DURBAN UNIVERSITY OF TECHNOLOGY

EMPLOYEE FACTORS INFLUENCING PRODUCT QUALITY WITHIN MANUFACTURING AT SKYBLU TECHNOLOGIES (PTY) LTD. DURBAN

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EMPLOYEE FACTORS INFLUENCING PRODUCT QUALITY WITHIN MANUFACTURING AT SKYBLU TECHNOLOGIES (PTY) LTD. DURBAN

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APPROVED FOR FINAL SUBMISSION

Supervisor Prof M. Ramchander Signat ate: 10 April 2025

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Vernon Packreeappen

Student Number: 20607443

15 November 2024

DEDICATION

This dissertation is dedicated to my late Dad, Govindsamy Packreeappen who would have been proud of my achievements today, and to my Mum, Roobathiamma Packreeappen for standing by me and always encouraging me to do better. This dedication is also extended to all those in my personal and professional life who have been supportive and encouraging during my studies for my degree in the Master of Philosophy in Quality Management.

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ABSTRACT

The electronic goods manufacturing sector in South Africa is an extremely competitive environment with global price parity adding to the difficulty in positioning organisations in a favourable competitive position. Product quality is the minimum expectation from customers that havenumerous product range options to select from. The research is based on SkyBlu Technologies (Pty) Ltd, based in Mount Edgecombe, Durban, South Africa, an electronics contract manufacturing facility specialising in the design and manufacture of digital satellite decoders, television sets and consumer electronics.

Employee behaviour influences the culture of an organisation that ultimately contributes to the level of product quality. The aim of this study was to ascertain employee factors that influence product quality and the objectives were to ascertain employees' understandings of quality, to ascertain if the employees understand their job specific quality requirements and to ascertain if quality objectives are clearly defined.

A quantitative research approach was utilised to gather and analyse the data. A cross-sectional survey was conducted, with data collected through a self-administered questionnaire. Statistical analysis was performed to extract the necessary information to achieve the study's objectives.

The research study's findings show that employees at SkyBlu Technologies generally have positive perceptions of product quality, expressing strong support for the company's quality assurance processes, work instructions, and leadership. However, the results also identify areas for improvement, specifically regarding the availability and upkeep of resources, the integration of technology, and the balancing of production demands with quality standards. By addressing these issues, SkyBlu Technologies can further improve its product quality and foster a work environment that encourages continuous product enhancement.

Recommendations were made to address the findings of this research, to close the gap and place the organisation in a more strategic competitive position.

The research has contributed knowledge by extending the understanding of the influence of employee behaviour on product quality. This research can be applied to other manufacturing organisations to enhance employee contribution to product quality.

Keywords: Product quality, quality 4.0, total quality management, process approach.

TABLE OF CONTENTS

PLAGIARISM DECLARATION iii

DECLARATION iv

DEDICATION v

ACKNOWLEDGEMENTS vi

ABSTRACT vii

TABLE OF CONTENTS viii

LIST OF TABLES xiv

LIST OF FIGURES xvi

LIST OF APPENDICES xvii

LIST OF ABBREVIATIONS AND ACRONYMS xviii

1 : CHAPTER ONE: INTRODUCTION 20

1.1 Introduction 20

1.2 Context of the research 20

1.3 Research problem and rationale 21

1.4 Research aim 23

1.5 Research objectives 23

1.6 Research questions 23

1.7 Theoretical framework 23

1.8 Conceptual framework 24

1.9 Process inputs and product quality 25

1.10 Research design 25

1.11 Population\target population 26

1.12 Sampling method 26

1.13 Measuring instrument 26

1.14 Data analysis 27

1.15 Pretesting 27
1.16 Delimitations/scope 27
1.17 Limitations 27
1.18 Validity and reliability/trustworthiness 28
1.19 Anonymity and confidentiality 28
1.20 Ethical considerations 28
1.21 Structure of the thesis 28
2 : CHAPTER TWO LITERATURE REVIEW 30
2.1 Introduction 30
2.2 Key components of quality 30
2.2.1 Quality definition 30
2.2.1 Customers perception of quality 32
2.2.2 Product quality 32
2.2.3 The evolution of quality 33
2.3 Process approach 37
2.4 Root cause analysis 38
2.5 Quality tools 38
2.6 Quality management systems 40
2.7 Cost of quality 40
2.8 Quality 4.0 41
2.9 Lean philosophy 43
2.10 Conformance to quality 45
2.11 Six sigma 45
2.12 Lean six sigma 46
2.13 Just in time 46
2.14 Plan, Do, Check, Act cycle 47

