenteeism • Excessive overtime • Sharp tinplate raw material • Manual operations with above target lost time injury frequency rate • High forklift activities • Low cash flow
Opportunities • Implementation of ISO 45001:2018 management system • Implementation of fully automated machinery • Implementation of an IMS	**Threats** • COVID 19 Pandemic • Economic conditions

Source: *Health and Safety Management Committee (2021: 9) minutes)*

Table 2:6 Environmental SWOT analysis

Strengths	Weaknesses
• Senior management's commitment in ensuring environmental sustainability, • ISO 14001 certification since 2003, • Annual environment management review • Dedicated SHER department • Approved Integrated Waste Management Plan • Recyclable products • Support of the organisation's corporate EMS sustainability initiatives, • Tracking of carbon • Organisation's recycling partnership, • Organisation's sustainability report, • SMETA compliance and BRC certification, • Technical expertise / skilled personnel, • Research and Development support, • Occupational hygiene surveys done for Asbestos evaluation, Thermal Stress, Sound impact on external environment, Hygiene assessment, Air contamination, Stack emission, dust evaluation, Hazardous chemical substance, noise, and lighting, • Outsourced legal compliance & legal auditing to ensure compliance to statutory and regulatory requirements, • Provision of EMS training • In house ink mixing in the printing department minimising obsolete inks, • Effluent plant water treatment, • Weekly SHER process auditing, • Management of waste streams and • Municipality approved integrated waste management plan.	• Inadequate auditing and inspection of waste services providers and suppliers, • No equipment to test for air pollutants on site and • Availability and communication of EMS
Opportunities • Waste disposal service providers to provide statistical waste disposal data, • Installing Low energy consumption LED lighting, • Use of solar energy, • Light weighting of cans manufactured, • Use of borehole water, • Harvesting of rainwater, • Structure & upload EMS documentation onto Qpulse documentation management system • Integrated SHEQ management system	**Threats** • COVID 19 Pandemic, • Imports, • Demand Fluctuation, • New entrants into the market, • COVID 19 challenges, • Extreme weather conditions e.g., drought, storm, flooding and • External air pollution impacting on organisations performance

Source: *Environment Management Committee (2021: 11) minutes*

Table 2.6 presents the Environmental SWOT analysis conducted by the organisation.

Table 2.7. presents the Quality SWOT analysis conducted by the organisation.

Table 2:7 Quality SWOT analysis

Strengths	Weaknesses
• ISO 9001 certification since 1995 • Annual quality management review, • Dedicated quality assurance department, • Dedicated quality assurance manager, • Allocated independent quality auditors per department, • Support of Organisation's Research and Development department, • Ongoing training provided, • Real time statistical process control, • Support of divisional quality manager, • Loyal customer base and partnership, • Use of root cause analysis techniques with cross function team for problem solving and • Senior management's commitment to quality with a signed quality policy by the General Managers	• Limited raw material supplier base, • Absenteeism and • Excessive overtime
Opportunities	**Threats**
• Light weighting of cans, • New product and development and Trial Management processes review and improvement and • Integrated SHEQ management system	• COVID 19 Pandemic, • Imports, • Demand Fluctuation, • New entrants into the market and • Alternative packaging. Replacement of metal container with plastic containers

Source: *Quality Management Committee (2021: 13)*

While the foregoing SWOT analysis paints a clear picture of the SHEQ state of the organisation, embedded therein are elements that could facilitate or that could serve as barriers to achieving a fully integrated model. The researcher takes cognisance of the SWOT analysis in the shaping the study at hand. In particular

the strength of the organisation provides a foundation to elevate, the organisations weaknesses and threats. Although there are organisational weaknesses and threats, the organisation has the strengths and opportunities to combat these weaknesses and threats. As such, the researcher envisages that an IMS is an opportunity for improvement that will build on the current strength of the organisation and that will assist in minimising the impact of any external threats to the organisation.

2.3 Context of the study

2.3.1 Theoretical framework

The theoretical framework provides the theory that the research study is based on, and it is important to explain the ideas and beliefs that frame the research and where these emerged from (Walker and Solvason 2014: 21). Furthermore, a theoretical framework provides guidance and structure to explain a problem, representing how a researcher considers the problem and formulates a solution by using existing literature (Wentz 2017: 84). Adom, Hussein and Agyem (2018: 439), supports this notion by stating that the theoretical framework of a research study guides the researcher to ensure that the researcher does not deviate from the accepted theories to make a final academic or scholarly contribution.

The theoretical framework for this study was based on process approach using the systems theory. Historically, organisations attempted to resolve their department's problems independent from other process activities outside their departments, but as early as the 1950's, consideration was given for an integrated approach that considered the influence of all process activities that formed a system (Kiran 2016: 64). The systems theory approach arose due to organisations being unable to use the linear thinking approach to solve complex system problems (Hossain, Dayarathna, Nagahi and Jaradat 2020: 1). Haywood, Forsyth, de Lange, and Trotter (2017: 231), describes a system as group of interacting, interrelated or interdependent elements forming a complex whole.

The systems approach accesses the efficiency of each of the sub systems and the overall effectiveness of an entire system and this results in better management of an organisation (Gordon 2021: 1). Moreso, the systems approach provides the management of an organisation a purposeful and powerful means of achieving objectives and an analytical framework for problem solving and decision making (Kiran 2016: 65). Teece (2018: 360), positions systems theory as a holistic approach wherein, the whole is greater than individual processes. Thus, a clear understanding of a system requires a clear understanding of the sub processes that make up the system. Kiran (2016: 64), defines a system as a group of processes so arranged in an order to work together as a whole to achieve an objective. Gordon (2021: 2), identified the following as the primary characteristics of a system:

i. An organisation comprises of interacting sub systems that are sequenced;
ii. Each of these subsystems have processes with inputs, transformation, out puts, feedback and operates within an environment;
iii. Each of the sub systems has a function that contribute to the whole system;
iv. The interacting sub systems are sequenced to form a whole system and the sum of the whole system is greater than the sub systems;
v. The entire organisation is an open system comprising of open and closed sub systems;
vi. The organisations system has boundaries that interact with systems external to an organisation.

In an open system, there are identifiable pathways that interacts and shares information, but first some discussion of what a process is warranted. Fuller (2019: 81) and Swink, Melnyk, Cooper and Hartley (2020: 8), conquers that a process is a component of a system that consists of inputs, that is converted into outputs by an activity. Kiran (2016: 65), adds that all processes must have a well-defined objective, and the output of a process must be compared to the objective and if the

objective is non-conforming then a root cause analysis exercise must be conducted by examining the inputs and activities of the process.

An organisation comprises of various departments that have various processes, and these processes interact with each other in a sequenced form a whole system that satisfies and organisations vision (Cornell and Jude (2015: 1). The systems theory framework allows an organisation to adopt a holistic approach that allows all organisation processes to adapt and align to a common objective (Teece 2018: 359). Haywood, Forsyth, de Lange, and Trotter (2017: 230), contends that systems thinking allows an organisation to assess the relationship between processes and provides a more dynamic risk assessment option. Hence, any integrated management system will firstly require a risk assessment of all business process from a SHEQ perspective and the responses to address these risks to minimise any negative impact on the business will result in better risk control, improved profitability, maximum use or resources, effective communication, improvement of management systems and process transparency (Talapatra, Santos, Uddin, and Carvalho 2019: 1040). Figure 2.2 illustrates the anatomy of a process that forms a part of a system.

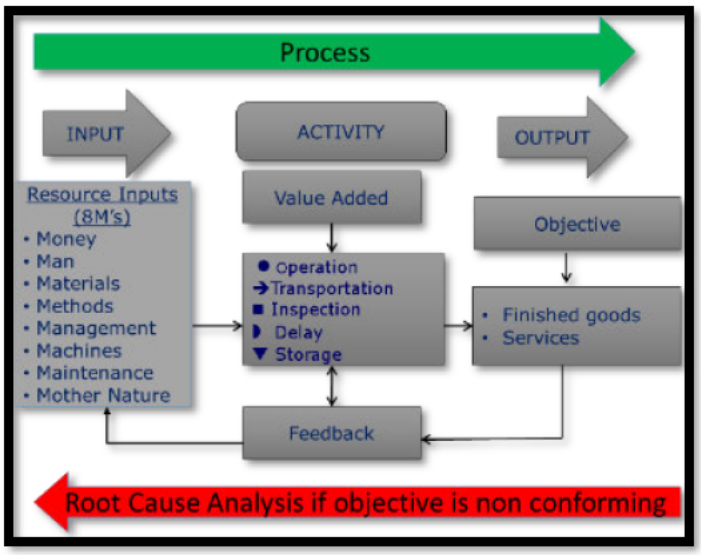

Figure 2:2 Anatomy of a Process

Source: *Adapted from Swink, Melnyk, Cooper and Hartley (2020: 8) and Kiran (2016: 65).*

Each department within an organisation has processes with inputs, transformation, outputs, and feedback that forms a sub-system (Cornell and Jude 2015: 3). As illustrated in figure 2.2 above, adapted from Swink, Melnyk, Cooper and Hartley (2020: 8) and Kiran (2016: 65), a process is defined as an activity that is performed on the resource inputs that results in a goods or services. Haywood, Forsyth, de Lange and Trotter (2017: 231) elaborate that, organisations view themselves as self-contained systems that obtain resources and perform a value-add activity to these resources to produce an output that contributes to the overall success of the organisation.

Although the management systems of the case organisation are based on the sequence and interaction of the same business processes, each of these management systems are managed independently. These independent management systems form the subsystem of an IMS and could therefore be integrated. The integration of these independent management systems will require a clear understanding of the challenges and a supportive IMS model that focuses on the research organisation. Figure 2.3 illustrates the three independent management systems supporting the same business processes.

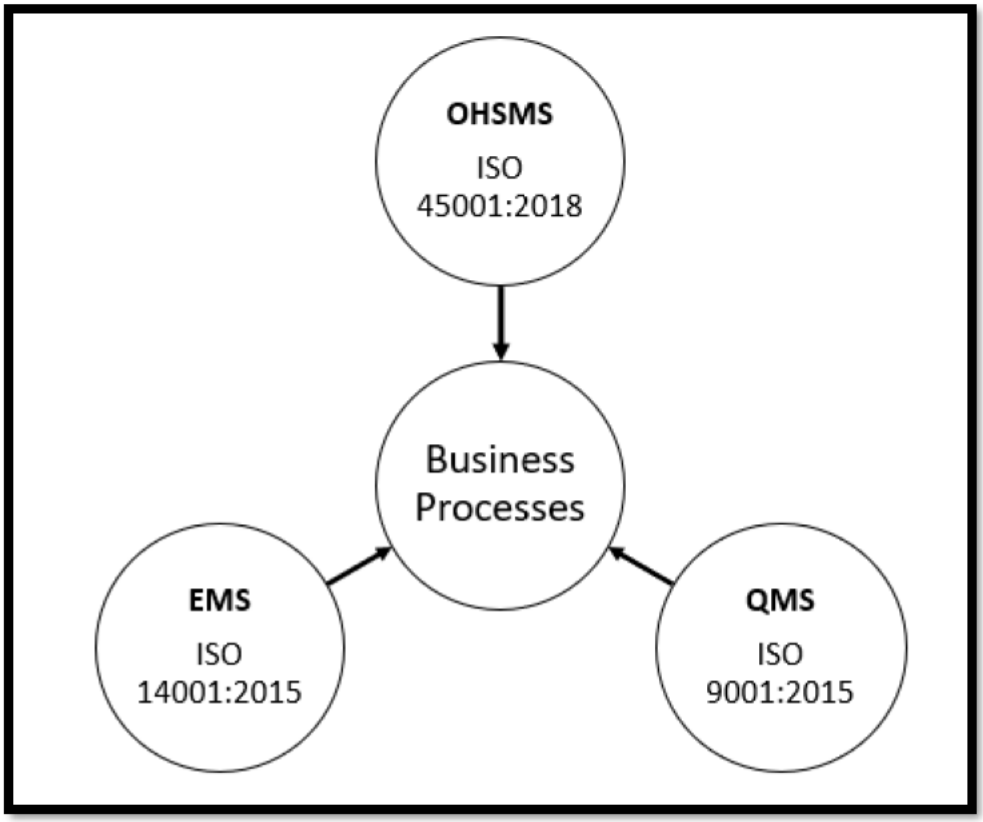

Figure 2:3 Theoretical Framework

***Source**: Researcher's own construct*

It is noteworthy that while there are currently three independent management systems for SHEQ, these independent management systems are supportive of the same business processes. For example, the three independent management systems support the same manufacturing processes. Aside from the fact that the independent systems act on or support the same business process, the case for integration becomes more obvious when a closer look is taken at the elements of each of the systems as depicted in figures 2.3, 2.4 and 2.5, respectively.

Figure 2.4 illustrate the ISO OHSMS that provides occupational health and safety for the organisation.

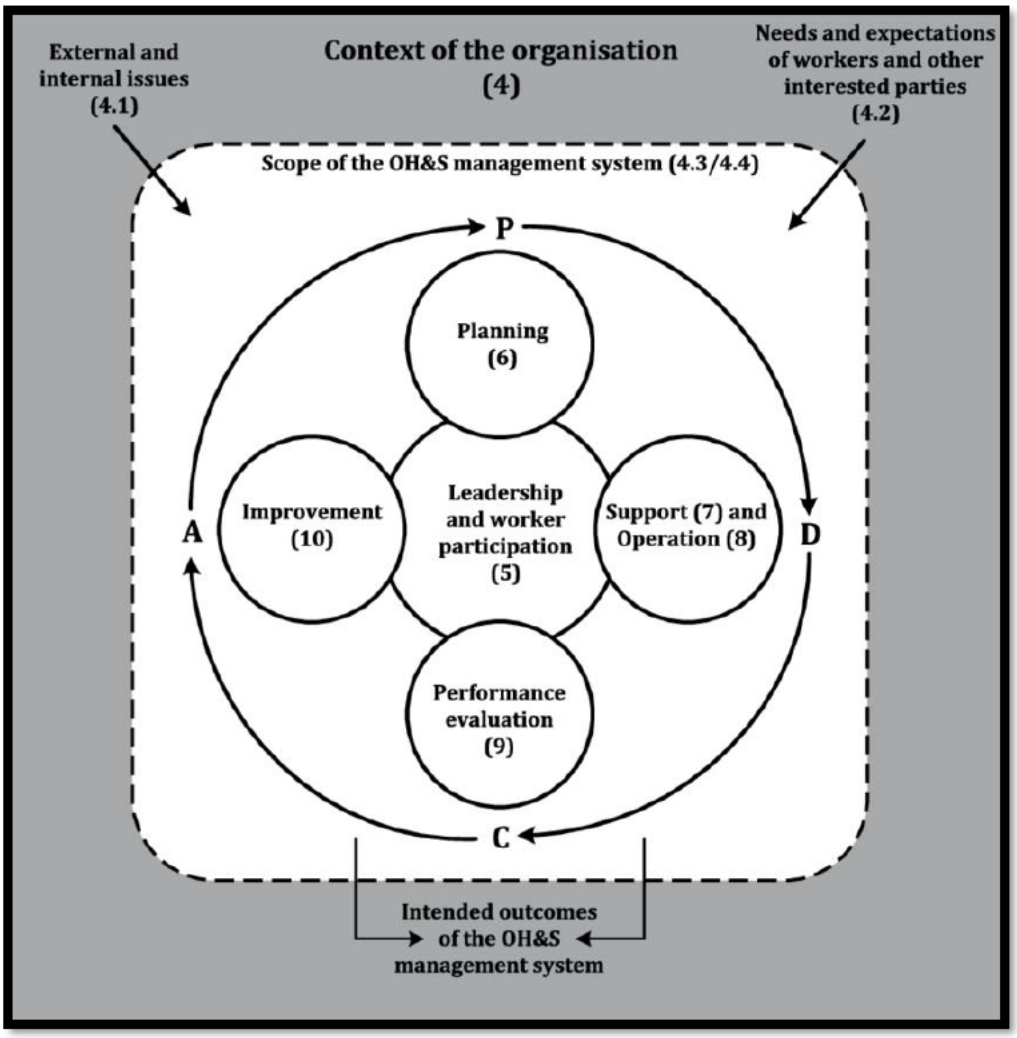

Figure 2:4 ISO 45001:2018 OHSMS

Source: International Organisation Standardisation (2018: viii)

As illustrated in figure 2.4 above, requirement 4 of ISO 45001:2018 indicates that the context of the organisation refers to the external environment that the organisation operates in that has an impact on the organisation's internal health and safety intended outcomes (Engelhardt 2018: 6). In this regard, the researched organisation conducted a SWOT analysis to contextualise the organisation. Requirements 6 to 10 of the ISO 45001:2018 standard is internal to the organisation and refers to the planning, support, operation, performance evaluation, improvement of the OHS

management system and these requirements are supported by requirement 5's leadership and worker participation (Engelhardt 2018: 6).

Figure 2.5 illustrate the ISO EMS that provides environmental management for the organisation.

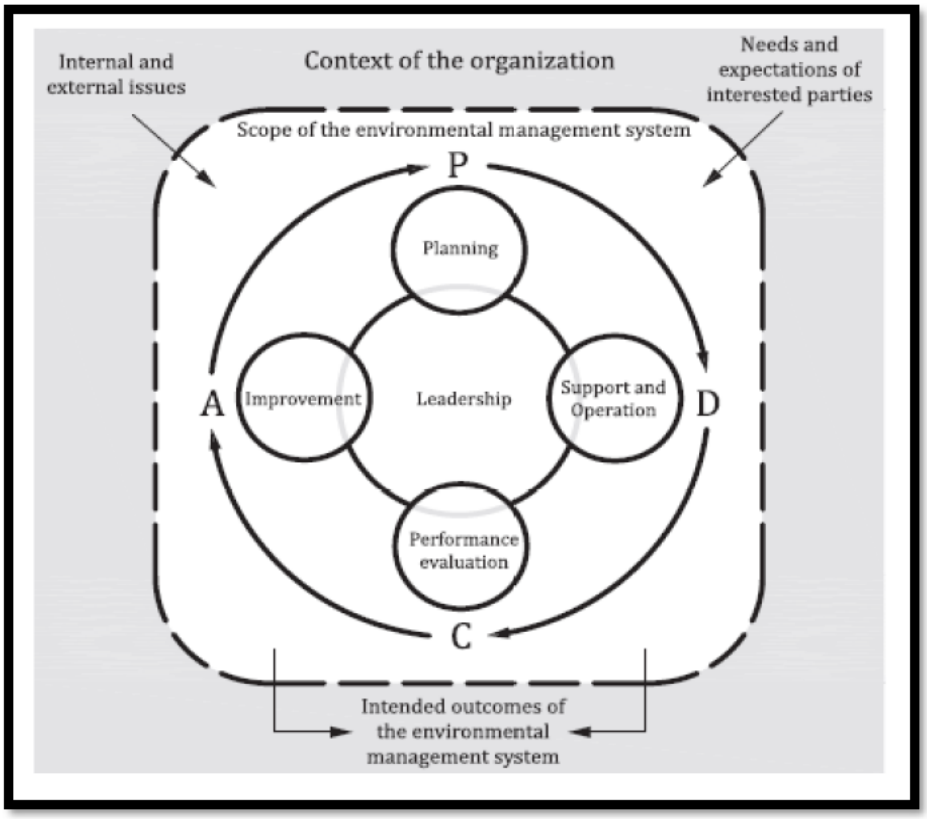

Figure 2:5 ISO 14001:2015 environmental management system

Source: *International Organisation Standardisation (2015: vii)*

As illustrated in Figure 2.5, ISO 14001: 2015 requirement 4 refers to the internal and external environment of the organisation that can positively or negatively influence the way that an organisation strategizes it environmental responsibilities (Greenworld 2016: 3). In this regard the researched organisation has conducted a SWOT analysis to determine the internal and external environment that can positively or negatively influence the organisation's environmental performance and has developed an environmental management strategy. Requirements 6 to 10 of the ISO 14001:2015 standard is internal to the organisation and refers to the planning, support, operation,

performance evaluation, improvement of the EMS and these requirements are support by requirement 5's leadership (Greenworld 2016: 3).

Figure 2.6 illustrates the ISO QMS that provides quality management for the organisation.

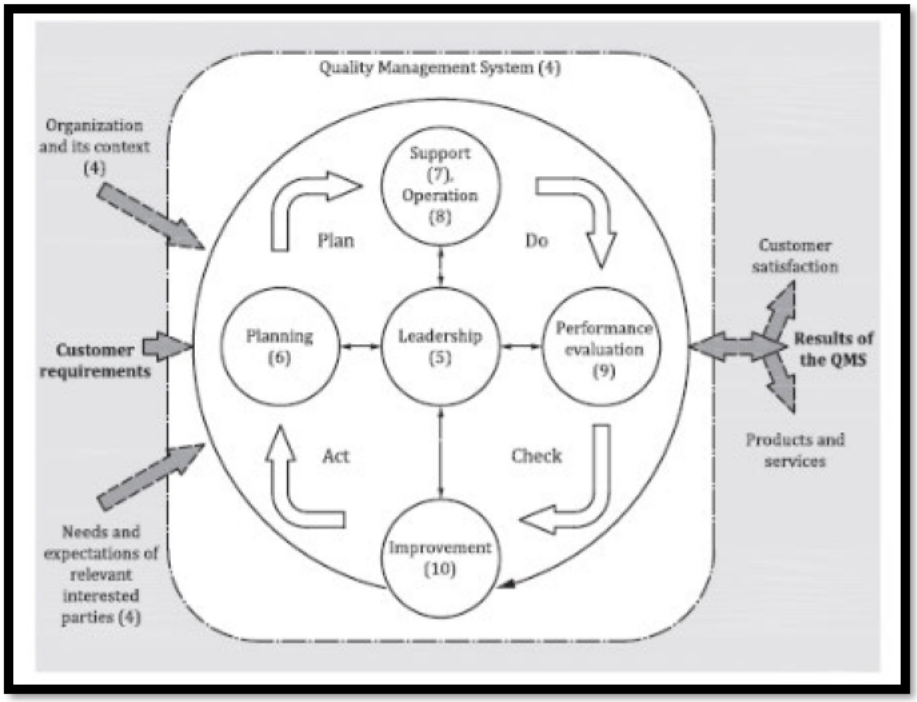

Figure 2:6 ISO 9001:2015 quality management system

Source: *International Organisation Standardisation (2015: viii)*

As illustrated in figure 2.6, ISO 9001: 2015 requirement 4 involves the strategic scanning of the organisation's internal and external environment to consider the internal and external issues that impacts on organisation achieving its QMS objectives (John and Charles 2016: 4). In this regard the researched organisation conducted a SWOT analysis to consider the internal and external issues that impacts on the organisation's QMS. Requirements 6 to 10 of the ISO 9001:2015 standard is internal to the organisation and refers to the planning, support, operation,

performance evaluation, improvement of the QMS and these requirements are support by requirement 5's leadership (John and Charles 2016: 4).

For each of the three systems depicted in figures 2.3, 2.4 and 2.5 above, it can be deduced that common elements are: planning, support and operation, performance evaluation and improvement. The commonality of the elements, thus, augurs well for the integration of the safety, health, environment and quality management systems. ISO management standards provides guidelines to formalise the organisations into a sequence of process that forms a system (Boiral and Heras-Saizarbitoria 2015: 3). The idea of having an integrated management system is not a new one. The literature evidences several unidimensional models and a short discussion of each is presented in the subsequent section.

2.3.2 IMS Models

Several authors (Boiral and Heras-Saizarbitoria 2015: 5; Teece 2018: 360; Barbosa, Oliveira and Santos 2018:925) describes an IMS model as a systematic framework that an organisation uses to implement an IMS in alignment with the organisation's strategic objectives. The six IMS models are discussed in the following sections.

2.3.2.1 Annex SL IMS model

The need to integrate and simplify the ISO standards through a common structure was identified by ISO (Steedman 2015: 3). The ISO 9001:2015 QMS, ISO 14001:2015 EMS and ISO 45001:2018 OHS management systems have similarities and the ISO High-Level Structure (HLS), Annex Statutory Limits (ASL) aids with the integration by having generic ten clauses for all three ISO standards (Kopia, Kompalla and Ceauşu 2016: 52). Organisations that use the ASL model, structure the IMS requirements using ASL HLS for system integration to structure the core content of the IMS using the same document structure (Baraforta, Mesquida and Mas 2017: 178). The objective of annex SL is to provide a similar HLS with common texts and terms, that facilitates a consistent integration among the different ISO standards (Poltronieri, Gerolamo, Dias and Carpinetti 2018: 373). The degree of compatibility among the ISO MS's, has increased with the introduction of Annex SL (Benyettou

and Abdellatif 2018: 135) and Majerník, Daneshjo, Chovancova and Sanciova (2017: 136), proposes that annex SL is based on the following management standards principles:

i. meet the requirements of stakeholders that it serves and must have relevance for the market;
ii. be compatible with other management standards in the family of the management standard;
iii. have sufficient coverage for all sectors;
iv. be flexible enough to be applicable to all organisations;
v. allow for free trade of goods and services;
vi. have an application for conformity assessment;
vii. exclude product specifications, test methods, the level of implementation and any other form of standardisation; and
viii. be easy to implement one or integrally more management standards.

Thus, ISO HLS, annex SL provides a common framework across ISO 45001:2018, 14001:2015 and ISO 9001:2015 management system that supports the integration of these management systems. However other IMS models must also be considered when developing an IMS for a more effective and beneficial multi-dimensional IMS model. The following literature provides an overview of the risk-based IMS model, organisation strategy IMS model, innovation IMS model, process approach IMS model and the Plan, Do, Check, Act (PDCA) IMS Model that must be considered when developing a multi-dimensional model.

2.3.2.2 Risk-based IMS model.

Risk is residual in all processes and failure to identify and manage these risks can result in loses that will have a negative impact on an organisation (Emetumah 2016: 2) and Field (2019: 23), state that risks are inherent in all systems, processes, and functions, therefore organisations must identify, assess, monitor and SHEQ control risks using ISO management systems. The application of systems thinking to risk management, provides an organisation an opportunity to gain a better risk

management of complexity by assessing the risk of individual processes within a system (Haywood, Forsyth, de Lange and Trotter 2017: 230). Organisations need resilience for survival and prosperity, and this resilience requires the early identification of risks and opportunities that forms the foundational building blocks of any organisation (Steedman 2015: 3). Challenges associated with the uncertainty during the introduction of new manufacturing technologies requires the management of risk through an understanding of processes and the implementation of process controls (Roca, Vaishnav, Morgan, Mendonca and Fuchs 2017: 1215). The capabilities of an organisation can be strengthened by using a risk-based IMS model to identify and manage the associated SHEQ risks of an organisation (Baraforta, Mesquida and Mas 2017: 176). Rebelo, Santos and Silva (2017: 396), explain that the internal and external environment that an organisation operates within, generates risks that can result in a loss of business competitiveness and a risk-based IMS model can provide business confidence by developing a risk management culture that enhances decisions making that minimises the impact of a risk.

2.3.2.3 Organisation strategy IMS model

For an organisation to be successful, an organisation must consider the internal and external context of the organisation and develop a business strategy that is aligned to an IMS model that will guide the success of the organisation Barbosa, Oliveira and Santos (2018: 929). Kopia, Kompalla and Ceauşu (2016: 53) further explain that it is necessary to continually improve an organisation's MS and the level of maturity of the MS must be measured against the goals and objectives of the organisation. As per earlier discussion, the organisation has conducted a safety, health, environment and quality SWOT analysis and the results of the SWOT analysis must be considered when developing a multi-dimensional IMS.

2.3.2.4 Innovation IMS model

The innovation IMS model is based on evaluating the innovation levels of the four perspectives of the balance scorecard namely, financial perspective, internal processes, learning and development and customers and creates a link between

innovation and defining the organisation's integrated management system (Maier, Sven-Joachim, Fortmuller and Maier 2017: 306).

2.3.2.5 Process approach IMS model

An organisation comprises of different sequenced processes that interact to form a whole system to achieve desired results, an IMS process model is based on the identifying, sequencing and managing an organisation's processes from a SHEQ perspective, allowing an opportunity to better manage an organisation's individual processes to achieve desired results (Basaran 2018: 14). Solomon, Bester and Moll (2017: 150) affirm that the process approach involves performing activities on inputs to produce desired process outputs and these organisation process outputs interact in a sequence to achieve business objectives. Business processes consists of activities that converts inputs into outputs, are linked in sequence to other business processes and is aligned with the strategic goals of an organisation (Ahidar, Sarsri and Sefiani 2018: 183).

2.3.2.6 Plan, Do, Check, Act (PDCA) IMS model

ISO 9001:2015, ISO 14001:2015 and ISO 45001 have the same underlying principle that is based on Quality Guru, Edward Deming's, Plan, Do, Check and Act continuous improvement concept and this concept is used as the basis for the PDCA IMS model (Muzaimi, Chew and Hamid 2017: 2). Kopia, Kompalla and Ceauşu (2016:52) contend that continuous improvement using the PDCA cycle is an absolute necessity irrespective of the maturity level of the IMS. The PDCA cycle allows an organisation to identify continual improvement opportunities and provide the required resources to manage its processes to achieve a continuous cycle of improvements (Gueorguiev and Sakakushev 2016: 972).

This section discussed the various IMS models that must be considered when developing a multi-dimensional model. The next section will discuss the range of debates and current discourse on integrated management systems.

2.4 The range of debates and current discourse on IMS

Various qualitative, quantitative, and systematic literature review (SLR) studies of IMS have been conducted in recent years. Evidence presented in literature reviews of qualitative and quantitative studies are illustrated in Table 2.8 that reflect different strategies and levels of management system integration.

Table 2:8 Qualitative, quantitative, and mixed research on Integrated management systems studies

	Context/Scope	Findings	References
1	Pharmaceutical Industry in Iran: an IMS based on organisations continuous improvement initiatives.	Integrated management systems assist organisations to achieve their objectives. There was a positive trend after implementation, but ongoing trend analysis was recommended. The study did not formulate a model for an IMS.	Mariouryad, Golbabaei, Nasiri, Mohammadfam and Marioryad (2015: 18)
2	32 German industries: the use of the ISO high level structure (Annex SL) for an IMS	Although there is a generic trend towards integrated management systems, organisations that integrated their management systems prior to the introduction of (Annex SL) high level structure do not see the benefits of using the (Annex SL). Therefore, a broader spectrum of industries was recommended. The study did not formulate a model for an IMS.	(Kopia, Kompalla and Ceauşu (2016:52)
3	A selective presentation of IMS case studies from organisation of different sectors: the implementation of an IMS as a strategic tool to manage processes to achieve organisational desired results.	IMS provides a holistic view of an organisations' management systems. The IMS Model presented by the author was based on using the systems approach for integrating the independent management systems. It is the authors view that a sector-based model will be more rational.	(Basaran 2018:2)

4	Small to Medium Size (SME) Portuguese organisation: the advantages and disadvantages of an IMS.	The integration of the independently managed systems added value to the organisation and stakeholders. The IMS Model presented by the author was based on using the Plan, Do, Check, Act (PDCA) model	(Rebelo, Santos and Silva 2015: 45).
5	66 Chinese organisations: the motivations and benefits obtained in implementing an IMS	An IMS can create a competitive advantage for an organisation. The IMS resulted in simplification of the certification process, decreased cost of systems management and a reduction in paperwork. The study did not formulate a model for an IMS.	(Zeng, Tam, and Le 2010: 1392).
6	381 organisations in Romania: innovation using an organisations' financial, learning and development, internal processes and customers perspective, the four quadrants of the balance scorecard.	Although using innovation as the bases for and IMS may contribute positively to an organisation. Further research is required on the contribution of innovation to an organisation because the research represented 381 organisations in Romania and needs to be expanded to a larger population of organisations. The inputs to the IMS model presented by the author and was based on defining the vision and objectives, planning, implementation methods and required resources for an IMS using innovation as the bases. The outputs were an innovative process, product, marketing and human resource	(Maier, Sven-Joachim, Fortmuller and Maier 2017: 302)

Source: *Researcher's own construction*

Systematic Literature Reviews (SLRs) involve the integration of findings from multiple qualitative, quantitative, and mixed research studies and builds the evidence base for both research and practice (Hesse-Biber and Johnson 2015: 167). Pittaway (2011: 217), further explains that SLRs are used to interpret large volumes of information based on a research topic, to identify research gaps and to develop recommendations to close these gaps.

Table 2.9 illustrates examples of systematic literature review studies that reflect different strategies and levels of management system integration.

Table 2:9 Systematic literature review on Integrated management systems studies

	Context/Scope	Findings	References
1	323 academic research articles from Web of science, Science direct, Scopus and Emerald databases from the year 2008 to 2018: the benefits of IMS	Many organisations globally implement integrated management systems that promotes the sustainable development of these organisations. Further research is recommended using more articles. The study did not formulate a model for an IMS.	Talapatra, Santos, Uddin and Carvalho (2019: 1040)
2	30 journal articles on IMS that was extracted from the Journal of Cleaner Production: the evolution of IMS and the contribution and gaps on IMS literature reviews.	The study did not formulate a model for an IMS. Further studies using other journals articles on integrated management systems is required regarding the analysis of integration levels, benefits, difficulties, performance improvements and the implications of using (Annex SL) high level structure to develop an IMS model.	Nunhes, Motta and de Oliveira (2016: 1234)
3	282 articles on the Scopus database: the effect of integration, approach for integration, scope, level and extent of integration.	The benefits of integrated management system included cost savings, customer satisfaction improvements, documentation reduction and improved communication. There is difficulty in employee motivation and integration can lead to extreme complexity. Greater scope of integrated management systems that includes other organisation dimensions where risk is identified is required. The study did not formulate a model for an IMS	Dahlin and Isaksson (2017: 536)
4	15 articles extracted from Scopus and Web of Science databases and did not have elements such as interviews,	The implementation of an IMS will impact the culture of the organisation and must therefore be formulated as part of the business strategy. The authors presented	Barbosa, Oliveira and Santos (2018:925)

	surveys, tests and participant's observation: explored the use of an organisations business strategy to develop an IMS	a model using the organisation business strategy to align the IMS.	
5	88 articles from 2000 to 2013 on Scopus, Web of Science and Science Direct: benefits and difficulties of implementing and IMS	The research identified a tendency to focus on the benefits and difficulties of implementing and IMS.	Bornia, Gisi, Spenassato, Severo-Peixe and Rotta (2016: 184)

***Source**: Researcher's own construction*

Table 2.9 presents examples of Systematic Literature Reviews (SLRs) conducted between 2016 to 2019 and is based on studies from 2000. The five studies in table 2.9 represent a total of 738 IMS journal articles that was extracted from different databases, providing a broad overview of IMS using SLRs.

The researcher surmises that the following are the shortcomings and recommendations of the research studies presented in table 2.5 and table 2.6.

i. Majority of the research studies focused on the difficulties and benefits of an IMS; therefore, further research is required to develop a broader perspective multi-dimensional IMS model;
ii. Although majority of the research presented positive trends, further research with an ongoing trend analysis is required to substantiate the positive trend;
iii. None of these studies provide a supportive integrated model using the evaluation of the actual IMS situation, the motivations, the advantages, the disadvantages, and the limitations in real organisation context;

iv. The studies were based on a specific business sector and did not represent the packaging sector;

v. Majority of the studies provided challenges experienced in implementing an IMS but did not provide strategies on overcoming these challenges;

vi. Majority of the IMS studies did not formulate an IMS model and the research studies that did present a model was single dimensional models focusing on either using ISO Annex SL or Plan, Do, Check, Act (PDCA) or strategic alignment to the organisation or the process approach or risk-based approach or the systems approach or stakeholder management approach.

The research proposes a multi-dimensional IMS model that presents a broader IMS perspective together with implementation strategies to overcome the challenges of implementing an IMS.

2.5 Conceptual framework

Rallis (2018: 355) argues that a conceptual framework captures the researchers view and makes sense of what the researcher is exploring to provide focus and direction. As illustrated in Chapter one section 1.9, the conceptual framework for this study, involved combining the three independent ISO sub-systems into one coherent SHEQ system. The different models from researched organisations will be used to develop a multi-dimension integrated SHEQ system for the three business units that operates as separate parts of the packaging organisation in South Africa.

The single dimension IMS depicted in the conceptual framework in chapter 1 is further elaborated in figure 2.7.

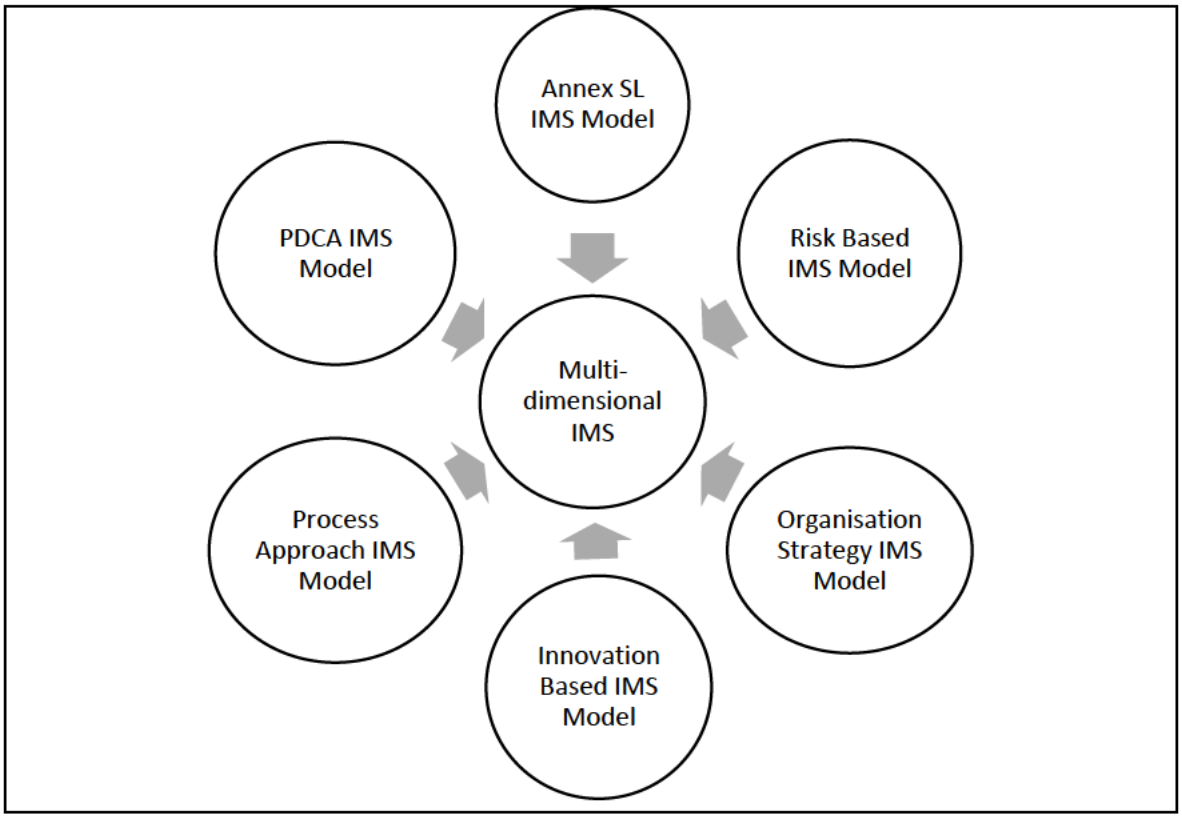

Figure 2:7 Single dimension IMS models

***Source**: Researcher's own construction*

As illustrated in figure 2.7 above, the single dimensional model uses only one IMS model, and the researcher envisages that a multidimensional model proposed will use a combination of IMS models using the ISO Annex SL framework and system theory. From the foregoing discussion, it can therefore be summarised those organisations must evaluate the current internal and external environment, consider existing IMS literature and models before embarking on the implementation of a multi-dimensional IMS model.

2.6 Conclusion

This chapter contextualised the researched organisation, which is a leading packaging organisation that is listed on the JSE and operates in a dynamic competitive market. The SHEQ SWOT analysis provided the internal and external environmental factors that the organisation operates in and the basis for a strategic framework for business continuity. The context of the study presented the systems theoretical framework of the research study that depicted the existing independent ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 management systems that was used for the same business processes. The theoretical framework formed the foundation for the conceptual framework of the study. The foregoing systems theory literature review defined a system as the sequence and interaction of an organisation's processes from a holistic business perspective and supports the consideration for an IMS. The common elements of the ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 management systems was summarised, and it argued well for an IMS. Examples of systematic literature review presented a broad overview of integrated management systems and the shortcoming and recommendations. Single dimension IMS models were presented, and the researcher proposed that these models could be combined to formulate a multi-dimension SHEQ IMS that provides a wider perspective to implement, manage and support an IMS.

The next chapter will provide an introduction, requirements, and an overview of the ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 management standards.

3 CHAPTER THREE: ISO 45001:2018 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM, ISO 14001:2015 ENVIRONMENTAL MANAGEMENT SYSTEM AND ISO 9001:2015 QUALITY MANAGEMENT SYSTEM

3.1 Introduction

The environment that organisations operate in is extremely competitive and volatile due to globalisation, the COVID-19 pandemic, the introduction of the fourth industrial revolution and the global economy. Thus, organisations have implemented management systems that support the strategic objectives of the organisation. ISO standards has been compiled and reviewed every five years by a panel of global experts that considers the current business environment and aligns these standards to assist organisations to achieve strategic objectives. This chapter discusses the requirements, objectives, benefits, success factors, opportunities and challenges of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015, the three key management systems that are customer requirements to conduct business. The chapter concludes by bringing into focus the critical elements that are pertinent to an IMS.

3.2 ISO Standards

The introduction of the fourth industrial revolution has epitomised a disruptive effect on production systems, support service and value chain and organisations must therefore implement strategies to manage change and develop autonomous and dynamic operations to enable the mass production of highly customized products (Asif 2020: 1). To match or beat the accelerating pace of global change, only organisations that adapt to these changes are able to succeed (British Standards Institute 2018). Standardisation has a long history that dates back thousands of years and was a necessity to organise life in early civilisation (International organisation for standardisation 2019: 20). The first management system standard that originated

from the military sphere was created in the quality assurance field to increase product reliability (Boiral and Heras-Saizarbitoria 2015: 4). ISO is the largest global non-governmental standards organisation that was established in 1947 with a central office in Geneva, Switzerland, with a network of standards institutes from 164 countries and with 22 500 international standards (International organisation for standardisation 2019: 2). ISO was formed after World War II with the objective of facilitating international coordination and unification of industrial standards (Aseeva 2016: 74). According to a, quantitative research study that was conducted in Belgium by Buts, Van Droogenbroeck, Dooms and Willems (2020: 45), standards disseminate knowledge, enhances efficiency, boosts global trade and the research results indicated that ISO standards has a positive contribution to social element that is labour productivity and as well as the economic element that is GDP. ISO does not regulate or legislate but may provide a framework for a country's regulatory or legislative requirements hence countries have adopted ISO standards as part of their regulatory or legislative framework (Hoyle 2018: 38). The implementation of standards can open huge possibilities with regards to trade cost and trade flows (Shepherd 2020: 10).

The International Organisation for Standardisation (2019: 14) define an ISO standard as a document that is established in consensus of the ISO technical committee to facilitate strategic good operating practices and is driven by the growth of global trade and growing technology. ISO standards are reviewed every five years to determine if the standard should be revised, withdrawn, or confirmed continued for a further five years (Hoyle 2018: 6). It can therefore be deducted that the fourth industrial revolution has brought about changes that, organisations need to adapt to, to remain competitive and hence organisations have developed strategies for alignment.

The ISO technical committee consists of member experts from 164 members countries and is guided by the following process, according to Hoyle (2018: 25):

i. A new standard is proposed to the technical committee;
ii. Discussions are held with a working group of experts and a first working draft is compiled;

iii. Committee stage: The first working draft is shared with the technical committee and the ISO Central Secretariat. The members of the committee comment and vote and if consensus is reached within the technical committee, it moves to the next stage;
iv. Enquiry stage: A Draft International Standard (DIS) is compiled and shared with the national members, who have three months to comment and if consensus is reached it moves to the next stage;
v. Approval stage: The final DIS is sent to all committee members and is approved if a two third majority of the participating members are in favour. Only editorial corrections are made to the final text of the standard; and
vi. The ISO international standard is then published.

Hence, from the foregoing discussion, it is recognised that although ISO management standards are not regulative or legislative, they have a long history of structural and content development by global experts. In addition, the International organisation for standardisation, International Electrotechnical Commission (IEC) directive (2018: 5), suggests that the following principles of a Management System Standard (MSS) must be observed:

i. The MSS must be clear to understand, and easily applicable to any business;
ii. The MSS must be relevant to the market and must meet the needs of and add value to the primary uses and any interested party and must promote free trade;
iii. The MSS must not be sector specific. The MSS must be generic to cover any specific sector to prevent any modifications to the MSS, must not include any specific product or services and there must be compatibility between a family of MSS's; and
iv. The MSS must provide for different stages of auditing.

It is evident from the above-mentioned principles that the objectives of an MSS are to align the MSS to the requirements of current global market, the structure of the

standards must support each other, the MSS must be applicable to all sectors, reduce trade barriers, provide the ability to audit the MSS at different stages, must not be product or service specific, the MSS must be clear to interpret and must be applicable to any business. Hence the MSS supports integration of the different standards. The following were the key findings stemming from a study conducted by Shepherd (2020:1) that focused on peer reviewed statistical models on standards and international trade:

i. Implementation of standards in the export market can lead to additional cost due to the adaption of product and production processes to comply with testing and certification requirements;
ii. Due to the financing of necessary investments, developing countries may have difficulty financing these necessary investments. Therefore, standards may limit the ability of developing countries;
iii. Where there is alignment with importing markets standards and international standards, such as ISO the negative impact is substantially lessened or reversed;
iv. There is evidence that some standards promote trade due to the alignment of information between producers and consumers and standards credibly signals quality;
v. The effects of standards differ across countries, sectors and organisations; and
vi. Although there initially maybe a negative cost impact of standards but over time there is substantial ability to adapt and prosper.

Figure 3.1. presents a summary of the trade effects of standards, that emanated from a study conducted by study Shepherd (2020:3) that indicates that standards could increase or decrease the cost of trading.

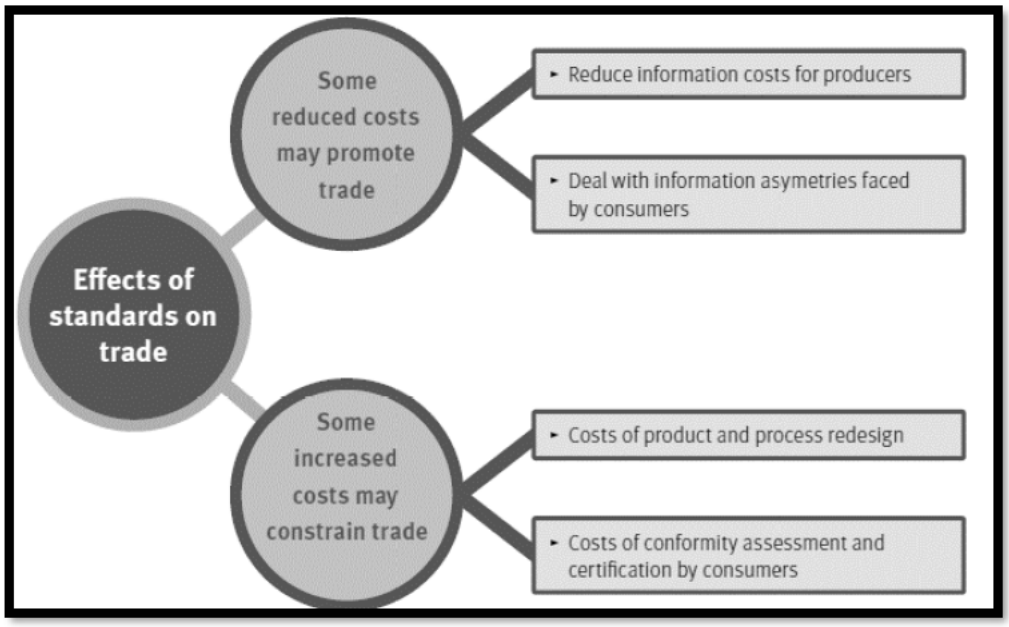

Figure 3:1 The trade effects of standards

Source: Shepherd (2020:3)

The primary objective of ISO is to align and improve how ISO standards support organisations in achieving sustained business performance (DNVGL 2016: 2). Significantly, the ISO standards offers a universal perspective of management standards that provides organisations with a reduction in risks, improved efficiencies, and a competitive advantage in a highly globalised environment (Emetumah 2016:1). Furthermore, a strategic risk management philosophy enables organisations to make strategic business decisions system that allows an organisation to be more efficient and competitive (Haywood, Forsyth, de Lange and Trotter 2017: 230).

Table 3.1 presents the six principles of standards that are listed by the world trade organisation technical committee and an additional three by the ISO technical committee (International organisation for standardisation 2019: 66).

Table 3:1 Principles of standards

	Principle	Definition
1	Transparency:	The committee must be clear and open about rules, plans, processes, and actions.
2	Openness	The expansion of involvement to include a wide and relevant audience, as well as developing an inclusive document or strategy that is more likely to be accepted by a wider audience.
3	Impartiality and consensus	Decisions that are made must be based on objective criteria and a general agreement.
4	Effectiveness and relevance	The needs of users must be addressed, the standard must be, clear, provided in a timely manner and relevant to both developed and developing nations.
5	Coherence	The quality of the standard must be logical, consistent, and there must be a unified approach
6	Development dimension	The process of economic and social transformation.
7	Stakeholder engagement	The engagement of all stakeholders must become part of the process.
8	Due process	A course of formal proceedings must be carried out regularly and in accordance with established principles and rules.
9	National implementation	The adoption and application of the international standard must be at a national level.

***Source**: International organisation for standardisation (2019: 66)*

Considering that ISO standards are compiled by a global panel of subject experts using a structured approach, it argues well that these standards are well thought out and supportive of organisations interests. ISO standards are not compulsory and are issued by accredited certification bodies that assesses and verifies compliance to the ISO management standard (Emetumah 2016: 5). Organisations voluntarily implement ISO standards in order to have a social license to operate demonstrating the organisation's good governance, allowing the organisation to import and export (Aseeva 2016: 71). Organisations and their stakeholders can benefit from using international standards which sets the agreed level of performance that evens the global platform (Jones 2018: 3). ISO standards brings legitimacy and creditability, alleviates commercial barriers globally and can be implemented by both industrialised and developing countries, it (Heras-Saizarbitoria 2017: 4).

In Dahlin and Isaksson (2017: 536) research of 64 articles, a total or 57 articles stated that the integration of management systems was beneficial or mainly beneficial and seven articles did not address whether the integration of management systems was beneficial or not. Although ISO standards are voluntary, and ISO does not have the power to enforce the implementation of the standards that the organisation implements, there are derived benefits to implement (Hoyle 2018: 5). The International Organisation for Standardisation (2019: 8) and McKane, Daya and Richards (2017: 390), suggests that the benefits of adopting ISO standards include:

i. It allows an organisation to gain a greater share of local and global markets by firstly portraying a better image of an organisation's product quality, environment and health and safety responsibility and secondly ISO certification may be a customer requirement;
ii. An improved management of risks;
iii. Contribution to socio-economic development; and
iv. Standards that are recognised globally; and provides confidence in policies and regulations.

Buts, Van Droogenbroeck, Dooms and Willems (2020: 45) add that, ISO standards facilitates the process approach that facilitates the identification of the best way of achieving an objective through continuous improvement. The development of the

global economy and the growing number of requirements imposed by customers has stimulated ISO standardisation (Gueorguiev and Sakakushev 2016: 972).

3.3 ISO 45001:2018, ISO 14001:2015 and ISO 9001: 2015 requirements

Table 3.2 presents a summary of the requirements of ISO 45001:2018, ISO 14001:2015 and ISO 9001: 2015 requirements. These ISO standards use the same Annex HLS, terms and definitions that allows for easy integration (International organisation for standardisation 2015: 3) The requirements of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 is presented in table 3.2.

Table 3:2: Requirements of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015

Clause 1: Scope		
ISO 45001:2018	**ISO 14001:2015**	**ISO 9001:2015**
Provides the scope and the intended outcomes of the ISO 45001:2018 standard.	Provides the scope and the intended outcomes of the ISO 14001:2015 standard	Provides the scope and the intended outcomes of the ISO 9001:2015 standard.
Clause 2: Normative references		
There are no normative references in the ISO 45001:2018 standard.	There are no normative references for ISO 14001:2015	The ISO 9000:2015, Quality management systems — Fundamentals and vocabulary is normatively referenced in whole or in part in the ISO 9001:2015 standard.
Clause 3: Terms and definitions		
Provides interpretation of the terms and definitions in the ISO 45001:2018 standard to prevent any misinterpretation of the terms and definitions used in the standard.	Provides interpretation of the terms and definitions in the ISO 14001:2015 standard to prevent any misinterpretation of the terms and definitions used in the standard.	Provides interpretation of the terms and definitions in the ISO 9001:2015 standard to prevent any misinterpretation of the terms and definitions used in the standard.