2.15 The 5M inputs of a process 48
2.15.1 Man / employee 48
2.15.2 Material 49
2.15.3 Method 50
2.15.2 Machine 50
2.16 Employee factors that influence product quality 50
2.16.1 Employee engagement and motivation factors 51
2.16.2 Organisational culture and environmental factors 56
2.16.3 Job satisfaction and performance factors 61
2.17 Conclusion 64
3 : CHAPTER THREE RESEARCH METHODOLOGY 65
3.1 Introduction 65
3.2 Research aim 65
3.3 Research objectives 66
3.4 Research paradigm 66
3.5 Ontology 66
3.6 Epistemology 67
3.7 Research design 69
3.8 Study population 69
3.9 Research sample 69
3.10 The Research Instrument 70
3.10.1 The quantitative research survey 70
3.10.2 The quantitative method description 70
3.10.3 Section A - Biometric data (6 items) 70
3.10.4 Section B – 39 statements 71
3.11 Piloting quantitative method survey 71

3.12 Executing the quantitative method survey 71
3.13 Data analysis 72
3.14 Data reliability 72
3.15 Data validity 72
3.16 Ethical considerations 73
3.17 Exclusions 73
3.18 Limitations 74
3.19 Conclusion 74
4 : CHAPTER FOUR DATA PRESENTATION, ANALYSIS AND INTERPRETATION .. 76
4.1 Introduction 76
4.2 The sample 76
4.3 Reliability statistics 77
4.4 Factor analysis 78
4.5 Rotated component matrix 80
4.6 Section A: Biographical data 83
4.7 Section analysis 87
4.8 Section B 88
4.9 Section B1: Employee's perception about quality 88
4.10 Section B2: Job specific quality requirements 91
4.11 Section B3: Quality resources and objectives 93
4.12 Section B4: Employee factors that influence product quality 96
4.13 Section B4.1 Employee engagement and motivation factors 96
4.14 B4.2 Organisation culture and work environment factors 99
4.15 B4.3 Job satisfaction and performance factors 101
4.16 B4.4 Employment and technology factors 104
4.17 Section summary 106

4.18 Crosstabulations 108
4.18.1 General trends in fisher's p-value table: 111
4.18.2 Specific observations: 112
4.19 Correlations 114
4.20 Structural Equation Model 114
4.20.1 Discussion on Model Validity and Reliability 119
4.20.2 Further Exploration of Significant Relationships 121
4.21 Model fit summary 124
4.22 Regression analysis 125
4.23 Overall findings 127
4.24 Employee perceptions of product quality (Section B1) 127
4.25 Job-specific quality requirements (Section B2) 128
4.26 Quality resources and objectives (Section B3) 128
4.27 Employee engagement, organisational culture, and job satisfaction (Section B4) 129
4.28 Employment conditions and technology (Section B4.4) 129
4.29 Structural equation modelling 129
4.30 Conclusion 130
5 : CHAPTER FIVE SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION 131
5.1 Introduction 131
5.2 Summary of findings 131
5.2.1 Section B1: Employee's perception about quality 131
5.2.2 Section B2: Job-specific quality requirements 131
5.2.3 Section B3.1: Quality objectives 132
5.2.4 Section B3.2: Quality resources 132

5.2.5 Section B1: Employee's perception about quality 138
5.2.6 Section B2: Job-specific quality requirements 138
5.2.7 Section B3.1: Quality objectives 139
5.2.8 Section B3.2: Quality resources 140
5.2.9 B4:Employee factors that influence product quality 141
5.2.10 Proposed organisation strategy 143
5.3 Research limitations 144
5.4 Conclusion 144
REFERENCES 145

LIST OF TABLES

Table 2.1: Quality perceived and defined by various quality gurus and authors..... 31