Clause 4: Context of the organization		
4.1 Requires an organisation to determine internal and external issues that may impact on the intended objectives of the occupational health and safety outcome. 4.2 Requires the organisation to determine and understand the needs and expectations of all the organisations stakeholders. 4.3 Requires the organisation to determine the scope of the OHS management system considering 4.1, taking into account 4.2 and taking into account the planned or performed work-related activities. The scope of the OHS management system must be documented and available. 4.4 Requires that the OHS management system be established using interactive processes to achieve desired outcomes and deliver continual improvement of the organisation's OHS performance.	4.1 Requires an organisation to determine internal and external issues that may impact on the intended objectives of the EMS outcome. 4.2 Requires the organisation to determine and understand the needs and expectations of all the organisations stakeholders. 4.3 Requires the organisation to determine the scope of the EMS considering 4.1, taking into account 4.2 and taking into account the planned or performed work-related activities. The scope of the EMS must be documented and available. 4.4 Requires that the EMS be established using interactive processes to achieve desired outcomes and deliver continual improvement of the organisation's EMS performance.	4.1 Requires an organisation to determine internal and external issues that may impact on the intended objectives of the QMS outcome. 4.2 Requires the organisation to determine and understand the needs and expectations of all the organisations stakeholders. 4.3 Requires the organisation to determine the scope of the QMS considering 4.1, taking into account 4.2 and taking into account the planned or performed work-related activities. The scope of the QMS must be documented and available. 4.4 Requires that the QMS be established using interactive processes to achieve desired outcomes and deliver continual improvement of the organisation's QMS performance.

Clause 5: Leadership and worker participation		
5.1 Requires the senior management of the organisation to take responsibility and accountability of the OHS management system to prevent and provide a safe and healthy workplace by establishing OHS objectives, providing resources to ensure that desired OHS outcomes are achieved and continually improved. 5.2 Requires senior management to establish, implement and maintain OHS policy that includes a commitment to provide a safe working environment, a framework to set objectives, fulfil legal requirements and other requirements, eliminate hazards and reduce OH&S risks, continual improvement and consultation and participation of workers and worker representatives. 5.3 Requires senior management to assign, communicate and document OHS roles and responsibilities. 5.4 Requires the organisation to ensure consultation and participation of all worker and representatives, in the development, planning, implementation, performance evaluation and actions for improvement of the OHS management system.	5.1 Requires the senior management of the organisation to take responsibility and accountability of the performance of the EMS by establishing EMS objectives, providing resources to ensure that desired EMS outcomes are achieved and continually improved. 5.2 Requires senior management to establish, implement and maintain EMS policy that includes a commitment to protect the environment, a framework to set objectives, fulfil legal requirements and other requirements, eliminate or reduce environmental risks and continual improvement of the EMS. 5.3 Requires senior management to assign, communicate and document EMS roles, responsibilities and performance of the EMS.	5.1 Requires the senior management of the organisation to take responsibility and accountability of the performance of the QMS by establishing QMS objectives, use a risk-based approach and provide resources to ensure that desired QMS outcomes are continually achieved and improved. 5.2 Requires senior management to establish, implement and maintain QMS policy that includes a commitment to satisfy applicable requirements, a framework to set objectives, fulfil legal requirements and other requirements, quality risks and continual improvement of the QMS. 5.3 Requires senior management to assign, communicate and document QMS roles, responsibilities, and performance of the QMS.

Clause 6: Planning		
6.1 Requires the organisation to plan the OHS management system considering the context of the organisation, interested parties and, the scope of the OHS management system. The organisation is required to determine, assess and document the risks and opportunities, considering the effectiveness of existing controls. The organisation is required to determine and document legal requirements and other requirements. The organisation is also required to plan actions to address risks and opportunities, action legal requirements and prepare for and respond to emergency situations. 6.2 Requires the organisation to OHS objectives in order to maintain and continually improve the OHS management system and performance.	6.1 Requires the organisation to plan the EMS considering the context of the organisation, interested parties and, the scope of the EMS. The organisation is required to determine, assess and document the risks and opportunities, considering the effectiveness of existing controls. The organisation is required to determine and document legal requirements and other requirements. The organisation is required to plan actions to address risks and opportunities, action legal requirements. The organisation also needs to determine the environmental aspects that the organisation can control or influence the environmental impacts considering an environmental life cycle perspective. 6.2 Requires the organisation to establish EMS objectives in order to maintain and continually improve the EMS management system and performance.	6.1 Requires the organisation to plan the QMS considering the context of the organisation, interested parties and, the scope of the QMS. The organisation is required to determine, assess and document the risks and opportunities, considering the effectiveness of existing controls. The organisation is required to determine and document legal requirements and other requirements. The organisation is required to plan actions to address risks and opportunities, action legal requirements. 6.2 Requires the organisation to establish QMS objectives in order to maintain and continually improve the QMS and performance. Requires that any changes to the QMS are completed in a planned manner.

Clause 7: Support		
7.1 The organisation is required to determine and provide the required OHS resources. 72 Requires that the organisation must determine and provide the required competence for employees to achieve the OHS management system objectives. 7.3 The organisation must create employee awareness regarding the OHS policy, objectives, employee contribution, risks, opportunities, incidents, outcome of investigations and the consequence of non-compliance. 7.4 Requires the organisation to provide relevant OHS communication internally to all levels of the organisation and also to external interested parties. 7.5 The organisation is required to maintain, and control documented information of internal and external origin.	7.1 The organisation is required to determine and provide the required EMS resources. 7.2 Requires that the organisation must determine and provide the required competence for employees to achieve the EMS objectives. 7.3 The organisation must create employee awareness regarding the EMS policy, objectives, employee contribution, risks, opportunities, incidents, outcome of investigations and the consequence of non-compliance. 7.4 Requires the organisation to provide relevant EMS communication internally to all levels of the organisation and also to external interested parties. 7.5 The organisation is required to maintain, and control documented information of internal and external origin.	7.1 The organisation is required to determine and provide the required QMS resources to ensure valid and reliable results and to verify the conformity of the results. Where measuring results are a requirement or to provide product or service confidence, the measuring equipment shall be calibrated or verified. 7.2 Requires that the organisation must determine and provide the required competence for employees to achieve the QMS objectives. 7.3 The organisation must create employee awareness regarding the QMS policy, objectives, employee contribution, risks, opportunities, incidents, outcome of investigations and the consequence of non-compliance. 7.4 Requires the organisation to provide relevant QMS communication internally to all levels of the organisation and also to external interested parties. 7.5 The organisation is required to maintain, and control documented information of internal and external origin.

Clause 8: Operation		
8.1 Requires the organisation to plan, implement, control and maintain the processes needed to meet requirements of the OHS management system, and to implement the actions determined under section 6.1. Establish, implement and maintain a process(es) for the elimination of hazards and reduction of OHS risks. Control planned temporary and permanent changes that impact OHS performance. Control procurement that impacts on OHS management system conformity. Control outsourced process. 8.2 Implement and maintain an emergency preparedness and response process/es.	8.1 Requires the organisation to plan, implement, control and maintain the processes needed to meet requirements of the EMS, and to implement the actions determined under section 6.1 In alignment with a life cycle perspective, the organisation must establish, controls to ensure environmental considerations are addressed. The organisation must maintain document information to the extent that the organisation has confidence that process/es have been carried out as planned. 8.2 Implement and maintain an emergency preparedness and response process/es.	8.1 Requires the organisation to plan, implement, control and maintain the processes needed to meet requirements for the provision of products and services, and to implement the actions determined. The organisation must also ensure that outsourced processes are controlled. 8.2 Requires the organisation to communicate product and service information, handle queries, handle contracts or orders, obtain customer feedback including customer complaints, handle and control customer property and establish special actions for contingencies. 8.3 Requires an organisation to implement and maintain an appropriate design and development process. 8.4 Requires the organisation to ensure that externally provided processes, products and services conform to customer requirements. 8.5 Requires the organisation to identify the status of outputs throughout the production and service provision. 8.6 Requires the organisation to control non-conforming products or services to prevent the unintended use of these.

Clause 9. Performance		
9.1 Requires the organisation to establish, implement, maintain a process(es) for monitoring, measurement, analysis, and performance evaluation of the OHS management system. Evaluate legal and other requirements and take action. 9.2 Require the organisation to establish, an OHS audit programme, conduct audits to establish OHS management system compliance. 9.3 Requires senior management to review the OHS management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness.	9.1 Requires the organisation to establish, implement, maintain a process(es) for monitoring, measurement, analysis and performance evaluation of the EMS. Evaluate legal and other requirements and take action. 9.2 Require the organisation to establish, an EMS audit programme, conduct audits to establish EMS management system compliance. 9.3 Requires senior management to review the EMS management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness.	9.1 Requires the organisation to establish, implement, maintain a process(es) for monitoring, measurement, analysis and performance evaluation of the QMS. Evaluate legal and other requirements and take action. 9.2 Require the organisation to establish, an QMS audit programme, conduct audits to establish QMS management system compliance. 9.3 Requires senior management to review the QMS management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness.

Clause 10. Improvement		
10.1 Requires the organisation to determine opportunities for improvement and implement necessary action to achieve the intended outcome of the OHS management system. 10.2 Requires the organisation to take control, correct, deal with adverse impacts and take preventive action of non-conformities. 10.3 Requires the organisation to continually improve the OHS to enhance performance.	10.1 Requires the organisation to determine opportunities for improvement and implement necessary action to achieve the intended outcome of the EMS. 10.2 Requires the organisation to take control, correct, deal with adverse impacts and take preventive action of non-conformities. 10.3 Requires the organisation to continually improve the EMS to enhance environmental performance.	10.1 Requires the organisation to determine opportunities for improvement and implement necessary action to achieve the intended outcome of the QMS. 10.2 Requires the organisation to take control, correct, deal with adverse impacts and take preventive action of non-conformities. 10.3 Requires the organisation to continually improve the QMS to enhance environmental performance.

Source: Adapted from (South African National Standard 45001:2018: 1), (South African National Standard 14001:2015: 1) and (South African National Standard 9001:2015: 1)

It is notable that although the ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 requirements are voluntary, the requirements provide a structured guideline that organisations can use to formalise their management system to comply with government regulations and satisfy the safety, health, environmental and quality requirements of stakeholders.

3.4 ISO certification

Three of the most popular standards due to its global applicability are ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 (Barbosa, Oliveira and Santos 2018:925). An organisation is issued a certificate and is certified to a standard for the site where it carries out its work once the organisation has displayed conformity to the standard by a certification body (International Organisation for Standardisation 2020: 1). A global survey conducted by the International Organisation for Standardisation (2020: 1), as of 31 December 2019, exemplified that there were 883 521 organisations certified to ISO 9001 QMS, 312 580 organisations certified to ISO 14001 EMS and 38 654 organisations certified to ISO 45001 OHS management systems. The highlights of results of the survey are presented in table 3.2 and the number of certified organisations globally in figure 3.2 (International Organisation for Standardisation 2020: 1).

Table 3:2 Highlights of the ISO 2019 certification survey.

No.	Results Highlights
1	The participation of the study was good compared to the previous year, although the survey commenced during the COVID 19 pandemic outbreak.
2	A total of 12, ISO certification standards were surveyed and showed an increase of ISO certification of 3.8%. This was partially due to the introduction of the ISO 45001 OHS standard that was published in 2018 that had limited number of certifications in 2018.
3	Although all the ISO standards saw an increase in the number of certifications, two of the standards that had the biggest number of certification increases were ISO 9001 with a 0.5% increase and ISO 14001 with a 2% increase.
4	The adjustments and clarifications made to the survey methodology in the 2018 edition, improved the data quality and reliability.
5	The non-participation of some certification bodies in some countries resulted in a fluctuation of certification in some countries

***Source**: International Organisation for Standardisation (2019: 2).*

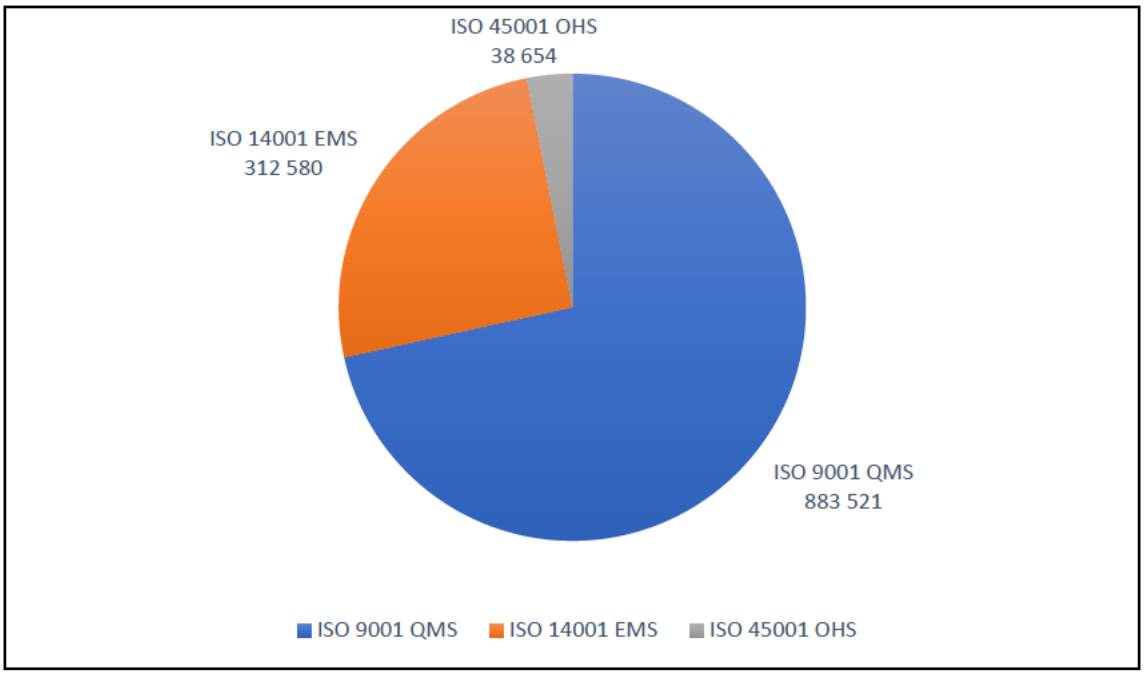

Figure 3:2: Number of organisations certified to ISO 9001 QMS, ISO 14001 EMS and ISO 45001 OHS management standards globally.

Source: International Organisation for Standardisation (2019: 2).

Figure 3.2 illustrates the number of organisations that are certified to ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015. Figure 3.2 demonstrates that a larger number of organisations that are certified to ISO 9001 QMS, and this can be attributed to ISO 9001 QMS being introduced first and 14001 and 45001 being later introduced on the basis of ISO 9001 QMS.

The preceding discussion on ISO standards, provided a broad general overview of ISO standards. That which follows is a more detailed explication of ISO 45001:2018 occupational health and safety, ISO 14001:2015 environmental management system and ISO 9001:2015 quality management system.

3.5 ISO 45001:2018 OHSS

3.5.1 ISO 45001:2018 OHS: Introduction

Consideration for employee health and safety dates far back as 3000 BC with the Egyptians having a first aid manual for their workers, during 2000 BC, Hammurabi, the Babylonian king paid worker compensation for permanent workplace injuries and during the first part of 1900's worker compensation started appearing (Reese 2016: 31). In 1919 the international labour organisation (ILO) was formed to improve that working conditions of employees, in1944 the Declaration of Philadelphia was introduced that reiterated labour is not a commodity, in 1999 the decent work agenda focused on employee's health and safety as a global perspective and in 2019 the ILO's future of work report was released that called for additional protection of employees (Eurofound and International Labour Organization 2019: 3). It is indicative that there has been historical concerns and an evolution of employee's workplace health and safety. The global workforce comprises of 3.5 billion people, who spend more than 33% of their adult life at work and despite the modernisation of the work environment, human labour continues to be a key contributor to productivity and therefore plays a vital role in the development and sustainability of any country (Rantanen, Muchiri and Lehtinen 2020: 1). Globalisation includes transportation, manufacturing, handling of products, disposal of products, provision of services, introduction of new technology and each of these has its own OHS risks to employees (Fuller 2019: 2).

There are an estimated 2.8 million fatalities and 300 million of non-fatal occupational health and safety cases annually that leads to a 4% loss of Gross Domestic Product (GPD) and the trend is expected to grow, therefore there is a need for OHSS (Rantanen, Muchiri and Lehtinen 2020: 8). Historically health and safety activities were performed in a reactive manner with a corrective action being conducted after a health or safety incident and this resulted in a financial burden to organisations (Calıs and Buyukakıncı 2019: 1061). Employee health and safety practices in some countries is secondary, claiming from workman's compensation rather than a primary proactive approach to managing employee health and safety (de Jager et al. 2017:176).

The health and safety culture of an organisation reflects the attitudes, beliefs, perceptions, values and how an organisation responds to health and safety issues at the workplace (DNVGL 2016: 11). Due to the high health and safety incident rate, unions pressurised employers to implement health and safety programmes and employers realised that workplace health and safety is productive and makes business sense, hence in 1970 the occupational health and safety act was implemented (Reese 2016: 37). The South African labour administration recognises the need for organisations to have market flexibility for competitiveness, but this needs to be balanced with the provision of adequate safety initiatives to protect the basic health and safety rights of employees (Department of labour South Africa 2019: 9).

Due to poor occupational safety and health conditions, annually 2.78 million employees die globally from occupational accidents and work-related diseases and there is a further annual 374 million non-fatal occupational accidents which results in vast economic cost and suffering of employees (International Labour Organisation 2019: 2). Ryder (2018: 3), adds that the global impact of occupation health and injuries is estimated at 3.94% of the global Gross Domestic Product (GDP) and the toll is unacceptable and avoidable and it is imperative that organisations must act together to reduce the impact. The Department of labour South Africa (2019: 4) and the South African Compensation for Occupational Injuries and Diseases (COID) has registered and adjudicated a total of 703 440 claims from 2016 to 2019 to enable employees to have access to social protection. Although, it may seem common sense that organisations need to adopt preventative measures to avoid occupational health issues and injuries, healthy and safe work standards are not universally practiced in the workplace resulting in organisations missing opportunities to prevent the associated implications of these health and safety incidents (Zondo 2021:3). Besides the devastating impact that injuries at the workplace can have on employees, poorly managed occupation health and safety management systems can have a negative impact on an organisation by the loss of employees, interruption of the business processes, insurance claims, legal action, damage of an organisation’s reputation loss of investors and the ultimate loss of the survival of the business (Smith 2015: 22).

In South Africa, there is constraint environment of resources, competing with a multitude of health and economic priorities, and therefore the health and safety of employees are overlooked and requires a paradigm shift (de Jager et al. 2017:177). Morgado, Silva and Fonseca (2019: 1), argues that majority of organisations have the cost-benefit perspective of implementing OHS initiatives, thus minimising the amount of spend on OHS to satisfying legislative requirements and also organisations that view OHS as a return of investment benefit from a reduction of employee absenteeism. The constitution of South Africa provides for all South Africans to have the right to a work environment that is not harmful to their health, safety, and wellbeing, therefore organisations cannot afford to ignore legal health and safety compliance on the grounds of costs (Esterhuyzen 2019:2522). Munnoo (2018:1) reiterates that management needs to be aware of the disadvantage of cost cutting plans that can result in the following consequences:

i. Employee fatalities, disabilities, and absenteeism;
ii. Damage to the organisation's equipment and production loss due to equipment downtime;
iii. Equipment downtime due to accident investigations;
iv. Time spent on accident investigation;
v. Increased insurance premiums due to workplace accidents; and
vi. Poor reflection on the organisation's injury statistics that can result in the potential loss of market share and poor employee moral due to high s accident frequency rate.

The ILO estimates the total cost of occupational accidents and diseases to be approximately four percent of the global gross domestic product and the investment in good OHS reduces an organisations direct and indirect cost (Kisting 2019: 20). Hence, although organisations may be unable to justify implementing an OHS management system based on the return of investment, there is a cost associated with not implementing an OHS management system.

Odigie, Badar, Sinn, Moayed and Shahhosseini (2017:441) assert that safety professionals, therefore implement behaviour motivational incentives to promote a positive safety behaviour for compliance to safety standards and regulations. A risk-

based IMS supports a reduction in occupational accidents and diseases by preventing hazardous occupational risk profiles (Rebelo, Silva and Santos 2017: 395). The behavioural based safety initiative together with health and safety prevention and control protocols forms an integral component of an organisation's health and safety programme to motivate employees by highlighting unsafe acts and conditions and promoting positive behaviour (Reese 2016: 101. A study conducted by Sklad (2019:71), indicated that an organisations leadership has the greatest influence on an organisation's overall safety performance. Thus, a positive organisation health and safety culture supported by committed leadership with strategic health and safety objectives will have a positive impact in achieving an effective OHSS.

To achieve the vision of achieving efficient service delivery and maintaining financial viability, COID has developed initiatives to provide sustainable compensation for occupational injuries and diseases (Department of labour South Africa 2019: 4). Sklad (2019:72) notes that OHSS processes are interrelated and the performance of one process relies on other interrelated processes. Therefore, adopting the process approach is fundamental in achieving the objectives of an OHSS. Considering the labour ill health and injury statistics presented in this chapter, organisations require a management system to proactively manage employee's health and safety hence ILO guidelines, suggests that an organisation's OHS objectives needs to be measurable and in alignment with the organisation's OHS policy and must have the following attributes (Somavia 2009:6):

i. Be specific to the organisation and appropriate to organisation's size and the nature of activities;
ii. Be consistent with the relevant and applicable national laws and regulations and the OHS obligations of the organisation;
iii. Be focused on the continuous improvement of employee OHS protection to achieve the best OHS performance;
iv. Be realistic, achievable, and communicated to all employees within the organisation; and
v. Be periodically evaluated and updated if necessary.

The foregoing attributes is indicative that organisations need to continually monitor and eliminate or minimise the contributors of work-related deaths. The greatest contributor to work related deaths is occupational disease which is 86.67%, which equates to approximately 6500 employees that die per day due to occupational disease compared to 1000 per day that die from occupational injury (International Labour Organisation 2019:1).

Table 3.4. outlines the health and safety factors and effects that organisation experience globally.

Table 3:3 Global health and safety factors and effects

	Global health and safety factors	Effect
1	The introduction of new technology and material	Technology can have a positive or negative health and safety impact on the working environment depending on how these are applied
2	There is a high occupational injury rate among young workers and older workers	Requires more adaptive practices and equipment to work safety
3	There is an increasing number of women that are entering the work environment	They have a higher risk of musculoskeletal disorders due to non-standard work arrangements.
4	Development of the work environment and climate change	Results in the risk of air pollution, heat stress, emerging diseases, shifting weather and temperature patterns although new job opportunities will be created through sustainable development and the green economy
5	There is approximately 36 per cent of the global workforce that currently work excessive hours of more than 48 hours per week.	This compromises rest time

Source: International Labour Organisation (2019:1)

There is a constant change in the working environment that has an impact on the health and safety of employees and these changes need to be properly managed to ensure a healthy and safe working environment (Jones 2018:1). OHS practices up to the 1980's was more traditionally compliance-based approach due to regulations imposed by government and organisations realised that this approach was not necessarily assisting with maintaining and improving an organisation's OHS performance (Fuller 2019: 80). A national OHS management system policy needs to be formulated for the establishment and promotion of OHS in organisations and Table 3.4 presents the ILO guidelines on OHSMS (Somavia 2009:6).

Table 3:4 ILO Guideline on OHSMS policy

	OHSMS Policy Guidelines
1	The promotion of the implementation and integration of OSH management systems as part of the overall management of an organization
2	The facilitation and voluntary arrangements for the systematic identification, planning, implementation and improvement of OSH activities at national and organization levels,
3	The promotion and the participation of workers and their representatives at organization level,
4	The implementation of continual improvement initiatives, while avoiding unnecessary bureaucracy, administration and costs,
5	The promotion collaboration and support arrangements for OSH management systems
6	The evaluation of the effectiveness of the national policy and framework at appropriate intervals
7	The evaluation and publicity of the effectiveness of OSH management systems and practice by suitable means
8	Ensuring that the same level of safety and health requirements applies to contractors and their workers as to the workers, including temporary workers, employed directly by the organization.

Source: *Somavia (2009:6)*

Hence, the ILO guidelines on occupational safety and health management systems recommended national OHS management system policy promotes a safe work environment for all individuals at the workplace including employees, contractors and visitors.

Traditionally, OHS approach was more focused on historical data, for example illness, injuries, and fatality statistics, whereas with the introduction of the systems approach the traditional approach is not ignored but there is shift in focus on managing OHS based on OHS performance using the interactive process approach (Fuller 2019: 81). There is an increased global expectation from society for organisations to actively engage in to provide a healthy and safe work environment by protecting the health and safety of worker and ISO 45001:2018 offers organisations an OHS framework that can effectively manage workplace health and safety (Kapp 2018: 242). The compilation of ISO 45001:2018 began in 2013 and was introduced in 2018, a five-year effort resulted in an OHS standard that has consensus among the research and consultancy committee of offering an opportunity to play an important role in addressing compelling global health and safety issues (Neag, Ivascu and Draghici 2020: 2).

A proactive risk-based approach needs to be adopted by organisations to improve employee health and safety and in 2018, ISO 45001:2018 was introduced, providing a framework to proactively manage and prevent occupational deaths and injuries (da Silva and Amaral 2019: 123). ISO 45001: 2018 was developed from Occupational Health and Safety Assessment Series (OHSAS) 18001 as per a proposal from the British Standards Institute (BSI) (Jones 2018: 5). The main differences between OHSAS and ISO 45001:2018 is illustrated in Table 3.5 (Glaesel and Corrie 2018: 1). The introduction of ISO 45001:2018, is a milestone in the evolution of managing and improving employee health and safety performance globally (Fuller 2019: 92) and Heras-Saizarbitoria (2017: 4), ISO 45001:2018 alludes that ISO 45001:2018 provides a framework to proactively manage the prevention of work-related deaths, injuries, and the deterioration of employee health.

Table 3:5 The main differences between OHSAS and ISO 45001:2018

	OHSAS	ISO 45001:2018
1	Focused on managing occupational health and safety hazards and other internal issues	concentrates on the interaction between an organization and its business environment
2	Based on procedures	ISO 45001:2018 is based on the process approach
3	Not dynamic in all clauses. Based on scoring system	Dynamic in all clauses. Based on requirements.
4	Deals exclusively with risk	Considers both risk and opportunities
5	Does not include the views of interested parties	Includes the views of interested parties

Source: *Glaesel and Corrie (2018: 1).*

Indicative from the above comparison, it is apparent that ISO 45001:2018 in comparison to OSHSA 18001 has a broader OHS perspective in the management of workplace occupational health and safety. The historical mandate of ILO is the protection of employees against work-related sickness, disease, and injury, promote opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security, and human dignity hence the ILO has prepared the guidelines on occupational safety and health management systems (Somavia 2009:6). ISO 45001:2018 builds on the success of OHSAS 18001, the ILO's guidelines on occupational safety and health management systems, various national standards, and is consistent with the ILO's international labour standards and conventions (International organization for standardization. 2018: 1).

ISO 45001:2018 represents the work of global experts and it is where the world is heading as it connects the cost of the OHS to the benefits of implementing a risk-based system that allows an organisation to proactively allocate cost to higher

health and safety risk concerned areas (Wells 2018: 71). The South African National Standard ISO (45001:2018 vi), suggests that the purpose of OHS management system is to provide a framework for managing OHS risks and opportunities and the aim and intended outcome is to prevent work related injuries and ill health, thereby providing a safe work environment. The ISO 45001:2018 standard provides a framework that organisations can use to increase safety, reduce workplace risks and enhance employee health and well-being, enabling an organization to proactively improve its OHS system management performance (International Organization for Standardization 2018:1). Hence considering the global change in the work environment and the negative impactive of health and safety incidents, it is imperative that organisations implement a proactive approach to manage workplace health and safety and ISO 45001:2018 provides a framework that organisations can use to achieve this objective.

3.5.2 ISO 45001:2018 OHSS: Objectives

ISO 45001:2018 is a risk-based health and safety standard that provides a framework for the prevention of deaths, work-related injuries and work-related pathologies, in order to provide a safe working environment for employees and other stakeholders working under the authority of the organisation (Ahidar, Sarsri and Sefiani 2018: 183). ISO 45001:2018 enables organisations to fulfil their responsibility of promoting and protecting their employees physical and mental safety and health by providing a safe and healthy workplace, preventing work-related injury and ill health, and continually improve its OHS performance (South African National Standard 45001:2018: vi). Reese (2016: 37) highlights the following reasons to prevent workplace accidents, injuries, illnesses, and deaths:

i. To ensure a safe and healthy workplace. The health and safety destruction of an employee's life is morally unjustified;
ii. Organisations are responsible to identify and eliminate or mitigate workplace hazards. Employers are morally responsible for employee health and safety incidents if they do not identify workplace hazards

and take the necessary precautionary preventative measures. A proactive health and safety programme results in a reduction of health and safety incidents;

iii. Organisations must minimise the negative impact of loss time due to health and safety incidents. The efficiency and productivity of an organisation is impacted upon due to occupational health and safety incidents;

iv. Organisations have a social responsibility to all stakeholders. The impact of an organisation's health and safety incidents results in social harm to that organisation; and

v. Organisations have an obligation to comply with legislative and regulative health and safety requirements.

3.5.3 ISO 45001:2018 OHSS: Benefits

The South African National Standard (45001:2018: 1), da Silva and Amaral (2019: 123) and the International Organization for Standardization (2018: 3), discuss the following benefits of ISO 45001:2018:

i. Enables an organisation to manage work related injuries and ill health, to manages hazards and reduces workplace accidents thus providing a safe and healthy workplace;

ii. Proactively assesses and manages OHS risks and opportunities;

iii. Reduces absenteeism and employee turnover, thereby increasing productivity, reducing insurance premiums and assists in ensuring compliance to statutory and regulatory requirements; and

iv. Creates a safe and healthy work organisation culture that demonstrates senior management's commitment to employee health and safety and improves the morale of employees, enhances the reputation of the organisation.

From the preceding benefits it can be concluded that there are motivational reasons for organisations to implement an OHS management system however as indicative in the following discussion, organisations sometimes conduct a cost benefit

analyses as justification for implementation. Organisations that do not believe that there is a cost benefit of implementing a proactive OHSMS, will implement the minimum occupational health and safety measures to satisfy statutory and regulatory requirements and on the other hand organisations that view occupational health and safety as a return of investment will benefit from a reduction of workplace OHS incidents, reduction in absenteeism, higher employee motivation and improved productivity (Morgado, Silva and Fonseca 2019: 756). Engelhardt (2018: 3), reiterates that the development of a robust occupational health and safety management system must not be viewed as a financial and administrative inconvenience but an opportunity for improvement that assists in minimising the loss of experienced people, reduces absenteeism, reduces business interruption, assists in preventing legal action, reduces the increases in insurance premiums. and is therefore central to an organisation's performance This indicates that although, it may be difficult to justify health and safety initiatives based on return of investment, the cost of not implementing these initiatives can be the basis for justification.

ISO 45001:2018 is not a legally binding document but a management tool for voluntary use and does not specify the following (International Organization for Standardization 2015: 2):

i. The criteria for OH&S performance;
ii. The prescriptive nature about the design of an OH&S management system because an OHS management system must be specific to satisfy its own OHS in preventing injuries and ill-health; and
iii. How to address issues such as product safety, property damage or environmental impacts.

However, it must be noted that that researched organisation facilitates OHS legal audits in support of their OHS management system to ensure compliance to regulatory and statutory requirements.

3.5.4 ISO 45001:2018 OHSS: Success factors

The South African National Standard (45001:2018: 1) and Sklad (2019:71), reiterates that the following factors will determine the success of an organisation's ISO 45001:2018 implementation:

i. An organisation culture that is driven by the senior management of the organisation that supports the implementation of ISO 45001:2018. There must be commitment of senior management and employee at all levels within the organisation. If the senior management of the organisation is not committed to safety, then it is unlikely that other employees of the organisation will be committed to OHS;
ii. Consultation and communication of all aspects of ISO 45001:2018 OHS to all stakeholders and the allocation of the necessary resources for implementation and maintenance of the OHS management system. There must be an alignment of, OHS objectives with the OHS policy of the organisation and OHS policy with the strategic goals of the organisation;
iii. Implementation of risk-based process management for the identification, prevention, and handling of OHS hazards. Taking effective preventive and protective measures to eliminate hazards and minimise OHS risks, taking advantage of opportunities to improve OHS. The organisation must also ensure identification and compliance to OHS legal and other requirements; and
iv. OHS training and development of all individuals that will be impacted on or who can have an impact on OHS initiatives. Employee's willingness to report and share workplace accidents information and monitoring, evaluating and continuous improvement of the performance of the OHS management system.

Hence, for the successful implementation and to reap the benefits of ISO 45001:2018 occupational health and safety management standard, organisations must consider the factors for success. The technological advancements of the fourth industrial revolution, have changed the working environment and has resulted in the following OHS opportunities and challenges, presented in table 3.7 (International Labour Organisation. 2019:29).

3.5.5 OHS Opportunities and challenges.

Table 3:6 Fourth industrial revolution OHS opportunities and challenges

Opportunities	Challenges
• The possible reduction in some psychosocial risks from the improved work-life balance due to telework and the reduction of stress associated with commuting. • The Removal of employees from hazardous environments • The opportunity for the reduction of the need for work-related travel • The increased control over employee work-life balance • The reduced need for real-world trial of prevention measures • The real-time monitoring of exposure to hazards • The real-time monitoring of physiology and 'nudges' towards behaviours such as taking a break from computer use, • There is an increased understanding of human behaviour and its underlying mechanisms, • Improved communication of OSH practice • New opportunities for OSH research, development and learning, • Improved collection and sharing of accurate OSH records, • Cost-effective way for developing countries, to keep pace with progress in OSH, • Improved and widened access to education and training (including for OSH itself)	• Possible increase in some Psychosocial risk from, a perceived need to be 'available' at all times, poorer work-life balance, self-isolation (remote working and lack of social interaction), performance monitoring, job insecurity, cyber-bullying, -aggression and -attacks, technostress and technology addiction and overload that can lead to, an increased pressure to 'cut corners', taking fewer breaks, taking risks, using, performance enhancing drugs, • An increased risk to security and privacy from the collection and recording of sensitive personal information and the loss of jobs and roles, • Increased ergonomic risk from increasing use of mobile devices and sedentary work leading to increased risk of associated health problems, • Exposure to new chemical or biological risks or electromagnetic fields • Increased risk of incidents and exposures from lack of risk assessment in remote workspaces, particularly public places • OSH management and outcome challenges related to a more diverse and dispersed workforce

***Source**: International Labour Organisation (2019:29)*

Hence, it can be summarised that OHS management systems offer opportunities for improvement of employee health and safety; however, organisations must also take cognisance of the fourth industrial revolution OHS challenges. The fourth industrial revolution may present a challenge to adapt to the changing environment

for the research organisation, however the research organisation must also consider the opportunities for improvements.

3.6 ISO 14001: 2015 Environmental management system

Whilst ISO 45001:2018 is a management system for employee health and safety, ISO 14001:2015 is a management system that manages an organisation's environment sustainability responsibility. The research organisation is certified to ISO 14001:2015.

3.6.1 ISO 14001:2015 EMS: Introduction

Environment management is the management of all activities that can have an impact on the environment Kahraman and Sarı (2017: 1) and the environmental sustainability concept emerged in the late twentieth century due to a combination of concerns about the environment and the poor reflection of societies focus on the economy rather than the reduction of the consumption of raw materials (Poltronieri, Gerolamo, Dias and Carpinetti 2018: 376). Environment management has evolved over the years from a reactive approach to a more preventative proactive approach that focuses their attention to environmental impacts of their production processes and finally to a product life cycle perspective (Oliveira, Oliveira, Ometto, Ferraudo and Salgado 2016: 1384). To address the goals of climate and poverty reduction goals, there needs to be an improved utilisation of conventional energy sources and an increase in the use of renewable energy sources (McKane, Daya and Richards 2017: 389). However, Chowdhury, Prajogo and Jayaram (2018:340), echoes that the effective implementation of ISO 14001:2015 EMS is sometimes influenced by the strategic choice of an organisation in relation to the cost benefit analysis of implementation.

The metal industry, in particular, pays close attention to variables that impacts on cost, quality, competitiveness, and efficiency therefore the industry has been implementing environmentally friendly practices such as recycling and by product

reuse (Pinto, Sverdrup and Diemer 2019:2). For example, steel is the main driver of global economy, however the industry has tradition of recycling resulting in steel being the most recycled material (Reh 2012: 1). Consequently, the South African metal packaging sector has the highest recycling rate of almost 76% of recovery and although the sector is experiencing economic challenges, the sector is taking advantage of the trend to reduce plastic and use recyclable metal containers (Research and Markets report 2019:01).

Traditionally customers focused on the economic criteria for supplier selection, however more recently the deterioration of the environment have compelled organisations to include green criteria in their supplier selection process as part of their green supply chain management strategy (Yazdani, Zavadskas and Zolfani 2017: 3729). The green economy is defined as an economy that results in improved well-being of humans and social equity while significantly reducing environmental risks and ecological scarcities (Ramsarup and Ward 2017: 29).

Lifestyles have become increasingly resource dependable and there is an urgent need to adopt a more sustainable way of living by reducing the consumption of natural resources (Uren, Roberts, Dzidic and Leviston2019: 1). However, organisations are driven by a population growth and the demand for individual wealth, and this has resulted in a higher consumption of energy and raw material that negatively impact on the environment (Reh 2012: 1). To address the typical depletion and waste of resources predominant in a linear economy where resources reach an end of life, it is important to consider a circular economy where waste is viewed as a resource that is reintroduced into the economy (Franklin-Johnson, Figge, and Canning 2016: 589). Therefore, due to economic and environmental challenges, organisations have implemented production and supply chain systems to extend the product life from a linear, take, make, use, dispose chain, to a take, make, use, reuse circular value chain that extends the life of the product, that saves operational costs and reduces the environmental impact (Batista, Gong, Pereira, Jia and Bittar 2018: 7248). The environmental value chain considers the full range of processes from the conception to the end use of a product and uses the circular economy concept that highlights the importance of reuse and recycle in

consideration of the impact of the product on the environment at different stages of the product life cycle (Ramsarup and Ward 2017: 29).

The South African Department of Environmental, Forestry and Fisheries (DEFF) (1998: 10), accentuate that everyone has a right to an environment that is not harmful to their health and well-being, everyone has the right to protect the environment for current and future generation and the South African National Environmental Act (NEMA) is based on the following principles:

i. People and their needs must be placed in the forefront of environmental management. The effects of decisions on all aspects of the environment on people must be based on pursuing and selecting the best practical environmental option.
ii. Employees have the right to refuse work that is harmful to human health, or the environment and they must be informed of dangers that must be respected and protected.
iii. All factors must be considered for sustainable development. All elements of the environment are linked and interrelated therefore environment management must be integrated and there must be economically, socially, environmentally, and sustainable development. There must be a pursuit of environmental justice.
iv. There must be environment and health responsibility for the consequence of a policy, programme, project, product. process. service or activity throughout its life cycle and there must be national interest for global and international environment responsibilities There must be an equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human well-being and
v. Community wellbeing and empowerment must be promoted. There must be participation of all interested and affected parties in environmental governance must be promoted. Those that are responsible for harming the environment must bear the cost the remedy action. The harmonisation of policies, legislation and actions relating to the environment, must be co-ordinated intergovernmental. Specific planning and management attention is required for sensitive, vulnerable, highly dynamic or stressed ecosystems.

DEFF has developed a National Waste Management Strategy (NWMS) that provides a framework for a strategic approach to South African waste management that is aligned to the national development plan, vision 2030 and is structure around the following eight goals (National waste management strategy 2020: 30):

i. Ensuring that the delivery of waste services is effective and efficient by promoting the minimisation of waste generation, growing the waste sectors contribution to the green economy, the re-use of waste generated, recycling of waste generated, the recovery of waste generated and ensuring that there are measures to remediate contaminated land;
ii. Creating awareness of the impact of waste on health, well-being, and the environment and establishing effective compliance with and enforcement of the Waste Act by implementing an integrated waste management plan; and
iii. Ensuring that there is sound budgeting and financial management for waste services.

It can be concluded that the objective of NEMA is to protect the long-term environmental sustainability for future generation by providing guidelines and legislations that considers the sustainability interest of the environment.

Organisations must consider and implement action plans on the environmental topics discussed in Table 3.5 to create an image of an environmental responsible organisation.

Table 3.8 Environment topics

	Environment Topic	Considerations
1	Carbon footprint	Carbon management that aims to minimise carbon dioxide and other greenhouse gases that can have a negative impact on the environment,
2	Soil degradation management	The impact of human and natural hazards that creates a measurable loss of the potential of soil to produce plant material
3	Disaster Response and Management	The management of both human and natural disaster to mitigate, prepare, respond and recover the environment
4	Solid waste management	Measures that address the prevention, recycling, treatment and disposal from the generation to the disposal of solid waste.
5	Wastewater management	Initiatives to maintain the sustainability of wastewater by collecting and treating wastewater that goes into the rivers or seas for reuse,
6	Water resources management	Initiatives that pivot around the need for water preservation, availability, quality and supply,
7	Sustainable Transportation	Refers to the shaping of transportation to minimise the impact on the environment.
8	Hazardous Waste Management	Initiatives that address the adverse impact of solid, liquid or gas hazardous waste that has physical, chemical or biological characteristics.
9	Air Quality Management	Initiatives that address concerns over global warming and ozone layer depletion that have increased the concerns on air pollutants and air quality.
10	Energy Management	Initiatives that address the management for the growing demand and constraints for energy generation, energy distribution and energy consumption.

Source: *Kahraman and Sarı (2017: 2)*

Increased industrial development over the past two decades has resulted in environmental degradation that has become a social concern for organisations globally, resulting in these organisations implementing 14001:2015 environment management systems (Chowdhury, Prajogo and Jayaram 2018:340).

The ISO 14001 EMS, based on the British standard BS 7750, was introduced in 1996 due to the growing demand for environmental responsibility and the standard benefited from the success of its predecessor ISO 9001QMS (Heras-Saizarbitoria 2017: 4).

ISO 14001 is an internationally recognised standard that sets out the framework for an EMS that assists organisation to improve their environmental performance through efficient use of the required raw material resources, reduce the impact of waste generated on the environment and gain stakeholder confidence (International organisation for standardisation 2015: 2). The ISO 14001:2015 ISO standard provides guidelines and requirements for an organisation to adopt a structured approach to implement, manage, and improve the environmental performance of the organisation (Johnstone and Hallberg 2020: 3). The aim of ISO 14001:2015 is to plan an organisation's operational and administrative functions to manage the environmental impacts of the organisation's processes which will have a positive influence on the organisation's environmental performance (Oliveira, Oliveira, Ometto, Ferraudo and Salgado 2016: 1384).

The reduction of an organisation's carbon footprint is not a destination but a journey with the aim of achieving a zero-carbon footprint and the ambitious objective is to achieve a negative carbon footprint by removing carbon from the environment (Wilson 2015:433). The following principles are required to achieve a reduction of carbon emissions by the year 2030, (South African national development plan 2030 2017: 179):

i. Recognise and be mindful of the starting point considering that South Africa is a developing country and the protection, and the promotion of South African citizenship must be in the context of global human solidarity. There must be an acknowledgement of the well-being of the citizens on the preservation of the planet and this must be a strategic approach, adjusting risks and opportunities as these emerge and the management of trade-offs;
ii. Transition change must be transformative addressing all aspects, phased gradually, managed, focusing on opportunities for business,

growth, competitiveness, and the creation of employment. There must be a balanced collection of evidence with immediate actions the with effective participation of social partners and neighbours to achieve mutual benefits;

iii. Full cost accounting is required and early investment in low carbon technologies that will position South Africa to compete in a carbon constrained environment; and

iv. There must be sound, coherent, and aligned policies that will provide predictable signals and the transition must be led, managed, monitored and verified.

Based on the preceding literature, organisations are driven by the market they serve and government regulations and legislations to continually improve their environmental performance and the consequence of not adhering to these regulations and legislations could result in penalties and loss of market share. The research organisation is certified to ISO 14001:2015 and has conducted an environment SWOT analysis. However, the organisation must take advantage of the internal strengths, build on the weaknesses, combat threats and consider opportunities for improvement.

3.3.1 3.6.2 ISO 14001:2015 EMS: Objectives

Ahidar, Sarsri and Sefiani (2018: 183), Nunhes, Motta and de Oliveira (2016: 1235) and the international organisation for standardisation (2015: vi) envisage that the following are the objectives of ISO 14001:2015:

i. ISO 14001:2015, EMS provides a framework for protection of the environment and to respond to changing environment conditions with the objective of improving an organisations environment performance;

ii. Unlike ISO 9001:2015 QMS that is driven by customer satisfaction requirement, whilst ISO 14001:2015 EMS is driven by stakeholder expectations including government statutory and regulatory requirements and assists in the achievement of environmental compliance obligations;

iii. Communication of environmental information to relevant parties;
iv. Adopt a balance approach between the environment, society, and the economy by enhancing and maintaining environmental sustainability to preserve current resources for future generation. Thus, enhancing the environment performance of the organisation; and
v. Assess and reduce environmental risks and take advantage of environmental opportunities using a product life cycle perspective to analyse, review and minimise the impact on the environment at different stages of the product to achieve financial benefits by reducing and reusing.

To continually improve an organisation's environmental performance and satisfy the environmental requirements of interested parties, organisations develop environmental policies, define environmental objectives and implement supporting processes (Rebelo, Santos and Silva 2016: 97). Hence, for an organisation to successfully implement ISO 14001:2015 environmental management system, consideration must be given to the success factors and objectives mentioned above.

3.6.2 ISO 14001:2015 EMS: Benefits

The International organisation for standardisation (2015: 4), posited the following benefits of implementing an ISO 14001:2015 MS:

i. Demonstrates senior management's commitment to environment sustainability that will, increases the engagement of employees, create an environment sustainability organisation culture, enhance the reputation of the organisation, gain stakeholder confidence, and portrays an environmental responsibility organisation, resulting in a greater market share. Thereby, improving the financial situation of the organisation by better management of resources, reduction in waste generated and minimises the impact on the organisation;

ii. Assists an organisation in proactively managing environmental risks.
iii. Assists in ensuring compliance to statutory and regulatory requirements; and
iv. Encourages suppliers to also become environmentally conscious.

The Stats SA (2020: 17) 2020 third quarterly Labour Force Survey, reflected that the working age population increased by 146 000 and the number of unemployed people in South Africa increased by 2.2 million to 6.5 million unemployed persons, that is an unemployment rate of 30.8% and the increase in the unemployment rate was partially attributed to the COVID 19 pandemic. There is growing global evidence that green jobs that contribute substantially to preserving or restoring environmental quality can lead to economic development, and the creation of jobs (Ramsarup and Ward 2017: 29).

Incorporating environmental management system into the strategy of an organisation and including an environmental life cycle perspective, assists an organisation to improve their environment performance and reap the environmental performance benefits as demonstrated in figure 3.2 (Greenworld 2016: 3). However, Chowdhury, Prajogo and Jayaram (2018:340), reiterated that the effective implementation of ISO 14001:2015 sometimes hinges on the organisation's expectations of the benefits of implementation.

Figure 3.2. Benefits of ISO 14001:2015

***Source**: Greenworld (2016: 3)*

Figure 3.2 shows that the benefits of implementing ISO 14001:2015 EMS are a reduction of waste by continual environmental improvement initiatives, the protection of the organisation by avoiding and reducing environment risks, creation of business growth by increasing the competitive position of the organisation through the inspiration of business trust and complying to regulatory and industry compliance,

Pinto, Sverdrup and Diemer (2019: 1), echoes that organisation seek benefits from deviating from traditional environmental models toward closed loop circular environmental models focusing on the following aspects:

i. The use of waste as inputs to manufacturing;
ii. Adopting cleaner and renewable energy sources;
iii. Accurate biophysical costing of the extraction, transformation, use and reinsertion into either economy or biosphere; and
iv. Product design consideration to facilitate collection, recycling, refurbishing, reuse, redistribution, maintenance and sharing throughout the product lifespan.

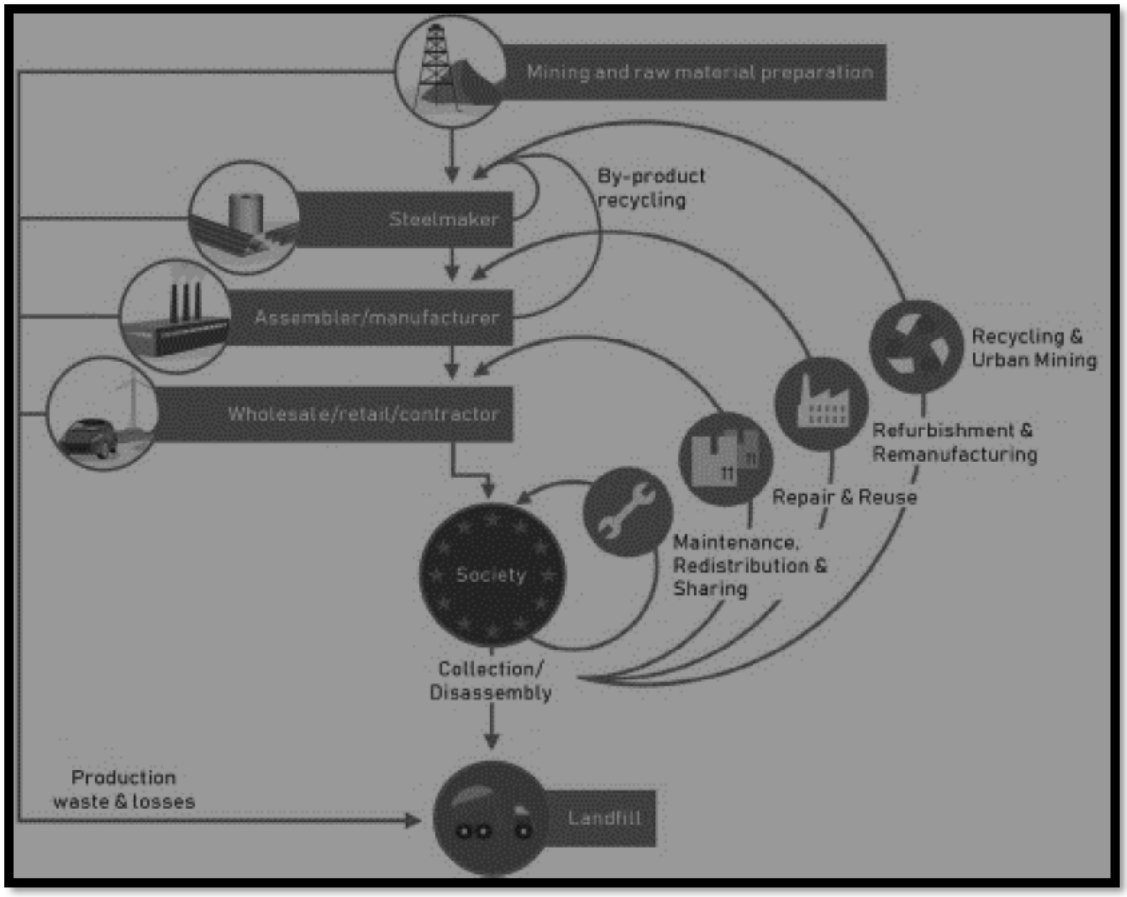

Figure 3.3 Circular economy of steel

***Source**: Pinto, Sverdrup and Diemer (2019:1)*

Figure 3.3. illustrates the circular economy of steel whereby there is a reduction of mining of raw materials because of the adoption of a life cycle perspective that accesses the raw material at the different stages promoting recycling and reusing. Thus, minimising the environmental impact of the various process stakeholders.

3.6.3 Circular economy

The traditional linear model of buy, consume and dispose, has been replaced with an environment sustainability circular model that focuses on all aspects of a products life cycle to maintain sustainability of the environment for future generations (Tantau, Maassen and Fratila 2018: 3). The constitution of South Africa

act 108 (1996: 1251), accentuated that everyone has the following environmental rights:

i. To an environment that is not harmful to their health or well-being; and
ii. To have an environment that is protected for the present and future generations through reasonable legislative and other measures to prevent pollution, to prevent ecological degradation, to promote conservation, to secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.

The South African national development plan 2030 (2017: 179), explains that the mapping of the transition to a low carbon economy requires consensus on the challenges and trade-offs involved in implementing the South African climate policy.

There is an increasing growth in industrialisation, urbanisation and population that contributes to an increase to the negative impact on the environment that therefore requires implementation of environmental management systems to decrease an organisations impact on the environment and improve its' environmental performance (Kahraman and Sarı 2017: vii). Due to the growing awareness to protect the environment, there is a growing demand from environmental conscious customers for ISO 14001 implementation, resulting in reduction in the cost of waste, an improved image of the organisation, savings in energy and material consumption (Ni 2019: 395). 55 million tonnes of general waste were generated in 2017 with only 11% being diverted from landfill, this has resulted in South Africa experiencing severe shortage of available landfill space as well as challenges to legally operate and decommissioning landfill sites (National waste management strategy 2020: 30).

Product life cycle assessment and circular economy has become a global strategy to improve environmental performance and achieve a sustainable economic system (Tantau, Maassen and Fratila 2018: 1). An organisations environmental performance is multidimensional and extends beyond the boundary of the organisation, promoting international trade and achieving social, economic, and environmental benefits (Johnstone and Hallberg 2020: 3). Initially ISO 14001 EMS

implementation was driven by compliance but in recent years due to stakeholder pressure to demonstrate environmental responsibility as a business relationship requirement, it is part of an organisation's corporate strategy (Heras-Saizarbitoria 2017: 4). An organisation's ISO 14001 EMS can complement government regulations in the global environmental sustainability governance context (Wagner 2019: 1066).

Certification to ISO 14001:2015, requires an organisation to implement or modify internal organisational processes that will result in internal and external environmental performance improvements (Johnstone and Hallberg 2020: 3). Hence a comprehensive EMS using the process approach and based on the PDCA continual improvement strategy is required by an organisation to satisfy the environmental requirements of all stakeholders thus ensuring preservation of current natural resources for future generations.

3.6.4 ISO 14001:2015 EMS: Success factors

The following factors will determine the success of an organisation's ISO 14001:2015 implementation (International organisation for standardisation 2015: vi):

i. Senior management of the organisation must lead the organisations EMS and there must be a commitment to environment sustainability by employees at all levels within the organisation;
ii. Environmental risks, aspects and the impacts must be identified and managed; and
iii. The organisation must leverage opportunities to avoid or minimise any adverse impacts on the environment and beneficial environmental impacts must be enhanced. The organisation must have a waste management strategy that is aligned with the organisation's strategic goals.

ISO 14001:2015 requires that organisations consider the following environmental issues that are relevant to the organisation (Gueorguiev and Sakakushev 2016: 972):

i. The internal and external factors that can impact on the environment relating to the pollution of the air by the organisations processes, Issues related to water and sewage, the management of the different waste streams, the contamination of the ground by the organisations processes and the efficient use of resource using a product life cycle perspective;
ii. The mitigation and adaption of climate change and the ozone level;
iii. Maintenance of emergency preparedness and response processes; and
iv. Statutory and regulatory compliance.

Hence organisations must consider the success factors when implementing an ISO 14001:2015 EMS to reap the benefits and improve the organisation's EMS performance.

3.6.5 EMS opportunities and challenges

Kasner and Edward (2018:7) of Packaging SA has identified EMS opportunities and challenges illustrated in table 3.9.

Table 3:7 EMS opportunities and challenges

Opportunities	Challenges
• Adopting circular economy philosophy, that is a regenerative system, • Setting up of Producer Responsibility Organisations (PRO), • Application of Extended Producer Responsibility (EPR) where a producer's responsibility is extended to post stage of the product life cycle, • Set targets for waste reduction, recycling and re-use and implementation of industry waste management plans, that involve planning of waste generated actions by an organisation, • Creating of waste pickers job opportunities, • Waste prevention policy that involves taking measures to produce or reduce waste generation, • Recycling involving recovery process of waste for re-use whether for original product or for alternate products, • Introduction of refillable packaging that can be re-used, • Separation of waste for recycling and • Implementation of environment sustainable goals;	• Growing population and economy resulting in a higher volume of waste generated, • The increased complexity of waste streams, • Inadequate waste collection services for informal areas, • Unreliable and contradictory waste date because the submission of waste data is not obligatory resulting in limited understanding of waste flows, • Waste management is not actively promoted by the policy and regulatory environment, • There is a lack of infrastructure to support waste separation at the source, • Declining levels of capital investment and maintenance on waste management, • Preference of waste disposal against other options due to the low appreciation of waste management resulting in under-pricing, • Few waste management options are available resulting in being more expensive than landfill cost, • Too few compliant landfills. and hazardous waste facilities hindering safe disposal of waste and • Additional tax burden with the introduction of environment levy for paper and packaging.

Source: (Kasner and Edward 2018:7)

Hence an organisation must take into cognisance the opportunities and challenges when implementing an EMS. The researched organisation is a member of MetPac PRO, that provides guidance on regulatory and statutory packaging products requirements.

3.7 ISO 9001:2015 QMS

Whilst ISO 45001:2018 manages an organisation employee health and safety and ISO 14001:2015 manages an organisations environment aspects and impacts, ISO 9001:2015 manages an organisations product quality. The research organisation is certified to ISO 9001:2015 QMS.

3.7.1 ISO 9001:2015 QMS: Introduction

Implementation of ISO 9001:2015 is voluntary and can be applied to any organisation irrespective of product manufactured or services provided (Hallberg, Hasche, Kask and Oberg 2018: 486). There has been an evolution of QMS by various quality gurus over the last century with the goal being to achieve sustained continuous quality improvement and this is achieved by setting and accomplishing the overall quality objectives of the organisation (Kumar, Maiti and Gunasekaran 2018: 1036). The ISO 9001 QMS was developed from the British standard BS 5750 in 1987 and was substantially revised in 1994, 2000, 2008 and 2015 (Heras-Saizarbitoria 2017: 3).

Due to the trend of globalisation, the introduction of the fourth industrial revolution and an increase in customer expectations, ISO 9001 is an important quality assurance programme that establishes a quality cultured oriented environment that that helps to build sustainable competitive (Kakouris and Sfakianaki 2018: 2248). Gaining ISO 9001:2015 certification, marks the outgoing quality to global standards, improves the internal operations and processes of an organisation, helps in gaining market share and increases customer loyalty (Majerník, Daneshjo, Chovancova and Sanciova 2017: 135). Since the dawn of civilisation, the survival of organisations depended on trade, certification to the ISO 9001 standard gives customers confidence that the supplier will satisfy their current and future needs and expectations, thereby facilitating trade (Hoyle 2018: 67).

An organisation’s relationship with customers goes through sequential stages over a long period of time, with QMS certification being one of the selection criteria that

prescribes the nature and longevity of the customer and supplier relationship (Hallberg, Hasche, Kask and Öberg 2018: 483). Non-conforming quality results in a higher defect rate, which results in a higher scrap rate and this impacts on wasted environmental resources, waste of resources in conversion and also impacts on disposal in the environment (Odigie, Badar, Sinn, Moayed and Shahhosseini 2017:439). ISO 9001:2015 necessitates the requirements to be integrated into the processes of the organisation, thereby ensuring that quality is an essential part of the organisation (Hoyle 2018: 50). Implementation of ISO 9001:2015 demonstrates that an organisation can consistently satisfy and enhance the requirements of the customer and also meet statutory and regulatory requirements (Abuhav 2016: 1). Hence, although the implementation of ISO 9001 maybe voluntary, it may be an essential market requirement to conduct business that can promote and sustain an organisation's existence.

The ISO 9001:2015 QMS is based on seven principles that was developed by the ISO technical committee and these principles can be used as a guide to improve an organisation's product and service quality. (International Organization for Standardization 2015). Table 3.9 presents the seven principles of ISO 9001:2015.

Table 3:8 The seven principles of ISO 9001:2015c

ISO 9001:2015 Principles	Description
1.Customer focus	The primary objective of a QMS is to satisfy and strive to exceed the requirements of customers
2. Leadership	Leaders at all levels of an organisation establish unity of purpose, set strategic direction and create a culture for employee engagement to achieve an organisations quality objectives
3. Engagement of people	In order to achieve organisation quality objectives, efficiency and effectiveness , organisations require competent, empowered and engaged people
4. Process approach	The activities of and organisation must be understood and managed as interrelated processes that function as a coherent system
5. Improvement	Organisations must be able to focus on maintaining the current levels of performance , react to changes and create opportunities for improvement.
6. Evidence-based decision making	Organisation must make objective decisions based on the analysis and evaluation of data and information.
7. Relationship management	An organisations relationsionship with interested parties impact on the organisation's performance therefore organisations must manage these relation to optimize their impact on its performance

***Source**: Adapted from South African National Standard (9001:2015: 1).*

The seven principles of ISO 9001:2015 derived from the collective knowledge and experience of global quality professionals that are members of the ISO technical committee (Gueorguiev and Sakakushev 2016: 972). It can be deducted that considering the growing demand from customers for higher quality products, organisations have implemented QMS's to remain competitive for the long-term sustainability of the organisation.

3.7.2 ISO 9001:2015: Objectives

Hoyle (2018: 7), stipulates that the primary objective of ISO 9001 was to develop a simplified set of standards that will be applicable to all types of organisations for the documentation required to achieve the desired results of the organisation The objective of the ISO 9001 QMS standard is to assist organisations to achieve an improved level of quality resulting in, greater customer satisfaction, reduction in

customer complaints, increase in competitive advantage and access to new markets (de Oliveira 2013:125). Abuhav (2016: 7), contends that all organisations require a business strategy and ISO 9001:2015, requires an understanding of the context of the organisation that aligns the context of the organisation to quality, which is key to achieving the quality objectives of the organisation. Odigie, Badar, Sinn, Moayed and Shahhosseini (2017:441) support the contention that an improved level of quality can be achieved by improving the quality of all organisations processes and activities, however this must be a continuous process widely used by the organisation as a management strategy to build a quality culture that promotes customer satisfaction and is based on continuous improvement.

Hence, to enhance the level of the organisation's quality, organisations must determine what they want to achieve in terms of quality, set quality objectives that are aligned to the strategy of the organisation and have a plan to achieve these objectives.

3.7.3 ISO 9001:2015: Benefits

The International Organisation of Standards (2015:vi) quality management system requirements standard, Kumar, Maiti and Gunasekaran (2018: 1056) and Tahir (2017: 18), infer the following are the benefits on implementing ISO 9001:2015:

i. Allows an organisation to consistently to achieve customer, statutory and regulatory requirements;
ii. Provides opportunities for the organisation to enhance the satisfaction of the customer;
iii. Allows the organisation to address risks and opportunities that is associated with the organisation's context and quality objectives;
iv. Provides the ability of the organisation to demonstrate conformity to the QMS requirements;
v. Improves the quality of an organisation's products and processes; and
vi. Promotes export market opportunities.

Hence, organisations must consider the benefits of implementing a QMS when justifying the implementation.

The findings of a study conducted by Kumar, Maiti and Gunasekaran (2018: 1056), reflected that of a total of 263 articles that was researched on QMS's, 90 percent of the organisations that implemented a QMS confirmed a positive relationship between implementing a QMS and a positive impact on the organisation's performance and the balance 10 percent indicated that there was no relationship or a negative relationship. A study conducted by Shepherd (2020:8), also deduced that the results indicated that ISO 9001 boosts trade however there is little evidence of a positive impact in developed countries. Hence for organisations to reap the benefits of implementing ISO 9001:2015, organisations must consider the objectives, benefits, success factors and challenges of implementing a QMS.

3.7.4 ISO 9001:2015: Success factors

Hoyle (2018: 67) and Tahir (2017: 18), infers that the following factors will determine the successful implementation of an ISO 9001:2015 QMS:

i. The implementation of a QMS must be a strategic decision that is embraced by all levels of the organisation and must focus on satisfying the quality requirements of all stakeholders;
ii. There must be commitment and involvement of all stakeholders to produce quality products and offer quality services;
iii. Resources required to manage and improve an organisations product and service quality must be identified and provided;
iv. There must be ongoing communication of relevant information to all interested parties;
v. The organisation must conduct training needs analysis and employees must be developed and
vi. ISO 9001:2015 must be mapped into the existing organisation processes and not be implemented as a paper system that adheres to the standard clause by clause.

Hence, organisations must consider these factors when implementing a QMS to ensure successful implementation that will align and support the organisations strategic quality objectives.

3.7.5 QMS opportunities and challenges

Assuring high quality products is a competitive factor therefore an organisation QMS must be planned and implement in consideration of the surrounding environment (Behmera, Jochemb and Hanke (2016: 963), and to promote QMS certification, decision makers must understand the environmental opportunities and challenges that organisations face (Aamer, Al-Awlaqi and Mandahawi 2020: 358). The introduction of the fourth industrial revolution has presented further quality management system opportunities and challenges for consideration (Corti, Masiero and Gladysz 2021: 1). Table 3.9 illustrates the opportunities and challenges of quality management systems.

Table 3:9 QMS opportunities and challenges

Opportunities	Challenges

• Provide consistent high-quality products,
• Gain a greater market share,
• Implementing Fourth industrial innovations
  ○ Digital and technology providing competitive advantages in quality,
  ○ Data driven quality,
  ○ Availability of big data,
  ○ Internet of things devices operating as data acquisition source,
  ○ Real time monitoring of quality,
  ○ Investment in artificial intelligence,
  ○ Problem solving using cyber physical systems,
  ○ Embedding quality in the process, allowing for quick detection of non-conformances,
  ○ Introducing real time statistical process control
	• Cost cutting
	• Unclear goals
	• Workload
	• Poor communication
	• Lack of commitment
	• Resistance to change.
	• Resource allocation
	• Fourth industrial revolution
	  ○ Required quality culture changes and involvement of employees in embracing quality 4.0,
	  ○ Provision of quality assurance for complex products,
	  ○ Higher cost of quality non-conformances,
	  ○ Limited skills and knowledge of quality 4.0,
	  ○ Planning and implementation challenges of quality 4.0,
	  ○ Management of large amount of data,
	  ○ Adoption of new technology and
	  ○ Funding;

Source: *Behmera, Jochemb and Hanke (2016: 963), Corti, Masiero and Gladysz (2021: 1) and Aamer, Al-Awlaqi and Mandahawi (2020: 358).*

3.8 Challenges in implementing the different management standards.

Table 3.11 is based on a study conducted by DNVGL in 2016 and represents the challenges and the percentage of the 981 organisations that experienced these challenges in implementing ISO 45001:2018, ISO 14001:2015 and IS 9001:2015 MS (DNVGL 2016: 8).

Table 3:10 MS implementation challenges

Implementation challenges	Percentage of 981 organisations that experience the implementation challenge		
	ISO 9001:2015	ISO 14001:2015	ISO 45001:2018
Taking accountability of the effectiveness of the MS.	32%	34%	26%
Establishing MS policy and objectives that are compatible with the context and in alignment with the direction of the organization's strategy.	29%	33%	30%
Managing the integration of the MS requirements into the organization's business processes.	36%	44%	38%
Promoting the use of the process approach and risk-based thinking	41%	NA	NA
Ensuring that the resources needed for the MS are available.	28%	25%	41%
Ensuring the active participation of employees, employee representatives and the identification and removal of obstacles to participation.	NA	NA	34%
Communicating the importance of effective MS and of conforming to its requirements.	25%	33%	15%
Ensuring that the MS achieves its intended results.	20%	22%	18%
Engaging, directing and supporting persons to contribute to the effectiveness of the MS.	32%	25%	23%
Promoting continual improvement.	23%	19%	23%
Provision of supporting by the organisation's management in their respective roles to demonstrate leadership commitment;	27%	27%	19%

Developing, leading and promoting a culture in the organization that supports the OH&S management system.	NA	NA	34%
None of the above.	7%	8%	11%
Don’t know.	4%	4%	1%

***Source**: DNVGL (2016:8).*

Thus, as illustrated in table 3.12, the most significant challenge experienced by the 981 researched organisation is ensuring the integration of the MS requirements into the organization’s business processes. The fourth industrial revolution offers organisations continuous improvement opportunities. However, to take advantage of these opportunities, organisations must first overcome the challenges of adapting to the changes that are required for the successful implementation of the technology advancements (Asif 2020: 6).

3.9 SHEQ and the Fourth Industrial Revolution

The first industrial revolution saw the introduction of steam power machinery, mass production enabled by electrical power was the essence of the second industrial revolution saw, the core of the third industrial revolution was automation supported by electronic devices and information technology and the fourth industrial revolution evolves around the internet of things that enables more integrated, automated and efficient production flow that realises the vision of the smart factory (Gungor 2019: 2). The fourth industrial revolution represents entirely new ways of creating value by transforming all systems that we take for granted and it is entirely within our power to take advantage of the opportunities that are presented on the basis of continual improvement, in alignment with best practices (Schwab 2018: 12), Hence, business management systems need to find innovative ways to incorporate the technological advances of the fourth industrial revolution to gain a competitive advantage. It is envisaged that the organisation uses a cloud based SHEQ management system that will be easily accessible to all stakeholders that require access.

Organisations strive to excel in technology, operations, information systems and support processes and the latest advancements offered by the fourth industrial revolution leverages organisations to create a competitive advantage (Asif 2020: 1). There is diverse technology that leads the fourth industrial revolution that will change the manufacturing processes that will impact on, the health and safety of employees, environment, and quality (Min, Kim. Y, Lee, Jang, Kim. I and Song 2019: 400).

Several studies (Sony, Antony and Douglas 2020: 779; Gungor 2019: 2; Sumitha, Kannan, Karr, Loh and Andres 2020: 4; Garad 2021: 839), posited that the fourth industrial revolution comprises of the following notions:

i. Smart factories with manufacturing equipment that are linked to the internet of things utilising cyber-physical systems;
ii. Self-organization in manufacturing that promotes process interaction,
iii. Digitisation of the entire supply chain;
iv. Adaptation of digitisation to humans;
v. There is a shift from a supplier's market to a customer's market due to the growing surplus of industrial capacity and the wide choice offered to customers; and
vi. The COVID 19 global pandemic crisis compels organisations to restructure and consider accelerating the technological opportunities of the fourth industrial revolution.

The vision of the fourth industrial revolution is the introduction of smart factories which will allow for machine to machine, machine to human and human to human communication using the internet of things by analysing a substantial volume of generated data (Sumitha, Kannan and Garad 2021: 839). The manufacturing industry digitalisation influences the emergence of business model innovation, energy saving initiatives, cost saving initiatives for financial sustainability and profitability (Roblek, Thorpe, Bach, Jerman and Mesko 2020: 1). The fourth industrial revolution global challenges provide a window of opportunity for organisations to assist with attaining occupational safety, health, environment, and quality goals and not make these harder to achieve (Herweijer, Combes, Johnson,

McCargow, Bhardwaj, Jackson and Ramchandani 2018: 2). The fourth industrial revolution's technological advancements provide organisations a new wave of revolution in manufacturing to produce maximum output whilst using minimum resources (Antony, McDermott and Sony 2021: 1) and this notion is supported by Schwab (2018: 15), who posited that the fourth industrial revolution is a set of ongoing transformation in the systems that surround us and presents the following views:

i. Provides a significant source for human development to improve the quality of life for billions of people since 1800;
ii. The realisation of the benefits will require collaboration among diverse stakeholders to overcome the core challenges of fair distribution of technology benefits and ensuring that the emerging technologies empower human beings;
iii. The technology offered by the fourth industrial revolution is connected by the way extended digital capabilities are presented, the way and scale technology are embedded, the impact on human lives and the way existing systems are challenged;
iv. To harness the benefits emerging technologies must not be viewed as mere tools but human values that are embedded in these technologies needs to be understood to establish how these technologies can be shaped to enhance common good; and
v. There must be a global stakeholder discussion on ways that technologies are changing the systems that surround us and the impact that these technologies have on humans, particularly, in developing economies, environmental institutions and people across all income groups.

Benesova and Tupa (2017: 2196), suggest that the implementation of industrial revolution 4.0 will require gradual change using the following four phases:

i. First phase will require real time digital representation, with a fully-fledged enterprise resource planning system, an increase volume of stored cloud data;
ii. The second phase will require horizontal integration with the implementation of automated machines that are network connected, allowing for data collection and analyses. This phase will also require the training of employees in use of the automated machines and data analysis;
iii. The third phase will require vertical integration that will entail sophisticated methods for data processing that will require business intelligence for data analysis; and
iv. The fourth phase will involve self-controlled manufacturing and logistics with autonomous self-optimising manufacturing and increased communication.

Several studies (Sony, Antony and Douglas 2020: 779; Gungor 2019: 2; Roblek, Thorpe, Bach, Jerman, Mesko 2020: 1; Bussmann, Baumgaertel and Schild 2018: 1) show that the fourth industrial revolution presents the following challenges:

i. Organisations culture that requires the identification and maintenance of key performance indicators in alignment with the organisation's strategic plans to maintain a continual improvement strategy. There must be an awareness, understanding, acceptance, incorporation, adaption, and support of the fourth industrial revolution to prevent resistance to change. The long-term return of investment in implementing the fourth industrial revolution strategy must be calculated and the required resources that are required for big data, collection, processing, analysis and decision-making, to ensure the successfully implementation of digitisation; and
ii. Adaptability of manufacturing flexibility with shorter product life cycles, reduce time to market, increase product range while maintaining the safety, health, environment, and quality and reducing investment costs, whilst minimising job loss.

The consequences of the digital revolution of the fourth industrial revolution have brought about huge culture, society and economic changes that has depicted a new

work environment with new challenges that has brought about extraordinary scale of automation and connectivity, based on artificial intelligence, big data, robotics and the internet of things (Ivaldi, Scaratti and Fregnan 2021: 2). To be considered competent in the context of the fourth industrial revolution, there is a need for a greater understanding of the social, economic and cultural challenges brought about by the fourth industrial revolution (Ivaldi, Scaratti and Fregnan). Hence organisations need to gain a full appreciation and adapt to the changes brought by during the fourth industrial revolution by implementing supportive SHEQ management systems that takes advantage of the technology provided during the fourth industrial revolution to benchmark and sustain the long-term existence of the organisation. Asif (2020: 6), proposes that organisations need to adapt and make intelligent use of available technologies to optimise business processes and the following dimensions require special attention:

i. There must be social alignment which requires the engagement of employees in processes and available technology;
ii. Attention must be paid to the intellectual capital management comprising of employee's skills and knowledge;
iii. Implementation of a lean organisation structure that integrates artificial intelligence and human capital to achieve greater flexibility;
iv. Manage an ecosystem of supportive networked supplier organisations; and
v. Utilise big data to make fast and accurate predictions.

3.9.1 Fourth industrial revolution and occupational safety and health

The fourth industrial revolution introduced, the Internet of things, cyber-physical systems, and artificial intelligence greatly changes human intelligent labour, introduces faster process equipment, and effects mental health that impacts on the occupational health and safety of employees (Min, Kim. Y, Lee, Jang, Kim. I and Song 2019: 400). The introduction of smart devices can be considered through innovation of smart personal protective equipment examples include smart t-shirts, watches, helmets, shoes or glasses that are equipped with sensors, transmitters

and receivers that cannot only proactively detect and prevent any potential human injury but also enable better data collection and risk analysis (Gungor 2019: 2). The global coronavirus pandemic has resulted in a global crisis that has employee occupational health implications which requires the acceleration of the fourth industrial revolution technology to aid in the management of the pandemic by scientific research, technology and data science (Neto, Maia, Neiva, Scalia and Guerra 2020: 1). (Karr, Loh and Andres 2020: 1), adds that organisations are facing growing coronavirus pandemic pressure with employees that have comorbidities, government regulations and economic challenges that is accelerating the deployment of the fourth industrial revolution. Hence although the fourth industrial revolution, offers organisations OHS improvement opportunities, organisations must also be mindful of the implications on employee's health and safety.

3.9.2 Fourth industrial revolution and environmental sustainability

The fourth industrial revolution breakthrough technology with the introduction of artificial intelligence, the Internet of things and machine learning will promote environmental sustainability by producing environmentally friendly products however on the other hand, electronic devices will lead to a higher generation of electronic waste which can lead to more emissions and toxic chemicals that can result in health issues and contribute to global warming (Elheddad, Benjasak, Deljavan, Alharthi, Almabrok 2021: 1). There is an increasing concern that the fourth industrial revolution can exacerbate environmental problems, it therefore is crucial to promote emission reduction and replace fossil fuel with renewable energy, enabling environmental sustainability, aid in the decarbonisation of the environment and reduce the carbon footprint during the fourth industrial revolution (Roblek, Thorpe, Bach, Jerman and Mesko 2020: 1). One of the key challenges of the fourth industrial revolution is a technological breakthrough that provides a grid of clean renewable energy and electric cars with zero carbon emissions that will be optimised by artificial intelligence and machine learning (Herweijer, Combes, Johnson, McCargow, Bhardwaj, Jackson and Ramchandani 2018: 13).

3.9.3 Fourth industrial revolution and quality management

Product and service quality is viewed as an organisation's source of competitive advantage that organisations use to strive to differentiate themselves from other organisations by producing consistent quality products and offering consistent quality service (Asif 2020: 1). Quality 4.0 is the quality component that aligns with industry 4.0 and provides a unique opportunity to create a competitive advantage by improving customer quality experience and thereby enhancing an organisations' profitability (Antony, McDermott and Sony 2021: 1). The primary objective of a manufacturing organisation is to ensure consistency and reduce process variation and the technological advancements of the fourth industrial revolution offers organisations this opportunity by replacing traditional labour-intensive methods by modern machines and robots (Yadav, Shankar and Singh 2020: 815).

The findings of a study conducted in an electronics manufacturer from Malaysia by Sumitha, Kannan and Garad (2021: 839), revealed that the use of augmented reality tools will require quality professionals to have technical competencies to interpret large amounts of data from processes to make strategic decisions, methodological competencies to use the data for root cause analysis to solve complex problems. The initial cost of implementing quality 4.0 is high, the return of investment must be calculated over a long-term considering the reduction of internal and external failure cost, increase in market share as a result of better-quality products and improved customer satisfaction (Sony, Antony, Douglas and McDermott 2020: 9).

A study conducted by (Sony, Antony and Douglas 2020: 779) and (Yunus 2020: 1214) deduced that Quality 4.0 focuses on the digital tools that are available in the fourth industrial revolution to enhance product and service quality and the findings of the studies revealed the following requirements for an effective implementation of Quality 4.0:

i. Ensure top management commitment and support to provide leadership and training to create an organizational Quality 4.0 culture. Readiness and willingness of the organisation to endure the fourth industrial relations journey by including Quality 4.0 in the organisation's strategic plan;

ii. Using Quality 4.0 for effective vertical across the manufacturing processes, horizontal across the value chain and end-to-end integration throughout the product life cycle; and
iii. Ability to handle a large amount data, improvement in prescriptive analytics and expertise in data analytics, corporate digitization, and the management of data security.

3.3.2 3.9.4 The benefits of the fourth industrial revolution

Sony, Antony, Douglas and McDermott (2020: 7) and Sumitha, Kannan and Garad (2021: 839), revealed the following benefits of the implementation of fourth industrial revolution tools:

i. Improved productivity, quality, customer satisfaction, profitability of the organisation and long-term cost saving resulting in greater competitive advantage;
ii. Ability of the organisation to achieve global benchmark standards by improving quality, minimising, or eliminating workplace injuries and reducing environmental carbon footprint;
iii. Greater flexibility of the organisation's manufacturing systems and
iv. Improved decision-making process based on data management.

Although organisations may be aware of the drivers of the fourth industrial revolution, in order to maximize the benefits of this revolution, it is important to have a complete understanding of its full potential (Ivaldi, Scaratti and Fregnan 2021: 2). Organisations need to develop best practice continuous improvement smart factory strategies by implementing and integrating information technology, artificial intelligence, and robotics to remain competitive (Asif 2020: 1). The critical elements of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 that is pertinent to an IMS is illustrated in table 3.13.

Table 3:11 The critical elements of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015

	Critical elements of the chapter	Discussions Pertinent to an IMS
1	Organisation sustainability	Organisations require management systems to sustain the long-term interest of the business. Combining these management systems into one coherent IMS makes better sense
2	ISO Standards	Although the ISO standards are independent management systems, the requirement of each standard is the same, facilitated by annex SL. Considering that these requirements are the same and are for the same business processes, this argues well for integration of these management systems
3	Certification	The cost of certification and internal auditing will be reduced by having one IMS certification and surveillance audit instead of auditing each management system independently.
4	Fourth industrial revolution opportunities and challenges	Although each management system has its own fourth industrial revolution opportunities and challenges, these contribute to one organisation strategic plan and hence will require a more holistic approach that supports the idea of an IMS.
5	Management standards objectives. opportunities and challenges.	Each of the management objectives maybe different but these all contribute a single strategic objective of the organisation. Hence a holistic approach will be more favourable to the organisation.
6	Management standards benefits	The benefits of each management standard will still be achieved by adopting an IMS strategy. However, the added benefit of an IMS provides the better deployment of resources that can result in cost saving
7	Management standards success factors	The success factors of each management standard will remain the same, but these include common success factor, which are, leadership commitment, support organisation culture and provision of resources.
8	Management standards opportunities and challenges.	The opportunities for improvement and challenges must be viewed holistically because these impact on the overall strategic objectives of the organisation. Hence an IMS will enable an organisation to align the opportunities for improvement and challenges holistically.

***Source**: Researcher's own construction*

3.10 Conclusion

There is long history of the consideration of health and safety of employees however there is a still a high employee fatality and injury rate that must be addressed adopting a proactive risk-based preventative approach. The health and safety culture of an organisation that is driven by the commitment of the organisation's leadership, depicts the foundation for employee wellbeing. Although there is a resource constraint in South Africa, the South African constitution requires organisations to provide a safe and healthy workplace. The foregoing literature illustrates that benefits outweigh the challenges of an occupational health and safety management. The concept of environment sustainability emerged in the early twentieth century where there was a shift from concentrating on just profit because of the need to sustain resources for the future generation. The growth of, population, economy and industrialisation and the right to an environment that is not harmful to wellbeing was the main drivers of environment sustainability. This was driven by the market that organisations serve and became an essential supplier selection criterion to conduct business. Thus, environment sustainability became a strategic initiative that organisations implemented using an environmental life cycle perspective to reduce or create a negative carbon footprint.

The fourth industrial revolution is transforming the way organizations operate by leveraging advanced technologies such as artificial intelligence, robotics, and the Internet of Things to achieve greater efficiency, flexibility, and innovation. It is envisaged that the introduction of the fourth industrial revolution technological advancements will enhance employee health and safety, minimise negative environmental impacts and improve the level of quality products and services.

The research organisation is certified to ISO 14001:2015 and recognises the need to be an environment sustainable responsible organisation. Organisations depend on trade and quality differentiates and organisation's product from competitors. However, globalisation, the introduction of the fourth industrial revolution and growing demand from customers for better quality products has resulted in organisations implementing QMSs to remain competitive. ISO 9001:2015 QMS provides a framework that an organisation can use to provide consistent quality

product and service to achieve a better competitive position. Nevertheless, organisations must consider the objectives, benefits, success factors and challenges when implementing a QMS. As such, ISO standards provide a framework that provides guidance on implementing management systems and the HLS annex SL, facilitates the integration of the different management systems into one coherent IMS that facilitates local and international trade. The next chapter will discuss SHEQ IMS.

4 CHAPTER FOUR: INTEGRATED MANAGEMENT SYSTEMS

An IMS involves combining multiple management systems into one coherent integrated management system. This is achieved by using a structured implementation method and an IMS model. This chapter discusses the implementation stages, the reasons why organisations integrate their management systems, the challenges of implementing an IMS, the benefits of implementing an IMS, introduces the systems approach, annex SL high level structure clause by clause requirement and management system auditing. The chapter concludes by bringing into focus the critical elements of the chapter that are pertinent to an IMS.

4.1 Introduction

Muzaimi, Chew and Hamid (2017: 1) define an IMS as, "*the combination of multiple business management systems into one coherent business management system to achieve the strategic goals of an organisation"*. This definition is expanded by Ahidar, Sarsri and Sefiani (2018: 184), to include the management of the requirements and expectations of an organisation's stakeholders in a coordinated and balanced approach. This definition is further supported by Chountalas and Tepaskoualos (2018: 14) referring to an IMS as the unification multiple management systems into a single management system instead of implementing these systems independently has been termed as IMS. Field (2019: 10), include the process and risk perspective to the definition by defining an IMS, as the integration of all organisation processes and systems to achieve one set of SHEQ policies and objectives, that requires the senior management of an organisation to manage risk and opportunities holistically rather than in silos. It can be summarised that an IMS is the consolidation of multiple independent management systems into one coherent IMS using the process and risk-based approach to achieve a common SHEQ goal.

The concern of customers from just product quality to a broader perspective that include the life of the product, the sustainability of the organisation, the rights of

humans and the development of society (Ahidar, Sarsri and Sefiani 2018: 183). Maier, Sven-Joachim, Fortmuller and Maier (2017: 304), highlights that for organisations to survive and prosper in an increasingly competitive environment, organisation must commit to producing and offering quality products, preserving, and protecting the environment and taking care of their employees.

An organisation's supply chain and management standards have convergent goals and common priorities and is therefore necessary for the smooth flow of goods and services in the supply chain (Zimon, Madzik and Sroufe 2020: 939). The evaluation and selection of suppliers is an important component in strategic planning of an organisation to reduce operating costs and improve an organisation's competitiveness in a supply chain environment where there are low profit margins (Yazdani, Zavadskas and Zolfani 2017: 3729). Kahraman and Sarı (2017: 257), alludes that the aim of sustainability development is to balance economic, environmental, and social needs of human beings, allowing the preservation of current resources for future generations. The triple bottom line concept that requires consideration for people, planet, and profit, is becoming a core dimension in gaining competitive advantage for an organisation's economic, environmental, and social sustainability; therefore, organisations are implementing triple bottom line strategies to remain sustainable (Wilson 2015:432). Organisations that want to maintain economic sustainability and demonstrate that they want to protect their employees and environmentally responsible monitor their triple bottom line (Jones 2018: 3). A growing requirement for a sustainable supply chain relationship is the triple bottom line concept and therefore to ensure a sustainable supplier partnership, organisations must consider social, environmental, product quality and economic factors during supplier evaluation and selection (Sarkis and Dhavale 2015: 177). Organisations have implemented management systems to satisfy the triple bottom line requirements of customers but if these systems are independently managed, it often results in counterproductive consequence, low efficiency and effectiveness, high cost and unnecessary bureaucracy (Sui, Ding and Wang 2018: 261).

Based on product and service improvements, organisations implement SHEQ management systems and if these systems are implemented independently, the result will not only be confusing and complex but can also lead to a waste of time

and resources, duplicated documentation, reduction in efficiency and conflicting policies, therefore management systems are merged into one Integrated Management System (IMS) (Mariouryad, Golbabaei, Nasiri, Mohammadfam and Marioryad 2015: 18).

The integration of management systems has been a topic of interest for many years, due to an organisation's objective of reducing cost, improving efficiency, improving effectiveness, and gaining a better market position (Baraforta, Mesquida and Mas 2017: 177). Due to the current globalised and competitive environment that organisations operate in, organisations need to develop strategies to sustain the interest of the organisation and organisation therefore started to develop IMS as part of the business optimisation strategy (Barbosa, Oliveira and Santos 2018:925). The need for IMS has increased due to the development and adoption of more than one MS (Poltronieri, Gerolamo, Dias and Carpinetti 2018: 373), Rebelo, Silva, Santos and Mendes (2016: 907), argues that due to the increase in the number of organisations that have more than one management system, there is an increase in the number of organisations that are opting for an IMS.

The objective of a MS is to guide an organisation on what and how activities need to be done in order to achieve the goals of the organisation (Poltronieri, Gerolamo, Dias and Carpinetti 2018: 373). Although these business MS can perform independently, these are counterproductive and difficult to manage and therefore the need for an integrated business management system that can result in employee teamwork and the synergy can result in improved productivity at a reduced cost to the organisation (de Oliveira 2013:124). Rebelo, Silva, Santos and Mendes (2016: 907), supports this notion by adding that an IMS provides synergy, promotes cost savings, saves time, strategic objectives and a holistic result driven approach that provides a route to an organisation's success.

A study conducted by Rebelo, Silva and Santos (2017: 395), revealed that an IMS reduces the risk that affect the key aspects of an organisation and risk management is therefore a core element of an organisation's business practice. A SHEQ, IMS is set of interconnected processes to achieve the goal of and organisation and to satisfy the requirement of stakeholders (Hassan, Zailani and Hasan2019: 110).

Steedman (2015:3), expresses the sentiment creating silos within an organisation is counterproductive and results in each management standard having to compete for resources and commitment. Hence, an IMS will enable the organisation to manage safety, health, environment, and quality as one coherent system that will assist in, becoming more competitive, maintaining market share, better utilisation of resources and will ultimately result in the long-term sustainability of the organisation.

There is greater IMS awareness among organisations therefore IMS's has become part of organisation's strategic portfolio and viewed as a management system of the future (Olaru, Maier, Nicoara and Maier: 2014).

4.2 Stages of implementing an IMS

Majerník, Daneshjo, Chovancova and Sanciova (2017: 136), depicts there are basic stages that are followed when implementing an IMS, as depicted in figure 4.1..

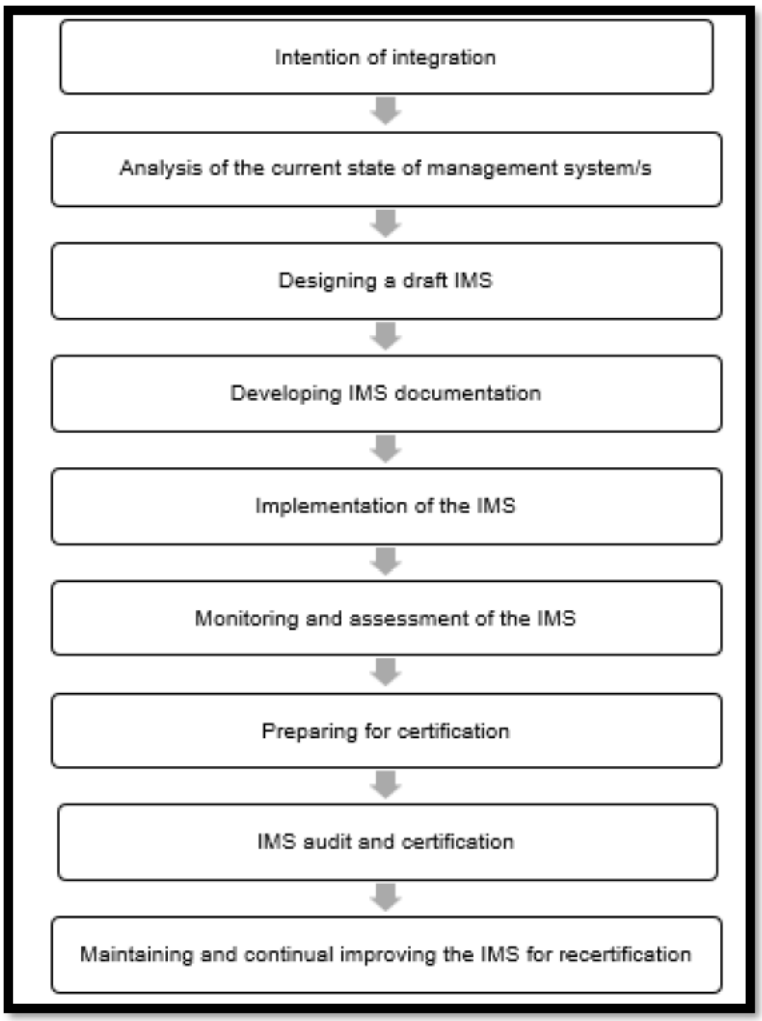

Figure 4:1 IMS implementation stages

***Source**: Majerník, Daneshjo, Chovancova and Sanciova (2017: 137)*

There are two methods that can be used when implementing an IMS: the first option is to start with one or two MS and progressively add or the second option is to implement all the MS at once (Kopia, Kompalla and Ceauşu 2016:52). Hence, the implementation of an IMS commences with an intention to integrate the independent

management systems then identifying the current state of the independent MS and designing a draft IMS before development and implementation. It is proposed that the research organisation commences with acknowledging the intention of IMS certification and follow the stages to IMS certification and continuous improvement for recertification.

4.3 Objectives of implementing an IMS

The researcher has summarised the various objectives for organisations to adopt IMS. Table 4.1 presents reasons why organisations adopt on an IMS.

Table 4:1 Objectives of implementing an IMS

Objectives	References
Remove the duplication of efforts of independent MS and alignment of the IMS to the strategic objectives of an organisation	Poltronieri, Gerolamo, Dias and Carpinetti (2018: 373)
Better utilisation of time and resources, removal of duplicated documentation, reducing inefficiencies and conflicting policies	Mariouryad, Golbabaei, Nasiri, Mohammadfam and Marioryad (2015: 18)
Achievement of greater efficiency of resources, greater management coordination, better management of SHEQ risks and to achieve greater stakeholder confidence	Rebelo, Silva, Santos and Mendes (2016: 907)
Improvement of business process and facilitate continuous improvement	Muzaimi, H., Chew, B.C. and Hamid, S.R. (2017:3)
Drive the operation to improve operational efficiency or market driven to create a better company image	Kopia, Kompalla and Ceauşu (2016:52).
To satisfy a stakeholder requirement	Abad, Cabrera, and Medina, A. (2016:861)
Eliminate the difficulty of managing multiple parallel independent MS	Nunhes, Motta and de Oliveira (2016: 1234)
Reduction of cost required to manage independent management systems, holistic strategic approach to managing SHEQ	Chountalas and Tepaskoualos (2018: 15)

***Source**: Researcher's own construction*

Poltronieri, Gerolamo, Dias and Carpinetti (2018: 373), de Oliveira (2013:124) and Rebelo, Silva, Santos, and Mendes (2016: 907), concur that an IMS will reduce the number of resources required to manage SHEQ, will avoid duplication of efforts, achieve greater SHEQ synergy, result in the adoption of a holistic systems approach that will result in a reduction in the cost of management systems and an improvement in SHEQ performance.

The motivation for implementing an IMS can be either internal driven by the strategic goals of the organisation or external interested parties' driven pressure (Dahlin and Isaksson 2017: 536). However, Field (2019: 11) contends that the decision to implement an IMS will remain to be a strategic objective that is motivated by the organisation's need to minimise risk, continuous improvement of SHEQ performance, enhance the organisation's image, provide greater cost efficiency, simplify SHEQ administrative processes or as a lean structure initiative. Hallberg, Hasche, Kask and Oberg (2018: 485) point out that, the ISO certification is one of the selection criteria for supplier selection, depicting that the supplier has processes in place to continually perform routine processes consistently, The implementation of an IMS is a strategic decision that is motivated to minimise SHEQ risks, improve health and safety, improve environmental performance, achieve cost efficiency, simplify SHEQ administrative processes, basis for continual improvement or implement organisational structural changes (Field 2019: 12). It is indicative that whether an IMS is internally, or market driven the ultimate goal of an IMS is to improve SHEQ performance whilst reducing the IMS cost. Therefore, it is important that an organisation clearly understand the reasons for implementing an IMS and use these reasons to motivate an IMS implementation.

4.4 Benefits of an IMS

There are benefits of implementing an IMS that organisations should consider for the organisation to remain competitive. Table 4.3 presents the benefits of implementing an IMS stemming from various research studies that was conducted.

Table 4:2 The benefits of implementing and IMS

Benefits	Explanation of benefits	Authors
Enhances the effectiveness of the organisational	Provides a holistic perspective to manage business risk and to strategically align SHEQ to harness the synergy among the requirements of the SHEQ management systems, thus averting clashes between individually managed systems.	Pardo, Francisco, Pino and Garcia (2016: 217), (Ahidar, Sarsri and Sefiani 2018: 183), (Chountalas and Tepaskoualos 2018: 14), (Kopia, Kompalla and Ceauşu 2016:52), Nunhes, Motta and de Oliveira (2016: 1234) and Muzaimi, Chew, and Hamid (2017:2)
Improves competitiveness	Assures confidence in stakeholders, attracts new customers and enhances customer loyalty, and improves brand image;	
Reduces costs	Optimises human resource allocation and the assignment of responsibilities, decreases system management costs and certification costs and minimises the duplication of paperwork and meeting time and	
Facilitates continuous improvement	Facilitates a unified management review that allows for more rational decision making by streamlining and the better coordination of processes.	

***Source**: Researcherr's own construction*

The success of implementing an IMS depends on the organisation, the circumstance, and the expectation of customers, therefore, before commencing with

implementing an IMS, organisations must conduct a cost benefit analysis and feasibility study (Field 2019: 26). Kymal, Gruska and Reid (2015: xiv), alludes that applying the concept of integration will provide an estimated cost savings of 50% on implementation, 66% on maintenance and more than 20% on third party auditing. Implementing and IMS is a journey that will take time to implement and will require additional resources, therefore, an organisation needs to explicitly decide if they want to integrate their management systems before commencing (Field 1019: 10).

It is noteworthy that the long- term benefits of implementing an IMS must be measured against the challenges of implementation and if the long-term benefits outweigh the implementation challenges, then it is logical to implement an IMS.

4.5 IMS implementation challenges

Organisations face different problems that can hamper the successful integration of management systems (Abad, Cabrera, and Medina 2016: 861). Therefore, organisations must focus and develop strategies to overcome these difficulties to ensure success of the IMS. The researcher has summarised the difficulties organisations experience in implementing an IMS. Table 4.2 presents the difficulties organisations experience in implementing and IMS.

Table 4:3 Challenges in implementing and IMS

IMS implementing challenges	References
Complexity of integration and employee hostility	Rebelo, Silva, Santos and Mendes (2016: 907)
Resource availability, organisation cultural issues, employees not willingness to share their knowledge and the lack of commitment of the senior management	Kopia, Kompalla and Ceauşu (2016:52).
No IMS model for implementing MS integration	(Rebelo, Santos and Silva (2015: 46)
Employee's resistance to change, approach used for implementing an IMS, insufficient availability of specialised external consultants, insufficient certification agencies support and the new integrated system structure	Abad, Cabrera, and Medina, A. (2016: 861)
Justification of the cost of certification	Nunhes, Motta and de Oliveira (2016: 1234)
Cross functional issues and limited employee engagement	Hassan, Zailani and Hasan (2019: 2013)
Lack of management commitment, lack of resources availability, lack of attention, the lack of technical guidance and the fear of losing focus of a specific system	Chountalas and Tepaskoualos (2018: 15)
Resistance to change, the structure of the organisation, the diversity of products and services offered, objective of IMS not clearly defined and a lack of internal competencies	Rebelo, Santos and Silva (2016: 104),
Lack of human resource, little or no employee motivation, little or no organisational commitment, insufficient training and attitudes that are counterproductive	Dahlin and Isaksson (2017: 531)
The ability to Integrate the requirements of the management system into the business processes	DNVGL (2016: 9)

***Source**: Researcher's own construction*

Hence, whilst organisations have various objectives for implementing an IMS, these organisations must consider both the benefits and challenges of the implementation and if the benefits outweigh the challenges, it argues well for the organisation to implement an IMS. Considering the current volatile competitive business environment, where organisations must adopt business improvement initiatives, it is recommended that the research organisation consider implementing strategies to overcome the challenges to reap the long-term benefits.

The implementation of an IMS will require a strategy that considers the processes of the organisation as a system, the following discussion will introduce the systems approach to an IMS.

4.6 Systems approach

Whilst senior management's commitment and organisation culture is important to a business, it is important to have efficient and effective organisation processes (Kymal, Gruska and Reid 2015: xv) and the international organisation for standardisation, ISO 9001:2015 (2015: vii), highlight that to control the interrelationship and independencies among organisation processes and achieve effectiveness, efficiency and intended results, organisations must understand and manage processes from a systems perspective. Abuhav (2016: 24), describes a process as the conversion of input resources into output goods or services to achieve a desired goal. The ability of an organisation to perform several interrelated processes simultaneously, to achieve intend results, will determine the effectiveness of the organisation to satisfy the needs and expectations of interested parties (Abuhav 2016: 23). Figure 4.2 illustrates the schematic representation of the elements of a single process.

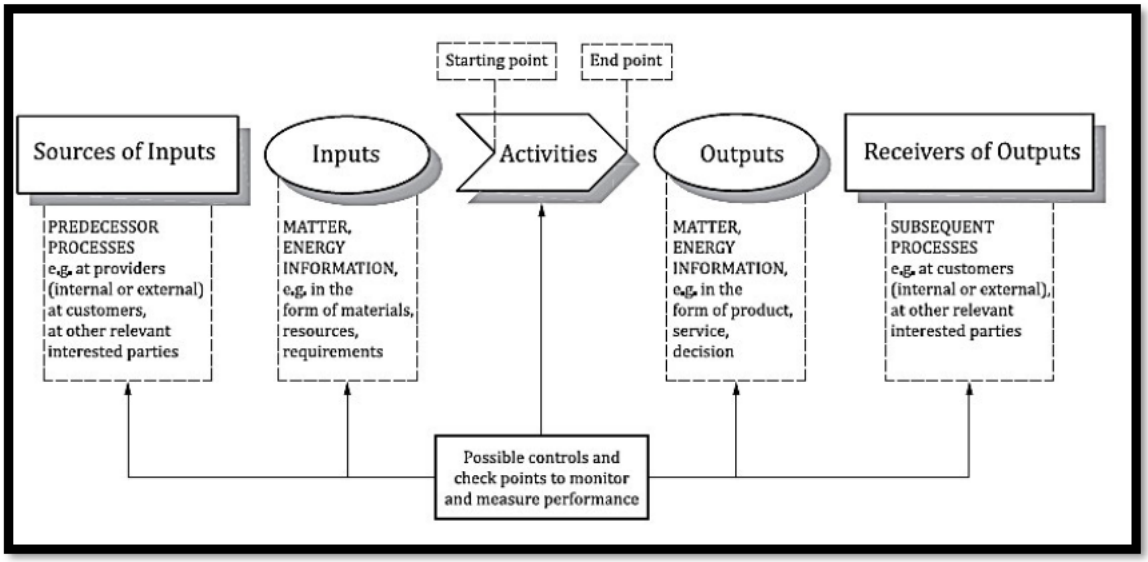

Figure 4:2 Schematic representation of the elements of a single process

Source: International organisation for standardisation (2015: viii)

The implementation of management standards supports the innovation of supply chain processes creating a value chain (Zimon, Madzik and Sroufe 2020: 939). It is indicative that adopting a systems approach for an organisation's IMS will result in the management of the SHEQ chain of processes within the supply chain of the organisation.

The basis of the foregoing literature was on the systems approach, that sights an organisation as a holistic system that comprises of various processes, however organisations need to consider the continual improvement of the various processes that make up the system. The following literature discusses the PDCA cycle continuous improvement tool.

4.7 PDCA cycle

(Muzaimi, Chew and Hamid 2017: 2), Kopia, Kompalla and Ceauşu (2016:52), posited that ISO 45001:2018, ISO 14001:2015 and ISO 9001: 2015 uses Edward Deming's PDCA cycle as an underlying approach to achieve continual improvement and is based on the following:

i. **P**lan: Requires an organisation to establish SHEQ objectives and processes required to achieve desired results in the SHEQ policies;
ii. **D**o: Requires an organisation to implement the processes required to achieve these objectives and processes;
iii. **C**heck: The organisation must monitor and measure processes against SHEQ policies, commitment and objectives and report on results; and
iv. **A**ct: An organisation must take the required actions to continually improve.

The PDCA cycle is applied to individual processes of an entire management system that assists organisation in continuous improvement initiatives Engelhardt (2018: 3). The PDCA cycle is a management strategy to continuously improve the performance of the organisation (Heras-Saizarbitoria 2017: 4). Table 4.4 presents the relationship between the PDCA cycle and the Annex SL clauses.

Table 4.4 Relationship between the PDCA cycle and the Annex SL clauses

PDCA	Annex SL clause	Definition
Plan	6 Planning	Establish SHEQ objectives and provide the required resources to achieve desired results
Do	7 Support and 8 Operation	Implement the plan to improve the operational processes
Check	9 Performance evaluation	Monitor and measure the operational processes and outputs against planned targets
Act	10 Improvement	Take actions against plans that do not achieve the desired results

***Source**: Hoyle (2018: 77) and Gueorguiev and Sakakushev (2016: 972)*

Field (2019: 3) echoed that annex SL assumes that continual improvement is the core objective of an IMS and therefore uses PDCA strategy.

4.8 Annex SL HLS

A decision was made in 2012 by the ISO committee to use a common framework for all MS containing a unified high-level structure (HLS) and common text and terminology (DNVGL 2015: 2). Annex Statutory Limits (SL) provides a framework with a common structure and common text for all new and future revisions of ISO standards that organisations are expected to conform to (Hoyle 2018: 50). Annex SL is an HLS that was developed by the ISO committee, an international panel of experts, that provides similarities between the ISO 9001, ISO 14001 and ISO 45001 standards which helps with the integration process (Kopia, Kompalla and Ceauşu 2016: 52). Annex SL contains, a high-level structure, identical core text, common terms and core definitions that aids in ensuring consistency across ISO standards and enables management system integration (Jones 2018: 4). The Annex SL HLS consists of ten common sections that standardises the core content of management systems to facilitate the integration of ISO management systems (Baraforta, Mesquida and Mas 2017: 178).

Table 4.5 illustrates how Annex SL, the HLS of ISO 14001:2015, ISO 45001 and ISO 14001:2015 standards support an IMS.