Table 3.1: Fourfold typology of sociological theories..... 68

Table 4.1: Cronbach's alpha score..... 77

Table 4.2 : KMO and Bartlett's Test 79

Table 4.3: Rotated component matrix B1..... 80

Table 4.4: Rotated Component Matrix B2 80

Table 4.5: Rotated component matrix B3..... 80

Table 4.6: Rotated component matrix B4.1..... 81

Table 4.7: Rotated Component Matrix B4.2 81

Table 4.8: Rotated Component Matrix B4.3 81

Table 4.9: Rotated Component Matrix B4.4 82

Table 4.10: Overall gender distribution..... 83

Table 4.11: Racial composition of the sample..... 84

Table 4.12: Respondents type of employment..... 85

Table 4.13: Respondents job categories..... 86

Table 4.14: Scoring patterns of Section B1: Employee's perception about quality..... 89

Table 4.15: Scoring pattern 4.11 on B2: Job specific quality requirements..... 91

Table 4.16: Section B3: Quality resources and objectives 94

Table 4.17: Section B4.1 Employee engagement and motivation factors 97

Table 4.18: B4.2 Organisation culture and environment factors..... 99

Table 4.19: B4.3 Job satisfaction and performance factors..... 102

Table 4.20:B4.4 Employment and technology factors 104

Table 4.21: Fisher values table vs biographical 109

Table 4.22: p-value between "Quality is evaluated against product specifications" and "Age" 113

Table 4.23: Regression weights: (Group number 1 - Default model) 117
Table 4.24: Standardised regression weights: (Group number 1 - Default model)..... 118
Table 4.25: CMIN 124
Table 4.26: Baseline comparisons 124
Table 4.27: RMSEA..... 125
Table 4.28: Covariances: (Group number 1 - Default model)..... 126
Table 4.29: Correlations: (Group number 1 - Default model) 126

LIST OF FIGURES

Figure 1:1: Internal and supplier non-conformances 22

Figure 1:2: Conceptual framework 24

Figure 2:1: Evolution of TQM 33

Figure 2:2: Anatomy of a process 37

Figure 2:3: The Ishikawa diagram aka Fishbone diagram 39

Figure 2:4: Conformance to quality requirements 45

Figure 4:1: Age distribution 84

Figure 4:2: Racial composition of the sample 85

Figure 4:3: Respondents job categories 86

Figure 4:4:Distribution of respondents across different departments 87

Figure 4:5: Scoring patterns Section B1: Employee's perception about quality 89

Figure 4:6: Scoring pattern: B2: Job specific quality requirements 92

Figure 4:7: Section B3: Quality resources and objectives 94

Figure 4:8: Section B4.1 Employee engagement and motivation factors 97

Figure 4:9: B4.2 Organisation culture and environment factors 100

Figure 4:10:B4.3 Job satisfaction and performance factors 102

Figure 4:11: B4.4 Employment and technology factors 105

Figure 4:12: Structural equation model 115

Figure 5:1: Proposed quality strategy 143

LIST OF APPENDICES

Appendix 1: Ethics clearance

Appendix 2: Gatekeeper’s letter

Appendix 3: Turnitin summary report

Appendix 4: Editor’s certificate

Appendix 5: Statistician certificate

Appendix 6: Correlations

Appendix 7: Quantitative research questionnaire

Appendix 8: Letter of information and consent

Appendix 9: Ethics certificate

LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
CVF	Culture Values Framework
CoQ	Cost of Quality
CtQ	Critical to Quality
DEI	Diversity, Equity and Inclusions
DMAIC	Define, Measure, Analyse, Improve, and Control
E.G.	Example
GDP	Gross Domestic Product
HR	Human Resource
ICT	Information and Communications Technology
IoT	Internet of Things
JIT	Just-In-Time
KPI	Key Performance Indicators
LSS	Lean Six Sigma
MES	Manufacturing Execution Systems
OC	Organisational Culture
PDCA	Plan-Do-Check-Act
QMS	Quality Management System
RCA	Root Cause Analysis
SMART	Specific, Measureable, Achievable, Relevant and Time-bound
SWOT	Strengths, Weaknesses, Opportunities and Threats
SPC	Statistical Process Control
TMC	Toyota Motor Company
TPS	Toyota Production System
TQC	Total Quality Cost

TQM	Total Quality Management
VSM	Value Stream Mapping
QA	Quality Assurance
QC	Quality Control
WIP	Work In Progress

1: CHAPTER ONE: INTRODUCTION

1.1 Introduction

According to Maisiri and van Dyk (2021: 1), the manufacturing industry is the fourth largest in South Africa and provides a considerable number of jobs. The growth in the manufacturing sector is widely recognised as a major contributor to a country's' economic development; however, data indicates that many African countries have experienced a decline in the ratio of manufacturing to Gross Domestic Product (GDP) (Moyo and Jeke 2019: 115).