Table 4:4 ISO Annex SL, HLS clause by clause

No	Element	ISO 14001:2015, ISO 45001:2018 and ISO 14001:2015 Requirements
1	Scope	Specific to the ISO standard
2	Normative reference	Specific to the ISO standard
3	Terms & definitions	Specific to the ISO standard
4	Context of the organisation	4.1 Understanding the organisation and its context. 4.2 Understanding the needs and expectations of interested parties. 4.3 Determining the scope of the scope of the specific management system. 4.4 Specific management system establishment, implementation, maintenance and continually improvement
5	Leadership	5.1 Leadership and commitment 5.2 Policy specific to the management system 5.3 Roles, responsibilities and authority
6	Planning	6.1 Actions to address risks and opportunities of the specific management system
		6.2 Objectives and planning needed for the specific management system
7	Support	7.1 Resources 7.2 Competence 7.3 Awareness 7.4 Communication 7.5 Documented information
8	Operation	8.1 Operational planning and control of specific management system
9	Performance evaluation	9.1 Monitoring, measurement, analysis and evaluation 9.2 Internal auditing 9.3 Management review
10	Improvement	10.1 non-conformity, and corrective action 10.2Continuous improvement

Source: *DNVGL (2015: 3)*

DNVGL (2015: 2), highlights that the benefits of ISO HLS are:

i. Improved compatibility of the different management standards
ii. The implementation of new standards is easier;
iii. The integration of the different standards into a management system is easier;
iv. There is an increased value for users of the standard who want to integrate; and
v. Increased effectiveness in standard development for the technical committees.

Publicly Available Specification (PAS) 99 certification, that is in alignment with annex SL was introduced by the British Standards Institute (BSI) in 2012 to achieve unity of independent managed systems and to demonstrate compliance to an independent management standard (British Standards Institute 2018: 2). Although PAS 99 certification is an excellent IMS tool, using annex SL provides more of a grounding for the principles of an IMS and ISO HLS can assist with defining strategy, provoking additional ideas and organisations will find it more straightforward to implement an IMS (Field 2019: 16).

Hence the introduction of ISO HLS annex SL provides organisations with an opportunity for easier integration of the management systems. The following literature outlines the requirements of the ten ISO annex HLS clauses.

4.8.1 ISO Clauses 1,2 and 3

Clause 1 covers the scope of the ISO standard, clause 2 covers normative references and clause 3 covers the terms and definitions of the ISO standard DNVGL (2015: 3).

4.8.2 Clause 4: Context of the organisation

The context of the organisation refers to the environment that an organisation operates in, the internal and external factors that impacts on the organisation Abuhav (2016: 9), suggests the following process for defining the context of an organisation:

i. Defining the context of the organisation will commence with an analysis of the Political, Economic, Social, Technological, Legal and Environment (PESTLE) factors;
ii. After understanding the external business environment, the organisation needs to conduct an analyse of the business against the PESTLE environment. The PESTLE will provide inputs for an analysis of the organisation's Strengths, Weaknesses, Opportunities and Threats (SWOT). The SWOT analysis will determine the internal strengths and weaknesses as well as the external threats and opportunities of the organisation; and
iii. The SWOT analysis can be used to identify the interested parties of the organisation that can be used to determine the scope of the organisation. The scope can be used as a foundation of the management system.

Rastogi and Trivedi (2016: 385), explains that PESTEL is a strategic tool that an organisation can use to analysis the following:

i. Political, the extent that the government's legislation and policies influence the organisation;
ii. Economic, the extent that economic factors affect an organisation;
iii. Social, the extent that the socioeconomic market environment influences the organisation;
iv. Technological, the extent that technological innovations affect the operations of the organisation;
v. Environmental, the extent that environmental factors impact the organisation;
vi. Legal, the extent that legal aspects influence and organisation; and

vii. Environmental, the extent that environmental factors impact on the organisation.

Clause 4 is the flagstone of the management system, that requires a determination of the existence of the organisation and as part of the answer to this question, the organisation needs to identify internal and external issues that can impact on the organisation's intended outcome as well as the requirement of interested parties (British Standards Institute 2015: 3). Clause 4 also requires that the organisation identifies interested parties that are either individuals or organisations that can have an impacted on or be impacted by or perceived to be impacted by an organisation's decisions or activities (International organisation for standardisation 2019: 14). Thus clause 4 sets the scope and boundaries for the MS in alignment with the strategic objectives of the organisation.

4.8.3 Clause 5: Leadership

There is a variation of the level that organisations implement ISO management systems, and the reasons include compliance due to customer expectations with no long commitment or committed implementation due to the organisation's long term continuous improvement strategy (Chowdhury, Prajogo and Jayaram 2018:340). Therefore, the implementation of ISO management standards must be driven by the senior management of the organisation, demonstration commitment to environmental responsibility. The objective of clause 5, is to drive leadership accountability requiring the senior to demonstrate management system leadership and commitment (DNVGL 2016:4). ISO HLS emphasises greater involvement, responsibility and accountability on the senior management of the organisation, in ensuring requirements to achieve its intended outcome are integrated into the core business processes and the allocation of resources (British Standards Institute 2015: 3). The leaders of an organisation must create an environment that all employees of the organisation are committed to achieving the goals of the organisation (Abuhav 2016: 39). Thus, the senior management of an organisation plays a pivotal role in ensuring the success of a MS that will contribute to the organisation achieving the core objectives.

4.8.4 Clause 6: Planning

Organisations operate in a very competitive risky environment and need to achieve their profit targets whilst reducing the SHEQ risks as far as reasonably practicable (Emetumah 2016: 1). ISO has developed the preventive action concept to risk-based thinking that requires an organisation to identify risks and opportunities (Abuhav 2016: 39). Clause 6 of the ISO HLS introduces proactive risk-based thinking, requiring the organisation to stipulate how the risks and opportunities identified in clause 4 will be addressed during planning (British Standards Institute 2015: 3). Organisations need to proactively evaluate business processes, identify and evaluate the probability and impact of SHEQ risk and implement controls to ensure business continuity and the success of the organisation (Kymal, Gruska and Reid 2015: 5). Risks and opportunities are identified during the analysis of a process and appropriate action must be determined to address these risks, if there is an unintended output of a process or if there is an ineffective interaction of a process (Abuhav 2016: 24). The aim of implementing an IMS should be to identify, evaluate and take appropriate action of potential risks and not to just integrate the independent management systems (Field 2019: 27). Adopting a risk-based approach to a management system, enables an organisation to proactively determine the factors that could cause its processes to deviate from planned results, allows the organisation to implement preventative controls and to maximise the opportunities for improvements (international organisation for standardisation 2015: vi). For an organisation to be constantly prepared and promptly respond to unexpected events, a solid risk management foundation is a prerequisite (Sklad 2019:72). Field (2019: 23), reiterate that adopting a risk and opportunity-based approach, will ensure that an organisation, identifies risks and opportunities, evaluate these risks and opportunities and take appropriate action throughout the design and management of the SHEQ IMS and each organisation will have a different appetite for risk, depending on the level of risk that the organisation is comfortable with accepting. The best method to influence risk is through incorporating a systems approach to risk management (Haywood, Forsyth, de Lange and Trotter 2017: 230). Thus, a proactive opportunity and risk- based

approach enables an organisation to strategically take advantage of opportunities and proactively address any risks.

4.8.5 Clause 7: Support

Once an organisation has determined the context of the organisation, has the commitment of senior management, and has a plan, the organisation needs to provide the required resource support to achieve the intended outcome (British Standards Institute 2015: 3). The provision of resources forms the foundation of a management systems and must therefore be identified, managed and controlled to achieve the desired goals of the organisation (Abuhav 2016: 39). Thus, the organisation must provide the resources that are determined as part of the organisation's strategic objectives to enable these strategic objectives are met.

4.8.6 Clause 8: Operation

Clause 8 includes the management of both in-house and outsourced processes, including the management of planned and unplanned changes (British Standards Institute 2015: 3). The organisation must plan, organise, lead, and control the master plan of the organisation for the realisation of an organisation's goods and services (Abuhav 2016: 39). Thus, organisations must have operation plans for its activities to ensure alignment with strategic objectives.

4.8.7 Clause 9: Performance evaluation

It is critical for an organisation to measure, monitor, analyse, and evaluate the performance of its management system to ensure optimum performance of the management system (Abuhav 2016: 39). Internal auditing and management reviews forms part of clause 9 to ensure that the requirements of the ISO standard are successfully implemented and managed (British Standards Institute 2015: 3).

4.8.8 Clause 10: Improvement

Improvement drives an organisation to achieve and enhance the requirements and satisfaction of customers and achieve the goals of the organisation (Abuhav 2016: 39). Clause 10 of the ISO HLS addresses corrective action when there are any non-conformities and the implementation of continuous improvement strategies (British Standards Institute 2015: 4). Thus, an organisation must continuously review its activities and identify opportunities for continuous improvement.

It is evident that the ISO requirements provides a guided structured method for organisations to implement an IMS that can be audited for compliance and based on continual improvement. It can be summarised that the objective of annex SL is to provide a common framework that facilitates the integration of independent ISO management systems, however Dentch (2018:1), argues that by creating cohesion between ISO 45001:2018 OHS, ISO 14001:2015 EMS and ISO 9001:2015 QMS the standards are not clearly presented as the older standards.

The following section will discuss the different types of auditing of an IMS

4.9 IMS Auditing

An audit is a "*systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled*" (South African National Standard ISO 45001 2018: 7). An integrated audit will have a common audit programme, a common audit check sheet, an audit team that can audit an IMS and processes will be audited from a SHEQ perspective (Kymal, Gruska and Reid 2015: 21). An IMS auditing system is cost effective, saves time and results in a reduction of human and financial resources (Hassan, Zailani and Hasan 2019: 110). An IMS auditing includes different audit types, as illustrated in Table 4.6 (Kymal, Gruska and Reid 2015: 65).

Table 4:5 Different audit types

Audit Type	Audit Description
Systems Audit	A systems audit is an audit against the requirements of the ISO 45001:2018, ISO 14001:2015 and 9001:2015 standards, clause by clause, to check effectiveness of the IMS
Process Audits	A Process Audit is an audit of the organisation's processes to verify compliance to the documented policies, procedures, and work instructions to determine adherence to planned controls
Layered Audits	A layered audit involves random auditing by auditors from various management levels within the organisation. The purpose of these audits is to check for adherence to controls and demonstrate management controls
Product audits	A product audit involves auditing the product against specification. The objective is to ensure conformance to customer product requirements.
Compliance audits	A compliance audit checks for legal compliance to statutory and regulatory requirements

***Source**: Kymal, Gruska and Reid (2015: 65)*

The new version of the ISO standards has been designed for business rather than auditors and is less prescriptive, making it more difficult for auditors to audit (Hoyle 2018: 39). Hence auditing allows an organisation to verify the compliance to the ISO requirements and documented organisation policies, procedures and work instructions.

4.10 Conclusion

Organisations operate in a very competitive and challenging environment that are driven by the external markets and therefore implement business management systems to remain sustainable. The implementation of an IMS can be driven by the market that requires customers to adhere to the triple bottom line concept. These business systems can be implemented independently, as stand-alone systems as an IMS. An IMS is a combination of multi business systems into one coherent IMS that has a common objective that is in alignment with the strategies of the organisation. Organisation can follow a structured staged approach to implement an IMS to guide the organisation during implementation.

The primary goal of implementing an IMS is have a cost benefit SHEQ system that demonstrates SHEQ performance improvements. Although there are benefits to implementing an IMS, organisations must bear cognisance of the challenges of implementing an IMS and develop strategies to overcome these challenges to reap the benefits. An organisation must have clear IMS objectives that have strategic goal alignment of the organisation. Adopting the systems approach to managing an IMS can result in better performance of SHEQ within the supply chain.

The development of ISO annex SL, high level structure has facilitated the easier implementation of an IMS. An IMS facilitates integrated SHEQ auditing that may be beneficial from a cost and resource perspective. There is a gap in the research organisation to address the challenges experienced in implementing an IMS and to introduce a multi-dimension model, combining different models that can provide a more beneficial holistic systems approach to implementing an IMS. The organisation structure of the organisation, addressing the challenges of implementing an IMS, senior management commitment and resource allocation play a key role in ensuring a successful implementation of an IMS.

This chapter introduced Integrated management systems, the stages of implementation, reasons for implementing an IMS, implementation challenges, benefits of an IMS, objectives of an IMS, systems approach, PDCA, Annex SL HLS,

the ISO clauses and system auditing. The next chapter will discuss the research methodology that was used for this research study.

5 CHAPTER FIVE: RESEARCH METHODOLOGY

5.1 Introduction

This chapter focused on the design of the research detailing the research aim, research methodology, an overview of the research population, a discussion of the sampling strategy, the data collection method, the research instrument, a description of the data analysis technique and considerations to ethical aspects of the study. Ontology and epistemology definitions and stance is presented in this chapter outlining the researcher's views and the creation of new knowledge. A discussion on the research design discusses the case study and mixed research methods that includes the quantitative and qualitative research methods. The chapter concludes with the ethical considerations of the research.

5.2 Research aim

Saunders, Lewis and Thornhill: (2016: 71), refers to the research aim as a brief statement of the purpose of the research, and it defines what the researcher wants to achieve by conducting the research. The aim of this study is to ascertain the modalities for the multidimensional integration of standalone, safety, health and environment and quality management systems.

5.3 Research objectives

The objectives of research are to find solutions to problems that are not solved using scientific methods, understanding different phenomena, finding undiscovered truth and explain unexplored knowledge (Bairagi and Munot 2019: 3). The objectives of this study are outlined in chapter 1 of this study.

5.4 Research paradigm

Positivism, interpretivism and critical theory are three commonly known theoretical research paradigms used to guide research methods and analysis (Ryan 2018: 1). Crossman (2019:1), defines positivism research paradigm as a research method that specifically applies scientific evidence such as experiments, statistics, and qualitative results to reveal the truth and Ryan (2018: 1) alludes that positivists value objectivity and believe that there are facts that can be proven. Interpretivism argues that truth and knowledge is subjective based on personal experience and critical theory value modified subjectivity that are manipulated by power structures Ryan (2018: 1). Kivunja and Kuyini (2017: 35), refers to pragmatic theoretical research paradigm as the fourth paradigm that advocates the use of a mixed method that supports a relational epistemology where the researcher determines the most appropriate relationship and ontology that all individuals have their own and unique interpretations of reality.

5.4.1 Ontology

Ontology refers to, what exists that is worth studying and what we can gain knowledge from (Eriksson and Kovalainen 2011: 15) or understanding of the nature of reality (Lee and Saunders 2019: 15). King and Brooks (2017: 2), refers to ontology as *"the philosophical assumptions about the nature of being, which determine what we can know to be real, and what we can know to exist".* Saunders, Lewis and Thornhill: (2016: 127), further explains that ontological assumptions shape how a researcher views the organisation and management environment and therefore determines the researcher's choice of what to research. The research was based on the independent safety and health, environment, and quality management systems of the researched organisation. The researcher views an organisation as a holistic system that consist of processes that are sequenced and interact with each other and hence, considering that these processes are common to all management systems, it is logical to integrate these management systems.

5.4.2 Epistemology

Epistemology refers to the creation of knowledge (Eriksson and Kovalainen 2011: 15) or what is viewed as valid and legitimate knowledge (Lee and Saunders 2019: 15). The conceptual framework of this research provided the direction of the research, and the review of existing literature provided the basis for the understanding of existing knowledge for this research study. This allowed the exploration and creation of new knowledge on the research topic.

5.5 Research design

A research design flows from the specific research objectives to provides the basic direction for conducting the research by addressing gaps in the knowledge necessary hence, a rigorous research design results in ultimately a better execution of the research (Hair, Page and Brunsveld 2020: 35).

5.5.1 Case study research method

Harrison, Birks, Franklin and Mills (2017: 2), attest that the case study research method has grown in reputation as an effective methodology to investigate and understand complex issues in real world settings and the intention is to provide a rich holistic description that illuminates one's understanding of the research phenomena.

This research study adopted a mixed case research study method, using a quantitative followed by a qualitative research method. Yin (2018:45), describes a case study as an in-dept investigation of a phenomenon and may rely on both quantitative and qualitative data to describe or explain the case in its real-world context. Saunders, Lewis and Thornhill: (2016: 185), contends that a case study research method provides an intensive insight in real life context and usually uses a mixed research study method. The case study research method involves the administration of a survey to a case, either to an entire population or a sample of a

population and the results of the survey are analysed to describe trends or to test questions or hypothesis (Mills, Durepos and Wiebe 2012: 2).

There are three types of case study designs as illustrated in table 5.1

Table 5:1Types of case study designs

Type	Definition
Descriptive	To describe an intervention or phenomenon at the real-life context
Exploratory	To explore those situations in which the intervention being evaluated has no clear, single set of outcomes.
Explanatory	To explain the presumed causal link in real life intervention that are too complex for the survey or experimental strategies.

***Source**: Yin (2014:39)*

The descriptive case study type was the most appropriate for theory and model development for this research. Bairagi and Munot (2019: 3) suggest that descriptive research is used to analyse a business and to represent or analyse the previous and or current facts and Saunders, Lewis and Thornhill (2016: 175) infer that the objective of descriptive research is to obtain an accurate profile of persons, events or situations and this definition is supported by Patten and Newhart (2018: 203), who alludes that descriptive data attempts to describe the data for easier comprehension. Welman, Kruger and Mitchell (2010: 23), further elaborates the descriptive research methodology is used to try to understand the way things are and the goal is to explain the phenomena. Hence, a descriptive case study research design was used to describe, explore and analyse the phenomenon in detail, to obtain an accurate profile of the research.

5.6 Research approach

A mixed research method study includes both quantitative and qualitative research methods, where one research method is followed by another and involves multiple research methods, where the researcher will follow one method with another to elaborate or expand on the initial findings (Saunders, Lewis and Thornhill: (2016: 171). The mixed research method integrates the quantitative and qualitative research methods giving more confidence in the results (McKim 2017: 202). Mixed research methods tend to use a pragmatism / pluralism theoretical research perspective and tend to choose practical solving research methods to solve a problem (DeCuir-Gunby and Schutz 2018: 6). A mixed method uses a combination of both qualitative and quantitative research methods where qualitative data is collected using interviews and observations and quantitative data is general analysed using statistical methods (Harrison, Birks, Franklin and Mills 2017: 7).

Empirical research is defined as any study whose conclusions are exclusively derived from concrete, verifiable evidence and is based on direct or indirect observation and includes both quantitative and qualitative research methods (Patten and Newhart 2018: 5). For the elaboration of the quantitative findings, qualitative data analysis may be used together with the quantitative data analysis (Hesse-Biber and Johnson 2015: 33). Doyle, Brady and Byrne (2019: 10), indicated that in most cases analysis of the quantitative research method provides the framework for the qualitative research method and the integration of the quantitative and qualitative research methods is referred to as a mixed research method. An explanatory sequential mixed research approach was used, Edmonds and Kennedy (2019:2) describes this mixed research approach as the subsequent interpretation and clarification of the results from the quantitative data analysis for the qualitative research. Hence, a mixed research method is in sync with the epistemology and ontology described in previous literature and was the most appropriated method that was used for this research study. Figure 5.1 illustrates the mixed method strategy adopted by the researcher.

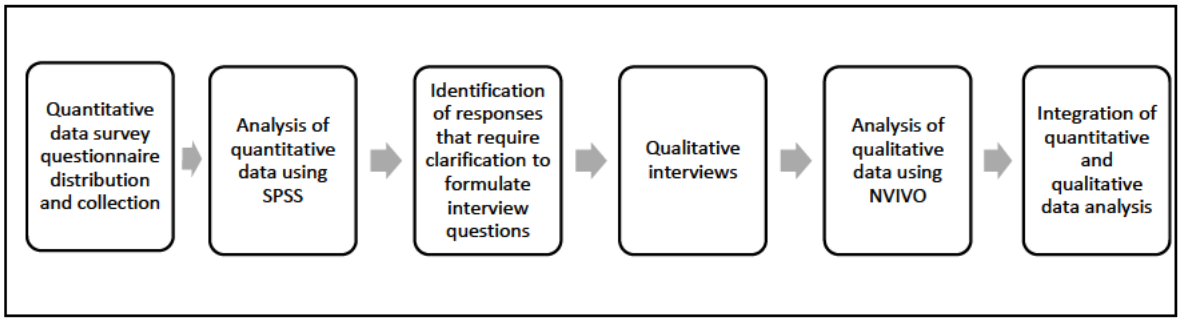

Figure 5:1 Mixed research method

***Source**: Research's own construction*

Survey questionnaires and interviews are the most common instruments to collect data for a case study research method (Mills, Durepos and Wiebe 2012: 2).

Table 5.2 represents the distinction between quantitative and qualitative data.

Table 5:2 Distinction between quantitative and qualitative data

Quantitative data	Qualitative data
Data is based on meanings derived from numbers.	Based on meanings expressed through spoken and textual words and images
The data collection results in numerical and standardised data.	Collection results in non-standardised data requiring classification into categories.
The data analysis is conducted using diagrams and statistics.	Analysis conducted using conceptualisation.

***Source**: Saunders, Lewis and Thornhil (2016: 569).*

5.6.1 Quantitative research

The quantitative research method encompasses the collection and the analysis mathematically of data using the results of closed-ended questionnaires questions (Dudovskiy 2015: 37). The quantitative descriptive case study research methodology of this study used a probability sampling method. The design of the quantitative questionnaire was compiled by the researcher using a five-point Likert scale. This was completed in context of the research objectives and research questions.

5.6.1.1 Target population

Case study research does not require an entire population to be studied, a carefully selected sample of the population is surveyed to examine individual characteristics to find population trends to gain an understanding of the phenomena (Mills, Durepos and Wiebe 2012: 2). The researched organisation human resource records (Human resource management committee 2021: 2), depicted a population of 500 operational, middle, and senior management employees of the organisation. A 5-point Likert Scale questionnaire survey was used to gather data from participating respondents and exploratory data was also collected through personal online interviews. Saunders, Lewis and Thornhill: (2016: 181), echoes that the survey questionnaire is associated with a deductive research approach and is used for exploratory and descriptive research.

5.6.1.2 Sampling

The purpose of sampling is to pursue an understanding of a situation, rather than just to achieve population representation (Saunders, Lewis and Thornhill: (2016: 194). Researchers use samples of a population because it is not practical to include every member of the population, especially if the size of the population is large and the sample infers that what is true for the sample is probably true for the population (Patten and Newhart 2018: 5).

A probability sampling method was used for this research study. Participants of the population have a random chance of being included in the sample, using a probability sampling method (Ruel, Wagner III and Gillespie 2018: 124). The sample for this study comprised of operational, middle, and senior management employees of the organisation. The entire population group was not requested to participate in this research study due to the lack of feasibility of the willingness of all employees to participate that was evident in the last research study that was conducted in the researched organisation. Therefore, the simple random probability sampling method was used as a representative sample for the research. Every element is known and has an equal chance of being selected in a simple random sampling method (Sekaran and Bougie 2016: 439) and Patten and Newhart (2018: 89). Stratified random sampling was used to ensure that the sample is a balanced representation of the population and to allow for subgroup analysis. Stratified random sampling method is a variation of the simple random sample method that assures that the allocation of the research sample will precisely reflect the population on whatever characteristic is used to stratify it Ruel (2019: 35). Sekaran and Bougie (2016: 137), explains that stratified random sampling involves dividing the research population is into mutually exclusive relevant, appropriate, and meaning full groups in relation to the research study and participants are selected from each group. A high degree of representation was ensured by selecting organisation employees that are operational, middle, and senior management using the stratified random sampling method. The employees that were selected for this study had various levels of responsibility and accountability for SHEQ.

A sample size of 217 operational, middle, and senior management is considered to be appropriate for a given population of 500 employees of the organisation's three business units, as depicted in Sekaran and Bougie's (2016: 294) table of population to sample size calculation. A sample size of 217 of a total population of 500 employees represents 43.4% of the total population. Therefore, 43.4% of the employees from each business unit and 43.4% of at each level of the business unit was used as the sample size. A cluster sampling method was used, and Breanna and cluster sampling is described by Poznyako (2018: 299), as a probability sampling technique in which all population elements are categorized into mutually

exclusive and exhaustive groups called clusters where some elements from selected clusters comprise the sample.

Table 5.3 represents the proportionate sampling that was used for this study.

Table 5:3 Proportionate sampling for the research study by Province

Business Unit	Job Level	Total employees	Proportionate sampling 43.4% of employees
KZN	Senior management	14	6
KZN	Middle management	23	10
KZN	Operational	177	77
Gauteng	Senior management	9	4
Gauteng	Middle management	18	8
Gauteng	Operational	119	52
Cape Town	Senior management	9	4
Cape Town	Middle management	21	9
Cape Town	Operational	110	47
Total employees		**500**	**217**

Source: *Researcher's own construction*

5.6.1.3 Data collection instrument

Quantitative research method is usually presented as quantities or numbers but are not always presented using statistical analysis (Patten and Newhart 2018: 5). Hair *et al*. (2020: 161), alludes that quantitative research method provides objectivity

because it is not based on the researcher's opinion and Hesse (2018: 2) posited that a research questionnaire comprises of written questions that are relevant to the research objectives and research questions, that requires participants to answer without assistance from the researcher. The research questionnaire comprised of a biometric section and a section based on the SHEQ research questions. The research questionnaire was compiled by the researcher and the questions was based on the research objectives, research aim and research questions. A five-point Likert scale with closed ended questions was used (refer to appendix 4).

5.6.1.4 Instrument administration

The survey questionnaire was emailed during May 2021 to all research participants. The respondents completed the questionnaire, and the questionnaires was emailed back to the researcher between May 2021 to July 2021 for data analysis. Respondents was assured confidentiality during the administration process. Participants were notified on the survey questionnaire that the survey questionnaire will be used solely for research purpose and will be anonymous and confidential and the results will be used to develop a proposed framework to Integrate the SHEQ MS's. The survey questionnaire was distributed using a password protected email system.

5.6.1.5 Data analysis

The questionnaires data was captured onto a excel spreadsheet and then the data exported to SPSS. The quantitative data was then analysed using the SPSS (version 26) statistical package using descriptive and inferential statistics. Analysis of Variance (ANOVA) was used to test whether the differences observed in the sample data are due to chance or represent a true difference between the groups. The Chi-Square test was used to test whether the observed frequencies of the categories in the sample data were significantly different from the expected frequencies. The descriptive statistics is presented in the form of charts and tables.

5.6.1.6 Reliability and validity

Ward and Street (2012: 801), Saunders *et al*. (2016: 202); Johnson (2018: 1425) and Patten and Newhart (2018: 136), refers to reliability as, how consistent and stable the results of the research are and the extent that the results and conclusions can be replicated if the research was repeated. The Cronbach's Alpha coefficient was used for internal consistency to determine the reliability for sectional items in the questionnaire. Industry experts together with lecturers in the safety, health, environment and quality management field was used to review the interview questions and responses to ensure content validity of the qualitative research.

5.6.1.7 Validity

Hodson (2011:63), defines data validity as a method to establish if the intended concept is measured and this definition is echoed by Sekaran and Bougie (2016: 204), that infers that data validity ensures that the right thing is being measured and Patten and Newhart (2018: 123) further elaborates that validity refers to the extent that the data is measured in comparison to what it is designed to measure. The ISO high level structure, annex SL that forms the structure for an IMS, was used to ensure that the intended constructs are operationalised for measurement. Sekaran and Bougie (2016: 206) extends the definition to content validity that ensures that the measurements included an adequate and representative set of items of the concept and face validity refers to, the intended measurement of a concept on the face measures the intended concept. Context and content validity were established prior to the data collection by having the research instrument subject to scrutiny by peers, academics, and practitioners. The feedback from these subject experts was used to make the recommended corrections to the research instrument.

5.6.2 Qualitative research

Qualitative research involves the collection of data by conducting unstructured deeply probing interviews and recording words of phrases as opposed to

quantitative data where data collection involves numbers (Hair *et al.,* 2020: 161). To gain a more in-depth understanding of the quantitative data, the researcher conducted interviews with the organisation's senior SHEQ employees.

Qualitative data is presented using words and researchers identify themes in the data (Patten and Newhart 2018: 5) and provides an insight and an understanding of individuals' experiences, and the results may be used to develop interventions, understand barriers or to facilitate implementation of successful improvements (Denny and Weckesser 2018: 369). The qualitative interviews questions were compiled after the collection and analysis of the quantitative data. The qualitative interview questions were refined to obtain a clearer understanding and confirmation of the quantitative data results. One-to-one Skype interviews was conducted with participants and the notes that was extracted from the interview was confirmed with participants before the analysis of the data.

5.6.2.1 Target population

The target population for this study were employees of the research organisation namely, nine participants comprising of three Senior Production Personnel, one Senior Safety, Health, and Environment Person, three Senior Quality Personnel and two Senior Engineering Personnel who have a good understanding of management systems.

5.6.2.2 Sampling

Because of time and financial resource constraints, this research was restricted to non-probability purposive sampling in the semi-structured interviews. This technique allowed the researcher to determine and/or control the likelihood of specific individuals being included or excluded in the study. It comprised of nine online interviews with key safety, health, environment, quality, engineering, and production personnel.

5.6.2.3 Data collection instrument

Blanche, Durrheim and Painter (2006: 21) believe semi-structured interviews give the researcher an opportunity to know the respondents intimately in order to understand how they think and feel. Creswell and Creswell (2017: 31) note that interviews can be either face-to-face, telephonic, or via the internet such as emails or skype. Advantages of interviews include the researcher having control over the line of questioning, a high response rate, and gaining useful and in-depth information. Semi-structured interviews (Appendix 5) were engaged as the principal plan for data collection in this phase of the study, which included the verbal questioning of respondents. The questions were formulated from the findings of the quantitative phase of this study. Each of these interviews took approximately 50 minutes and was conducted on Skype. All interviews were conducted in English.

5.6.2.4 Data analysis

Thematic analysis was conducted for this research and the information was presented as themes and sub themes. Nowell, Norris, White and Moules (2017: 2), alludes that thematic analysis is a well-structured approach in summarising large sets of data, highlighting similarities and differences and generating insights of the research findings. King and Brooks (2019:219), supports this definition by alluding that thematic analysis is a basic method for identifying and analysing qualitative data patterns and principally focuses on identifying, organising, and interpreting themes in textual data. In this study, the following approach was adopted to analyse the data:

Transcripts were carefully read in their entirety. The recorded interviews were transcribed immediately after each interview. The data obtained from the individual interviews were organised in a folder. During this process of developing themes, the data was coded reviewed repeatedly. The researcher aimed to bring meaning and insight to the words and acts of the participants in the study by analysing and interpreting what they said and did.

Recurring catagories that emerged from the data were noted. A list of themes was then generated from the broad categories. These themes were then grouped and organised according to their similarity. The list of themes was compared according to the data and codes were allocated. The data was then divided and organised into relevant themes and sub-themes. During the process of developing themes, the data was coded. Special care was taken with regards to the meaning and insight of the words and acts of the participants in the study (Marshall and Rossman 1999: 152).

5.6.2.5 Data credibility and transferability

Credibility refers to the truth that can be sited in the research findings and established if the research findings represent plausible representation and interpretation of respondent's data (Korstjens and Moser 2018: 120). This definition is supported by Nowell, Norris, White and Moules (2017:2), who adds that credibility is the fit between the respondent's views and the researcher's presentation of these views. The research findings were confirmed as a true representation with the participants to ensure credibility of the qualitative data.

The minutes of qualitative interviews was submitted to the interviewees for validation and confirmation. Saunders *et al*. (2016: 203), posited that internal validity is established when there is a casual relation between two variables and the following are threats to internal validity:

i. Past or present events that may change a participant perception;
ii. Participants may alter their behaviour during testing if they believe that the research will lead to future consequences for them;
iii. Change of behaviour between different stages of the research;
iv. The impact of participants of the research resigning from their jobs or getting promoted during the research study;
v. Any changes outside the research may impact on the participants response; and
vi. A lack of clarity between the cause and effect of a situation.

To check the language appropriateness, questionnaire completion time, and areas of the questionnaire that are confusing phrasing or ambiguous a pre-test of the draft survey questionnaire was conducted with ten employees. Based on the results of the pre-test, the draft survey questionnaire was amended to ensure that the language was appropriate, completion time was acceptable, ambiguity removed, and confusion rephrased. The final data analysis did not include the responses to these ten draft pre-test survey questionnaires. Pretesting pinpoints any errors to ensure that the survey questionnaire will function as a proper research tool (Ruel, Wagner III and Gillespie 2018:101).

Transferability refers to the degree to which the qualitative research results can be transferred to other contexts or setting with other respondents (Korstjens and Moser 2018: 120). A description of the research process and participants are provided in this research to enable readers to make a transferability judgement of the qualitative data to other settings.

5.6.2.6 Data dependability and confirmability

Dependability refers to the stability of data over time and over conditions (Korstjens and Moser 2018: 120). Confirmability refers to the degree that the data and research findings represents the research data and is not figments of the researcher's imagination. The research plan, execution and findings were audited by a subject expert to ensure dependability and confirmability.

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5.6.2.7 Data reflexivity

Reflexivity refers to the researcher's role awareness and how the researcher is influenced by the research, thus enabling the researcher to acknowledge the way in which the researcher affects both the research processes and outcomes (Korstjens and Moser 2018: 120). Notes was taken during the interview process and the interpretation was confirmed with participants to ensure reflexivity of the research.

5.6.2.8 Trustworthiness

Triangulation was used to develop a comprehensive understanding of the research study and to validate the findings of the quantitative research findings. Wilson (2016: 66) defines triangulation as, using more than one research method to gain richer and fuller data and assists in confirmation of the research results and this is supported by Yin (2014:313) defining, triangulation as using two or more different sources to ensure reliability. Patten and Newhart (2018: 156), further elaborates that triangulation refers to using multiple methods to obtain data to strengthen the researcher's argument and mitigate the weaknesses of using one research method. Triangulation using quantitative and qualitative methods was also be adopted to ensure the reliability of the research study. Minutes of the interviews was recorded and confirmed with the interviewees before being analysed to ensure the credibility of the qualitative data. Saunders, Lewis and Thornhill: (2016: 203), alludes that the following are threats to the reliability of a research:

i. Participant error refers to any aspect that adversely changes the way a participant performs in the research;

ii. Participant bias refers to any aspect that induces a false response;

iii. Research error, refers to any aspect that alters the researcher's interpretation; and

iv. Researcher bias refers to any aspect that induces the way the researcher records the participants response.

5.7 Ethical issues

Prior to collecting data, ethics approval (Appendix 1) was obtained from the Research Ethics Committee of the Faculty of Management Sciences (DUT). In addition, a gatekeeper's letter was supplied by the research organisation (Appendix 2). This requires the researcher to maintain a moral and professional obligation and to be guided by ethics, even when the respondents involved are unaware of ethics.

Each participant was provided with a letter of information and consent form which informed that participation in this study was voluntary and that the anonymity and confidentiality of information would be maintained (Appendix 3). Overall, the confidentiality and anonymity of participants, together with their informed consent to participate in this study, ensured that the study complied with ethical codes of practice. The researcher took reasonable measures to safeguard all data. The captured data is password protected on a google drive (also password protected).

5.8 Conclusion

This chapter presented the research methodology, the research design, the research population, research sampling, data collection, quantitative research method, qualitative research method, data analysis, data reliability, data context, pre-test, limitation, and a chapter conclusion. The research was based on an objective positivism research paradigm and the ontology was a holistic systems approach supported by the conceptual framework of the research The qualitative and quantitative research methods complemented each other, adopting a mixed research method that provided a better understanding of the research problem using the case study research design. and the Interview questions was refined to verify and get a clearer complete picture. The interview questions were shaped by the responses to the quantitative questionnaire. The chapter also discussed the trustworthiness of both the quantitative and qualitative research methods.

The next chapter will present the research findings.

6 CHAPTER SIX: RESULTS AND DISCUSSION (QUANTITATIVE)

6.1 Introduction

The previous chapter presented the research methodology. This chapter is based on the application of the research methodology for the quantitative data analysis and discussion of the quantitative research findings. The data from the quantitative research together with the research theory was used to present the findings, interpretation and gap analysis in text, data table and graphical format.

6.2 Quantitative data analysis

This section presents the results and a discussion of the findings obtained from the questionnaires in the quantitative section of the research study. The primary tool that was used to collect data for the quantitative analysis was the survey questionnaire that was distributed to 245 employees. The data collected from the responses was analysed with SPSS version 26.0 and the results was present the descriptive statistics in the form of graphs, cross tabulations and other figures for the quantitative data that was collected. Inferential techniques include the use of correlations and chi square test values, which are interpreted using the p-values. The traditional approach to reporting a result requires a statement of statistical significance where a p-value is generated from a test statistic and a significant result is indicated with $p < 0.05$.

6.2.1 Research sample

A total of 245 questionnaires were administered, and 221 responses was received, which gave a 90.20% response rate. The appropriate sample size illustrated by Sekaran and Bougie's (2016: 294) sample table is 217 employees therefore the 221

response that was received was deemed adequate for this research study. Table 6.1 represents the proportionate sampling that was used for this study.

Table 6:1 Proportionate sampling for the study by employee level

	Gauteng		KZN		Cpt		Total	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Senior Management	4	4	6	6	4	4	14	14
Middle Management	8	7	10	11	9	10	27	28
Operational Staff	52	52	77	80	47	47	176	179
Total	**64**	**63**	**93**	**97**	**60**	**61**	**217**	**221**

6.2.2 The research Instrument.

The research instrument consisted of 47 items (Appendix 4), with a level of measurement at a nominal or an ordinal level. Nominal level of measurement was used for the biographical data. Nominal level of measurements assigns names or categories to describe the various qualities of a variable, which are discrete and qualitative in nature, does not define distance between variables and only serve as names or labels (Cummings 2018: 942). Ordinal levels of measurements were used for the Likert scale data. Ordinal levels of measurements signify a continuous relationship that rank orders the magnitude or size of the qualities of a variable (Cummings 2018: 942). As illustrated in table 6.2, the nine sections which measured various themes is represented. These themes represent the research population biographical data, the requirements of ISO annex SL and integrated management systems.

Table 6:2 Sections of the quantitative questionnaire

Section	ISO Clause	Description	Literature Review Cross Reference
A	Not applicable	Biographical data	Not applicable
B	4	Context of the organization	4.8.2
C	5	Leadership	4.8.3
D	6	Planning	4.8.4
E	7	Support	4.8.5
F	8	Operation	4.8.6
G	9	Performance evaluation	4.8.7
H	10	Improvement	4.8.8
I	Not applicable	Integrated Safety, Health, Environment and Quality Management System	4.1

Source: Author's own construction

6.3 Reliability statistics

Reliability and validity are the two most important aspects of precision. and is concerned with the consistency of the research findings (Hair, Page and Brunsveld (2020: 259). Cronbach's alpha was used for computing the reliability of this study. The reliability coefficient of Cronbach's alpha is normally between the 0 and 1 range and a result that is closer to 1 indicates internal consistency of the scale items and an acceptable reliability coefficient for a newly developed construct is 0.60 or higher (Gliem and Gliem 2003: 87). the Cronbach's alpha score for all the items that constituted the questionnaire is reflected in table 6.3.

Table 6:3 Cronbach's alpha score

	Section	Number of Items	Cronbach's Alpha
B	Context of the organization	6	0.909
C	Leadership	3	0.681
D	Planning	9	0.919
E	Support	3	0.861
F	Operation	3	0.718
G	Performance evaluation	3	0.699
H	Improvement	6	0.826
I	IMS	7	0.762
Overall		**40**	**0.943**

The reliability scores for all sections exceed the recommended Cronbach's alpha value of 0.60 which indicates a degree of acceptable, consistent scoring for these sections of the research.

6.4 Factor analysis

Factor analysis is a statistical technique that summarises the information from many variables to a much smaller number of factors that simplifies the understanding of the data (Hair, Page and Brunsveld 2020: 161). The factor analysis definition is further explained by Kremelberg (2014: 287) as a statistical technique that is used to determine if many variables can be reduced to a reduced number of factors with conceptual meanings and the primary goal of factor analysis is the reduction of data. Factor analysis is typically used in survey research, where a researcher wishes to represent several questions with a small number of hypothetical factors (Hair *et al.*, 2020: 425) and there are two reasons why factor analysis is useful, firstly it is a

dimension reduction tool and secondly simultaneously represents the meaningful components of the covariance matrix of the observations (Motta 2018: 503). Hence factor analysis is useful because the factors that are attained after running a factor analysis, can be used as a reduced number of dependent variables for statistical analysis.

6.5 Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is statistics that indicates the proportion of variance in the variables that might be caused by underlying factors (Anon 2016:1). High values (close to 1.0) generally indicate that a factor analysis may be useful with the data and the results of the factor analysis and probably won't be very useful if it is below 0.5 which is often seen as a minimum appropriate level (Dawson 2018: 42).

Bartlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix, which would indicate that the variables are unrelated and therefore unsuitable for structure detection (Dawson 2018: 42). Small values (less than 0.05) of the significance level indicate that a factor analysis may be useful with the data (Anon 2016: 1). The matrix tables are preceded by a summarised table 6.4, that reflects the results of KMO and Bartlett's Test. The KMO and Bartlett's Test table 6.4 shows two tests that indicate the suitability of data for structure detection.

Factor analysis is done only for the Likert scale items and certain components are divided into finer components, as explained in table 6.4 the rotated component matrix.

Table 6:4 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.859
Bartlett's Test of Sphericity	Approx. Chi-Square	8841.416
	df	741
	Sig.	0.000

All of the conditions are satisfied for factor analysis, that is, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy value should be greater than 0.500 and the Bartlett's Test of Sphericity sig. value should be less than 0.05 (Anon 2016: 1). Table 6.5 illustrates the rotated component matrix.

Table 6:5 Rotated Component Matrix

	Component								
	1	2	3	4	5	6	7	8	
My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system.	0.208	0.242	0.011	0.344	0.686	0.355	0.033	0.009	B1
My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's environmental management system.	0.722	0.158	0.069	0.129	0.524	-0.003	0.139	0.030	B2
My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's health and safety management system	0.214	0.145	0.388	0.157	0.757	-0.022	0.063	0.018	B3
My organisation understands the quality needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	0.159	0.059	-0.082	0.283	0.788	0.326	0.076	0.000	B4
My organisation understands the environmental needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	0.749	0.077	0.025	0.108	0.512	-0.031	0.174	-0.033	B5
My organisation understands the occupational health and safety needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	0.173	0.093	0.448	0.188	0.778	-0.031	0.105	-0.002	B6
Top management demonstrates committed leadership with respect to the quality management system.	0.108	-0.014	0.034	0.407	0.401	0.451	-0.121	0.196	C7
Top management demonstrates committed leadership with respect to the environmental management system.	0.795	-0.070	0.090	0.189	0.202	0.092	0.062	0.093	C8
Top management demonstrates committed leadership with respect to the occupational health and safety management system	0.071	0.103	0.599	0.314	0.341	0.111	0.150	0.032	C9
My organisation has completed a product quality risk assessment	0.132	0.244	0.131	0.714	0.260	0.087	-0.046	0.089	D10
My organisation has completed an environmental risk assessment	0.793	0.158	0.072	0.333	0.179	-0.059	0.130	0.044	D11

My organisation has completed an employee occupational health and safety risk assessment	0.149	0.263	0.548	0.490	0.333	-0.066	0.026	0.078	D12
My organisation has determined its quality objectives	0.270	0.216	0.084	0.766	0.216	0.285	0.158	-0.068	D13
My organisation has determined its environmental objectives	0.830	0.102	0.112	0.374	0.148	-0.053	0.169	0.013	D14
My organisation has determined its occupational health and safety objectives	0.190	0.184	0.581	0.588	0.228	-0.039	0.133	-0.004	D15
My organisation has communicated its quality objectives to employees	0.223	0.242	0.105	0.729	0.159	0.389	0.111	-0.027	D16
My organisation has communicated its environmental objectives to employees	0.811	0.156	0.072	0.368	0.108	0.054	0.116	0.058	D17
My organisation has communicated its occupational health and safety Objectives to employees	0.102	0.148	0.556	0.638	0.165	-0.045	0.039	0.067	D18
My organisation provides the necessary resources needed for the operation of the quality management system	0.130	0.072	-0.110	0.161	0.115	0.191	0.776	0.218	E19
My organisation provides the necessary resources needed for the operation of the environmental management system	0.518	-0.082	0.041	0.016	0.048	0.059	0.722	0.130	E20
My organisation provides the necessary resources needed for the operation of the occupational health and safety management system	0.210	0.003	0.220	0.016	0.110	0.029	0.847	0.138	E21
My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the quality management system	0.187	0.180	0.212	0.110	0.100	0.675	0.252	-0.090	F22
My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the environmental management system	0.853	0.048	0.213	-0.071	-0.024	0.216	0.134	0.054	F23
My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the occupational health and safety management system	0.312	0.109	0.714	-0.019	0.027	0.282	0.131	-0.070	F24
My organisations reviews (monitors, measures, analyses, and evaluates) its quality performance	0.250	0.105	0.268	0.207	0.064	0.682	0.079	0.043	G25
My organisations reviews (monitors, measures, analyses and evaluates) its environmental performance	0.790	0.072	0.227	-0.070	0.029	0.284	0.087	0.041	G26
My organisations reviews (monitors, measures, analyses and evaluates) its occupational health and safety performance.	0.126	0.076	0.763	0.085	0.038	0.161	-0.063	0.060	G27

My organisation identifies opportunities for the improvement of the quality management system	0.013	0.201	0.147	0.064	0.123	0.760	0.041	0.308	H28
My organisation identifies opportunities for the improvement of the environmental management system	0.745	0.069	0.193	-0.026	0.006	0.341	0.052	0.307	H29
My organisation identifies opportunities for the improvement of the occupational health and safety management system	0.074	0.042	0.711	0.074	0.058	0.283	-0.079	0.389	H30
My organisation provides resources for the improvement of the quality management system	-0.006	0.072	-0.046	0.082	0.082	0.249	0.166	0.843	H31
My organisation provides resources for the improvement of the environmental management system	0.558	0.000	0.086	-0.066	-0.064	-0.045	0.190	0.682	H32
My organisation provides resources for the improvement of the occupational health and safety Management System	0.226	0.011	0.392	0.026	-0.038	-0.027	0.260	0.760	H33
I feel that there is too much duplication of documentation across the Safety, Health, Environment and Quality management systems	-0.002	0.844	0.063	0.176	-0.021	0.129	-0.132	0.038	I34
I feel that there is too much duplication of meetings across the Safety, Health, Environment and Quality management systems	-0.010	0.862	0.071	0.145	0.012	0.126	-0.116	0.022	I35
I feel that the different auditing check sheets used can be combined into a single auditing check sheet across the Safety, Health, Environment and Quality management systems	0.104	0.832	0.094	0.060	0.179	0.142	0.005	0.043	I36
I feel that an integrated SHEQ Management System will be easier to manage	0.296	0.324	-0.097	0.006	-0.203	0.115	0.310	0.126	I37
I feel that an integrated SHEQ Management System will result in better utilisation of resources	0.192	0.788	0.108	0.091	0.118	0.012	0.235	0.006	I38
I feel that an integrated SHEQ management System will result in cost saving benefits	0.091	0.789	0.121	0.197	0.145	0.025	0.121	-0.014	I39

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 15 iterations.

Source: Author's own construction

Table 6.6 illustrates the sections of the research questionnaire that is depicted in the last column of table 6.5 above.

Table 6:6 Research Likert Scale questionnaire sections

	Section
B	Context of the organization
C	Leadership
D	Planning
E	Support
F	Operation
G	Performance evaluation
H	Improvement
I	IMS

As illustrated in table 6.5, to enable factor loadings to be interpretable, factors are loaded in a way to produce simple structures and the two ways to rotate factors are oblique and orthogonal, also called varimax rotation methods (Motta 2018: 503). The principal component analysis that was used for this research study as the extraction method, and the rotation method was Varimax with Kaiser Normalization. The orthogonal method minimized the number of variables that have high loadings on each factor, it simplified the interpretation of the factors and constrained the factors to be independent of each other.

The factor analysis / loading table 6.5 displays inter-correlations between variables and the items of questions that loaded similarly imply measurement along a similar factor. An examination of the content of items loading at or above 0.5 (and using the higher or highest loading in instances where items cross-loaded at greater than this value) effectively measured along the various components.

The statements that constituted section B, “the context of the organisation” perfectly aligns with component 5, the statements that constituted section E “support” perfectly aligns with component 7 and the statements that constituted section I “Integrated Safety, Health, Environment and Quality Management System” perfectly aligns with component 2. Considering sections B, E and I aligns along a single component, implies that the statements that constituted these sections perfectly measured what it set out to measure.

It is noted that the variables that constituted the remaining sections loaded across 3 or 4 components (sub-themes). This means that respondents identified different trends within the section. Within the section, the splits are colour coded. The reasons for the different trends of the respondents’ can be attributed to that majority of the respondents were middle management and operational level of the organisation and did not fully comprehend the level of resource allocation, have knowledge of the senior management strategic intention, have a comprehensive understanding of integrated SHEQ systems or they may be familiar with one management system and not another.

The main theme identified within section C “Leadership” (C7, C8 and C9) are the commitment of the organisation’s leadership toward safety, quality environment and quality management systems. The success of any management system of any organisation is mainly dependent on the commitment of the management of an organisation towards these management systems.

The following three sub-themes are identified within the main theme of section D “Planning”:

Organisational objectives and assessments (D11, D14 and D17)

Employee objectives and assessments (D12)

Quality and health and safety objectives and assessment (D10, D13, D15, D16 and D18)

Organisational functionality depends on the synergies between the ability of the organisation to function effectively, the ability of employees to function effectively, and the impact of quality on all aspects of the organisation.

The main theme of section F “Operation” (F22, F23 and F24) is the primary functions of management, that is planning, organising, leading, and controlling. The success of the performance of an organisation’s SHEQ management system is dependent on the effective application of the primary functions of the management.

The main theme of section G “Performance evaluation” (G25, G26 and G27) is the monitoring, measurement, analysis, and evaluation of the organisation’s SHEQ performance. Based on ensuring that the SHEQ management system satisfies the requirement of the organisation and continually improves organisations must monitor, measure, analyse and evaluate the performance of these systems.

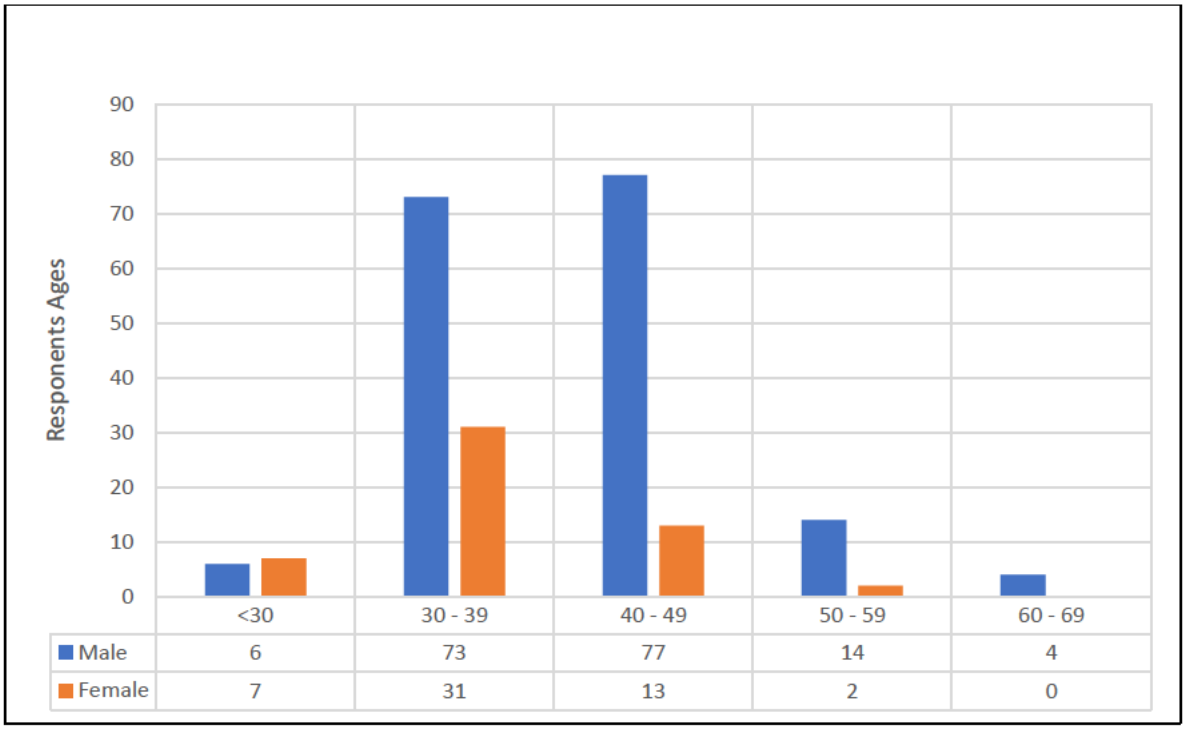
The main theme of section H “Improvement” (H28, H29. H30, H31, H32 and H33) is the identification of opportunities of improvement and provision of resources for the improvement for the organisation’s SHEQ management systems. To remain relevant and ensure adherence to changes in the ISO requirements and the organisation’s micro and macro environment, organisations must identify these changes and allocate the necessary resources.

6.6 Research questionnaire: Section A - Biographical Data

This section summarises the biographical characteristics of the respondents of the research questionnaire.

6.6.1 Distribution of the ages of the respondents

Figure 6.1 illustrates the distribution of the ages of the respondents.



	<30	30 - 39	40 - 49	50 - 59	60 - 69
Male	6	73	77	14	4
Female	7	31	13	2	0

Figure 6:1 Distribution by respondents ages

Table 6.7 describes the overall gender distribution by age.

Table 6:7 Overall gender distribution by age

Age (years)		Gender		Total
		Male	Female	
< 30	Count	6	1	7
	% Within Age	85.7%	14.3%	100.0%
	% Within Gender	3.4%	2.1%	3.2%
	% Of Total	2.7%	0.5%	3.2%
30 - 39	Count	73	31	104
	% Within Age	70.2%	29.8%	100.0%
	% Within Gender	42.0%	66.0%	47.1%
	% Of Total	33.0%	14.0%	47.1%
40 – 49	Count	77	13	90
	% Within Age	85.6%	14.4%	100.0%
	% Within Gender	44.3%	27.6%	40.7%
	% Of Total	34.8%	5.9%	40.7%
50 - 59	Count	14	2	16
	% Within Age	87.5%	12.5%	100.0%
	% Within Gender	8.0%	4.3%	7.2%
	% Of Total	6.3%	0.9%	7.2%
60 - 69	Count	4	0	4
	% Within Age	100.0%	0.0%	100.0%
	% Within Gender	2.3%	0.0%	1.8%
	% Of Total	1.8%	0.0%	1.8%
Total	Count	174	47	221
	% Within Age	78.7%	21.3%	100.0%
	% Within Gender	100.0%	100.0%	100.0%
	% Of Total	78.7%	21.3%	100.0%

Source: Author's own construction

As illustrated in table 6.7 and figure 6.1, overall, the males to female's ratio is approximately 4:1 (78.7%: 21.3%) ($p < 0.001$). This males to female ration are representative of the ratio of the total males to females' population of 395 males and 105 females representing a total population of 500 of the researched organisation, and this equates to 79% males and 21 % females.

Within the age category of less than 30 years old, 85.7% were male and 14.3% were female, within the gender category males were 3.4% and females were 2.1% and of the total sample, males formed 2.7% and females formed 0.5%. Within the age category of 30 to 39 years old, 70.2% were male and 29.8% were female, within the gender category males were 42.0% and females were 66.0% and of the total sample, males formed 33.0% and females formed 14.0%.

Within the age category of 40 to 49 years old, 85.6% were male and 14.4% were female, within the gender category males were 44.3% and females were 27.7% and of the total sample, males formed 34.8% and females formed 5.9%. Within the age category of 50 to 59 years old, 87.5% were male and 12.5% were female, within the gender category males were 8.0% and females were 4.3% and of the total sample, males formed 6.3% and females formed 0.9%. Within the age category of 60 to 69 years old, 100.0% were male and 0% were female, within the gender category males were 2.3% and females were 0% and of the total sample, males formed 1.8% and females formed 0%.

The age distributions are not similar as there are more respondents younger than 50 years ($p < 0.001$).

Hence, the sample of males and females is a good representation of the population gender.

6.6.2 Racial composition of the population and sample

Figure 6.1 indicates the racial composition of the population.

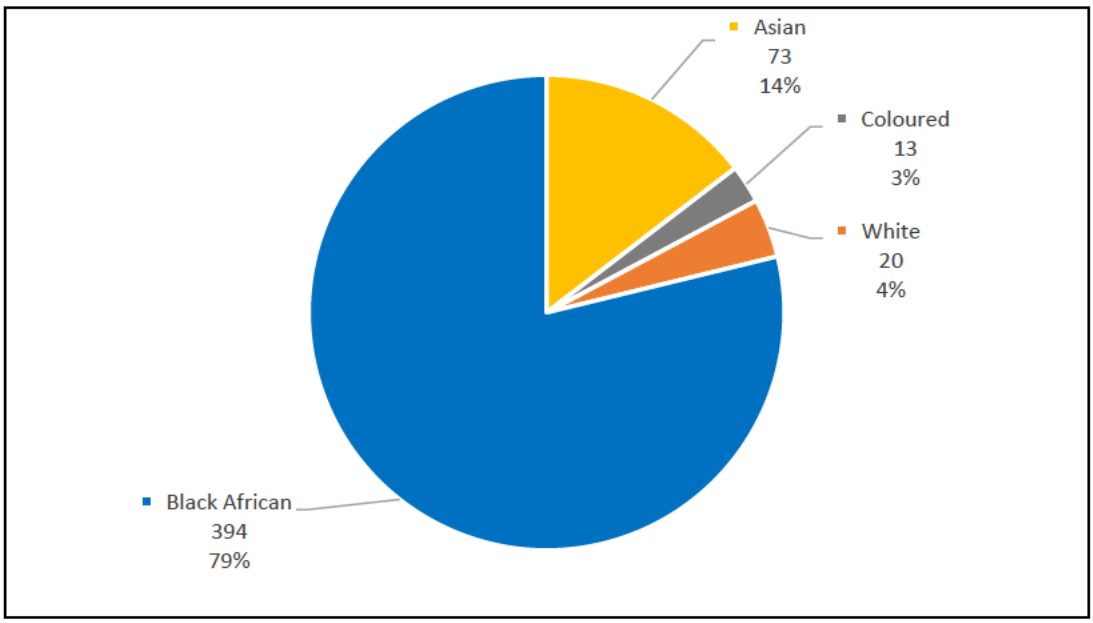


Figure 6:2 Racial composition of the research population

Figure 6.3 indicates the racial composition of the research sample.

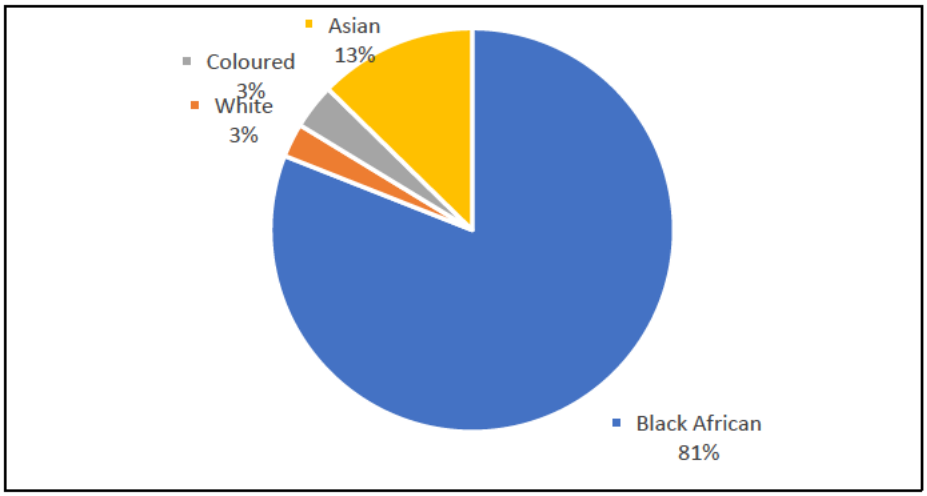


Figure 6:3 Racial composition of the research sample

The sample is predominantly African (81.0%), with Asians (12.7%) forming the next largest grouping. There were similar and smaller numbers of Coloured and White ($p < 0.001$). The sample is representative of the composition of the research population.

6.6.3 Staff position composition of the population and sample

Figure 6.4 indicates the staff position composition of the population.

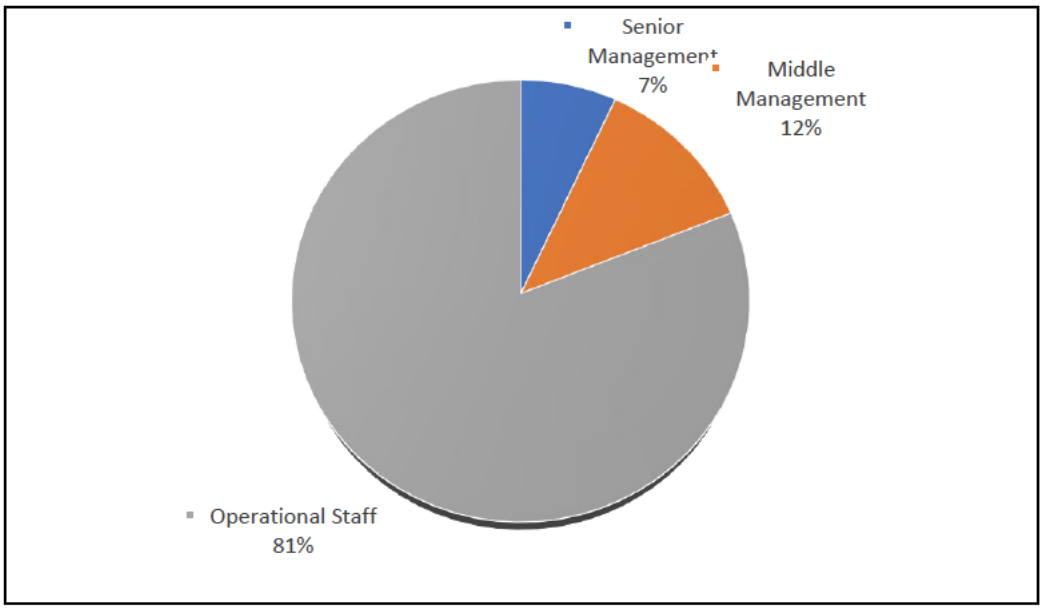


Figure 6:4 Staff position composition of the population

Most of the staff were Operational (81.0%). A little less than 13% were Middle Management, with 6.3% being Senior Management ($p < 0.001$). The staff position sample represents the positions of the research population.

Figure 6.5 indicates the department percentages to which the research population belong.

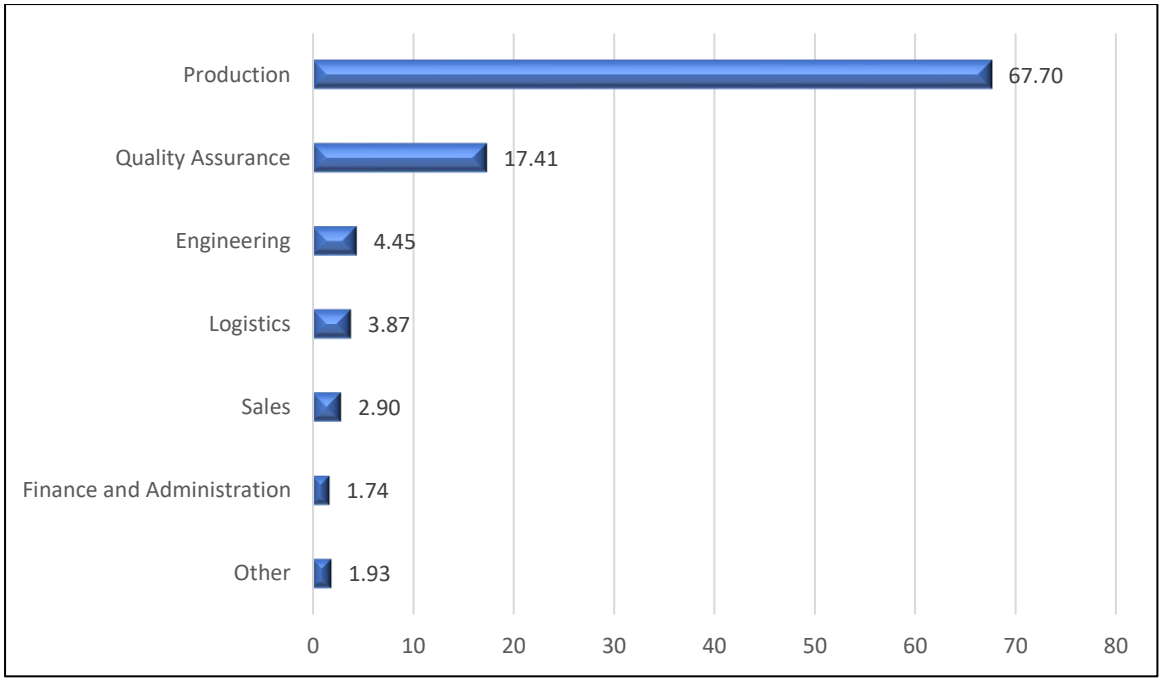


Figure 6:5 Department percentages of the research population

Figure 6.6 indicates the department percentages to which the research sample respondents belong.

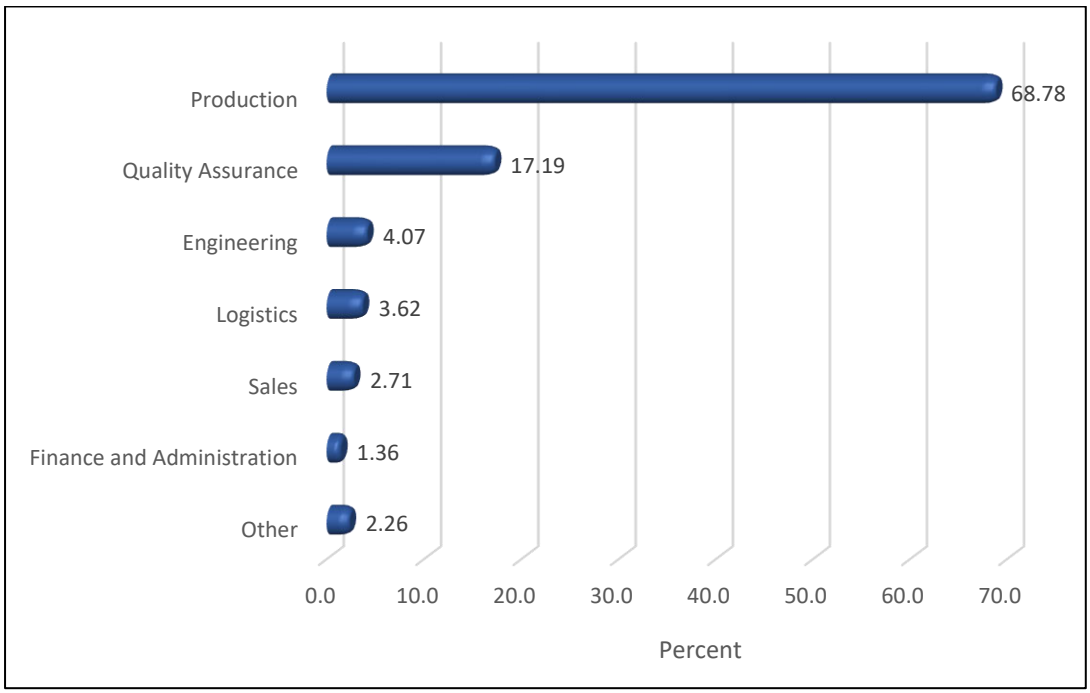


Figure 6:6 Department percentages of the research sample respondents

A little more than two-thirds of the respondents (68.8%) were in Production, with 17.2% being in Quality Assurance. Each of the other categories have less than 5% in each of them ($p < 0.001$). The departments research sample represents the department research population.

6.6.4 Province of the research respondents

Figure 6.7 indicates the percentage of each province of the research respondents.

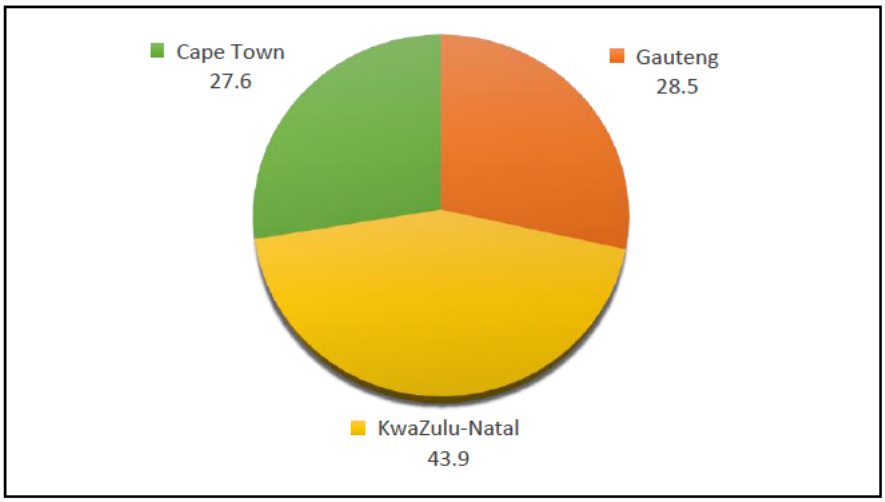


Figure 6:7 Percentage of each province of the research respondents

There were significantly more respondents from KwaZulu Natal (43.9%), with the remaining respondents being split between Gauteng (28.5%) and Cape Town (27.6%) ($p = 0.004$). This ratio is representative of the population split of 42.80% from KwaZulu Natal, 29.20% from Gauteng and 28.00% from Cape town.

Overall, the sample represented the research population in all categories discussed.

6.6.5 Audit capability of respondents

Figure 6.8 indicates management systems and processes that the respondents can audit.

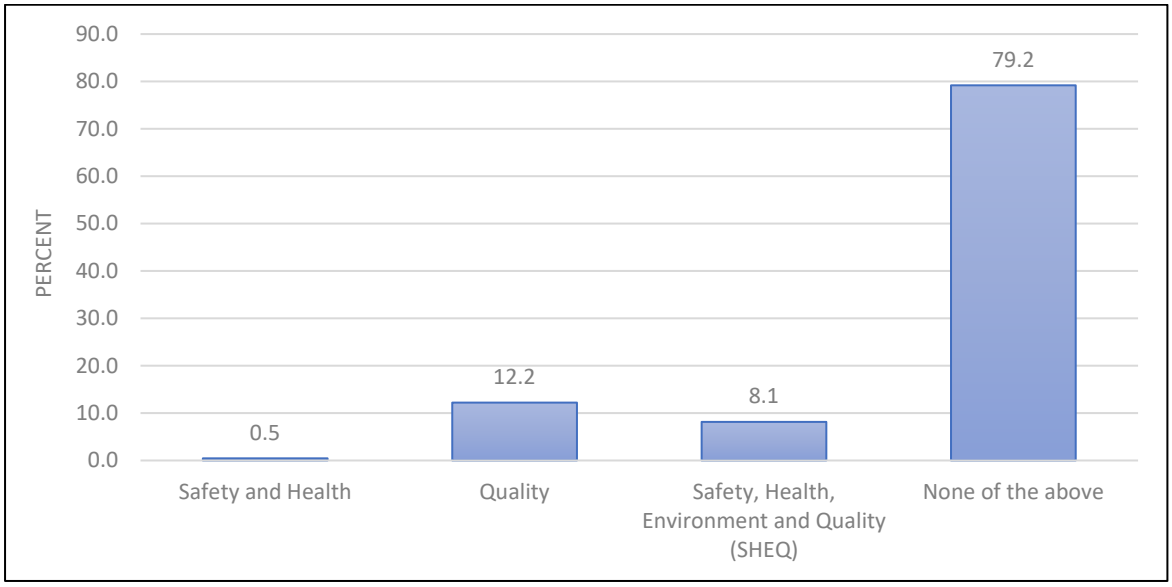


Figure 6:8 MS and processes that the respondents can audit.

12.2% of the respondents can audit only quality management systems, 8.1% can audit SHEQ management systems and 0.5% can audit only safety and health management systems. The majority of the respondents (79.2%) are unable to audit any of the three SHEQ management systems ($p < 0.001$). However, it must be noted that although all employees are required to perform their jobs as per the management system requirements, it is not an expectation that all employees are required to conduct audits. It must be noted that although all employees are not required to perform audits, it was important to establish how many employees can audit and which systems that they can audit to ensure that there is sufficient pool of auditors, considering the ISO auditing requirement, that states that auditors are not allowed to audit their own sections.

6.7 Research questionnaire: Section B

This section deals with section “B” of the questionnaire, that analyses the scoring patterns of the respondents per variable per section. The results are first presented using summarised percentages for the variables that constitute each section. Results are then further analysed by the importance of the statements. The objective of section “B” of the questionnaire is to establish respondents’ views on the current independent SHEQ management systems and on integrated SHEQ management systems. A five-point Likert scale ranging from 1 “strongly disagree” to 5 “strongly agree” was used to determine the extent to which respondents agreed or disagreed with the statements in section “B” of the questionnaire.

The goodness-of-fit test was developed to determine whether observed distributions of frequency data matched, or “fitted,” a theoretical distribution and the smaller the difference, the better the fit (Salkind 2011: 134). To determine whether the scoring patterns per statement were significantly different per option, a chi square goodness-of-fit test was done. The null hypothesis claims that similar numbers of respondents scored across each option for each statement (one statement at a time). The alternate states that there is a significant difference between the levels of agreement and disagreement. The results are shown in the table 6.8. The highlighted sig. values (p-values) are less than 0.05 (the level of significance), it implies that the distributions were not similar. That is, the differences between the way respondents scored (agree, neutral, disagree) were significant.

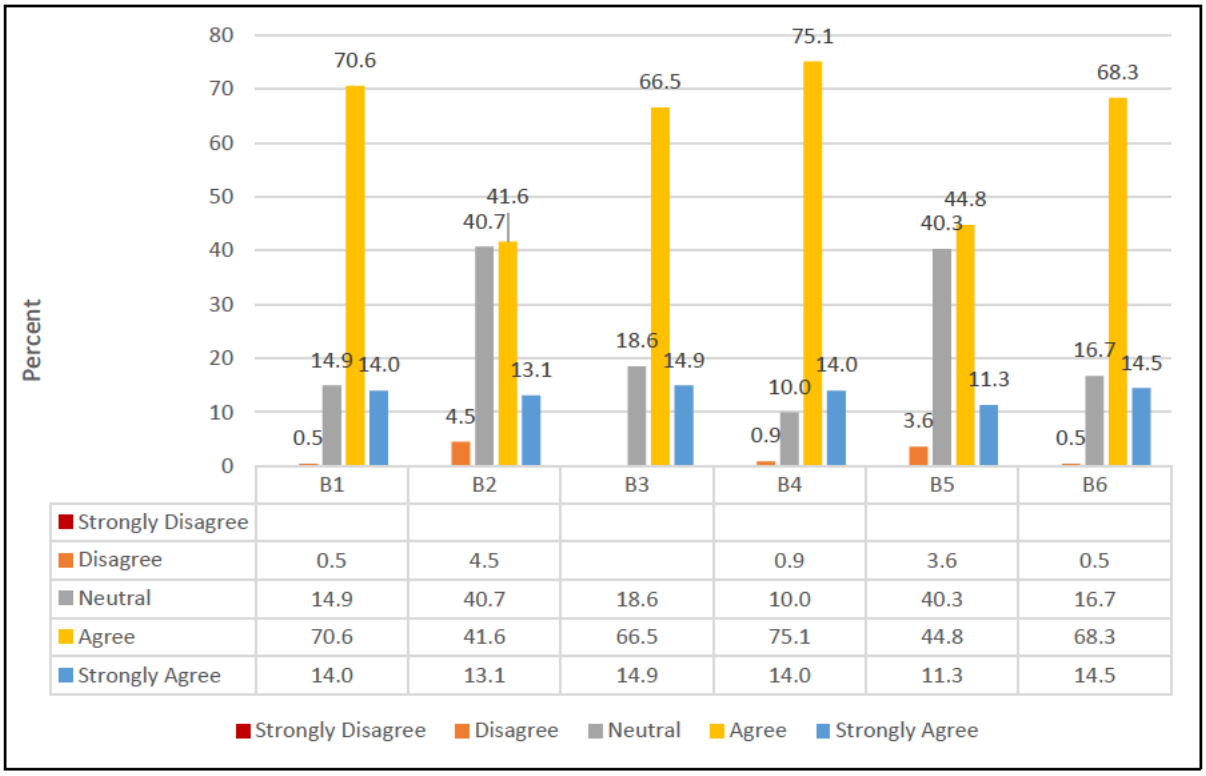
6.7.1 Scoring pattern for section B: 4. Context of the organisation

The external and internal environment of an organisation influences the strategy of the organisation (Engelhardt 2018: 6). Hence organisation must evaluate the internal and external business environment when developing strategic plans. This section discourses the research objective of ascertaining the current business environment. Table 6.8 summarises the scoring patterns for section B1 to B6 of the context of the organisation.

Table 6:8 Scoring pattern for the context of the organisation

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system.	B1	0	0.0%	1	0.5%	33	14.9%	156	70.6%	31	14.0%	< 0.001
My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's environmental management system.	B2	0	0.0%	10	4.5%	90	40.7%	92	41.6%	29	13.1%	< 0.001
My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's health and safety management system	B3	0	0.0%	0	0.0%	41	18.6%	147	66.5%	33	14.9%	< 0.001
My organisation understands the quality needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	B4	0	0.0%	2	0.9%	22	10.0%	166	75.1%	31	14.0%	< 0.001
My organisation understands the environmental needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	B5	0	0.0%	8	3.6%	89	40.3%	99	44.8%	25	11.3%	< 0.001
My organisation understands the occupational health and safety needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	B6	0	0.0%	1	0.5%	37	16.7%	151	68.3%	32	14.5%	< 0.001

Table 6.8 presented the scoring pattern for the context of the organisation and figure 6.9 indicates a graphical representation of the scoring patterns for section B 1 to B6 on the context of the organisation.



	B1	B2	B3	B4	B5	B6
Strongly Disagree						
Disagree	0.5	4.5		0.9	3.6	0.5
Neutral	14.9	40.7	18.6	10.0	40.3	16.7
Agree	70.6	41.6	66.5	75.1	44.8	68.3
Strongly Agree	14.0	13.1	14.9	14.0	11.3	14.5

Figure 6:9 Scoring pattern for the context of the organisation.

This section measured respondents perception of the context of the organisation, the significance of the differences was tested and shown in the table 6.8. and the following patterns were observed with statements B1 to B6 depicted in figure 6.9:

i. None of the repondents strongly disagreed and there are no statements with high levels of disagreement;
ii. Statements B1 and B4 are based on the quality management system, have similar scoring patterns;
iii. Statements B2 and B5 are based on the environmental management system, have similar scoring patterns. The levels of agreement and the levels of neutral are also similar;
iv. Statement B3 and B6 are based on the health and safety management system, have similar scoring systems;
v. All statements show significantly higher levels of agreement whilst levels of strong agreement are lower but still greater than levels of disagreement; and
vi. Statements B1, B3, B4 and B6 based on safety, health and quality management systems have higher levels of agreement (> 80%) (adding Agree and Strongly Agree) in comparison to statements B2 and B5 based on environmental management system.

6.7.2 Summary of findings of section 4: Context of the organisation

An understanding of the context of the organisation and the requirements of interested parties enables an organisation to develop and align the strategic intentions of the organisation (Barbosa, Oliveira and Santos 2018:925). The research findings indicate that the research organisation has achieved this objective. Question 1 to question 6 of the survey questionnaires measured respondent's perception of the SHEQ context of the organisation and the response was further clarified during the interviews. There was a high level of agreement that the that the management of the organisation contextualised the external factors that impacted on the organisation and understands the needs and expectation of all stakeholders. However, there was greater focus on the health, safety and quality elements and an IMS will shift focus from silo to a holistic focus that will result in a balanced SHEQ approach.

6.7.3 Scoring pattern for section B: 5. Leadership

This section discourses the research objective of determining, what is the extent of leadership's commitment and support of an IMS.Table 6.9 summarises the scoring patterns for section C7 to C9 on leadership.

Table 6:9 Leadership scoring pattern

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
Top management demonstrates committed leadership with respect to the quality management system.	C7	1	0,5%	3	1,4%	18	8,1%	177	80,1%	22	10,0%	< 0.001
Top management demonstrates committed leadership with respect to the environmental management system.	C8	0	0,0%	13	5,9%	87	39,4%	108	48,9%	13	5,9%	< 0.001
Top management demonstrates committed leadership with respect to the occupational health and safety management system	C9	0	0,0%	2	0,9%	26	11,8%	145	65,6%	48	21,7%	< 0.001

For an organisation to achieve its strategic objectives, there must be an organisation culture and commitment that is created by the leaders of the organisation to achieve the goals of the organisation (Abuhav 2016: 39). Figure 6.10 indicates a graphical representation of the scoring patterns for section C7 to C9 on the organisation's leadership committment towards the management systems.

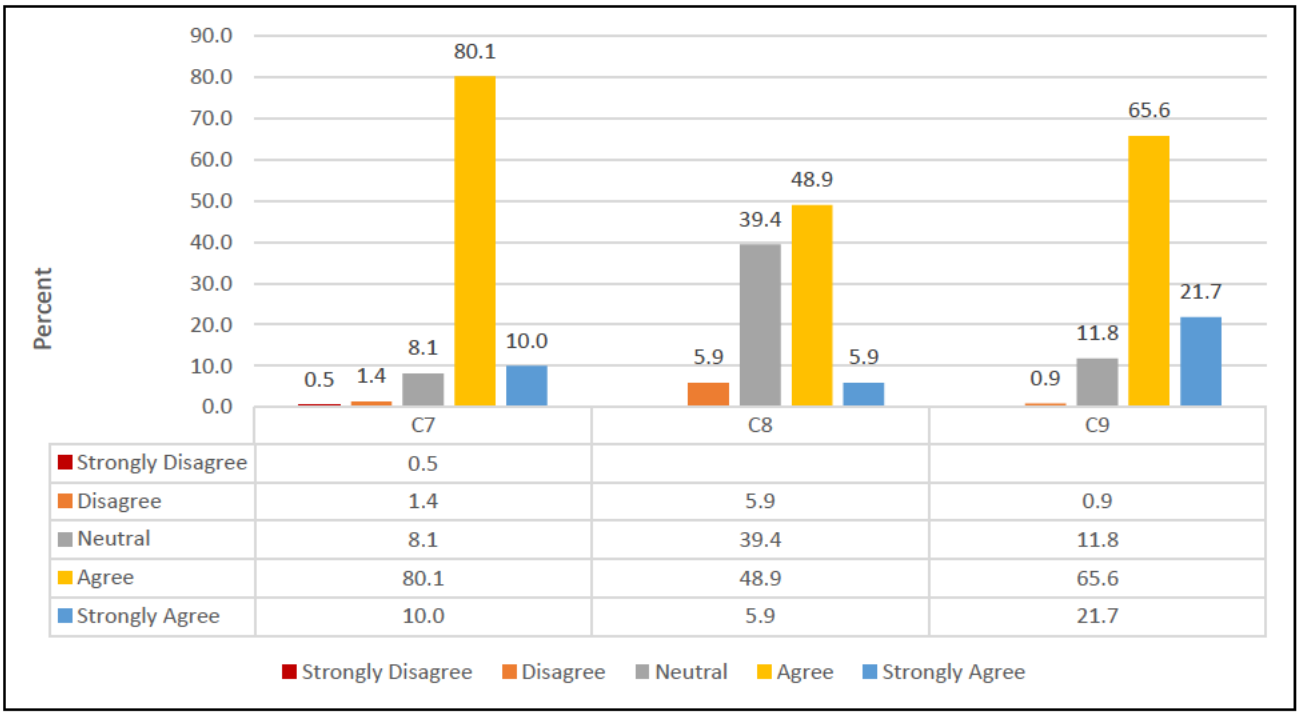


Figure 6:10 Scoring pattern for organisation's leadership

This section measured respondents perception of the organisation's leadership, the significance of the differences was tested and shown in the table 6.9.and the following patterns were observed with statements C7 to C9 depicted in figure 6.10:

i. There are no statements with high levels of disagreement. 0.5% strongly disagreed with C7 and none of the repondents strongly disagreed with C8 and C9;

ii. Statement C7 is based on leadership's commitment to the quality management system, with 80.1% of the respondents agreeing and 10% strongly agreeing. There was a higher level of agreement than neutral or disagreement;
iii. Statement C8 is based on leadership's commitment to the environmental management system with 48.9% of the respondents strongly agreeing and 5.9% strongly agreeing. 39.4% of the respondents was neutral;
iv. Statement C9 is based on leadership's commitment to the health and safety management system. 65.6% of the respondents agreed and 21.7% strongly agreed. The percentage of agreement was higher percentage compared to disagreement;
v. All statements show significantly higher levels of agreement whilst levels of strong agreement are lower but still greater than levels of disagreement; and
vi. Statements C7 and C9 was based on safety, health and quality management systems have higher levels of agreement in comparison to statements C8 which was based on the environmental management system.

6.7.4 Summary of findings for section 5: Leadership

Question 7 to question 9 of the survey measured respondent's perception of the leadership's commitment to SHEQ and the response was further clarified during the interviews. There was a high level of agreement that the management of the organisation was committed to SHEQ. The SHEQ commitment of the senior management of the organisation provides a good foundation for an IMS. However, to ensure the continued support of senior management of the organisation, it is recommended that prior to the implementation of the IMS, the IMS project plan is communicated, understood and agreed upon by the senior management of the organisation for continued support. The leadership of an organisation must be committed and accountable for the success of an organisations management system (DNVGL 2016:4). Although this section indicated that respondents perceived greater leadership commitment towards

safety, health and quality compared to the environmental management system, only 5.9% disagreed that management supported the environmental management system . The next section will discuss the planning of management systems.

6.7.5 Scoring patterns for section 6: Planning

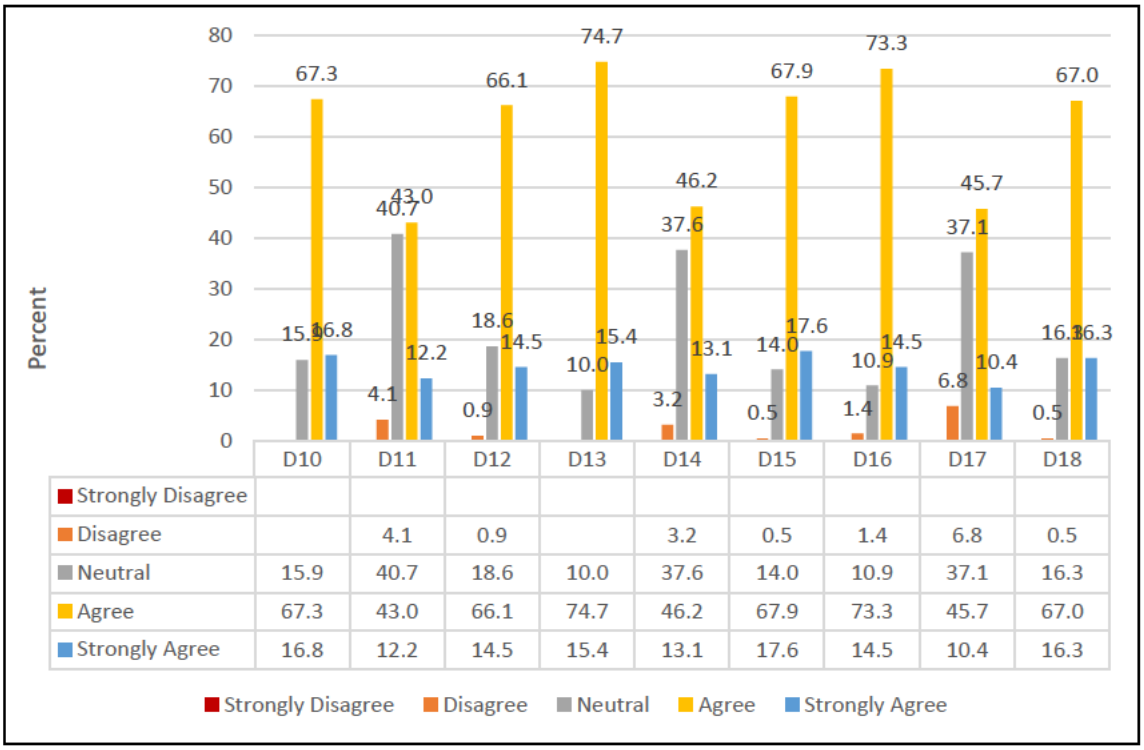
The organisation needs to define the plan of the management system's objectives and the associated risk (DNVGL 2015: 3). This section discusses the research objective of understanding the structure and management of the current independent managed SHEQ management systems. Table 6.10 summarises the scoring patterns for section D10 to D18 on planning

Table 6:10 scoring patterns for section 6: Planning.

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
My organisation has completed a product quality risk assessment	D10	0	0,0%	0	0,0%	35	15,9%	148	67,3%	37	16,8%	< 0.001
My organisation has completed an environmental risk assessment	D11	0	0,0%	9	4,1%	90	40,7%	95	43,0%	27	12,2%	< 0.001
My organisation has completed an employee occupational health and safety risk assessment	D12	0	0,0%	2	0,9%	41	18,6%	146	66,1%	32	14,5%	< 0.001
My organisation has determined its quality objectives	D13	0	0,0%	0	0,0%	22	10,0%	165	74,7%	34	15,4%	< 0.001
My organisation has determined its environmental objectives	D14	0	0,0%	7	3,2%	83	37,6%	102	46,2%	29	13,1%	< 0.001
My organisation has determined its occupational health and safety objectives	D15	0	0,0%	1	0,5%	31	14,0%	150	67,9%	39	17,6%	< 0.001
My organisation has communicated its quality objectives to employees	D16	0	0,0%	3	1,4%	24	10,9%	162	73,3%	32	14,5%	< 0.001
My organisation has communicated its environmental objectives to employees	D17	0	0,0%	15	6,8%	82	37,1%	101	45,7%	23	10,4%	< 0.001
My organisation has communicated its occupational health and safety Objectives to employees	D18	0	0,0%	1	0,5%	36	16,3%	148	67,0%	36	16,3%	< 0.001

Source: Author's own construction

Table 6.10 presented the scoring pattern of section 6, planning and figure 6.11 indicates a graphical representation of the scoring patterns for section D10 to D18 on the organisation's planning of management systems.



	D10	D11	D12	D13	D14	D15	D16	D17	D18
Strongly Disagree									
Disagree		4.1	0.9		3.2	0.5	1.4	6.8	0.5
Neutral	15.9	40.7	18.6	10.0	37.6	14.0	10.9	37.1	16.3
Agree	67.3	43.0	66.1	74.7	46.2	67.9	73.3	45.7	67.0
Strongly Agree	16.8	12.2	14.5	15.4	13.1	17.6	14.5	10.4	16.3

Figure 6:11 Scoring pattern for the planning of the organisation's MSs

This section measured respondents perception of planning of the organisation's management system. The focus of this section was on risk assessment, objectives and communication of the management systems, the significance of the differences was tested and shown in the table 6.10. and the following patterns are observed with statements D10 to D18 depicted in figure 6.11:

i. There are no statements with strong disagreement;
ii. Although there were statements of disagreement and neutral, the percentage of respondents that agreed and strongly agreed was greater. There was a higher level of agreement than neutral or disagreement;

iii. Statements D10, D13 and D 16 was based on the organisation's quality risk assessment, determination of quality objectives and communication of quality objectives, has a higher percentage of agreement compared to safety, health and environment;

iv. Statements D11, D14 and D17 was based on the organisation's environmental risk assessment, determination of environmental objectives and communication of environmental objectives. Although none of the respondents strongly disagreed, there was a high percentage of disagree and neutral statements compared to the statements on quality. The percentage of respondents that agreed and strongly agreed to these statements was greater than those that disagreed and those that were neutral; and

v. Statements D12, D15 and D18 was based on occupational health and safety. None of the respondents strongly disagreed and there was a higher percentage of agreement than disagreement. Although the percentage of agreement was lower than the quality statements, the respondents that agreed was greater that the environmental statements.

6.7.6 Summary of findings for section 6: Planning

Question 10 to question 18 of the survey questionnaires measured respondent's perception of the organisation's planning of management systems and the response was further clarified during the interviews. Risk assessment and SHEQ objectives, the two important requirements of planning was measured. There was a high level of agreement that the organisation has conducted risk assessments and set objectives for SHEQ. However, considering that the organisation has independent managed systems these were conducted in silos for each management system for each of the business process. All statements showed significantly higher levels of agreement whilst levels of strong agreement are lower but still greater than levels of disagreement. Hence the survey results indicate that there is a strong agreement that the organisation has set objectives for the management systems and has completed a risk assessment of the SHEQ processes.

6.7.7 Scoring patterns for section 7: Support of the organisation's management systems

The foundation of a management system is the provision of resources (Abuhav 2016: 39), therefore, to achieve the intended outcome of the management system, the organisation needs to provide the required resource support (British Standards Institute 2015: 3). This section discourses the research objective of ascertaining employee's perception of the extent of leadership's commitment and the level of supporting resources, tools and techniques for an IMS. Table 6.11 summarises the scoring patterns for section E19 to E21 on support of the organisation's management systems.

Table 6:11 Scoring patterns for section 7: Support of the organisation's management systems

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
My organisation provides the necessary resources needed for the operation of the quality management system	E19	0	0,0%	3	1,4%	104	47,1%	105	47,5%	9	4,1%	< 0.001
My organisation provides the necessary resources needed for the operation of the environmental management system	E20	0	0,0%	16	7,2%	127	57,5%	70	31,7%	8	3,6%	< 0.001
My organisation provides the necessary resources needed for the operation of the occupational health and safety management system	E21	0	0,0%	6	2,7%	115	52,0%	88	39,8%	12	5,4%	< 0.001

The scoring patterns for section 7: Support of the organisation's management systems was presented in table 6.11 and Figure 6.12 indicates a graphical representation of the scoring patterns for section E19 to E21 on organisation management system support.

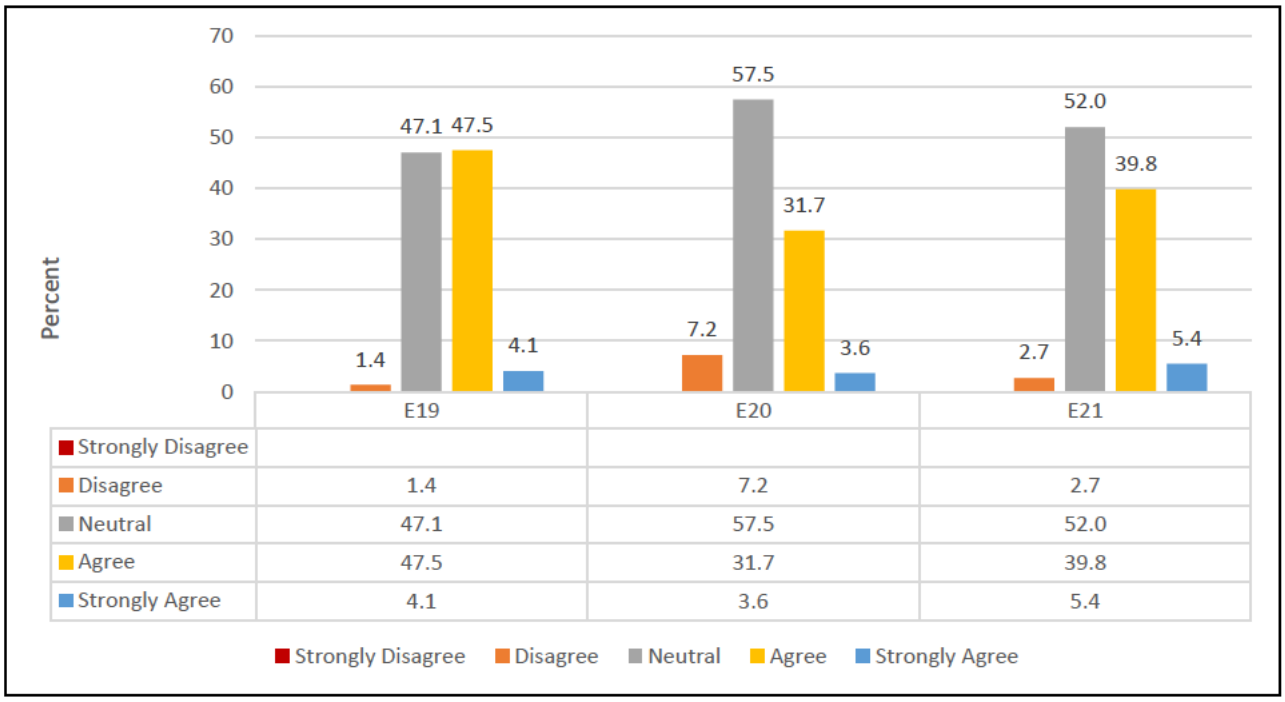


Figure 6:12 Scoring pattern for the support of the organisation's management systems

This section measured respondents perception of managements support towards the operation of the management systems, the significance of the differences was tested and shown in the table 6.11 and the following patterns are observed with statements E19 to E21 depicted in figure 6.12:

i. There are no statements with strong disagreement;
ii. The percentage of respondents that disagreed or who were neutral was higher compared to those that agreed to the statements;

iii. Statement E19 was based on the organisation's provision of resources for the quality management system. The percentage of agreement compared to neutral and disagreement reponses was a marginal higher;
iv. Statement E20 was based on the organisation's provision of resources for the environmental management system. Although none of the respondents strongly disagreed, there was a high percentage of disagreement and neutral statements compared to the statements on quality. The percentage of respondents that disagreed and that were neutral was greater than those that agreed and strongly agreed to the statement; and
v. Statement E21 was based on the organisation's provision of resources for the occupational health and safety management system. The percentage of disagreement and neutral was a higher compared to those that agreed.

6.7.8 Summary of findings for section 7: Support

Question 19 to question 21 of the survey questionnaires measured respondent's perception of the organisation's support of management systems. Overall, for the section on the provision of resources, there was a higher level of disagreement and neutral than agreement. The reason for these responses was further explored during the qualitative interviews. The results of the survey questionnaire indicate that the management of the organisation provides the support required for the management system. The next section will provide the results of the operation of the organisation's management systems.

6.7.9 Scoring pattern of section 8: Operation of the organisation's management systems

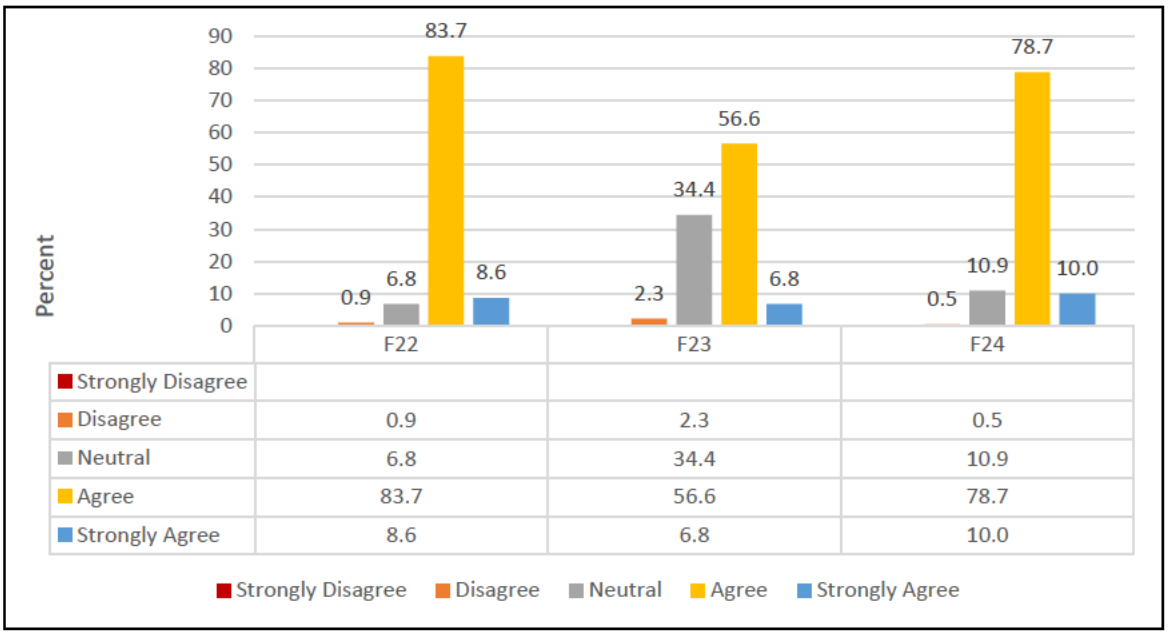
The organisation is required to establish, implement, maintain a process(es) for monitoring, measurement, analysis, and performance evaluation of the management system (South African National Standard 45001:2018: 1). Table

6.12 summarises the scoring patterns for section F22 to F24 on operation of the organisation’s management systems.

Table 6:12 Scoring patterns for section 8: Operation of the organisation's management

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the quality management system	F22	0	0,0%	2	0,9%	15	6,8%	185	83,7%	19	8,6%	< 0.001
My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the environmental management system	F23	0	0,0%	5	2,3%	76	34,4%	125	56,6%	15	6,8%	< 0.001
My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the occupational health and safety management system	F24	0	0,0%	1	0,5%	24	10,9%	174	78,7%	22	10,0%	< 0.001

Table 6.12 presented the scoring pattern of the organisation's management system and figure 6.13 indicates a graphical representation of the scoring patterns for section F22 to F24 on the organisation's management system operation.



	F22	F23	F24
Strongly Disagree			
Disagree	0.9	2.3	0.5
Neutral	6.8	34.4	10.9
Agree	83.7	56.6	78.7
Strongly Agree	8.6	6.8	10.0

Figure 6:13 Scoring pattern for the operation of the organisation's management systems.

This section measured respondents perception of the planning, organising, leading and control of the organisation's management systems, the significance of the differences was tested and shown in the table 6.12.and the following patterns were observed with statements F22 to F24 depicted in figure 6.13:

i. There are no statements with strong disagreement;
ii. The percentage of respondents that agreed was a higher compared to those that disagreed to the statements;
iii. Statement F22 was based on the organisation's planing, organising, leading and controlling of the organisation's quality management system. The percentage of repondents who agreed was a higher compared to neutral and disagreement reponses;
iv. Statement F23 was based on the organisation's planing, organising, leading and controlling of the organisation's environmental management

system. The percentage of respondents that agreed was a higher compared to those that disagreed or who were neutral. The pecentage of agreement was lower than quality and occupational health and safety. This indicates that there was greater focus in planing, organising, leading and controlling quality and occupational health and safety compared to environmental; and

v. Statement F24 was based on the organisation's planing, organising, leading and controlling of the organisation's occupational health and safety management system. Although the percentage of agreement was lower than quality the percentage was greater than that of the environmental management statements.

6.7.10 Summary of findings for section 8: Operation of the organisation's management systems

Question 22 to question 24 of the survey questionnaires measured respondent's perception of the organisation's operation of management systems and the response was further clarified during the interviews. Overall for the section on the organisation's planing, organising, leading and controlling, there was a higher level of agreement than neutral and disagreement. The quantitative survey results indicate that there was a strong agreement that the organisation has measures in place to manage plan, organise, lead and control the management systems. The next section evaluated the performance of the organisation's management system.

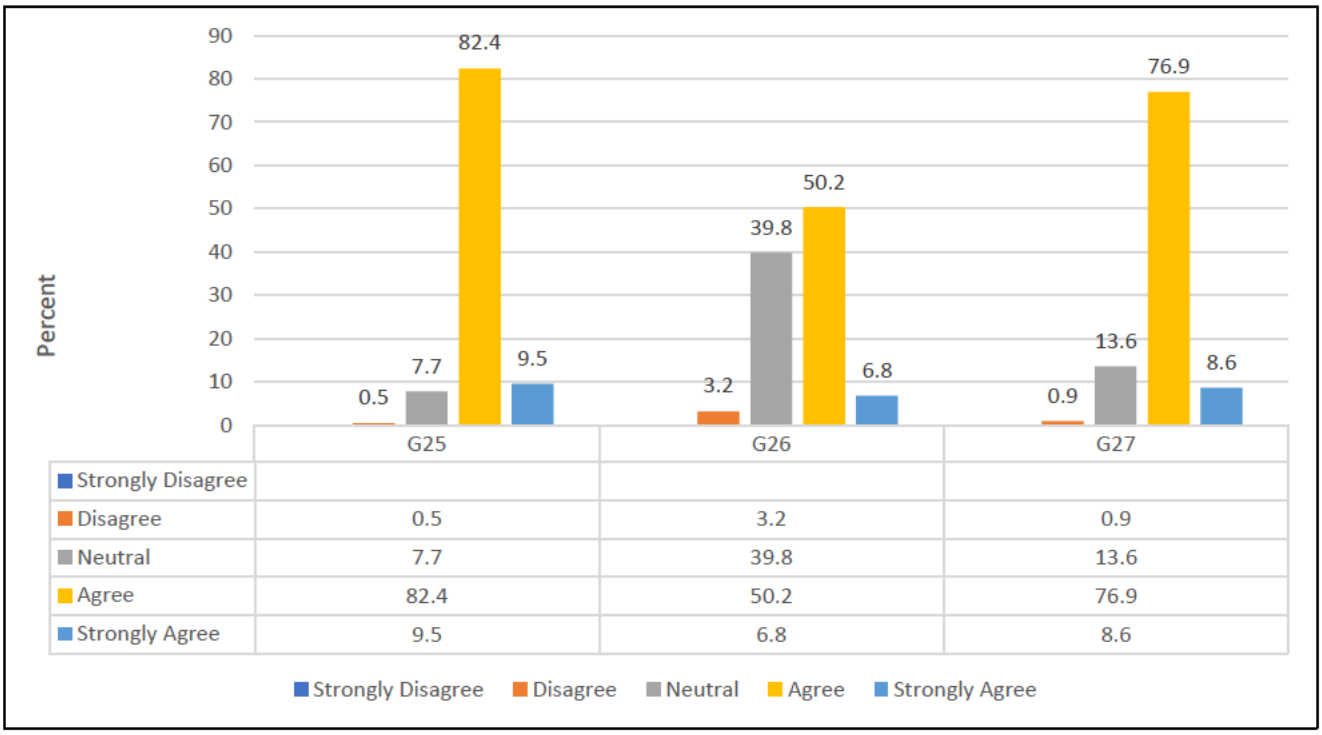
6.7.11 Scoring patterns for section 9: performance evaluation of the organisation's management systems.