This chapter outlines the research context, focusing on the significance of examining the relationship between employee factors that influences product quality. It presents the research problem and the challenges organisations face in enhancing product quality through employee-influenced factors, underscoring the necessity of addressing these issues to enhance product quality. The rationale for the study highlights its contributions to theory and practice, while the research aim and objectives guide the inquiry into how employee factors impact product quality outcomes.

The chapter also discusses the theoretical and conceptual framework that provides a structured approach to understanding the relevant variables. It details the research design, including methodological approaches and sampling strategies, while addressing potential limitations and ethical considerations to protect participants' rights and confidentiality. This introduction sets the stage for a deeper exploration of the link between employee engagement and product quality in the following chapters.

1.2 Context of the research

SkyBlu Technologies (Pty) Ltd, Durban, South Africa is an electronics contract manufacturing facility, specialising in the design and manufacture of digital satellite decoders, television sets and consumer electronics.

According to the International Institute for Management Development World competitiveness ranking, South Africa's high unemployment rates, especially among the youth; frequent power cuts and poor economic activities; corruption undermining

state legitimacy and service delivery; high debt levels limiting fiscal flexibility; and political uncertainty have led South Africa to being ranked 60th out of 67 countries in 2024 (Bris. 2024:130). High quality products determine the success of organisations by gaining customer satisfaction, building brand loyalty, and achieving long-term success in today's highly competitive market; however, product consistency is influenced by various factors (Khilji 2023: 1). This research study explores the employee factors that influence product quality.

1.3 Research problem and rationale

Today's competitive market environment is marked by shorter product life cycles and a growing demand for quality products also coupled with rising global competition, exerting pressure on manufacturing companies to enhance flexibility and resource efficiency to meet customer product quality demands and remain competitive (Buer, Semini, Strandhagen and Sgarbossa 2021: 1). Dana and Donorianto (2024: 681) posit that industrial growth is accelerating, especially in the context of globalisation, with the manufacturing sector seeing significant advancements due to increasing consumer demand for goods and in today's globalised landscape, quality is the key factor for achieving success. Safitri, Sutrimo, Huda and Erdi (2023: 9) advocate that product defects undermine an organisation's competitive advantage by reducing productivity and performance in meeting Key Performance Indicators (KPI), leading to increased failure costs from rework and customer complaints, which hinder market competitiveness as consumers prioritise quality. Therefore maintaining high quality standards is essential for customer satisfaction and allows for higher pricing of quality products.

Naskar (2023: 1) supports this notion and contends that product quality non-conformances has a detrimental impact on customer requirements satisfaction and organisation competitive positioning, and can result in the following consequences:

i. Financial impact: Failing to meet standards can incur higher costs due to rework, warranty claims, or penalties for regulatory breaches.

ii. Reputational harm: Non-conforming products can damage an organisation's reputation and diminish customer confidence.

iii. Legal ramifications: Non-compliance with regulations can lead to legal actions, fines, or other penalties.

iv. Decreased efficiency: Product non-conformance can result in delays, inefficiencies, and lower overall productivity.

v. Safety hazards: Product non-compliance can create significant safety risks for both employees and consumers.

Hence, organisations need to strive for zero product non-conformance. However, the research organisation detected an average of 801 internal non-conformances annually since 2020 (Quality Management Committee 2024: 3). Figure 1.1 illustrates the number of non-conformances since 2020 and reflects an internal upward trend in non-conformance. It must be noted that there was an annual average of 38 supplier non-conformances. In comparison, the number of internal non-conformances, significantly outweighs the supplier non-conformance. It, therefore, can be inferred that the product quality non-conformances are largely attributed to internal issues within the organisation. Moletsane, Tefera and Migiro (2019:114) contend that employees have a huge influence on the level of product quality. The key objectives of this research study was to understand employee factors that influenced product quality and to develop a strategy to reduce these non-conformances. Ultimately, the recommended strategy will position the organisation in a more favourable strategic competitive position.