Table 6.13 summarises the scoring patterns for section G25 to G27 on the performance evaluation of the organisation's management systems.

Table 6:13 Scoring patterns for section 9: performance evaluation of the organisation's management systems

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
My organisations reviews (monitors, measures, analyses, and evaluates) its quality performance	G25	0	0,0%	1	0,5%	17	7,7%	182	82,4%	21	9,5%	< 0.001
My organisations reviews (monitors, measures, analyses and evaluates) its environmental performance	G26	0	0,0%	7	3,2%	88	39,8%	111	50,2%	15	6,8%	< 0.001
My organisations reviews (monitors, measures, analyses and evaluates) its occupational health and safety performance.	G27	0	0,0%	2	0,9%	30	13,6%	170	76,9%	19	8,6%	< 0.001

Table 6.13 presented the organisation's performance evaluation of the management system and Figure 6.14 indicates a graphical representation of the scoring patterns for section G25 to G27 on the organisation's performance evaluation of the management systems.



	G25	G26	G27
Strongly Disagree			
Disagree	0.5	3.2	0.9
Neutral	7.7	39.8	13.6
Agree	82.4	50.2	76.9
Strongly Agree	9.5	6.8	8.6

Figure 6.14 Scoring pattern for the performance evaluation of the organisation's management systems.

This section measured respondents perception of the performance evaluation of the SHEQ management systems, the significance of the differences was tested and shown in the table 6.13 and the following patterns are observed with statements G25 to G27 depicted in figure 6.14:

i. There are no statements with strong disagreement;
ii. The percentage of respondents that agreed was a higher compared to those that disagreed to the statements;

iii. Statement G25 was based on performance evaluation of the organisation's quality management system. The percentage of repondents who agreed was a higher compared to neutral and disagreement reponses;

iv. Statement G26 was based on performance evaluation of the organisation's environmental management system. The percentage of respondents that agreed was a higher compared to those that disagreed or who were neutral. The pecentage of agreement was lower than quality and occupational health and safety. This indicates that there was greater focus in performance evaluation of quality and occupational health and safety compared to environmental; and

v. Statement G27 was based on performance evaluation of the organisation's occupational health and safety management system. Although the percentage of agreement was lower that quality the percentage was greater than that of the environmental management statements.

6.7.12 Summary of findings for section 9: performance evaluation of the management system

Question 25 to question 27 of the survey questionnaires measured respondent's perception of the organisation's performance evaluation of management systems and the response was further clarified during the interviews. There was a high level of agreement that the organisation's management monitors' measures, analysis and evaluates the performance of the management systems. Overall for the section on performance evaluation of the organisation's management systems, the level of agreement was a higher than neutral and disagreement. The next section presents the evaluation of the improvement of the organisation's management system.

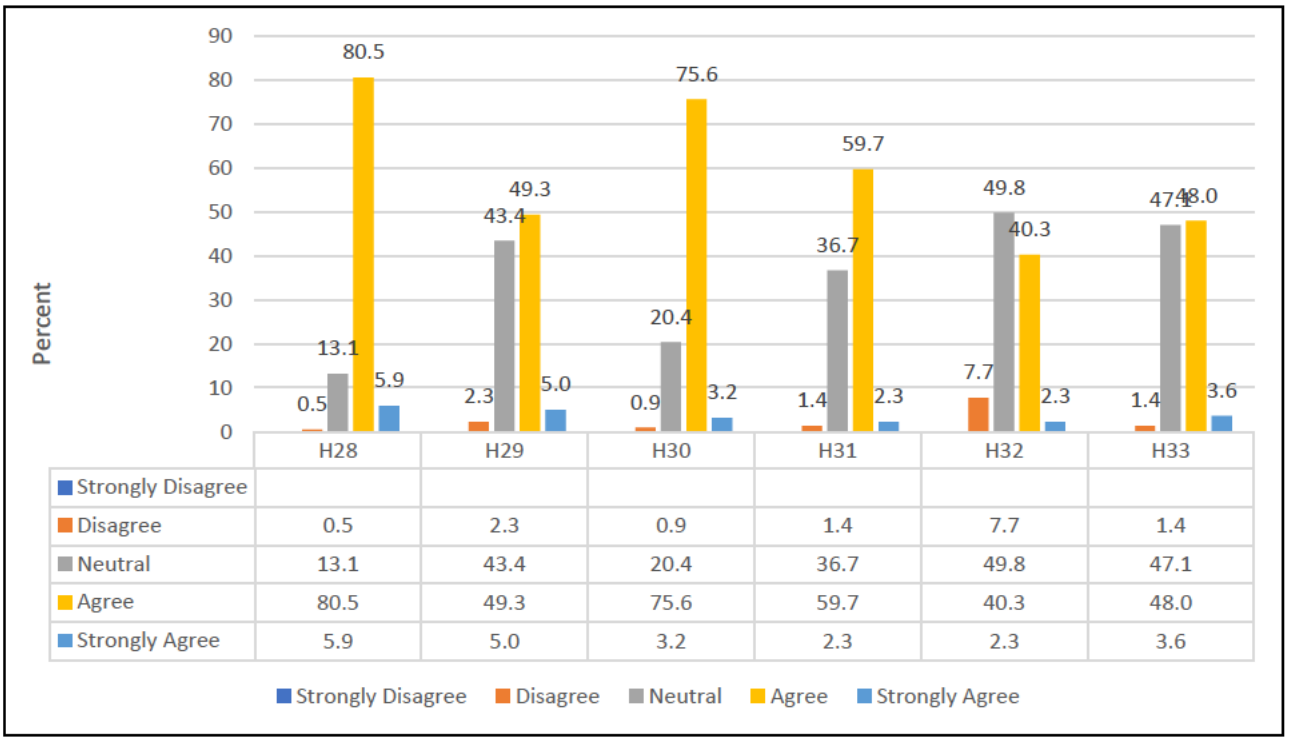
6.7.13 Scoring patterns for section 10: Improvement of the organisation's management systems

The organisation is required to continual improve the business processes to achieve the strategic goals of the organisation (Abuhav 2016: 39). Table 6.14 summarises the scoring patterns for section H28 to H33 on the improvement of the organisation's management systems.

Table 6:14 Scoring patterns for section 10: Improvement of the organisation's management systems

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
My organisation identifies opportunities for the improvement of the quality management system	H28	0	0,0%	1	0,5%	29	13,1%	178	80,5%	13	5,9%	< 0.001
My organisation identifies opportunities for the improvement of the environmental management system	H29	0	0,0%	5	2,3%	96	43,4%	109	49,3%	11	5,0%	< 0.001
My organisation identifies opportunities for the improvement of the occupational health and safety management system	H30	0	0,0%	2	0,9%	45	20,4%	167	75,6%	7	3,2%	< 0.001
My organisation provides resources for the improvement of the quality management system	H31	0	0,0%	3	1,4%	81	36,7%	132	59,7%	5	2,3%	< 0.001
My organisation provides resources for the improvement of the environmental management system	H32	0	0,0%	17	7,7%	110	49,8%	89	40,3%	5	2,3%	< 0.001
My organisation provides resources for the improvement of the occupational health and safety Management System	H33	0	0,0%	3	1,4%	104	47,1%	106	48,0%	8	3,6%	< 0.001

Table 6.14 presented the scoring pattern for the improvement of the organisation's management systems and Figure 6.15 indicates a graphical representation of the scoring patterns for section H28 to H33 on the improvement of the organisation's management systems.



	H28	H29	H30	H31	H32	H33
Strongly Disagree						
Disagree	0.5	2.3	0.9	1.4	7.7	1.4
Neutral	13.1	43.4	20.4	36.7	49.8	47.1
Agree	80.5	49.3	75.6	59.7	40.3	48.0
Strongly Agree	5.9	5.0	3.2	2.3	2.3	3.6

Figure 6:14 Scoring pattern for the improvement of the organisation's management systems

This section measured respondents perception of the identification and provision of resources for the SHEQ management systems, the significance of the differences was tested and shown in the table 6.14. and the following patterns were observed with statements H28 to H33 depicted in figure 6.15:

i. There are no statements with strong disagreement;
ii. The percentage of respondents that agreed was a higher compared to those that disagreed to the statements;

iii. Statements H28 and H31 was based on improvement of the organisation's quality management system. The percentage of repondents who agreed compared was a higher to neutral and disagreement reponses;

iv. Statements H29 and H 32 was based on improvement of the organisation's environmental management system. There was a higher percentage of respondents that agreed compared to those that disagreed or who were neutral. The pecentage of agreement was lower than quality and occupational health and safety. This indicates that there was greater focus in improvement of quality and occupational health and safety compared to environmental; and

v. Statements H30 and H33 was based on improvement of the organisation's occupational health and safety management system. Although the percentage of agreement was lower that quality the percentage was greater than that of the environmental management statements.

6.7.14 Summary of findings for section 10: Improvement of the organisation's management systems

Question 28 to question 33 of the survey questionnaires measured respondent's perception of the organisation's improvement of management systems and the response was further clarified during the interviews. The organisation has identified opportunities for improvement; including opportunities arising from the fourth industrial revolution, however, these were not communicated to all stakeholders. Overall for the section on improvement of the organisation's management systems, there was a higher level of agreement than neutral and disagreement. The results of the quantitative survey indicated that leadership provided the resources required for the improvement of the management systems.

6.7.15 Scoring patterns: Integrated SHEQ management system

The successful implementation of an IMS depends on the circumstances of the organisation; therefore, organisations must establish the circumstances for a feasibility study (Field 2019: 26). Table 6.15 summarises the scoring patterns for section I34 to I40 on an integrated SHEQ management system that establishes the organisations circumstance.

Table 6:15 scoring patterns on an integrated SHEQ management system.

		Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
I feel that there is too much duplication of documentation across the Safety, Health, Environment and Quality management systems	I34	0	0,0%	8	3,6%	26	11,8%	160	72,4%	27	12,2%	< 0.001
I feel that there is too much duplication of meetings across the Safety, Health, Environment and Quality management systems	I35	0	0,0%	13	5,9%	24	10,9%	153	69,2%	31	14,0%	< 0.001
I feel that the different auditing check sheets used can be combined into a single auditing check sheet across the Safety, Health, Environment and Quality management systems	I36	1	0,5%	6	2,7%	16	7,2%	165	74,7%	33	14,9%	< 0.001
I feel that an integrated SHEQ Management System will be easier to manage	I37	0	0,0%	8	3,6%	64	29,0%	132	59,7%	17	7,7%	< 0.001
I feel that an integrated SHEQ Management System will result in better utilisation of resources	I38	0	0,0%	1	0,5%	18	8,1%	172	77,8%	30	13,6%	< 0.001
I feel that an integrated SHEQ management System will result in cost saving benefits	I39	0	0,0%	1	0,5%	14	6,3%	162	73,3%	44	19,9%	< 0.001
I feel that the Quality auditors would resist an Integrated Management System due to the additional workload (Safety, Health, Environment and Quality auditing)	I40	2	0,9%	58	26,2%	114	51,6%	40	18,1%	7	3,2%	< 0.001

Table 6.15 presented the scoring pattern for the section on an integrated SHEQ management system and Figure 6.16 indicates a graphical representation of the scoring patterns for sections I 34 to I40 on an integrated SHEQ management system.

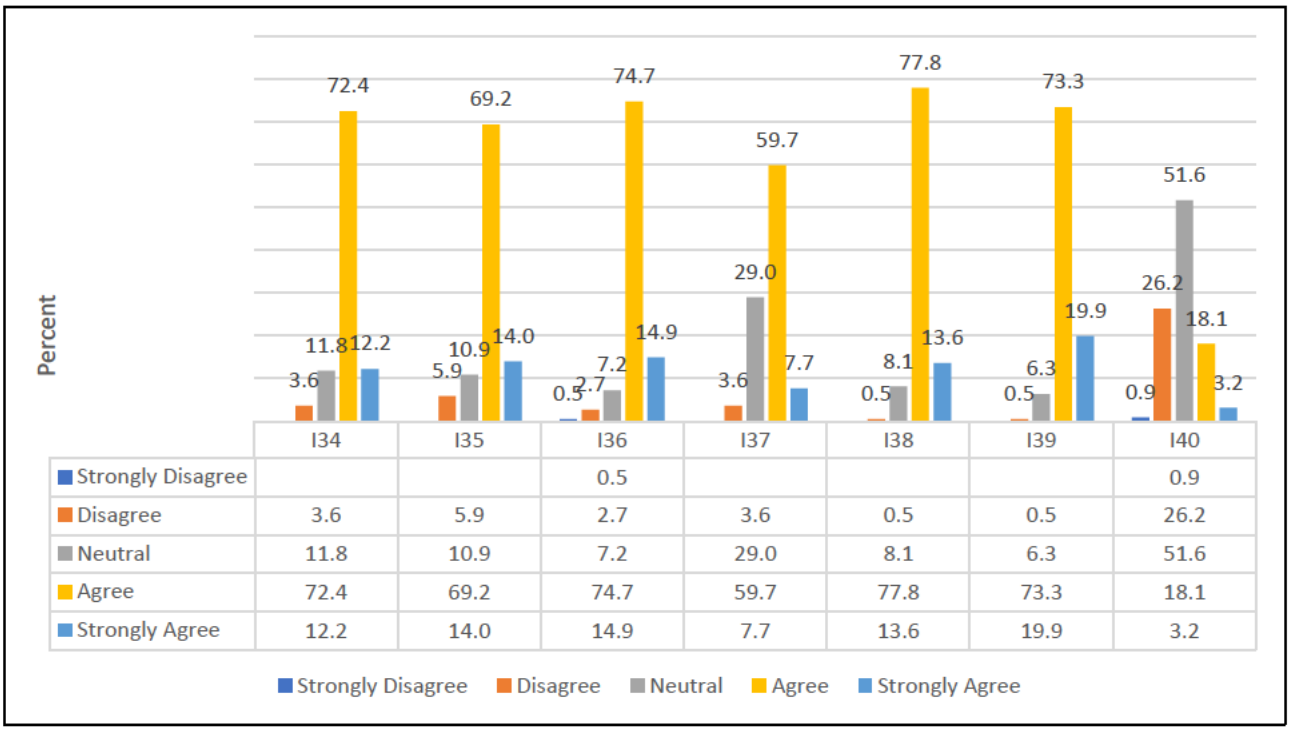


Figure 6:15 Scoring pattern for an integrated SHEQ management system

This section measured respondents perception of an integrated SHEQ management system and the significance of the differences was tested and shown in the table 6.16.

i. Statement I34 was based on the duplication of documentation across the safety, health environmental and quality management systems. There was a high percentage of agreement compared to neutral and disagreement of this statement;
ii. Statement I35 was based on the duplication of meetings across across the safety, health environmental and quality management systems. There was a high percentage of agreement compared to neutral and disagreement of this statement;

iii. Statement I36 was based on the combination of the diffferent management system audit check sheets into an integrated SHEQ management check sheet. There were respondents who strongly disagreed or disagreed that the independent audit check sheets can be combined. This will be further explored during the qualitative inverview questioning;

iv. Statement I37 was based on whether an integrated management system will be easier to manage. There was a higher percentage of respondents that agreed compared to those that disagreed or who were neutral;

v. Statement I38 was based on whether and integrated SHEQ management system will result in better utilisation of resources. There was a higher percentage of respondents that agreed compared to those that disagreed or who were neutral;

vi. Statement I39 was based on whether an integrated SHEQ management system will result in cost saving benefits. There was a higher percentage of respondents that agreed compared to those that disagreed or who were neutral; and

vii. Statement I40 was based on whether the quality auditors would resist an integrated management system due to the additional workload. There were respondents who strongly agreed or agreed that the quality auditors would resist due to the additional workload. This will be further explored during the qualitative inverview questioning.

6.7.16 Summary of findings: Integrated management systems

Question 34 to question 40 of the survey questionnaires measured respondent's perception of the integration of management systems and the response was further clarified during the interviews. A high percentage of respondents agreed that there was a high level of duplication of documents and meetings. The percentage of respondents that agreed was a higher compared to those that disagreed to the statements. Overall, respondants supported the idea of an IMS which argues well for the organisation to consider an IMS implementation. The percentage of respondents that agreed that an IMS will be easier to manage, will lead to cost savings and will result in better utilisation of resources was also a high. This is indicative that these

respondents support the notion of an IMS. However, considering that there were respondants that agreed that the quality auditors would resist the implementation of an IMS, this was further researched during the qualitative interview session.

6.8 Cross-tabulations

One of the best ways to examine how two variables are related is by creating a cross tabulation, showing how the distribution of one variable fits within the categories of another variable (Longest 2020: 131). A Chi square test of independence was performed on the research data to determine whether there was a statistically significant relationship between the row variables vs columns variables. The chi-square test is used to establish if the observed sampling differs significantly from the anticipated outcome or distribution (Gordon 2018: 269). The chi-square statistic provides an excellent indication of whether two variables are significantly related (Longest 2020: 131). The null hypothesis states that there is no association between the two. The alternate hypothesis indicates that there is an association. Quantitative research studies conducted by means of statistical hypothesis testing often depend on the calculation of a probability value or p value and the goal of testing a statistical hypothesis is to determine whether the sample evidence challenges the research study's null hypothesis indicating that there is no observed effect and supports the alternative hypothesis indicating that there is an observed effect (Kim 2018: 1195). The significance in the relationship between two variables was test using cross-tabulation.

The Pearson's Chi Square Test and Fisher's Exact Test was used. If the p-value (Asymptotic Significance (2-sided)) < 0.05, for the Pearson's Chi Square Test, it implies that there is a significant relationship between the variables. If the p-value (Exact Sig. (2-sided)) < 0.05, for the Fisher's Exact Test it implies that there is a significant relationship between the variables and if > 0.05, there is no significant relationship. Cross tabulations were conducted between section A biometric data and section B the forty Likert scale statements.

Table 6.16 illustrates the cross tabulation between the statement "*My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system." and "Province*".

Table 6:16 Cross Tabulation between external factors that may impact the strategic direction of the organisation and province.

			Province			Total
			Gauteng	KwaZulu-Natal	Cape Town	
My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system.	Disagree	Count	0	1	0	1
		% within Province	0,0%	1,0%	0,0%	0,5%
	Neutral	Count	8	16	9	33
		% within Province	12,7%	16,5%	14,8%	14,9%
	Agree	Count	42	73	41	156
		% within Province	66,7%	75,3%	67,2%	70,6%
	Strongly Agree	Count	13	7	11	31
		% within Province	20,6%	7,2%	18,0%	14,0%
Total		Count	63	97	61	221
		% within Province	100,0%	100,0%	100,0%	100,0%

Table 6.17 summarises the results of the chi square tests for the statement "My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system." and "Province". Majority of the respondents agreed with this statement across the three provinces. Thus, indicating that across the three provinces there is consensus that the organisation has considered the internal and external factors that impacts on the organisation's strategy. In a competitive environment, organisations are usually successful because they engage in strategic initiatives that considers the internal and external environment because the ultimate objective of strategic planning is to position the

organisation optimally for the future (Lazenby 2018: 22). Therefore, since the researched organisation has considered the internal and external environment, it sets a good foundation for the organisation to proceed with the implementation of an IMS. Table 6.17 presents the Chi square tests for external factors that may impact the strategic direction of the organisation and province.

Table 6:17 Chi square tests for external factors that may impact the strategic direction of the organisation and province

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	8.050[a]	6	0,234	0,203		
Likelihood Ratio	8,814	6	0,184	0,167		
Fisher-Freeman-Halton Exact Test	8,454			0,157		
Linear-by-Linear Association	.241[b]	1	0,624	0,630	0,341	0,057
N of Valid Cases	221					
a. 3 cells (25.0%) have expected count less than 5. The minimum expected count is .28.						
b. The standardized statistic is -.491.						

The p-value of the Fisher-Freeman-Halton Exact Test between “My organisation’s management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation’s quality management system.” and “Province” is 0.157 which is greater than 0.05 thus implying that there is no significant relationship between these two variables. ANOVA was not used to test the difference in means in the three provinces because the distribution is not normal and therefore the alternate approach below was followed.

Tables 6.18, 6.19, 6.20, 6.21, 6.22, 6.23, 6.24, 6.25 and 6.26 presents the cross-tabulation Fisher's Exact Test results between section A biometric data and section B. If the p-value (Exact Sig. (2-sided)) < 0.05, for the Fisher's Exact Test, it implies

that there is a significant relationship between the variables and if => 0.05, it implies that there is no significant relationship between the two variables.

Table 6:18 Cross-tabulation: Fisher's Exact Test results between section A biometric data and the section B Context of the organisation

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
1. My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system.	0,049	0,215	0,215	0,022	0,000	0,157	0,000
2. My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's **environmental management system.**	0,792	0,199	0,066	0,000	0,000	0,432	0,000
3. My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's **health and safety management system**	0,644	0,710	0,014	0,029	0,001	0,937	0,000
4. My organisation understands the **quality** needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	0,062	0,028	0,018	0,005	0,000	0,376	0,000
5. My organisation understands the **environmental** needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	0,514	0,411	0,051	0,001	0,000	0,417	0,000
6. My organisation understands the **occupational health and safety** needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)	0,905	0,678	0,121	0,037	0,003	0,825	0,003

There is a significant relationship between statements 1 to 5 of the context of the organisation and the respondent's job category, department and the audit system, the other categories had mixed significances.

Table 6:19 cross-tabulation: Fisher's Exact Test results between section A biometric data and the section B Leadership

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
7. Top management demonstrates committed leadership with respect to the quality management system.	0,027	0,387	0,048	0,005	0,001	0,627	0,003
8. Top management demonstrates committed leadership with respect to the environmental management system.	0,039	0,043	0,008	0,000	0,003	0,653	0,001
9. Top management demonstrates committed leadership with respect to the occupational health and safety management system	0,801	0,205	0,018	0,340	0,144	0,886	0,327

There is a significant relationship between statements 7 to 9 of leadership and the respondent's age, the other categories had mixed significances.

Table 6:20 Cross-tabulation Fisher's Exact Test results between section A biometric data and the section B "Planning"

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
10. My organisation has completed a product quality risk assessment	0,005	0,034	0,207	0,030	0,000	0,719	0,000
11. My organisation has completed an environmental risk assessment	0,329	0,645	0,030	0,000	0,005	0,214	0,000
12. My organisation has completed an employee occupational health and safety risk assessment	0,345	0,208	0,007	0,035	0,021	0,828	0,053
13. My organisation has determined its quality objectives	0,001	0,469	0,118	0,006	0,000	0,607	0,000
14. My organisation has determined its environmental objectives	0,178	0,031	0,095	0,000	0,000	0,645	0,000
15. My organisation has determined its occupational health and safety objectives	0,012	0,586	0,147	0,170	0,008	0,428	0,075
16 My organisation has communicated its quality objectives to employees.	0,001	0,171	0,022	0,012	0,000	0,231	0,000
17. My organisation has communicated its environmental objectives to employees	0,282	0,006	0,005	0,001	0,000	0,508	0,000
18. My organisation has communicated its occupational health and safety Objectives to employees	0,012	0,266	0,056	0,150	0,010	0,511	0,096

There is a significant relationship between statements 10 to 18 of planning and the respondent's department, the other categories had mixed significances.

Table 6:21 Cross-tabulation Fisher's Exact Test results between section A biometric data and the section B "Support"

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
19. My organisation provides the necessary resources needed for the operation of the quality management system	0,019	0,048	0,009	0,003	0,003	0,842	0,008
20. My organisation provides the necessary resources needed for the operation of the environmental management system	0,001	0,108	0,000	0,000	0,000	0,624	0,000
21. My organisation provides the necessary resources needed for the operation of the occupational health and safety management system	0,034	0,161	0,002	0,000	0,037	0,245	0,002

There is a significant relationship between statements 19 to 21 of support and the respondent's race, age, job category, department and SHEQ audit systems, the gender and province categories had mixed significances.

Table 6:22 Cross-tabulation Fisher's Exact Test results between section A biometric data and the section B "Operation"

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
22. My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the quality management system	0,507	0,011	0,026	0,065	0,000	0,217	0,000
23. My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the environmental management system	0,030	0,009	0,017	0,001	0,000	0,357	0,000
24. My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the occupational health and safety management system	0,241	0,115	0,246	0,032	0,032	0,458	0,001

There is a significant relationship between statements 22 to 24 of operation and the respondent's department and SHEQ audit systems, the other categories had mixed significances.

Table 6:23 Cross-tabulation Fisher's Exact Test results between section A biometric data and the section B "Performance Evaluation"

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
25. My organisations reviews (monitors, measures, analyses, and evaluates) its quality performance	0,596	0,022	0,006	0,028	0,000	0,503	0,000
26. My organisations reviews (monitors, measures, analyses and evaluates) its environmental performance	0,014	0,067	0,026	0,002	0,000	0,050	0,000
27. My organisations reviews (monitors, measures, analyses and evaluates) its occupational health and safety performance.	0,876	0,583	0,232	0,011	0,137	0,308	0,002

There is a significant relationship between statements 25 to 27 of performance evaluation and the respondent's job category and SHEQ audit systems, the other categories had mixed significances.

Table 6:24 Cross-tabulation Fisher's Exact Test results between section A biometric data and the section B "Improvement".

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
28. My organisation identifies opportunities for the improvement of the quality management system	0,036	0,039	0,068	0,469	0,001	0,160	0,022
29. My organisation identifies opportunities for the improvement of the environmental management system	0,551	0,087	0,193	0,008	0,005	0,264	0,002
30. My organisation identifies opportunities for the improvement of the occupational health and safety management system	0,139	0,788	0,165	0,602	0,039	0,278	0,015
31. My organisation provides resources for the improvement of the quality management system	0,037	0,479	0,003	0,007	0,066	0,299	0,011
32. My organisation provides resources for the improvement of the environmental management system	0,123	0,332	0,012	0,000	0,053	0,718	0,008
33. My organisation provides resources for the improvement of the occupational health and safety Management System	0,139	0,980	0,002	0,012	0,185	0,042	0,036

There is a significant relationship between statements 28 to 33 of improvement and the SHEQ systems the respondent can audit, the other categories had mixed significances.

Table 6:25 Cross-tabulation Fisher's Exact Test results between section A biometric data and the section B "Integrate safety, health, environment and quality management system"

Statement	Race	Gender	Age	Job Category	Department	Province	SHEQ Audit Systems
34. I feel that there is too much duplication of documentation across the Safety, Health, Environment and Quality management systems	0,004	0,598	0,510	0,001	0,000	0,001	0,000
35. I feel that there is too much duplication of meetings across the Safety, Health, Environment and Quality management systems	0,016	0,399	0,574	0,006	0,000	0,000	0,000
36. I feel that the different auditing check sheets used can be combined into a single auditing check sheet across the Safety, Health, Environment and Quality management systems	0,008	0,288	0,531	0,007	0,000	0,008	0,000
37. I feel that an integrated SHEQ Management System will be easier to manage	0,032	0,707	0,395	0,001	0,000	0,544	0,007
38. I feel that an integrated SHEQ Management System will result in better utilisation of resources	0,076	0,514	0,348	0,019	0,000	0,324	0,004
39. I feel that an integrated SHEQ management System will result in cost saving benefits	0,025	0,062	0,543	0,012	0,000	0,289	0,174
40. I feel that the Quality auditors would resist an Integrated Management System due to the additional workload (Safety, Health, Environment and Quality auditing)	0,179	0,776	0,004	0,021	0,750	0,480	0,043

There is a significant relationship between statements 34 to 40 of Integrate safety, health, environment and quality management system and the job category, the other categories had mixed significances.

Overall, the cross tabulation represents the population sample that was used for race, gender, age, job category, department, province and the systems that respondents can audit.

6.9 Correlations

Bivariate correlation was performed on the ordinal data and the results are presented in the appendix 6, all significant relationships of this research study are indicated by a * or **. The bivariate correlation is a statistical method that is used to test the relationship between two different variables displaying how much one variable will change if the other changes (Carpenter 2018: 1599). In statistical analysis, a correlation coefficient that falls between -1 and +1 is used as a numerical index to represent the relationship between two variables and a coefficient that is closer to the absolute value of 1 indicates a stronger relationship, a coefficient that is closer to 0 indicates a weaker relationship and a conversely, the coefficient of 0 means that the two variables have no linear relationship (Nishishiba, Jones and Kraner 2017: 222).

The overall results of the correlations are presented in Appendix 6, examples of the significant relationships and interpretations are illustrated in table 6.27.

Table 6:26 Examples of the significant relationships and interpretations

Statement	Comment
"My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system" and "My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's environmental management system" is 0.597.	This indicates that these two variables are directly related proportionally and the greater the determination of the quality factors, the greater will be the determination of environmental factors, and vice versa.
"My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's quality management system" and "My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's health and safety management system" is 0.663.	This indicates that these two variables are directly related proportionally and the greater the determination of the quality factors, the greater will be the determination of health and safety factors, and vice versa.
"My organisation understands the quality needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)" and "My organisation has determined its quality objectives" is 0.594.	This is a directly related proportionality. Respondents indicate that the greater the organisation's understanding of the needs of stakeholders, the more the organisation will enforce its quality objectives, and vice versa.
"My organisation understands the quality needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies) and "My organisation has determined its environmental objectives" is 0.353.	Respondents indicate that the greater the organisation's understanding of the needs of stakeholders, the more the organisation will enforce its environmental objectives, and vice versa.
"My organisation understands the quality needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies) and "My organisation has determined its occupational health and safety objectives" is 0.397.	Respondents indicate that the greater the organisation's understanding of the needs of stakeholders, the more the organisation will enforce its occupational health and safety objectives, and vice versa.

Table 6.26 reflects that there needs to be greater understanding of the needs of stakeholders to enable the organisation to implement health, safety and environmental objectives more effectively.

6.10 Structural Equation Modelling (SEM)

SEM is a statistical method that allows researchers to examine how independent variables interact and affect one or more dependent variables (Polonsky and Waller 2021: 222). (Rosenthal 2018: 1683) accentuated that SEM is a versatile tool that is used to conduct an extensive range of multivariate statistical analyses, including multiple regression, mediation analysis, moderation analysis, and analyses of variance and covariance.

SEM allows path analysis, which enables to model the effect of one variable through a second variable on a third variable and also allows the inclusion of latent variables that are not directly measured but that are instead constructed through the use of a number of indicators (Kremelberg 2014: 358). The distinct features of SEM are, firstly it can estimate the complex relationships between variables, secondly it allows researchers to test hypothesized models based on theory and prior empirical findings, thirdly it takes measurement error into account, thereby giving unbiased parameter estimates and lastly, it provides multiple fit indices of model fit and suggests how a model can be modified (Ma and Shek 2018: 1625).

Figure 6.16 is a SEM that looks at the overall dimension interactions.

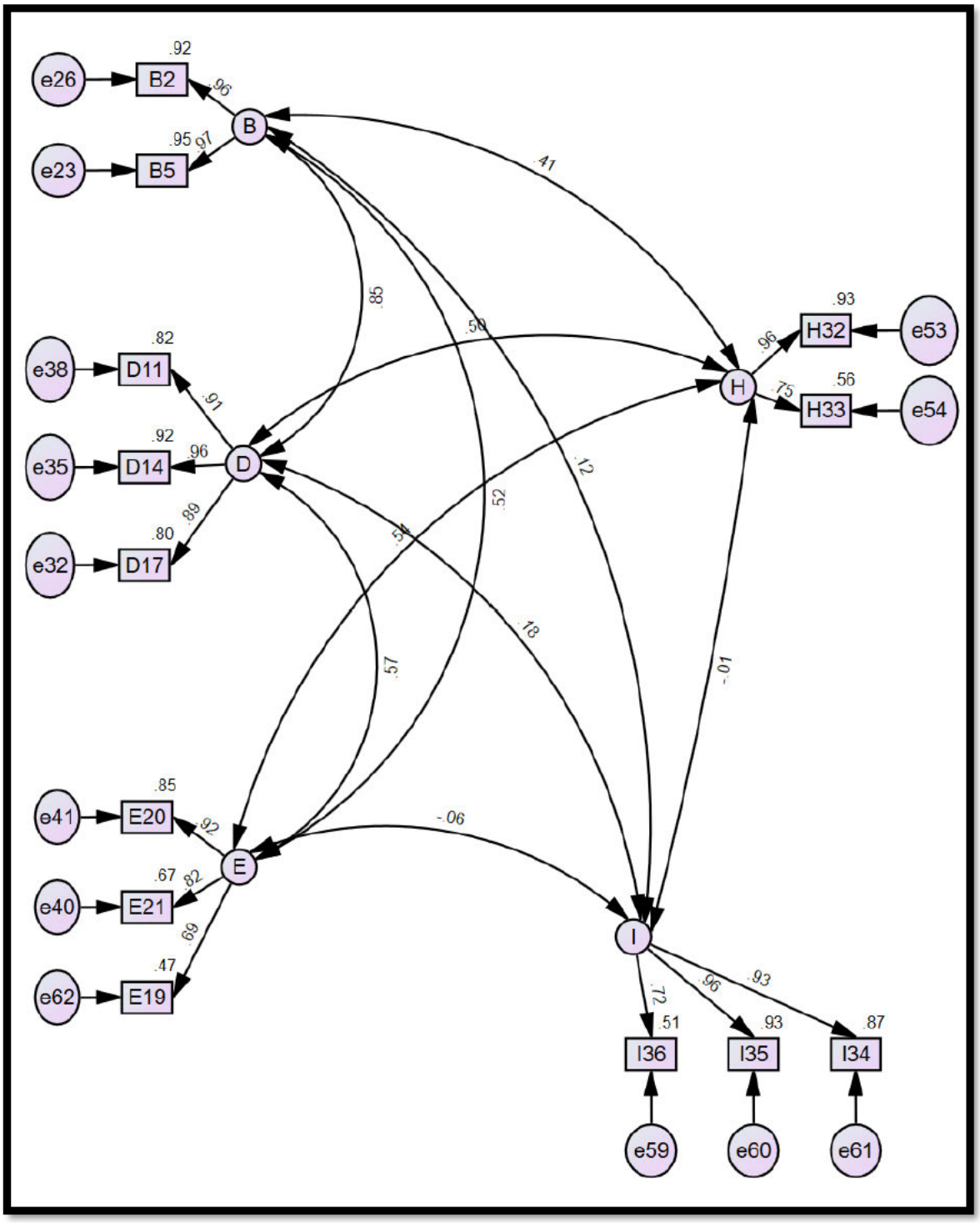


Figure 6:16 The path diagram for the modified SEM

The model is a multivariate statistical result that was obtained using structural relationships, applying a combination of factor analysis and multiple regression analysis techniques. It is used to analyse the structural relationship between measured variables and latent constructs. The key to the measured and latent variables is shown table 6.27.

Table 6:27 Measurement keys and latent variables

	Context of the organization
C	Leadership
D	Planning
E	Support
F	Operation
G	Performance evaluation
H	Improvement
I	IMS

6.10.1 Result (Default model)

Minimum was achieved.

Chi-square = 151.280

Degrees of freedom = 55

Probability level = .000

The Chi-square test allows the determination if two or more variables are distributed independently (Polonsky and Waller 2021: 252). This Chi-square tests the null hypothesis that the overidentified (reduced) model fits the data as well as does a just-identified (full, saturated) model. In a just-identified model there is a direct path (not through an intervening variable) from each variable to each other variable. In such a model the Chi-square will always have a value of zero, since the fit will always be

perfect. The probability should not be significant. In this model, the chi square p-value < 0.001.

It is however worth noting that even though, technically, the Chi-Square should be non-significant in model testing, this is very hard to achieve due to the usually large sample required for it. Hence, if it is in fact significant, that isn't a problem so long as the other indicators of fit are good.

6.10.2 Maximum Likelihood Estimates

Table 6.28 illustrates the Regression Weights: (Group number 1 - Default model)

Table 6:28 Regression Weights

			Estimate	S.E.	C.R.	P	Label
B5	<---	B	1.000				
B2	<---	B	1.035	.032	32.380	***	par_1
D17	<---	D	1.000				
D14	<---	D	1.029	.043	23.864	***	par_2
D11	<---	D	.992	.047	20.936	***	par_3
E21	<---	E	1.000				
E20	<---	E	1.154	.081	14.311	***	par_4
H32	<---	H	1.432	.155	9.229	***	par_5
I36	<---	I	.757	.056	13.628	***	par_6
I35	<---	I	1.158	.051	22.834	***	par_7
I34	<---	I	1.000				
H33	<---	H	1.000				
E19	<---	E	.784	.072	10.900	***	par_12

The variables loaded strongly along their various factors (significant p-values indicated by *** p < 0.001). These verify the EFA obtained under factor analysis.

Table 6.29 illustrates the Standardized Regression Weights: (Group number 1 - Default model)

Table 6:29 Standardized Regression Weights

			Estimate
B5	<---	B	.973
B2	<---	B	.958
D17	<---	D	.893
D14	<---	D	.957
D11	<---	D	.907
E21	<---	E	.817
E20	<---	E	.920
H32	<---	H	.963
I36	<---	I	.715
I35	<---	I	.965
I34	<---	I	.933
H33	<---	H	.749
E19	<---	E	.689

The parameters are estimated by maximum likelihood (ML) methods, which (is an iterative procedure that) attempts to maximize the likelihood that obtained values of the criterion variable will be correctly predicted. All of the coefficients were above the suggested value of 0.700, with only one being marginally lower. It is noted that most of the omitted coefficients were between 0.500 and 0.600.

6.11 Model fit summary

The suggested acceptable value for relative chi-square, CMIN/DF should not be greater than 5 which are used to reduce dependency on sample size. However, the cut-off points for TLI, CFI, NFI and IFI is between zero to one. A good model is indicated by RMSEA value of less than or equal to 0.05.

Table 6:30 CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	49	151.280	55	.000	2.751
Saturated model	104	.000	0		
Independence model	26	2600.134	78	.000	33.335

CMIN is a Chi-square statistic comparing the tested model and the independence model to the saturated model. The ratio, CMIN/DF, the relative chi-square, is an index of how much the fit of data to model has been reduced by dropping one or more paths. The CMIN/DF is less than the acceptable value of 5 (2.751). This meets the CMIN condition.

Table: 6.31 Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.942	.917	.962	.946	.962
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

These “goodness of fit indices” compares the model to the independence model rather than to the saturated model. The Normed Fit Index (NFI) is simply the difference between the two models’ chi-squares divided by the chi-square for the independence model. For this data, the NFI is 0.942, which is more than recommended value of 0.900 for a good fit. The Comparative Fit Index (CFI) uses a similar approach (with a noncentral chi-square) and is said to be a good index for use even with small samples. It ranges from 0 to 1, like the NFI, and 0.90 indicates good fit. The CFI value (0.962) exceeds the minimum boundary for a good fit.

Table 6:31 Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.705	.664	.678
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

PRATIO is the ratio of how many paths are dropped to how many that could have been dropped (all of them). The Parsimony Normed Fit Index (PNFI) is the product of NFI and PRATIO, and PCFI is the product of the CFI and PRATIO. The PNFI and PCFI are intended to reward those whose models are parsimonious (contain few paths). A value greater than 0.900 is considered acceptable. This model has a value less than the recommended (.705).

Table 6:32 Root Mean Square Error

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.089	.072	.106	.000
Independence model	.383	.371	.396	.000

The Root Mean Square Error of Approximation (RMSEA) estimates lack of fit compared to the saturated model. RMSEA of .05 or less indicates good fit, and between .05 and .08 an adequate fit. LO 90 and HI 90 are the lower and upper ends of a 90% confidence interval on this estimate. Even though the model is somewhat adequate, the PCLOSE p value that tests the null that RMSEA is no greater than .05, is significant ($p < 0.001$). The RMSEA value is 0.091.

6.12 Correlations

The relationships between the latent variables were tested using correlations. The level of significance relates to the strength of the relationships. The correlations are tested.

Table 6.34 Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
B	<-->	D	.412	.046	8.941	***	par_8
B	<-->	E	.193	.032	6.112	***	par_9
D	<-->	H	.151	.029	5.290	***	par_10
I	<-->	H	-.003	.018	-.172	.863	par_11
B	<-->	H	.127	.027	4.720	***	par_13
I	<-->	B	.049	.029	1.686	.092	par_14
I	<-->	D	.071	.028	2.500	.012	par_15

			Estimate	S.E.	C.R.	P	Label
E	<-->	H	.126	.024	5.328	***	par_16
I	<-->	E	-.017	.022	-.786	.432	par_17
D	<-->	E	.204	.032	6.369	***	par_18

The level of significance relates to the strength of the relationships. The correlations are tested below.

Null hypothesis: There is no correlation between each of B, C, D, E, F, G, H, I

Alternate hypothesis: There is a significant correlation.

Table: 6.35 Correlations: (Group number 1 - Default model)

		Estimate	
B	<-->	D	**.852**
B	<-->	E	**.519**
D	<-->	H	**.500**
I	<-->	H	-.012
B	<-->	H	**.406**
I	<-->	B	.119
I	<-->	D	**.180**
E	<-->	H	**.544**
I	<-->	E	-.057
D	<-->	E	**.569**

There are seven significant relationships between the various latent variables. Those indicated by **** imply that the p-value < 0.001. An analysis of the results indicates a strong, directly proportional relationship between the latent variables.
Only section D (Planning) has a significant positive correlation with section I (Integrated Safety, Health, Environment and Quality Management System). That implies that better Planning results in better SHEQ management systems.

6.13 Summary of data analysis

Two of the indices did not meet the required cut-off p-value of < 0.001. This is mainly due to the developmental nature of this construct. Some of the low loading factors (statements) were omitted from the model. An inspection of the coefficients for each latent variable indicated high factor loadings. In addition, the path coefficients are reflected on the diagram. Most of the coefficients are high indicating strong positive correlations between the latent variables. As this was a newly developed construct, it is also expected that the structural relationships may not have fitted accurately. However, certain indices are met, and it is a recommendation that the model be revised in terms of the measured variables constituting the latent variables to improve factor loadings.

The SEM indicates the following significant correlations:

i. B (context of the organisation) and D (planning);
ii. B (context of the organisation) and E (support);
iii. D (planning) and H (improvement);
iv. B (context of the organisation) and H (improvement);
v. I (integrated safety, health, environment, and quality management system) and iii. D (planning);
vi. E (support) and H (improvement); and
vii. D (planning) and E (support).

6.14 Post quantitative analysis responses requiring further research in this study for a deeper understanding.

The findings of the quantitative study informed the following qualitative research.

6.14.1 Context of the organisations

There are external and internal factors that impacts the organisation's SHEQ management system that the senior management of the organisation needs to consider. It is unclear if the effect these external and internal factors that have an impact of the organisation's SHEQ management system and the measure that the organisation has taken were considered.

6.14.2 Leadership

Although the results of the quantitative survey findings indicated the commitment of the senior management of the organisation, a greater understanding is required on how urgent it is to implement an integrated SHEQ management system and what actions management can take to achieve a greater safety, health, environment and quality commitment from employees.

6.14.3 Planning

The results of the quantitative survey findings indicated that the organisation planned for the management systems however, the current major SHEQ risks, objectives and targets needs to be indicated and the tracking of these needs to be elaborated.

6.14.4 Support

Although the quantitative research findings indicated that the organisation provided the necessary resource for the management systems, the current economic

challenges that organisations are facing that impacts on the provision of resources for an SHEQ IMS needs to be understood.

6.14.5 Operation

Although the quantitative survey findings indicated that the organisation plans, organises, leads and controls the management systems, the organisations' SHEQ operational challenges needs to be understood before developing an IMS. Strategies must be developed to address these challenges.

6.14.6 Performance evaluation

The quantitative survey results indicate that the organisations reviews (monitors, measures, analyses, and evaluates) its SHEQ performance however the performance measurements that the organisation has for SHEQ needs to be established.

6.14.7 Improvement

Although the quantitative survey results indicate that the organisation identifies opportunities for the improvement of the management systems, the opportunities for improvement that the organisation has identified for SHEQ needs to be established and the progress in implementing these opportunities for improvement needs to also be established. Also, the fourth industrial revolution provides opportunities for improvement, the organisations identification, implementation plans, and progress needs to be established.

6.14.8 Integrated SHEQ Management System

Although the quantitative survey findings argued well for an IMS, senior managements understanding of the challenges and benefits of integrating the independent SHEQ management, their views on combining the audit checks and resistance of quality auditors due to additional workload needs to be explored.

For a deeper understanding of the quantitative analysis responses that required further research in this study, one-to-one Skype qualitative interviews were conducted with eight senior personnel of the organisation to achieve an in-depth understanding.

6.12 Conclusion

This chapter presented, analysed and discussed the research findings of the quantitative research. The quantitative research involved the distribution and collection of the survey questionnaires, analysis of the data using SPSS and interpretation of the results. The reliability statistics indicated a degree of acceptable. Factor analysis was used to reduce the large number of variables to a reduced number of factors and all of the conditions were satisfied for factor analysis. Section “A”, the biographical characteristics of the respondents of the research questionnaire was summarised and the findings was presented. The scoring patterns of the respondents per variable per section of section “B” was presented and the results were then further analysed by the importance of the statements. Cross-tabulations was created to determine whether there was a statistically significant relationship between the row variables vs columns variables. Bivariate correlation was performed on the ordinal data and significant relationships of this research study was identified and presented. SEM allowed the examination of how independent variables interacted and affected one or more dependent variables.

From the foregoing quantitative research, it can be concluded that from a SHEQ management perspective, the organisation internal and external environment is contextualised, there is an allocation of resources, senior management of the

organisation is committed, the organisation uses a process risk based approach, there are set objectives and the performance of these objectives are measured, evaluated and managed, opportunities for improvement are identified and the implementation of an IMS is understood. Nevertheless, certain aspects necessitate a clearer comprehension, and this will be presented in the next chapter on the analysis and discussion of the qualitative research findings.

7 CHAPTER SEVEN: RESULTS AND DISCUSSION (QUALITATIVE)

7.1 Introduction

The previous chapter presented the analysis and discussion of the quantitative data analysis, and this chapter presents the analysis and discussion of the qualitative research findings. The response from the quantitative questionnaire questions was used to develop the interview questions for a clearer understanding and confirmation of the quantitative data responses. Qualitative data was collected using unstructured interviews to probe deeply into an issue and rather than collecting numbers the data is collected by recording words or phrases, this method is supported by Hair *et al.* (2020: 161). The interviews were conducted by the researcher with three Senior Production Personnel (SPP), one Senior Safety, Health and Environment Personnel (SSHEP), three Senior Quality Personnel (SQP) and two Senior Engineering Personnel (SEP) who have a good understanding of management systems. Notes was extracted from the interview and confirmed with participants before data analysis, to ensure trustworthiness. Thematic data analysis was conducted.

7.2 Structure of SHEQ staff

Figure 7.1 illustrates in graphical format the current organisational structure for safety, health, environment and quality staff as per respondent's responses in the Interviews.

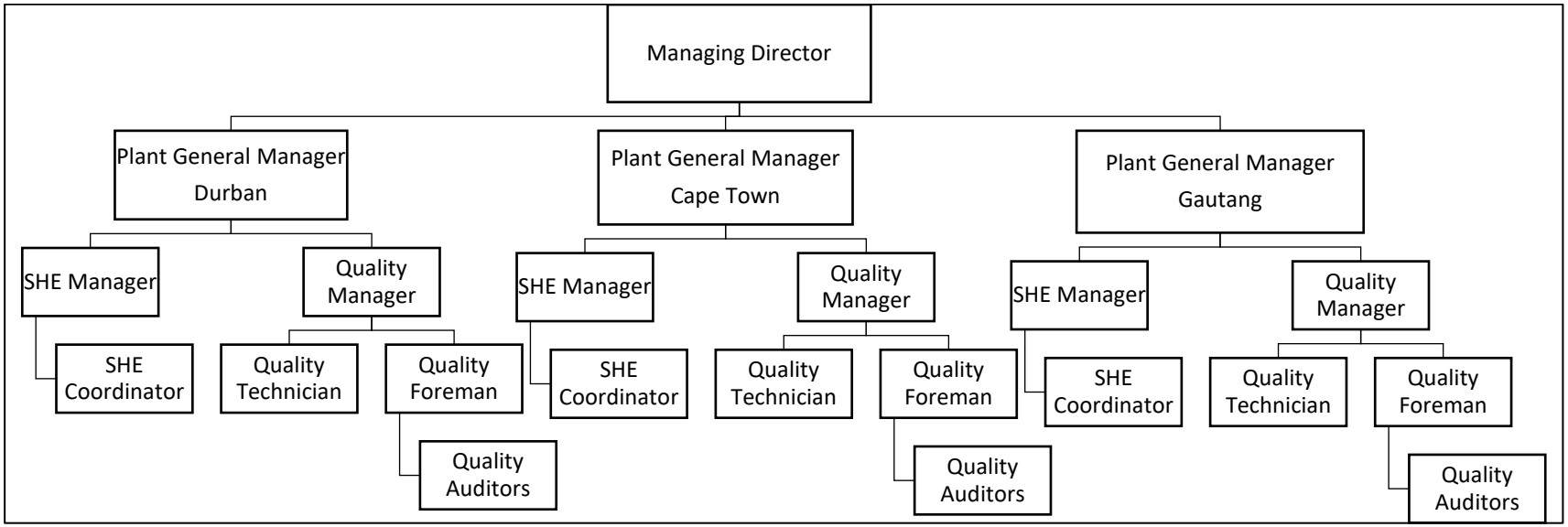


Figure 7:1 Current organisation structure for safety, health, environment, and quality

7.3 Current framework for the organisation's health and safety management system

Figure 7.2 illustrates in graphical format the current management system structure for safety, health, as per respondent's response in Table 7.1, Interview questions and respondents' responses, bullet point 8.2.

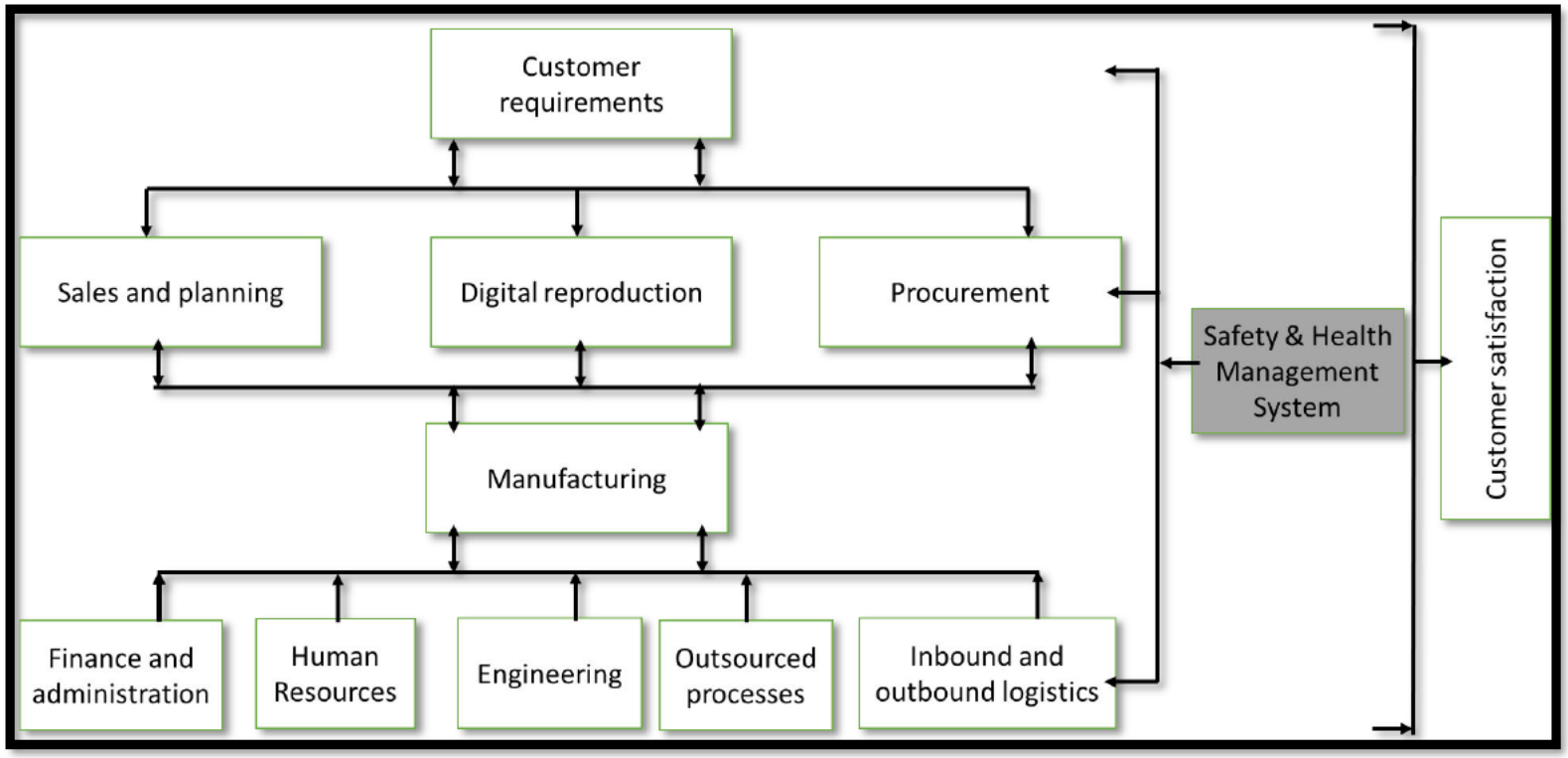


Figure 7:2 Current safety and health management system framework, showing the sequence and interaction of processes that forms the organisation's safety and health management system

7.4 Current framework for the organisation's environmental management system

Figure 7.3 illustrates in graphical format the current management system structure for the organisation's environmental management system, as per respondent's response in Table 7.1, Interview questions and respondents' responses, bullet point 8.2.

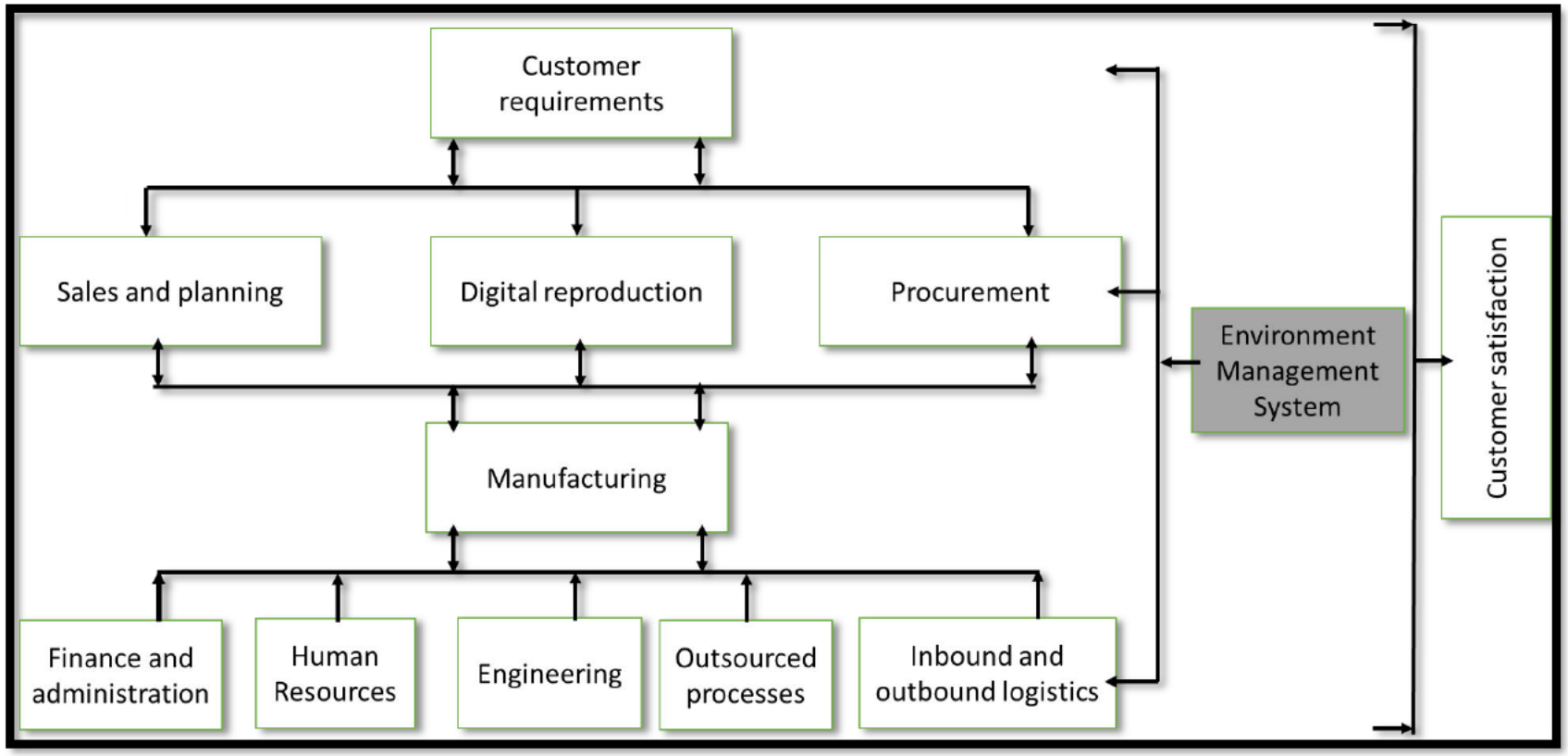


Figure 7:3 Current environmental management system framework, showing the sequence and interaction of processes that forms the organisation's environmental management system

7.5 Current framework for the organisation's QMS

Figure 7.4 illustrates in graphical format the current management system structure for the organisation's quality management system, as per respondent's response in Table 7.1, Interview questions and respondents' responses, bullet point 8.2.

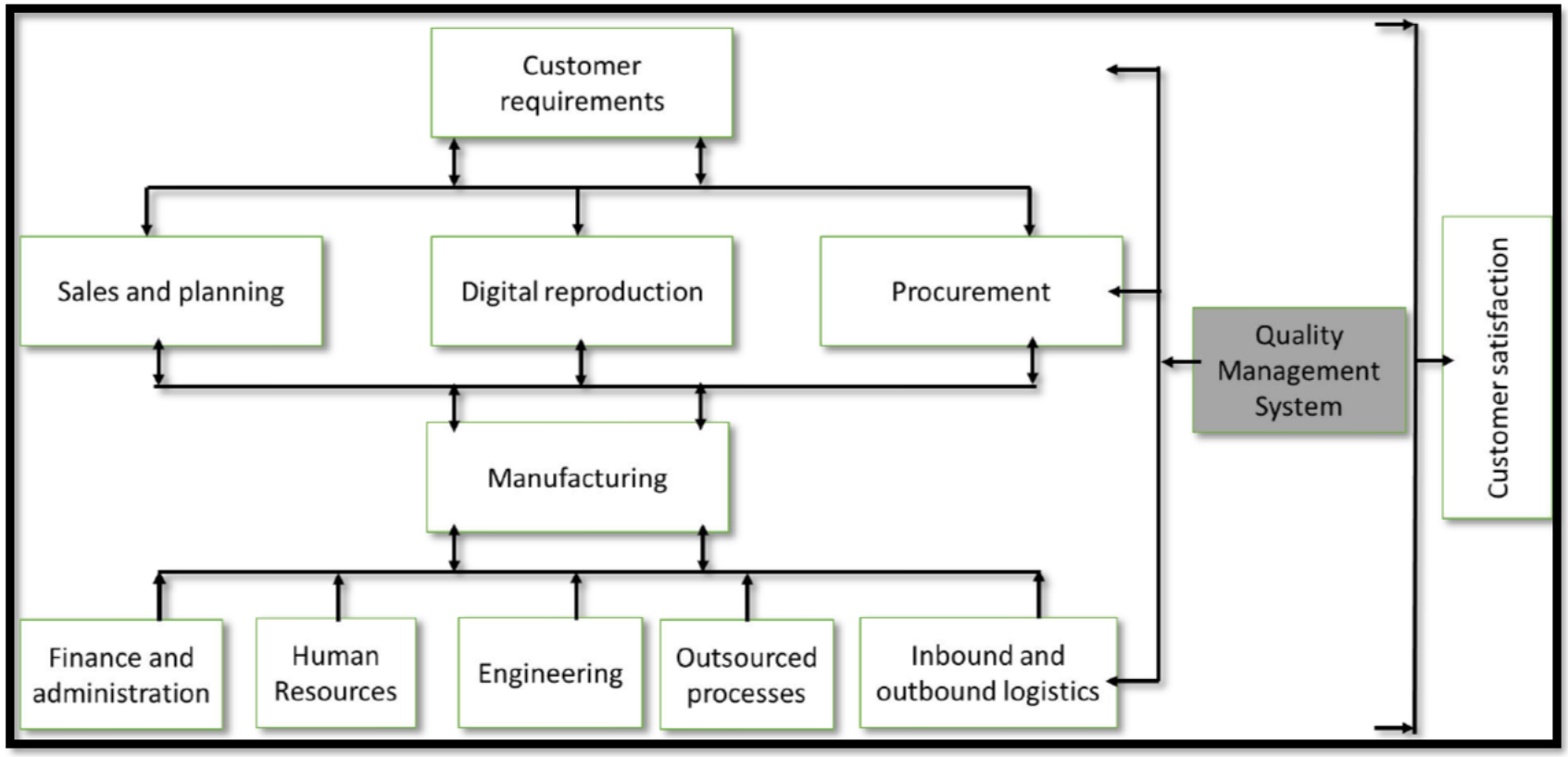


Figure 7:4 Current quality management system framework, showing the sequence and interaction of processes that forms the quality management system.

7.5.1 SHEQ documentation structure

Figure 7.5 illustrates in graphical format the current document structure for safety, health, environment, and quality staff as presented in Table 7.1, Interview questions and respondents' responses.

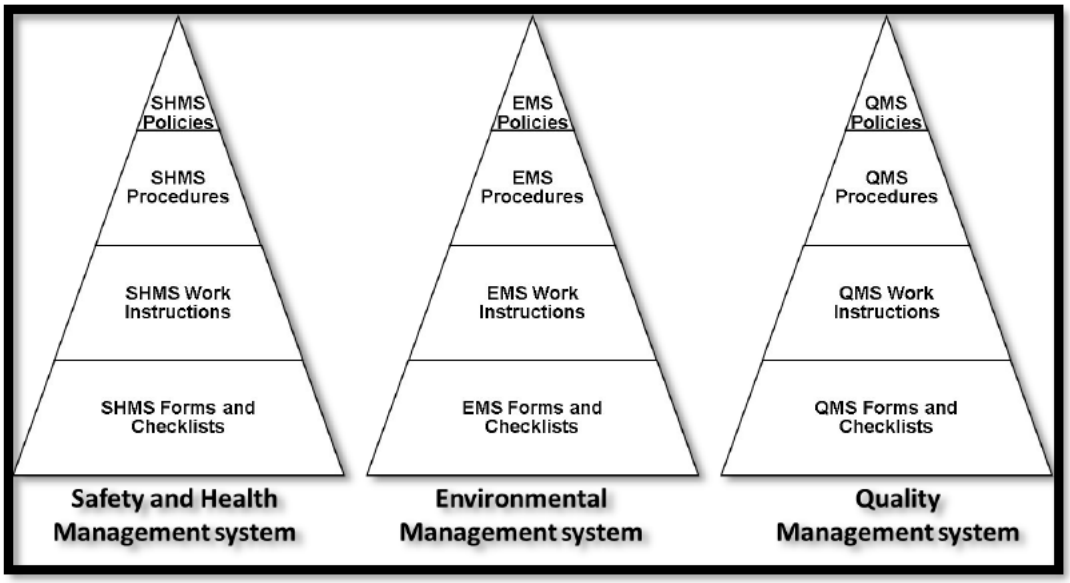


Figure 7:5 Current independent documentation systems

The SHEQ management systems are currently structured and managed independently has depicted in figures 7.2, 7.3, 7.4 and 7.5. The process commences with sales determining the product and digital artwork requirements of the customer. Once the order is captured onto the JDE enterprise resource planning system an advance planning schedule is compiled depicting raw material requirements, manufacturing resource requirements and distribution schedules. The manufacturing of metal packaging is the core function of the organisation supported by finance management, human resource management, engineering management, outsourced processes, inbound and outbound logistics. This forms the internal supply chain of the organisation that is currently support by independently managed SHEQ management systems. It is envisaged that a SHEQ IMS will provide a holistic management system for the supply chain creating a more efficient value chain.

7.6 Thematic analysis of qualitative data

This section presents the outcomes of the qualitative data gathering process and reports the results and discusses the findings from the semi-structured interviews with participants purposively selected at the organisation under study. The data collected was deductively coded with the aid of a software (NVIVO version 12).

7.6.1 Emerging themes and subthemes

The analysis of the data gathered from the semi-structured interviews resulted in the identification of the themes and subthemes highlighted in Table 7.1

Table 7:1 Themes and subthemes

	Theme	Subtheme
Theme 1	Factors impacting SHEQ management system	➢ Internal factors ➢ External factors
Theme 2	Factors influencing leadership commitment	➢ Planning ➢ Performance evaluation and monitoring ➢ Increase of opportunities ➢ Support and operation
Theme 3	Implementation of multi-dimensional IMS	➢ Complexity of integration ➢ Organisational structure ➢ Perceived risks and benefits ➢ Strategies ➢ Challenges

The themes were identified in line with answering the following research questions:

vi. What is the urgency and benefits of implementing a multi-dimensional IMS?
vii. What is the extent of leadership's commitment and support of an IMS?
viii. What are the inherent risks and challenges of implementing an IMS and what strategies can be adopted to overcome these risks and challenges?

The interviews were conducted by the researcher with three Senior Production Personnel (SPP), one Senior Safety, Health, and Environment Person (SSHEP), three Senior Quality Personnel (SQP) and two Senior Engineering Personnel (SEP) who have a good understanding of management systems. In addition, and in supporting the discussion on themes, relevant quotes from the data generated from the interviews are used. The data from semi-structured interviews was transcribed verbatim and used as such during discussion. The names of participants have been coded to ensure anonymity.

7.6.2 Theme 1: Factors impacting SHEQ management system

In a constantly changing external environment where resources are scarce, new technology being introduced, and ongoing competitive market requirements, there is a need for organisations to adapt their internal environment to these changes (de Oliveira 2013:124). Organisations need to have strategies that continuously adapt to the internal and external environments that impacts an organisation and management systems plays a vital role in achieving these strategic objectives and the rationale is to integrate these management systems to achieve a holistic synergy (Basaran 2018: 2). The study of the internal and external environment of an organisation allows the organisation to determine its current competitive position and to strategically reposition the organisation to a more viable position (Shatilo 2019: 95).

This theme aimed to add further dimension to the above discourse by exploring the factors impacting the SHEQ systems in an organisation. The thematic data generated from the interviews resulted in the identification of the following subthemes as shown in figure 7.6. Participants offered insight into the external and internal factors impacting the SHEQ management system.

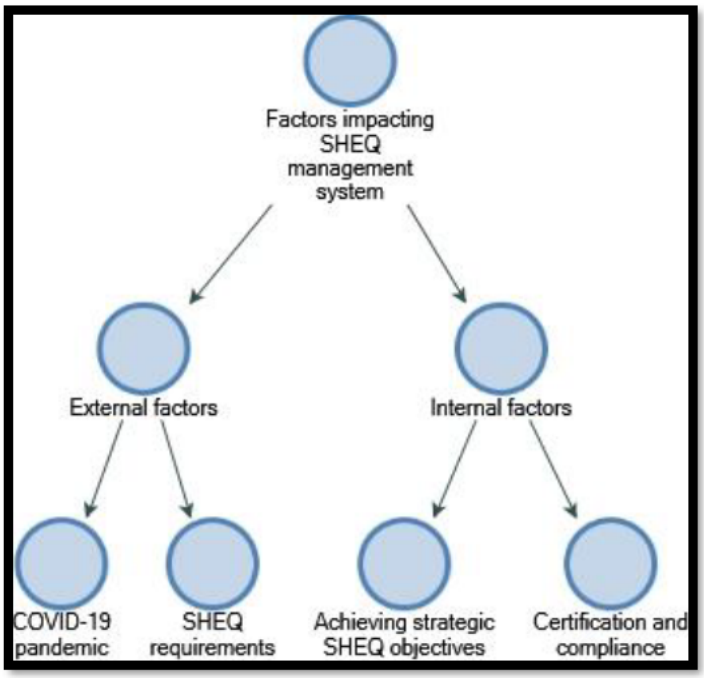


Figure 7:6 Map visualisation of the factors impacting SHEQ management system.

7.6.3 Subtheme 1: External factors

An important aspect in the strategic development of an organisation is the identification of the internal and external factors that impact on the organisation (Shatilo 2019: 85). A SWOT analysis was conducted by the researched organisation and the identified external factors that impacted the organisation were the COVID 19 pandemic, economic conditions, demand fluctuation, new entrants into the market, the introduction of alternative packaging (Management Committee minutes 2021: 3).

It emerged during the interview process that the two main external factors impacted on the SHEQ management system at researched organisation, namely the COVID-19 pandemic of the external environment and SHEQ certification requirements.

7.6.4 Subtheme 1a: COVID-19 pandemic

In regard to the current COVID 19 pandemic, it was found that it had a negative impact of the daily functioning of the organisation. One of the participants accentuated that:

> *The organisation has to consider the requirements of COVID-19 and as such, implement protocols to minimise the spread of the virus. This is to maintain a safe and healthy environment as reasonably practicably possible (SPP1).*

Echoing similar sentiments, another participant provided insight on the protocols followed to ensure that staff who were at work physically felt safe.

> *The organisation has undertaken to screening those employees who were working from the office and making sure that masks were used during staff interaction. Furthermore, we are expected to always maintain a 1,5-metre social distance parameter. Even though it is challenging at times, every effort is undertaken to ensure we follow COVID-19 protocols in the workplace (SQP2).*

Overall, it can be deduced that while COVID-19 has impacted negatively on the organisation, participants were satisfied with the protocols in the workplace to minimise the spread of the virus. This is in line with (Hamouche 2021:1) who observed that whilst the COVID 19 pandemic created a complex environment for management, it also presented organisations with the challenge to find ingenious solutions to ensure business continuity.

7.6.5 Subtheme 1b: SHEQ requirements

Another external factor was the consideration of SHEQ requirements in a competitive market sphere particularly, whereby supply exceeds demands. One participant indicated that this was a growing requirement from customers, as part of their supplier selection criteria for the organisation to ensure that the workplace is healthy and safe for employees. As such, it was imperative that the organisation pay attention to this external factor.

> *In keeping with this requirement by our customers, our organisation adopts an environmental product life cycle perspective to minimise the impact on the environment and provide safe and quality products (SPP2).*

In addition, another participant argued that the inflow of new entrants and imports into a competitive market was making it harder for businesses to survive.

> *However, our organisation strives to differentiate itself from competitors by continuing to strive to provide better quality products, minimising the impact on the environment and provide a safe and health work environment for all personnel (SPP3).*

In order to ensure that SHEQ requirements are met, one participant stated:

> *The organisation has annual health, safety and environmental legal audits to ensure compliance to the occupational health and safety act and the national environmental management act. This is also supported by certification to ISO 14001:2015 EMS, ISO 9001:2015 QMS and the Willis Blue risk management system (SQP2).*

Drawing from the above, it is reasonable to infer that although external variables are outside the control of the organization, however, it can only respond to them and make decisions to ensure its continued success.

7.6.6 Subtheme 2: Internal Factors

A SWOT analysis was conducted by the researched organisation and the identified internal factors that impacted the organisation were absenteeism, excessive overtime, manual operations, low cash flow, and limited source of raw material (Management Committee minutes 2021: 3). Shatilo (2019: 85) reiterated that the development and operation of an organisation, is influenced by the external environment that creates a reaction by the internal environment that can either result in expansion or disruption of the existence of the organisation. Bornia, Gisi, Spenassato, Severo-Peixe and Rotta (2016: 184), has identified the following internal factors that impact on the implementation of an IMS:

i. Human resources;
ii. Organizational structure;
iii. Company culture; and
iv. Understanding and perception.

The interview generated the following views related to the internal factors impacting the SHEQ management system.

7.6.7 Achieving strategic SHEQ objectives

Some participants stated that the organisation assessed the SHEQ requirements for all job description roles and maintained a training matrix, that is supported by continual awareness training, in order to accomplish the organization's strategic goals. This is reflected in the statement below:

> *Our training programmes are supported by safety, health and environment awareness talks, meetings and ongoing communication, The quality culture is driven by daily meetings, quality non-conformance reporting and investigation and awareness training. All meetings commence with safety, health, environment, and quality. SHEQ general information and statistics is*

shared on notice boards that are strategically located throughout the organisation (SQP3).

Furthermore, it was noted that health and safety issues formed a significant part of all employee's performance contracts, and annual increases were based on the score of these performance contracts.

The quality culture is driven by daily meetings, quality non-conformance reporting and investigation and awareness training. All meetings commence with safety, health, environment, and quality. SHEQ general information and statistics is shared on notice boards that are strategically located throughout the organisation (SPP2)

Krajcsak (2018:1467) noted that an organisation's culture is defined by the perceptions, values, attitudes, norms, and beliefs of employees of an organisation, and it determines the level of achievement of optimal quality management practices and employee commitment. The sentiments echoed by the participants is similar to Paraschivescu (2019: 31) who emphasised that the most important component of quality is the human factor, and an organisation can only excel if the organisation harnesses the full potential of its employees who are influenced by the culture of the organisation

7.6.8 SHEQ compliance

The organisation's safety, health and environment behavioural based system reinforced positive behaviour and corrected negative behaviour. This is supported by safety, health and environment awareness talks, meetings, and ongoing communication, according to one participant.

> *There are new environmental, health and safety requirements that the organisation needs to keep abreast with and ensure compliance to these requirements. The organisation has annual safety, health and environment legal audits that is conducted by an external legal advisor and is a member of Metal Packaging Association, (MetPac) and the Institute of Packaging South Africa (IPSA). Any new environment, health or safety requirements are communicated to the organisation via these channels (SQP1).*

This is in line with Aseeva (2016: 93) who averred that although ISO standards are voluntary, organisations have legal requirements that the ISO standard can assist an organisation to fulfil and compliance to legal and other requirements is an ISO requirement. Furthermore, as posited by Basaran (2018: 2, there is a greater focus on OHS due to legal requirements, economic policies and the health and safety of employees.

In summary, it can be inferred that the safety, health, environment, and quality risks was being adequately managed to ensure that risks are identified, and decisions are made according to the probability and impact of the risks. In addition, it was stated by participants that an annual risk assessment for safety, health and quality was conducted and reviewed.

7.6.9 Theme 2: Factors influencing leadership commitment

Clause 5.1 of the ISO HLS mandates that the organisation's senior management display leadership and commitment to the organisation's management systems, reinforcing the importance and expectations of senior management to be accountable for the management system's results. (DNVGL 2016: 2). In this study, the majority of the participants believed it was the onus of the senior management of the organisation to take responsibility and accountability of the OHSMS, EMS

and QMS by providing SHEQ resources, and establishing OHS, EMS and QMS objectives.

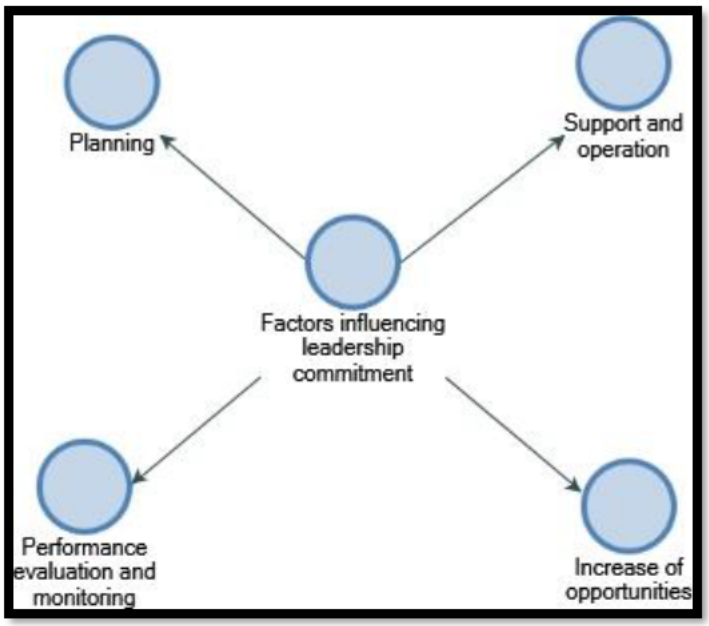


Figure 7:7 Map visualisation of factors influencing leadership commitment

Four subthemes were identified under this theme, namely, planning; support and operation; performance evaluation and monitoring; and the increase of opportunities.

The results of the quantitative phase of the study found that the respondents perceived greater leadership commitment towards safety, health and quality compared to the environmental management system. As such, interview participants were asked to comment on the factors which will contribute towards the implementation and maintenance of SHEQ policy.

7.6.9.1 Subtheme 1: Planning

Most of the participants indicated that planning was an important factor for the leadership of the organisation to determine, assess and document the SHEQ risks and opportunities.

> *The senior management of the organisation to take responsibility and accountability of the OHSMS, EMS and QMS by providing SHEQ resources, and establishing OHS, EMS and QMS objectives (SPP1).*

Significantly, one participant indicated that a commitment by leadership to provide a safe working environment by implementing a framework to set out OHS objectives and to fulfil other legal requirements will eliminate or reduces OH&S risks and as a result will lead to greater worker participation.

> *The organisation can plan the OHSMS, EMS and QMS considering the context of the organisation, interested parties and, the scope of the OHS management system. Also, the organisation can determine, assess, and document the SHEQ risks and opportunities, considering the effectiveness of existing controls. The organisation to determine and document legal requirements and other requirements (SQP3)*

ISO requires organisations to conduct a risk assessment for all processes from design to the final consumption of the product or service (Basaran 2018: 5). The ISO 45001:2018 OHSMS risk assessment involves a continuous improvement approach that requires an organisation to determine what are opportunities that the organisation can adopt to improve safety (Hogge 2019:22). The views expressed by the participants are in line with Kopia, Kompalla and Ceauşu (2016:52) who found that the success factors of implementing an IMS included senior management commitment, provision of resources, supportive organisation culture, generic SHEQ key performance indicators, expert project management and change management skills.

7.6.9.2 Subtheme 2: Performance evaluation and monitoring

All of the participants agreed that conducting risk assessments were effective countermeasures. Significantly, this provided proactive methods for improving SHEQ performance.

> *Findings from audits, non-conformance reports are investigated, and preventive action taken is based on continuous improvement of the SHEQ management systems (SQP2)*

It further emerged that the performance of SHEQ was monitored, measured, analysed and evaluated on a continuous basis. This was to ensure that the internal process, legal, certification and compliance audits are used to check adherence to existing systems and certification requirements. Significantly, as reported by Basarn (2018: 13), joint internal and external IMS audits results in time saving and cost saving benefits.

> *The performance of SHEQ is monitored, measured, analysed and evaluated during production meetings, safety, health, environment, quality meetings, monthly management meetings and the annual management review meetings (SPP3).*

This is supported by de Oliveira (2013:131) who stated that an organisation's risks and opportunities can be identified in the various meetings that are conducted in an organisation and the organisation's policies, objectives and strategies can be reviewed in these meetings.

7.6.9.3 Subtheme 3: Increase of opportunities

In context of the business environment, it is the organisation's responsibility to map and identify possibilities for improvement and implement appropriate strategies to

accomplish the intended outcome of the SHEQ management system (de Oliveira 2013:125). Participants were asked on whether the organisation considered the improvement opportunities related to the fourth industrial revolution. Whilst it was noted that opportunities arising from the fourth industrial revolution were identified, it was however, yet to be communicated to all stakeholders.

> *The organisation has conducted a SWOT analysis for safety, health, environment, and quality. Opportunities for improvement has been identified however these have not been communicated to all stakeholders (SSHEP)*

A SWOT analysis is a strategic tool that organisations use to analysis and set achievable goals and effective objectives by determining the organisation's internal strengths and weaknesses and external opportunities and threats (Alvarez, Carballo-Penela, Mateo-Mantecon and Rubio 2016: 238). Therefore, before developing a strategic plan, it is important to conduct a SWOT analysis to evaluate the internal strengths and weaknesses and to analyse the external opportunities and threats of the organisation, thus providing strategic alignment with an organisation's internal and external environment (Lazenby 2018: 28).

7.6.9.4 Subtheme 4: Support and operation

The results of the quantitative phase of the study further indicated a high percentage of respondents who were neutral with the statements on the support of the organisation's management systems. During the interviews, it emerged that this could be attributed to resource allocation towards the SHEQ requirements within the organisation,

> *There is a budget allocation for safety, health environment and quality resources. The budget is primarily spent on certification cost, SHEQ surveys, laboratory fees, personal protective clothing, and legal auditing that employees are not considering* (SQP2).

This is supported by Hogge (2019: 17) who stated that the cost of human life related to workplace deaths and injury is beyond calculation and there is an enormous financial burden and the intention of ISO 45001:2018 is to lessen the burden by creating a safer workplace and also further supported by Fuller (2019: 8), who alludes that employee health and safety hazard prevention initiatives can be quantified as a return of investment (ROI) by calculating the cost of the loss of labour, labour turnover cost, loss of productivity cost, medical treatment cost and increase in the cost of insurance due to workplace injuries and illnesses

7.6.10 Theme 3: Implementation of a multi-dimensional IMS

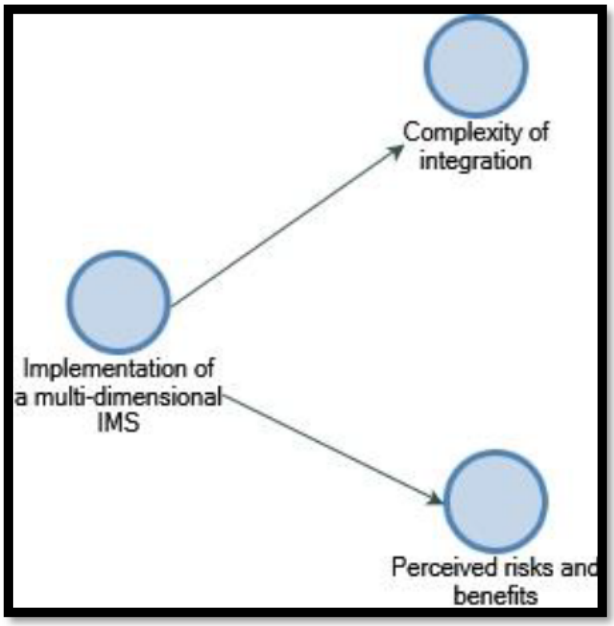


Figure 7:8 Map visualisation of the implementation of a multi-dimensional IMS

The biggest challenges of implementing management systems are the integration of the management system requirements into the existing business processes and the strategic alignment of the requirements to the organisation's business strategy, however a successful implementation strategy will result in a framework to achieve an organisation's goals (DNVGL 2016: 9). This study aimed to proffer a model that

would support the integration of the independent systems into one cost effective coherent integrated business management system that would be easier to manage.

7.6.10.1 Subtheme 1: Complexity of integration

Participants were asked to comment on the complexity of implementing a multi-dimensional IMS model that will use lesser resources to manage and that is also aligned to a common strategy of the organisation.

> *An IMS will require an organisation culture change to SHEQ and there will be some resistance to change (SEP1)*

> *The initial workload to review the existing documentation is going to be time consuming and will require the output of all department heads and supervisors (SEP2).*

> *The SHEQ manager position will result in a wider challenging job scope and as such additional resources will be required for the implementation (SPP2)*

> *There is no foundation for ISO 45001:2018 because the organisation is currently not certified to this standard, therefore concurrently managing the integration and certification of ISO 45001:2018 will not be easy (SPP3)*

From the above, it can be inferred that the biggest challenge experienced by the organisation is ensuring the integration of the MS requirements into the organization's business processes.

A systematic review of twenty-two IMS articles conducted by Bornia, Gisi, Spenassato, Severo-Peixe and Rotta (2016: 184), deduced that the authors proposed an IMS model of multi-level strategic, organisation structure, resource, culture, and documentation synergy. Popa (2018: 205) inferred that the culture of an organisation can either support or prevent the adaption of any internal or

external change process of the organisation and has an impact on the performance of the organisation and its employees. Significantly, as reported by de Oliveira (2013:124), the justification for implementing an IMS can be attributed to being less costly, less bureaucratic and the generation of better results. The derived benefit of implementing an IMS includes a simplified certification process, decreased management system cost and decreased documentation (Roca, Vaishnav, Morgan, Mendonca and Fuchs 2017: 1221).

7.6.10.2 Subtheme 2: Perceived risks and benefits

The underlining reason why there is great emphasis that is placed on ISO 9001:2015 QMS, ISO 14001:2015 and ISO 45001:2018 is because human health and safety, environmental impact and quality has become an integral part of today's life (Basaran 2018: 2). Although these MS's can perform separately, these independent MS's are counterproductive, difficult to manage independently and the bureaucracy that these independent systems generate is questionable (Bornia, Gisi, Spenassato, Severo-Peixe and Rotta (2016: 189).

The majority of participants felt that the primary advantage of an integrated system would be the ability to use a single set of rules and processes to fulfill the requirements of all applicable standards and regulations.

There are benefits to implementing an IMS, therefore the sooner that the implementation process commences, the sooner will the organisation reap the benefits. However, this needs to be planned process that has the buy in of all stakeholders (SPP1)

Furthermore, it was pointed out by participants that in order to ensure the successful implementation of an IMS, the SHEQ challenges needed to be understood and a strategy needed to be developed to manage these challenges.

> *Product quality differentiates the organisation from competitors. The metal packaging sector is a very competitive market environment, and it is difficult to maintain a high level*

> *of quality standard considering that there is a very low profit margin. The organisation is certified to ISO 9001:2015 and British Retail Consortium for Packaging organisations. The certifications together with the quality tools that are utilised by the organisation ensures compliance to customer quality requirements (SQP1)*

Another challenge that was foreseen with the implementation of an IMS, according to one participant:

> *There is no foundation for ISO 45001:2018 because the organisation is currently not certified to this standard, therefore concurrently managing the integration and certification of ISO 45001:2018 will not be easy (SSHEP).*

The three commonly used approaches to implementing an IMS is either sequential where one system is implemented at a time or parallel implementation where all management systems are implemented simultaneously or combined implementation where an organisation is certified to ISO 9001:2015 and implements a combination of 14001:2015 and ISO 45001:2018 (Zivkovic and Petrovic 2015: 170). Considering that the researched organisation is already certified to ISO 9001:2015 and ISO 14001: 2015, the sequential approach will be recommended to include 45001:2018 as a add on.

Figure 7:9 Word cloud showing clusters of similarities across the categories of the key participants.

The word cloud in Figure 7.9 above further subsumes the trends and patterns of responses across the categories of participants. At a glance, it is observed that words like SHEQ, organisation, health, management, environment, risk, and safety appear to dominate the comments and responses from the participants.

7.7 Conclusion

This chapter presented, analysed, and discussed the research findings of the qualitative research. The qualitative interview questions and the respondent's responses were presented, and these were further analysed using thematic analysis. The themes and subthemes were identified using the research questions. The respondents were coded to ensure anonymity. The COVID 19, SHEQ requirements in a competitive environment factors external factors together with the internal factors impacting SHEQ management system was analysed and discussed.

From the foregoing qualitative research, it can be concluded that from a SHEQ management perspective, the implementation of an IMS argues well for the organisation. The next chapter presents the research conclusions and the way forward.

8 CHAPTER EIGHT: CONCLUSION AND RECOMMENDATIONS

8.1 Introduction

This chapter presents the alignment of the research questions and research findings, current and proposed structure of the SHEQ management system, current and proposed documentation structure, current and proposed SHEQ organogram, current and proposed ISO structure and the proposed multi-dimensional model for in integrated SHEQ management system and a synopsis of how the single dimension IMS models was incorporated into the recommendations.

The following discourse provides answers to the research questions based on the literature review, quantitative and qualitative research findings.

8.2 Research questions

i. What is the urgency and benefits of implementing a multi-dimensional IMS?
ii. What is the extent of leadership's commitment and support of an IMS?
iii. What are the inherent risks and challenges of implementing an IMS and what strategies can be adopted to overcome these risks and challenges?
iv. How are the current independent SHEQ business management systems of the three business units of the corporate organisation structured and managed?
v. How can the different single dimension IMS models used globally be utilised to develop one cost effective coherent multi-dimensional IMS model?

8.3 Summary of findings

8.3.1 The urgency and benefits of implementing an IMS.

The following results of the quantitative and qualitative findings indicate the benefits of implementing an IMS:

i. There will be a coherent IMS that will have a balance focus on SHEQ objectives;
ii. The duplicated SHEQ documentation will be removed;
iii. SHEQ resources will be better utilised resulting in cost savings;
iv. An IMS will be easier to manage;
v. An IMS will enable the organisation to differentiate itself from competitors; and
vi. Internal and external audits can be integrated.

8.3.2 The extent of leadership's commitment and support of an IMS

The following results of the quantitative and qualitative findings indicate the commitment and support of the senior management of the organisation:

i. The senior management of the organisation has conducted a SWOT analysis of the organisation to determine the internal strengths and weaknesses and the external opportunities of the organisation;
ii. The senior management of the organisation has considered that internal and external factors that impact the SHEQ management system and has taken the required actions;
iii. The organisation understands the SHEQ needs and expectation of stakeholders (Customers, suppliers, employees, legal and regularity compliance bodies);
iv. Participants agreed that the senior management of the organisation demonstrated committed leadership to the management systems;
v. The senior management of the organisation has set the objectives for SHEQ, and these objectives has been communicated to employees;

vi. The senior management of the organisation provides the required support and resources for the operation of the management systems and there is an allocated financial budget for SHEQ resources;
vii. The organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the management systems;
viii. The organisations reviews (monitors, measures, analyses, and evaluates) its SHEQ performance;
ix. The organisation identifies opportunities for the improvement of the SHEQ management systems;
x. All meetings commence with SHEQ feedback;
xi. Health and safety forms part of all employee's performance contracts;
xii. Compliance to Willis Blue risk management system, compliance to SMETA and Certification to ISO 14001:2015, ISO 9001:2015;
xiii. Visual display screens installed at strategic locations in the organisation to create an ongoing SHEQ awareness; and
xiv. Effluent plant installed to control Ph level of water disposed in the municipality pipelines.

8.3.3 The inherent risks and challenges of implementing an IMS and adopted strategies to overcome these risks and challenges.

The following results of the quantitative and qualitative findings indicate the inherent risks and challenges of implementing an IMS, the strategies to overcome these risks and challenges are discussed under the recommendations section:

i. The quality auditors may resist an IMS;
i. Overcoming the COVID 19 pandemic;
ii. The competitive market environment;
iii. Buy in of all stakeholders;
iv. The difficulty in maintaining disabling injury frequency rate at acceptable levels due to the manufacturing processes being mainly manual with high powered machinery;
v. Lack of funding for high technological equipment;

vi. New environmental, health and safety requirements that the organisation needs to keep abreast with and ensuring compliance to these requirements;
vii. Current organisation structure needs to be reviewed to integrate the safety, health, and environment department with the quality department;
viii. Safety, health, environment and quality policies, procedures and work instructions needs to be reviewed and combined into SHEQ policies, procedures, and work instructions;
ix. The initial workload to review the existing documentation is going to be time consuming;
x. An IMS will require an organisation culture change to SHEQ and there will be some resistance to change;
xi. The SHEQ manager position will result in a wider challenging job scope;
xii. Additional resources will be required for the implementation; and
xiii. There is no foundation for ISO 45001:2018 because the organisation is currently not certified to this standard, therefore concurrently managing the integration and certification of ISO 45001:2018 will not be easy.

8.3.4 The structure and management of the current independent SHEQ business management systems of the three business units of the corporate organisation

The following results of the quantitative and qualitative findings indicate the current structure of the organisation's management systems:

i. Health, safety, and environment department is operated separate from the quality assurance department;
ii. Each management system is managed independently;
iii. There is too much duplication of documentation across the Safety, Health, Environment and Quality management systems; and

iv. SHEQ documentation is managed on QPulse document management software.

8.3.5 The different single dimension IMS models that are used globally that can be utilised to develop one cost effective coherent multi-dimensional IMS model

Majority of the respondents believed that the IMS model will guide the documentation requirements of an IMS. In addition, the following IMS models were observed during the literature review by the researcher:

i. Annex SL IMS model uses the ISO HLS across the ISO management standards (Kopia, Kompalla and Ceauşu 2016:52);
ii. Risk based IMS model, uses a risk-based IMS approach (Emetumah 2016: 2);
iii. Organisation Strategy IMS Model aligns the IMS management system with the strategy of the organisation (Barbosa, Oliveira and Santos 2018:929);
iv. Innovation IMS model links the four perspectives of the balance scorecard to the organisation's management system (Maier, Sven-Joachim, Fortmuller and Maier 2017: 306);
v. Process approach IMS model is based on the sequence and interaction of the organisation's processes (Basaran 2018:14); and
vi. Plan, Do, Check, Act (PDCA) IMS Model is based on the continuous improvement cycle of the organisation (Gueorguiev and Sakakushev 2016: 972).

8.4 Recommendations

Based on the results of both the quantitative and the qualitative phase of the study, the following are the IMS implementation recommendations that the organisation can consider in implementing an IMS to improve its strategic position and competitiveness. The recommendations are developed around a framework that is aligned to the ISO management standards, research aim, research objectives, research questions, research literature and are presented in such a manner that facilitates bridging the gap between theory and practice. These recommendations contribute to the body of knowledge in the field of SHEQ management systems and can be adopted by other organisations that are embarking on the implementation of an IMS.

The findings indicate that respondents perceived great focus on safety, health,quality and environmental. It is recommended that the organisation continues with the various protocols that it has in place to support SHEQ culture of the organisation. However, focus must shift from a independent perspective of each management system to a more holistics SHEQ perspective that will drive the competitive strategy of the organisation.

The intention of clause 5 of the ISO annex SL is aimed to drive accountability and commitment of the leadership of an organisation toward the management systems (DNVGL 2016:4). The research findings indicate commitment from the leadership of the organisation and it is apparent that the benefits of an IMS is understood by the senior management of the organisation, hence there is sense of urgency in implementing an IMS.

It is recommended that the risk assessments and objectives are reviewed from a SHEQ perspective using the systems, sub systems and process approach. There was a high percentage of respondents who were neutral with the survey questionnaire statements on the support of the organisation’s management systems. However, the reason was clarified during the interview sessions that there was a lot of background support that stakeholders are not aware off. It is therefore recommended that resource allocation for SHEQ is shared with all

stakeholders to create a greater appreciation for the efforts in maintenance of SHEQ management.

There was a high level of agreement that the organisation has established, implemented, controls and maintains the processes needed to meet management systems requirements and to implement the planned actions. It is evident that the organisation's management understands the challenges and it is recommended that the organisation continues on the drive to differentiate itself from competitors with high levels of safety, health, environment and quality standards.

The organisation has various mechanisms in place to support this initiative. It is recommended that that this initiative must continue but from an integrated SHEQ management system perspective. It is recommended that opportunities for improvement are communicated to all stakeholders.

The research questions, findings and recommendations are illustrated in table 8.1.

8.4.1 Research questions, findings and recommendations

Table 8:1 Research questions, findings and recommendations

Research question	Finding element	Recommendation
8.3.1 The urgency benefits of implementing an IMS	Urgency IMS of implementation	The management of the organisation recognises that there are benefits to implementing an IMS, it is therefore recommended that the sooner that the implementation process commences, the sooner the organisation will reap the benefits.
	IMS benefits	The organisation needs to compare the benefits an IMS to the challenges of implementing an IMS to make an informed decision. However, it must be noted that the researcher's opinion is that the research findings argue well for an IMS.
8.3.2 The extent of leadership's commitment and support of an IMS	Management commitment	The results of the quantitative and qualitative research indicates that the management of the organisation is committed to the management systems and have set objectives for safety, health, environment and quality. However, these were conducted from independent management systems perspective and therefore needs to be reviewed from a holistic SHEQ perspective.
	SWOT analyses	It is noted that the organisation has conducted a SWOT analysis to determine the internal strengths and weaknesses and the external opportunities and threats for safety, health, environment and quality. It is recommended that the SWOT analysis is reviewed from a holistic SHEQ perspective.

	Stakeholder needs and expectations	The organisation has established the stakeholder needs and expectations. It is recommended that this is expanded to include the IMS needs and expectations of stakeholders.
	SHEQ Budget	The senior management of the organisation has allocated a budget and resources for safety, health, environment and quality. However, the budget needs to consider the additional expenses and resources required for the implementation of an integrated management system
	SHEQ performance and improvement	The performance of SHEQ is monitored, measured, analysed, and evaluated. It is recommended that the organisation establishes benchmarks key performance indicators for these and continues with this initiative against the established benchmark standards.
	Employee performance contracts	It is noted that health and safety is included in employee contracts. It is recommended that this needs to be expanded to include environment and quality
	Management systems certification	The organisation is currently certified to ISO 14001:2015 and ISO 9001:2015. It is recommended that the organisation pursues the ISO 45001:2018 certification parallel to the IMS implementation
8.3.3 The inherent risks and challenges of implementing an IMS	SHEQ culture change	IMS implementation intentions and strategies must be communicated to all stakeholders to prevent a resistance to change.
	SHEQ risks	A holistic SHEQ risk management strategy needs to be implemented using the process approach. Provision of engineering solutions and personal protective equipment control measures must be established to eliminate or

		mitigate the risks. The annual safety, health and environment legal audits that is conducted by an external legal advisor must continue and membership of Metal Packaging Association must be maintained.
	COVID 19	The organisation needs to ensure management of COVID 19 and the Occupational Health and Safety Act hazardous biological agents' regulations to ensure a safe and healthy workplace.
	Maintaining a disabling injury frequency rate of less than 0.35	The health and safety risk assessment should be reviewed, and the organisation must continue to drive the behavioural based safety system and safety awareness talks to maintain a health and safety culture
	Adherence to regulatory and statutory requirements	The organisation needs to continue with legal audits and close of findings to ensure adherence to regulatory and statutory requirements
	SHEQ organisation structure	The existing organisation structure needs to be reviewed in consideration with the proposed organogram that the researcher has presented.
	Safety, health, environment and quality policies, procedures and work instructions	The organisations safety, health, environment and quality policies, procedures and work instructions need to be reviewed and integrated from an IMS perspective

8.3.4 The structure and management of the current independent SHEQ business management systems of the three business units of the corporate organisation	Organisation structure, Management system structure,	The organisation needs to consider the proposed organogram, management system structure
	Documentation duplication	The existing SHEQ documentation needs to be reviewed and integrated and structured onto the organisation's QPulse documentation management software system.
8.3.5 The different single dimension IMS models that are used globally that can be utilised to develop one cost effective coherent multi-dimensional IMS model	IMS Model (Multi-dimensional IMS model)	The researcher has taken into cognisance of six IMS models when developing the proposed IMS model. The organisation needs to consider adopting the researcher's proposed model for an IMS.

Source: *Authors own construction*

8.4.2 Integration of SHEQ management systems

8.4.2.1 Proposed organisation structure.

The research finding indicated the need to restructure the SHEQ department with an appointed SHEQ manager in support on an IMS. Integrating the safety, health, and environment department with the quality department, that will be supportive of an IMS. The proposed SHEQ department structure is presented in Figure 8. 3

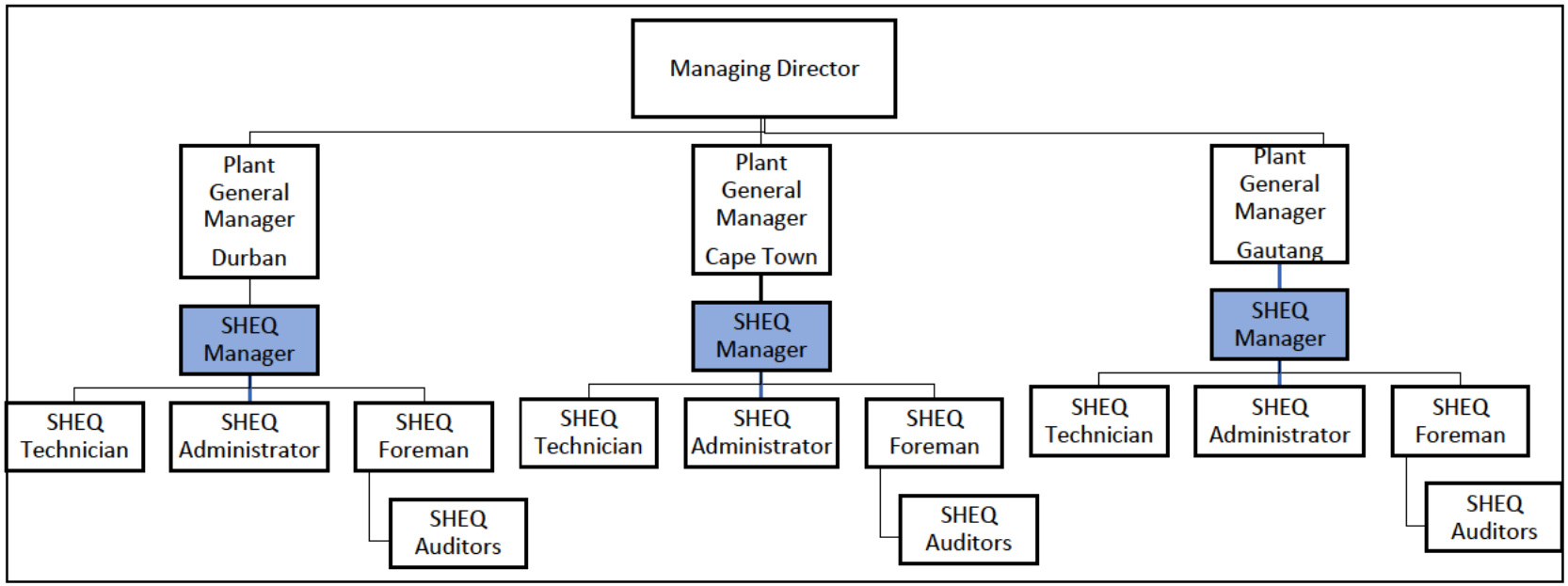


Figure 8:1 Proposed organisation IMS structure.

Source: *Author's own construction*

The concern regarding resistance of the quality auditors to the change was further clarified during the interview process and it is apparent that the quality auditors are supportive of an IMS. However, it is recommended that IMS training is provided and that there is an engagement of the quality auditors during the integration process.

It was recommended that the IMS be implemented as a project with a clear and agreed project plan. This research provided the concept, design and development of the project. The next steps of the project will be the implementation and close out stages.

8.4.2.2 Management of documentation

Emanating from the research finding, it was highlighted that there is separate documentation for each management system. The policies, procedures, work instructions, forms and checklists are based on the same business processes but from an independent safety, health, environment, and quality perspective. The quantitative and qualitative research findings supported the concept of integrating the safety, health, environment and quality check sheets and the documented systems. Considering that these policies, procedures, work instructions, and checklists are for the same business systems, it is reasonable to integrate the documentation from a SHEQ perspective. It is therefore recommended that the documents are reviewed in alignment with an integrated SHEQ management system and combined for a holistic SHEQ perspective. instructions, forms, and checklists Figure 8.1 illustrates the proposed integration of the SHEQ policies, procedures, work.

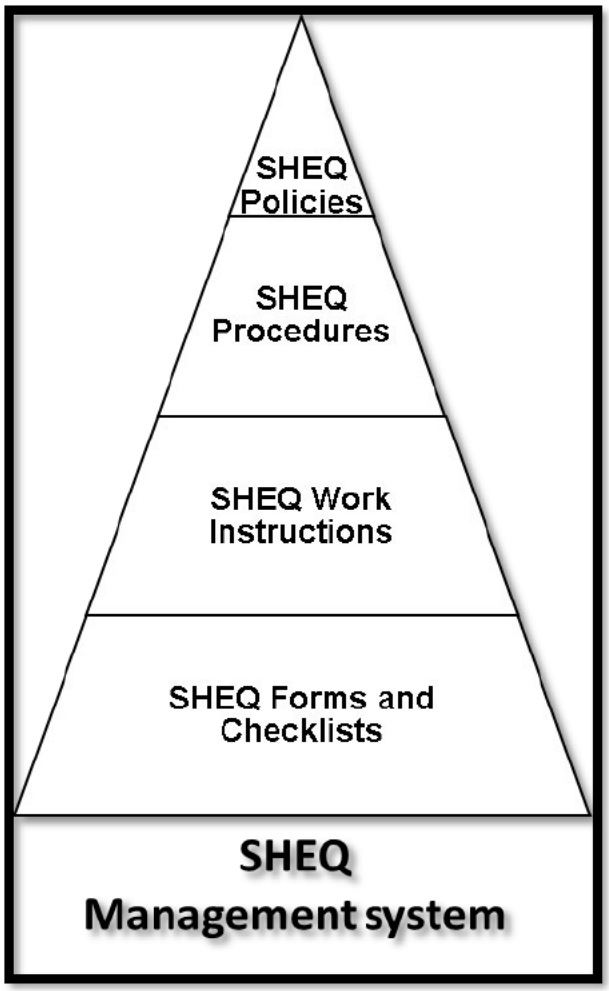


Figure 8:2 : Proposed IMS documentation management

Source: *Author's own construction*

The documentation for the independent SHEQ management systems is currently stored on QPulse document management system software and is structured by each business unit and there are different SHEQ specialists managing each management system. It is also recommended that the documentation on the QPulse documentation management system is structured accordingly.

8.4.2.3 Systems approach

As depicted in the literature review, the organisation must be viewed as a holistic system that comprises of sub systems that has processes. The sub systems and their processes must be identified and sequenced according to their interaction to create

a process map. In an IMS these sub systems and processes must be viewed from a SHEQ management system perspective and not as independent management systems (International organisation for standardisation :2015: vii). Although the safety and health, environment and quality management systems are for the same sub systems, these are currently managed independently in the researched organisation. It is recommended that the SHEQ risks assessments and objectives must be set for critical to SHEQ processes. Figure 8.2 illustrates the systems approach, showing the sequence and interaction of sub systems and that is recommended for the integration of the ISO 45001:2018 OHS management system, ISO 14001:2015 EMS management system and ISO 9001:2015 quality management system that illustrates the coherent integrated SHEQ management system that supports the organisation processes.

Figure 8.2 illustrates the proposed perspective of the organisation's processes that depicts an SHEQ IMS.

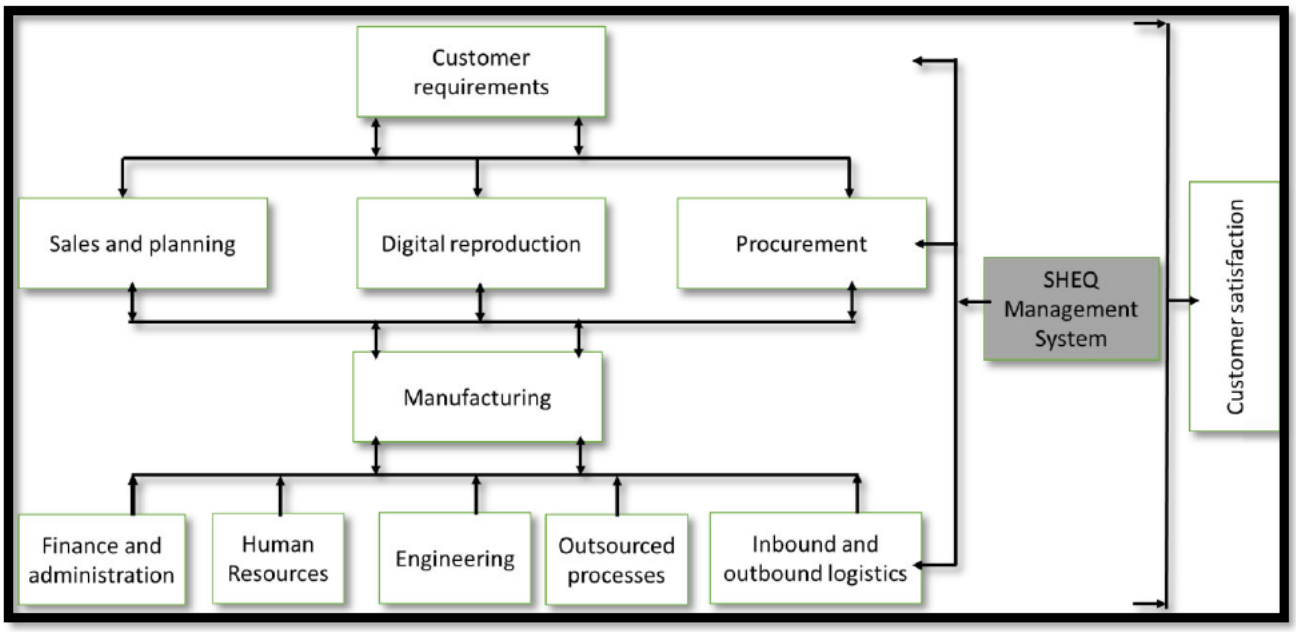


Figure 8:3 Proposed IMS structure, showing the sequence and interaction of processes that forms the Integrated management system

***Source**: Author's own construction*

8.4.2.4 Proposed ISO IMS structure

ISO annex SL supports the notion of IMS, Figure 8.4 illustrates the proposed combination ISO 45001:2018 Occupational Health and Safety management system, ISO 14001:2015 Environmental Management System and ISO 9001:2015 Quality Management System into one coherent SHEQ management system using annex SL.

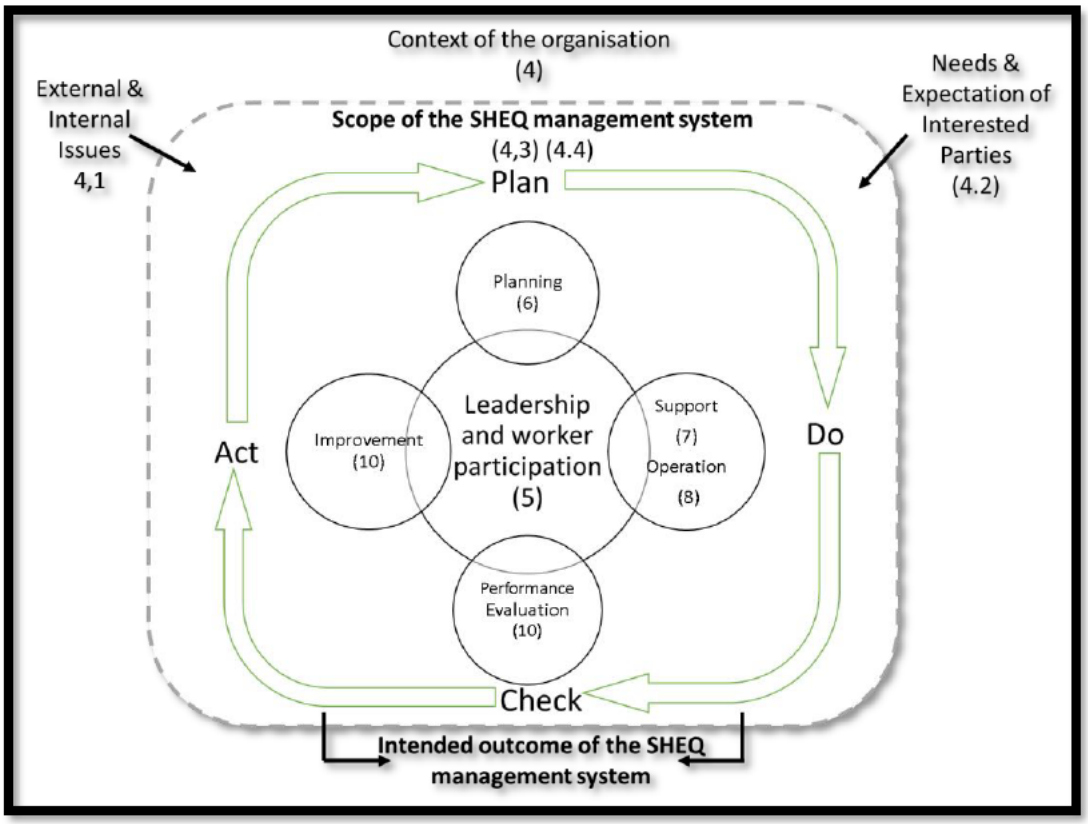


Figure 8.4 Integrated management system

***Source**: Adapted from ISO 45001:2018; ISO 14001:2015 and ISO 9001:2015*

Stemming from the discussion on the ISO high level structure and annex SL in the literature review, figure 8.1 illustrates how the requirements of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 can be integrated. The underlining perspective will be from a SHEQ perspective rather than independent perspective for each standard. IMS requirements.

Table 8:2 IMS requirements

1. Scope Refers to the scope and the intended outcomes provided in the ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 standards.
2. Normative references There are no normative references in the ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 standards.
3. Terms and definitions Refers to the interpretation of the terms and definitions provided in the 45001:2018, ISO 14001:2015 and ISO 9001:2015 standards. to prevent any misinterpretation of the terms and definitions used in the standard.
4. Context of the organization 4.1 The organisation to determine internal and external issues that may impact on the intended objectives of the occupational health and safety outcome, intended objectives of the EMS and issues that may impact on the QMS 4.2 The organisation to determine and understand the SHEQ needs and expectations of all the organisations stakeholders. 4.3 The organisation to determine the scope of the OHSMS, EMS and QMS considering 4.1, taking into account 4.2 and taking into account the planned or performed work-related activities. The scope of the OHSMS, EMS and QMS must be documented and available. 4.4 Establish the OHSMS, EMS and QMS using interactive processes to achieve desired outcomes and deliver continual improvement of the organisation's OHS, EMS and QMS performance.
5. Leadership and worker participation 5.1 The senior management of the organisation to take responsibility and accountability of the OHSMS, EMS and QMS by providing SHEQ resources, and establishing OHS, EMS and QMS objectives. 5.2 The senior management to establish, implement and maintain SHEQ policy that includes the following:

i. Commitment to provide a safe working environment, a framework to set OHS objectives, fulfil OHS legal requirements and other requirements, eliminate hazards and reduce OH&S risks, continual improvement and consultation and participation of workers and worker representatives,
ii. Commitment to protect the environment, a framework to set EMS objectives, fulfil legal requirements and other requirements, eliminate or reduce environmental risks and continually improve the EMS,
iii. Commitment to satisfy applicable QMS requirement, a framework to set QMS objectives, fulfil QMS legal requirements and other requirements, quality risks and continual improvement of the QMS,

5.3 Senior management to assign, communicate and document OHS, EMS and QMS roles and responsibilities,

5.4 The organisation to ensure consultation and participation of all worker and representatives, in the development, planning, implementation, performance evaluation and actions for improvement of the OHSMS, EMS and QMS.

6. Planning

6.1 The organisation to plan the OHSMS, EMS and QMS considering the context of the organisation, interested parties and, the scope of the OHS management system. The organisation to determine, assess and document the SHEQ risks and opportunities, considering the effectiveness of existing controls. The organisation to determine and document legal requirements and other requirements. The organisation also must plan actions to address risks and opportunities, action legal requirements and prepare for and respond to emergency situations.

6.2 The organisation to determine OHS, EMS and QMS objectives in order to maintain and continually improve the OHSMS, EMS and QMS and performance.

7. Support

7.1 The organisation to determine and provide the required OHS, EMS and QMS resources.

7.2 The organisation must determine and provide the required competence for employees to achieve the OHSMS, EMS and QMS objectives.

7.3 The organisation must create employee awareness regarding the SHEQ policy, objectives, employee contribution, risks, opportunities, incidents, outcome of investigations and the consequence of non-compliance.

7.4 The organisation to provide relevant OHS, EMS and QMS communication internally to all levels of the organisation and also to external interested parties.

7.5 The organisation is required to maintain, and control documented information of internal and external origin.

8. Operation

8.1 The organisation to plan, implement, control and maintain the processes needed to meet requirements of the OHSMS, EMS and QMS, and to implement the actions determined under section 6.1. Establish, implement and maintain a process(es) for the elimination of hazards and reduction of OHS, EMS and QMS risks. Control planned temporary and permanent changes that impact OHS, EMS and QMS performance. Control procurement that impacts on OHS< EMS and QMS conformity. Control outsourced process.

8.2 Implement and maintain an emergency preparedness and response process/es.

9. Performance

9.1 The organisation to establish, implement, maintain a process(es) for monitoring, measurement, analysis, and performance evaluation of the OHSMS, EMS and QMS. Evaluate legal and other requirements and take action.

9.2 The organisation to establish, an SHEQ audit programme, conduct audits to establish SHEQ management system compliance.

9.3 The senior management to review the SHEQ management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness.

10. Improvement

10.1 The organisation to determine opportunities for improvement and implement necessary action to achieve the intended outcome of the SHEQ management system.

10.2 The organisation to take control, correct, deal with adverse impacts and take preventive action of non-conformities.

10.3 The organisation to continually improve the SHEQ management system to enhance performance.

Source: *Adapted from ISO 45001:2018; ISO 14001:2015; and ISO 9001:2015*

8.4.2.5 Researched unidimensional models

The recommendation for the IMS considers the various single dimension models, annex SL, risk based, strategic, innovation, process based and PDCA models depicted in chapter 2 of this research. Table 8.4 illustrates the recommended use of these researched models

Table 8:3 IMS unidimensional and multi-dimensional models

	Unidimensional IMS Models	Proposed Multidimensional model
1	Annex SL high level structure	The proposed multidimension model uses annex SL high level structure. The researcher has presented in table 8.3 the recommended use of annex SL high level structure for an IMS
2	Risk based model	The recommendation includes the recommendation for the systems approach using a risk-based strategy
3	Innovation model	The recommendations contextualising the organisation considering innovation. Innovation is also included in the PDCA approach
4	Process based model	The recommended model is based on the system, sub system, process approach
5	PDCA Model	The recommended model uses the PDCA continuous improvement cycle

Source: *Author's own construction*

Table 8.4 illustrates 5 unidimensional IMS models that various organisation used to implement their IMS. However, these models view an IMS from one dimension, hence the model depicted in figure 8.5 proposes a more comprehensive multi-dimensional model that considers the five unidimensional models depicted in Table 8.4 and figure 8.5.

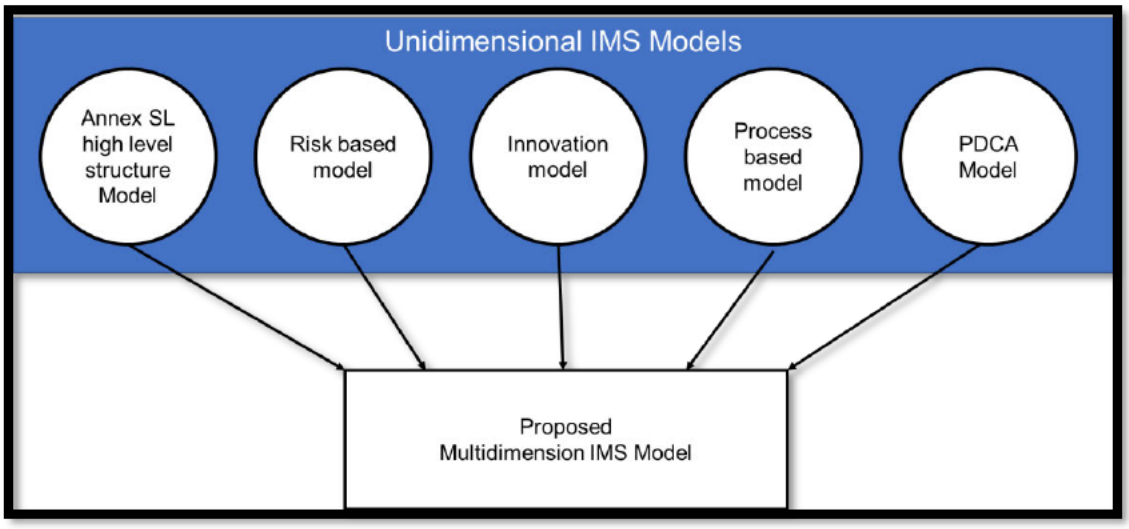


Figure 8:4 Unidimensional models combined to a Multidimensional model

***Source**: Author's own construction*

8.4.2.6 Proposed IMS Model

Figure 8.6 illustrates the proposed model for an IMS.

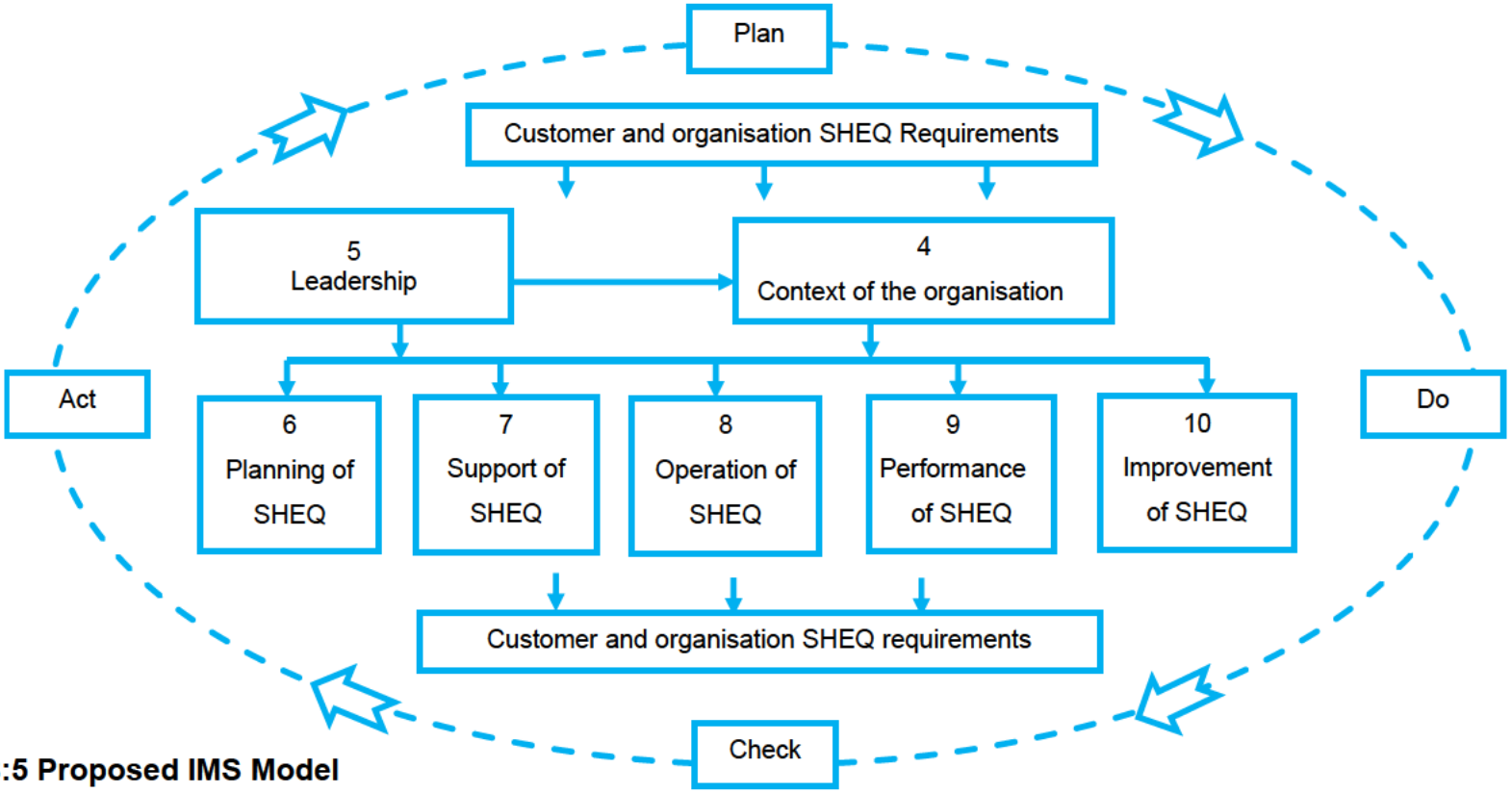


Figure 8:5 Proposed IMS Model

***Source**: Author's own construct*

As per foregoing recommendations Figure 8.6 illustrates the proposed IMS model that must be supported by the organisation's SHEQ management structure, documentation structure, organisation structure and alignment of the ISO annex SL, as depicted in table 8.3. It is envisaged that the proposed models consider innovation based on the continuous improvement PDCA cycle, is process and risk based and uses the annex SL framework.

8.4.2.7 Key elements of the proposed model

i. The proposed model is based on quality guru William Edward Deming's Plan, Do, Check, Act (PDCA) continuous improvement cycle using the systems approach. "Plan" will involve the planning of the IMS, "Do" involves the implementation of the IMS, "Check" involves verifying accomplishment of the IMS objectives and "Act" involves initiatives for realignment of objectives that are not met. The PDCA cycle is a continuous improvement initiative (Muzaimi, Chew and Hamid 2017: 2);
ii. The IMS is dictated by the market that the organisation serves, therefore when establishing the context of the organisation, the organisation should conduct a SWOT analysis. (Barbosa, Oliveira and Santos 2018:925), hence the starting point is to determine the internal and external factors that impacts on the organisation's IMS. The organisation must consider the fourth industrial revolution environment and how the organisation can benefit from the technology and the internet of things when contextualising the organisation as per requirement 4;
iii. The IMS is driven by requirement 5, the commitment of the leadership of the organisation Hoyle (2018: 67) and Tahir (2017: 18), this suggests that the leadership of an organisation is responsible to determine the context of the organisation, provide SHEQ strategic direction, provide IMS resources, build the foundation for the SHEQ culture, and support the IMS;
iv. Requirements 6 to 10 is based on the requirements of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 but from a SHEQ perspective;

v. Requirement 6 involves planning of the IMS and the SHEQ strategy will use a risk approach based on the context of the organisation;
vi. Requirement 7 involves providing the SHEQ resources and building an organisation SHEQ culture;
vii. Requirement 8 involves the planning, implementation, control, and maintenance of the processes needed to meet SHEQ requirements, considering the SHEQ risks;
viii. Requirement 9 involves the implementation of processes to evaluate the performance of the IMS, which includes schedule audits and IMS management reviews;
ix. Requirement 10 involves the continual improvement of the SHEQ IMS by identifying and implementing opportunities for improvement. The opportunities for improvement can emanate during establishing the context of the organisation or from audits;
x. The IMS needs to be guided by ISO Annex SL and proposed requirements as illustrated in table 7.1; and
xi. The ultimate objective is the satisfaction of the customer and organisation SHEQ requirements.

8.4.3 Recommendation: Implementation and maintenance of SHEQs

Emanating from the literature review (Majerník, Daneshjo, Chovancova and Sanciova 2017: 136) and Kopia, Kompalla and Ceauşu (2016:52), quantitative and the qualitative research findings, it was recommended that the implementation of the IMS must be implemented as a project with a detailed project plan using the following steps:

i. Appoint a project manager and project team;
ii. Restructure the SHEQ staff;
iii. Using annex SL and the proposed IMS model implement the IMS;
iv. Review the structure of the management system, using the systems approach by identifying the sub systems and processes and sequencing these by their interaction;

v. Compile a SHEQ policy manual;
vi. Review the existing documented procedures, work instructions, forms and check sheets and structure these in alignment with SHEQ;
vii. Conduct a systems audit to ensure adherence to the ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 requirements;
viii. Conduct a process audit to verify that the documented IMS system is in alignment with organisation practices;
ix. Schedule legal audit to verify compliance to legislation;
x. Schedule an external audit by the certification body;
xi. Schedule internal audits to verify compliance; and
xii. Schedule management reviews to validate effectiveness and adequacy of the IMS.

8.5 Recommendations for future research

The research was confined to the three business units of a metal packaging organisation, and it is recommended that the research is expanded to other industries and a wider research population.

8.6 Research knowledge contribution

The research problem indicated that there was not a clear understanding of the implementation of integrated management systems that resulted in the organisation's hesitancy in implementing an IMS. This study addressed these concerns by researching literature and conducting quantitative and qualitative research analysis, that resulted in a proposed organisation organogram, SHEQ documentation structure, IMS structure, an overview of the systems approach and a proposed IMS model that considered five unidimensional IMS models.

The proposed IMS model presents a holistic approach to implementing an IMS that the organisation can use. The researcher has presented an IMS overview to the

senior management of the organisation, who supports the notion of an IMS based on the proposed model and recommendations.

8.6.1 Systems approach

Kiran (2016: 64), describes a system as a set of sub systems and processes that synchronise together to achieve an objective and an organisation comprises of multiple systems with multiple objectives. The research study builds on the systems theory by transforming safety and health management system, environment management system and quality management system into sub systems and integrating these into one coherent integrated management system. Figure 8.5 illustrates the current management system structure and figure 8.6 illustrates the integration of safety and health management system, environment management system and quality management system. The safety and health management system, environment management system and quality management system become sub system of the integrated management system.

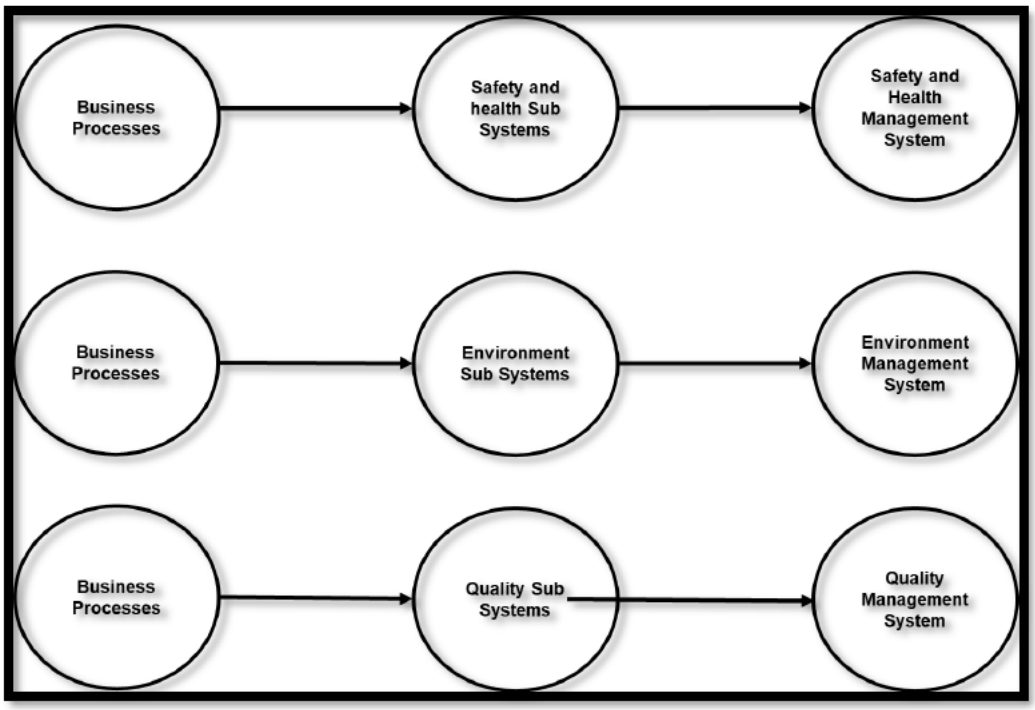


Figure 8:6 Current management systems structure

***Source**: Author's own construction*

Figure 8.7 illustrates the proposed IMS structure

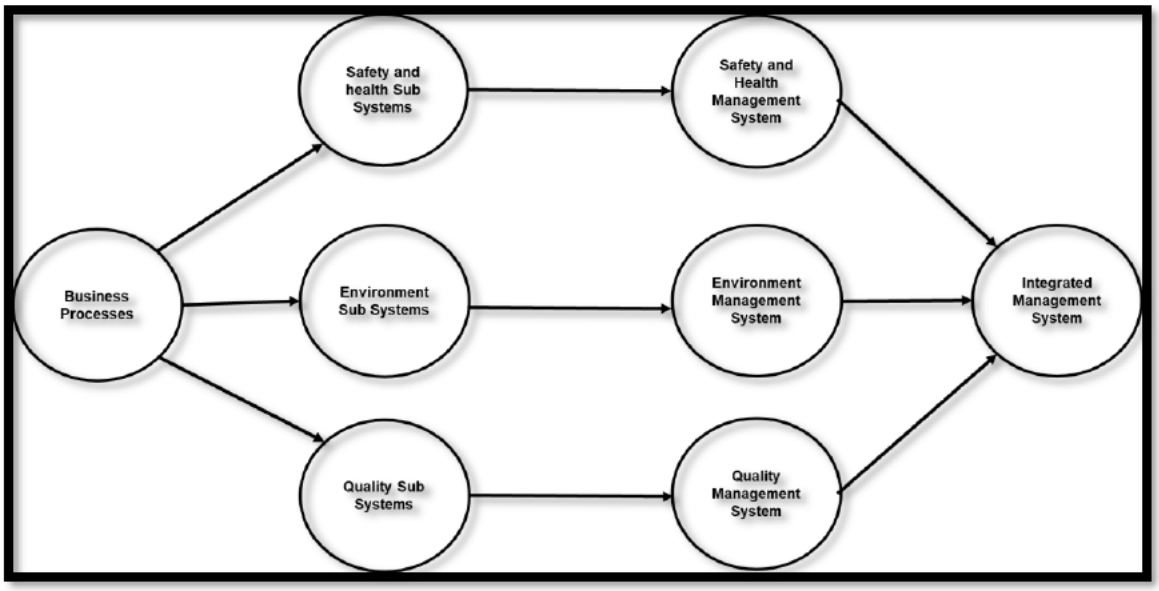


Figure 8:7 Integration of multiple systems to form one system

***Source**: Author's own construction*

Considering the volatile environment that organisation operate in, it argues well for organisations to adopt a wider strategic IMS perspective. The proposed IMS model integrates ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 and provides a multidimension IMS model that considered the five researched unidimensional IMS models.

8.7 Research limitations

This research study had the following limitations:

i. A case study research approach was used based on three business units of the metal division of one packaging organisation and therefore, the findings may not be representative of other packaging organisations. However, a description of the research process and participants are provided in this research to enable readers to make a transferability judgement of the qualitative data to other settings;

ii. The research was based on the organisation's three metal division branches that are located in three different South African provinces, Gauteng, Cape Town and KwaZulu-Natal and does not represent any of the organisation's other business units; and
iii. The research was confined to the integration of ISO 45001:2018, ISO 14001:2015 and ISO 9001:2015 and none of the other ISO standards.

The recommendation for the IMS considers the various single dimension annex SL, risk based, strategic, innovation, process based and PDCA models depicted in chapter 2 of this research.

An IMS offers organisations an opportunity for continual improvement, however organisations must also evaluate the risks and challenges against the benefits of implementing an IMS.

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9 APPENDIX 1: ETHICS CLEARANCE LETTER

MANAGEMENT SCIENCES: FACULTY RESEARCH ETHICS COMMITTEE (FREC)

7 October 2020

Student Name: **Mr MM Nadar**

Student No: 18251052

Dear Mr MM Nadar

DOCTOR OF PHILOSOPHY IN MANAGEMENT SCIENCES: QUALITY MANAGEMENT

TITLE: An integrated safety, healthy, environment and quality management system for a multibusiness packaging organisation in South Africa.

Please be advised that the FREC Committee has reviewed your proposal and the following decision was made: **Approved – Ethics Level 2**

Date of FRC Approval: 7 October 2020

Approval has been granted for a period of two years from the above FRC date, after which you are required to apply for safety monitoring and annual recertification. Please use the form located at the Faculty. This form must be submitted to the FREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the FREC according to the FREC SOP's. Please note that ANY amendments in the approved proposal require the approval of the FREC as outlined in the FREC SOP's.

Yours sincerely

Prof JP Govender

Chairperson: Faculty Research Ethics Committee

10 APPENDIX 2: GATEKEEPERS LETTER

NAMPAK DIVFOOD - MOBENI
25 RICHARD CARTE ROAD
MOBENI
P.O. BOX 12650
JACOBS 4026
SOUTH AFRICA
TEL: +27 (31) 450 5811
FAX: +27 (31) 462 7738 (ADMIN)
WEBSITE: www.n
DURBAN
4052
ampak.com

11 February 2020

To: DUT Research Committee

Dear Sir / Madam

Re. Consent to conduct Postgraduate Research

Consent is hereby granted for Mr Manikam Michael Nadar, Identitity number 630910 5202 08 8, student number 182 51052 to conduct his research on Quality Management at DivFood for his Doctor of Philosophy in Management science, specialising in Quality Management at the Durban University of Technology.

The business is currently facing economic challenges but every effort will be made to support Mr MM Nadar with the required information for his studies.

Yours Faithfully

General Manager
Malusi Msomi
Nampak DivFood Durban

11 APPENDIX 3: LETTER OF INFORMATION AND CONSENT

LETTER OF INFORMATION

Title of the Research Study: An integrated Safety, Health, Environment and Quality Management System for a multi-business packaging corporate in South Africa

Principal Investigator/s/researcher: (Name, qualifications)

Student / researchers name: Manikam Michael Nadar:

Current qualification: Master's Degree in the Philosophy of Quality Management

Registered programme: Doctor of Philosophy in Quality Management

Co-Investigator/s/supervisor/s: (Name, qualifications)

Dr M Ramchander: Doctor's Degree in the Philosophy of Quality Management

Brief Introduction and Purpose of the Study:

Scope of the study : This study explores the challenges of integrating the independent Safety, Health, Environment and Quality (SHEQ) management systems across three complex business units of a selected corporate packaging organisation that are in three South African provinces.

Statement of purpose

The aim of this study is to explore the independently managed SHEQ systems of a selected corporate packaging organisation that are in three provinces in South Africa against the different SHEQ integrated management system (IMS) models of globally researched organisations. The primary objective of the study is to develop a multi-dimensional IMS model to implement across the three business units of a corporate packaging organization in South Africa.

Outline of the Procedures: (Responsibilities of the participant, consultation/interview/survey details, venue details, inclusion/exclusion criteria, explanation of tools and measurement outcomes, any follow-ups, any placebo or no treatment, how much time required of participant, what is expected of participants, randomization/ group allocation)

Research Methodology

This study will adopt a mixed qualitative and quantitative method to achieve a balanced approach using the case study research design. The population for the study is the 500 operational, middle and senior management employees of the organization and the sample will comprise 217 employees, which is deemed to be appropriate according to Sekaran and Bougie's (2016: 294) population to sample table of calculations. A 5-point Likert Scale questionnaire survey will be used to gather data from participating respondents and exploratory data will also be collected through personal face to face interviews.

Risks or Discomforts to the Participant

There are no risks or discomforts to the participants of this study

Benefits:

- The research will determine the challenges facing the three business units of a selected corporate organisation in implementing an integrated SHEQ management system.
- The research study will be used to develop a multi-dimensional model to overcome these challenges.
- The research study will be used to develop a model to implement a multi-dimensional integrated SHEQ management system that will be easier to manage, more cost effective, using lesser resources to manage and aligned to a common goal of the organization.
- The basis of this study will be used to produce publications in journals accredited by DHET.

Reason/s why the Participant May Be Withdrawn from the Study:

None **Remuneration:**

None

Costs of the Study:

R15 000

Confidentiality:

The anonymity and confidentiality of all the questionnaire participants will maintain to ensure that the study is conducted ethically. Participants will be assured that their names will not be revealed and that their participation will not be disclosed. Information collected for this research will be kept a secret and will not be used for any other purpose.

Research-related Injury: There are no identifiable injury risks.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher Mr. MM Nadar (Ravi) on (083 654 0627), my supervisor Dr M Ramchander on (074 400 4400) or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the DVC: Research, Innovation and Engagement Prof S Moyo on 031 373 2577 or moyos@dut.ac.za.

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population e.g. isiZulu.

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Mr Manikam Michael Nadar, about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: __,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant	**Date**	**Time**	**Signature / Right Thumbprint**

I, Manikam Michael Nadar herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Manikam Michael Nadar	01 June 2020	
Full Name of Researcher	**Date**	**Signature**
Full Name of Witness (If applicable)	**Date**	**Signature**
Full Name of Legal Guardian (If applicable)	**Date**	**Signature**

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level

- use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counselling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of

Health, 2004).

If anyone makes a mistake completing this document e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and*

Processes

http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/

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http://www.nhrec.org.za/?page_id=14

12 APPENDIX 4: QUESTIONNAIRE

Survey Questionnaire

Integrated Safety, Health, Environment and Quality Management (SHEQ) Management System

Dear Work Colleague

I am studying for my Doctor of Philosophy Degree in Management Science, specialising in Quality Management and would appreciate it if you can please complete this survey questionnaire, which measures employee's perception of Nampak Divfood' s Safety, Health, Environment and Quality management systems.

This survey questionnaire is solely for research purpose and will be anonymous and confidential. The results will be used to develop a proposed framework to integrate the Safety, Health, Environment and Quality management systems.

The questionnaire consists of two sections, **please answer all questions.**

Section A covers Biometric Data.

Section B comprises 40 statements addressing the research topic.

Section A

Biometric Data

i.Race

☐ Black African

☐ White

☐ Coloured

☐ Asian

☐ Other

ii.Gender

☐ Male

☐ Female

iii.Age

☐ < 30 Years

☐ 30 years – 39 Years

☐ 40 Years – 49 Years

☐ 50 Years – 59 Years

☐ 60 Years – 69 Years

☐ > 69 Years

iv. Job Category

☐ Senior Management

☐ Middle Management

☐ Operational Staff

v. Department

☐ Sales

☐ Production

☐ Quality Assurance

☐ Finance and administration

☐ Engineering

☐ Human resource

☐ Logistics

☐ Other

vi. Province

☐ Gauteng

☐ KwaZulu-Natal ☐ Cape Town

vi. I audit the following management systems:

☐ Safety and health

☐ Environment

☐ Quality

☐ Safety, Health, Environment and Quality (SHEQ)

☐ None of the above

Section B

On a five-point Likert scale ranging from a value of (1☹) "strongly disagree" to a value of (5) "strongly agree" please indicate with an X the extent to which you agree or disagree to the following statements

ISO Requirements	No.	Question	1 ☹ STRONGLY DISAGREE	2 DISAGREE	3 😐 Neutral	4 AGREE	5 STRONGLY AGREE
[redacted]	1	My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's **quality management system.**					
	2	My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's **environmental management system.**					

	3	My organisation's management has determined the external factors (Political, Economic, Social, Technological, Legal and Environmental) that may impact on the strategic direction of the organisation's **health and safety management system**					
	4	My organisation understands the **quality** needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)					
	5	My organisation understands the **environmental** needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)					
	6	My organisation understands the **occupational health and safety** needs and expectation of stakeholders (Customers, suppliers, employees, legal & regularity compliance bodies)					
	7	Top management demonstrates committed leadership with respect to the **quality management system.**					
	8	Top management demonstrates committed leadership with respect to the **environmental management system.**					

	9	Top management demonstrates committed leadership with respect to the **occupational health and safety management system**					

	10	My organisation has completed a product **quality** risk assessment					
	11	My organisation has completed a **environmental** risk assessment					
	12	My organisation has completed an employee o**ccupational health and safety** risk assessment					
	13	My organisation has determined its **quality** objectives					
	14	My organisation has determined its **environmental** objectives					
	15	My organisation has determined its **occupational health and safety** objectives					
	16	My organisation has communicated its **quality** objectives to employees					

	17	My organisation has communicated its **environmental** objectives to employees					
	18	My organisation has communicated its **occupational health and safety** Objectives to employees					
	19	My organisation provides the necessary resources needed for the operation of the **quality** management system					
	20	My organisation provides the necessary resources needed for the operation of the **environmental management system**					
	21	My organisation provides the necessary resources needed for the operation of the **occupational health and safety management system**					
	22	My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the **quality management system**					
	23	My organisation has measures in place to manage (Plan, organise, lead and control) the					

		processes relating to the **environmental management system**					
	24	My organisation has measures in place to manage (Plan, organise, lead and control) the processes relating to the **occupational health and safety management system**					
[redacted]	25	My organisations reviews (monitors, measures, analyses, and evaluates) its **quality** performance					
	26	My organisations reviews (monitors, measures, analyses and evaluates) its **environmental** performance					
	27	My organisations reviews (monitors, measures, analyses and evaluates) its **occupational health and safety** performance.					
	28	My organisation identifies opportunities for the improvement of the **quality management system**					
	29	My organisation identifies opportunities for the improvement of the **environmental management system**					

	30	My organisation identifies opportunities for the improvement of the **occupational health and safety management system**					
	31	My organisation provides resources for the improvement of the **quality management system**					
	32	My organisation provides resources for the improvement of the **environmental management system**					
	33	My organisation provides resources for the improvement of the **occupational health and safety Management System**					
	34	I feel that there is too much duplication of documentation across the Safety, Health, Environment and Quality management systems					
	35	I feel that there is too much duplication of meetings across the Safety, Health, Environment and Quality management systems					
	36	I feel that the different auditing check sheets used can be combined into a single auditing check sheet across the Safety, Health, Environment and Quality management systems					

	37	I feel that an integrated SHEQ Management System will be easier to manage					
	38	I feel that an integrated SHEQ Management System will result in better utilisation of resources					
	39	I feel that an integrated SHEQ management System will result in cost saving benefits					
	40	I feel that the Quality auditors would resist an Integrated Management System due to the additional workload (Safety, Health, Environment and Quality auditing)					

Please email completed questionnaires to: ravi.nadar@nampak.com

Thank you for your time in answering this questionnaire: **Manikam Michael Nadar (Ravi)**

13 APPENDIX 5: INTERVIEW GUIDE

Measuring Instrument – Interview Questions

MM Nadar

Integrated Safety, Health, Environment and Quality Management (SHEQ)

Management Systems

1. Context of the organisations

1.1 What are the external factors that impacts on the organisations SHEQ management systems that the organisation has considered and what measures have been taken?

1.2 What are the internal factors that impacts on the organisations SHEQ management systems that the organisation has considered and what measures have been taken?

2. Leadership

2.1 The quantitative research reflected that, respondents perceived greater leadership commitment towards safety, health and quality compared to the environmental management system. Can you comment on this finding?

2.2 What is the urgency of implementing an integrated management system?

3. Planning

The quantitative research survey reflected that the majority of the respondents agreed or strongly agreed that the organisation has completed

SHEQ risk assessments and has set SHEQ objectives. Does the organisation consider SHEQ risks when setting SHEQ objectives?

4. Support

There was a high percentage of respondents who were neutral with the survey questionnaire statements on the support of the organisation's management systems. What do you perceive was the reasons for this response?

5. Operation

To ensure the successful implementation of an IMS, the SHEQ challenges needs to be understood and a strategy needs to be developed to manage these challenges. What are the organisations' SHEQ operational challenges and does the organisation have a strategy to manage these?

6. Performance evaluation

What performance measurements does the organisation have for SHEQ?

7. Improvement

7.1 Has the organisation considered the fourth industrial revolution opportunities for improvement and what opportunities has the organisation identified for SHEQ?

7.2 There was a high percentage of respondents who were neutral with the survey questionnaire statements on the improvement of the organisation's management systems. What do you perceive was the reasons for this response?

8. Integrated SHEQ Management System

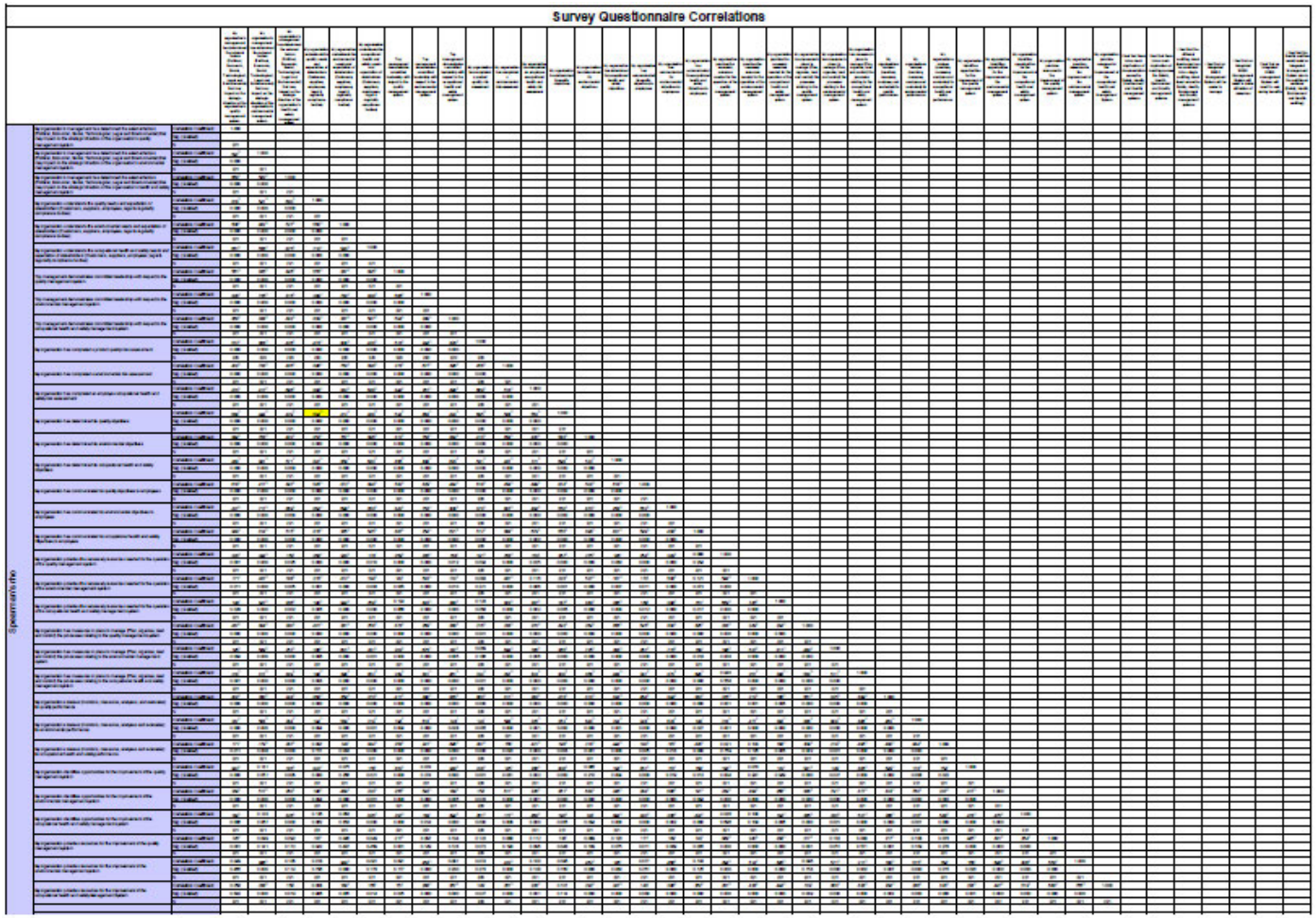
8.1 What is your perspective of an IMS?

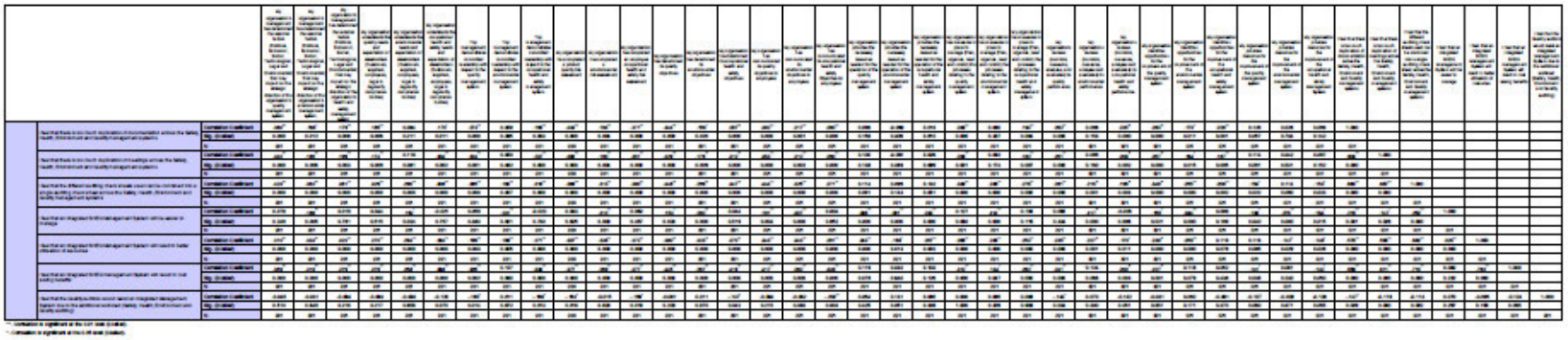
8.2 The quantitative survey questionnaire reflected that 84.6% of the respondents agreed or strongly agreed that there was too much duplication across the independently managed SHEQ systems. How can these documentations be reduced?

8.3 The quantitative survey questionnaire reflected that 21.3% of the respondents agreed or strongly agreed that the quality auditors would resist an IMS due to the additional workload. What is your viewpoint of the resistance of the quality auditors?

8.4 What are the challenges that you foresee with the implementation of an IMS?

14 APPENDIX 6: SPSS CORRELATIONS





15 APPENDIX 7: ETHICS CERTIFICATE

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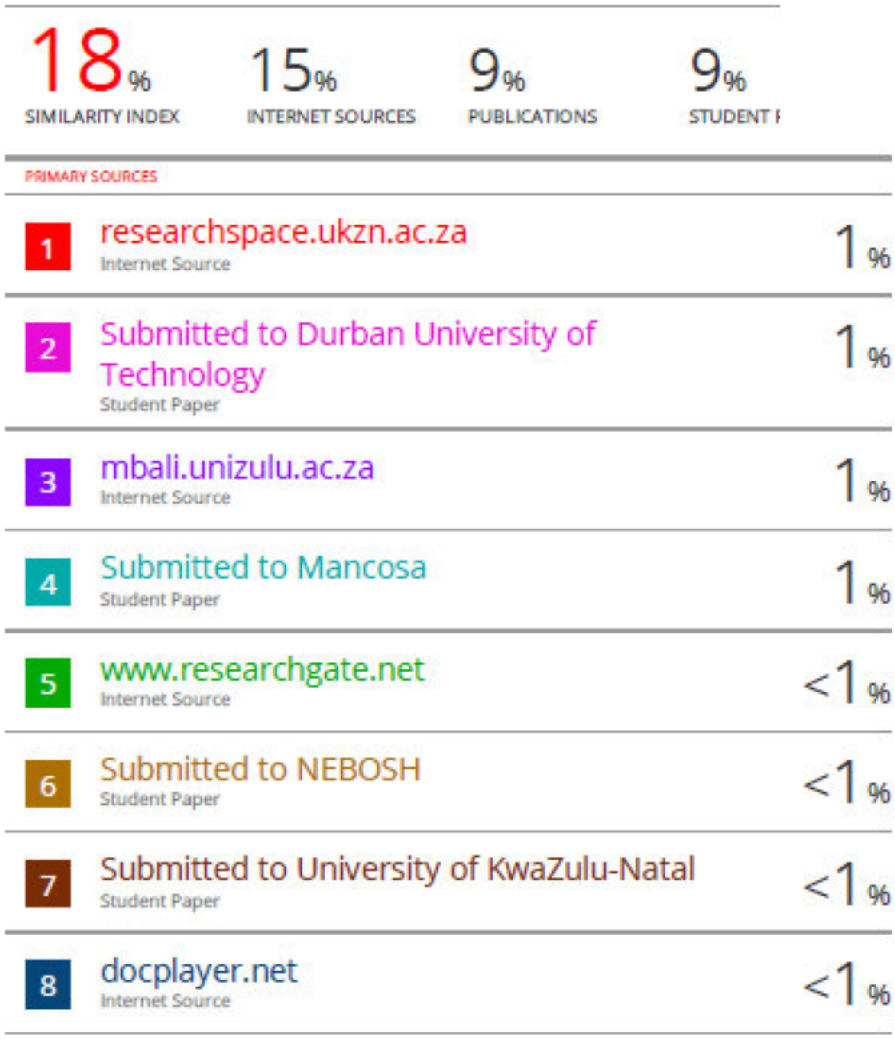
[REV : 20220217]

16 APPENDIX 8: TURNITIN REPORT

Turnitin Originality Report

An integrated safety, health, environment and quality management system for a multi-business packaging organisation in South Africa.
Class Name: master's and PHD students
Class ID :37074802
Submission ID: 2054385734
Submission Date: 07-Apr-2023 01:57PM (UTC+0200)
Submission Count: 2
File Name: MM_Nadar_Turnitin_07042023_V2.docx
File Extension: docx
File Size: 8.47M
Character Count: 360337
Word Count: 62066
Page Count: 285



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17 APPENDIX 9: EDITING CERTIFICATE LETTER

Dr. Maleni Thakur 92 Victoria Road, Hillary, Durban, 4094

B. Tech: Journalism, M. Phil: Quality Management 031-4645041 / 078 5442461

Ph.D. Public Admin (DUT) maleni.thakur@gmail.com

- **EDITING CERTIFICATE LETTER**

Date: 29 May 2022

Re: Mr. Manikam Michael Nadar

Student Number: 18251052

Doctorate dissertation: AN INTEGRATED SAFETY, HEALTH, ENVIRONMENT AND QUALITY MANAGEMENT SYSTEM FOR A MULTI-BUSINESS PACKAGING ORGANISATION IN SOUTH AFRICA

I confirm that I have proof-read, language edited and lay-out edited the abovementioned work by the doctorate candidate **Mr. Manikam Michael Nadar**.

The work was returned to the candidate with evidence of track changes and implementations to be undertaken. The correct implementation of the changes in the text and references is the responsibility of the student. The final edited version was returned to the student on 29 May 2022 via email.

I am satisfied that the editing and proof-reading of the above-mentioned work meets the post-graduate guidelines as set-out.

Sincerely,

Dr. Maleni Thakur (Editor)