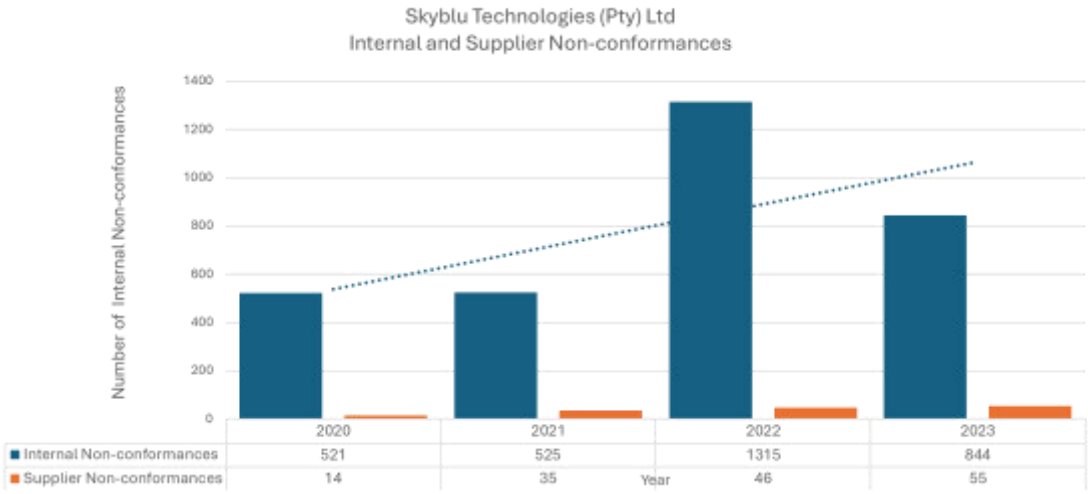

Figure 1:1: Internal and supplier non-conformances

Source: Researcher's own construct

1.4 Research aim

The aim of this study is to ascertain employee factors that influence product quality within Manufacturing at SkyBlu Technologies (Pty) Ltd, Durban, South Africa.

1.5 Research objectives

The research objectives for this study are:

i. To ascertain the extent of employee's understandings of quality.
ii. To ascertain if the employees understand their job-specific quality requirements.
iii. To ascertain the extent to which quality objectives are clearly defined.
iv. To ascertain the extent to which resources are provided in support of the organisation's product quality strategy.
v. To determine employee factors that influence product quality.
vi. To develop a strategy to improve product quality.

1.6 Research questions

The following research questions underpinned this study:

i. What are employees' perception about quality?
ii. To what extent do employees understand their job specific quality requirements?
iii. To what extent are quality objectives clearly defined?
iv. To what extent are resources provided in support of the organisation's product quality strategy?
v. What are the employee factors that influence product quality?
vi. What strategies can Skyblu Technologies implement to enhance product quality?

1.7 Theoretical framework

The theoretical framework of a research study serves as a filter or lens that directs attention to specific data, identifies which critical information needs emphasis,

articulates the meaning of existing theories, and highlights the strengths and weaknesses of the study (Given 2014: 872). According to Cho, Jung and Linderman (2017: 233) enhancing product quality performance requires an understanding of employee behaviour-oriented practices that are human-centric, intangible, and focused on building relationships. Kumar and Mishra (2019: 867) support this notion and claim that the success of Total Quality Management (TQM) is heavily influenced by the behaviour and engagement of employees, as their attitudes, commitment to quality, and willingness to collaborate play a crucial role in driving continuous improvement and fostering a culture of excellence within the organisation. Sjarifudin and Kurnia (2022: 159) are of the opinion that employee behaviour significantly influences the quality of products and the efficiency of processes, and fosters a positive work environment that emphasises training, engagement, communication and accountability that can lead to improved performance and reduced defects.This research is based on behavioural quality management theory that explores employee behavioural factors that influence product quality.

1.8 Conceptual framework

The conceptual framework for this study defines the approach taken to investigate the research problem, offering a comprehensive overview of the methodologies employed and the relationships between key concepts. Additionally, it includes a visual representation that illustrates the main ideas and components of the research study, enhancing understanding and clarity (Adom, Hussein, and Agyem 2018: 439). Figure 1.2 illustrates the conceptual framework for this research study.

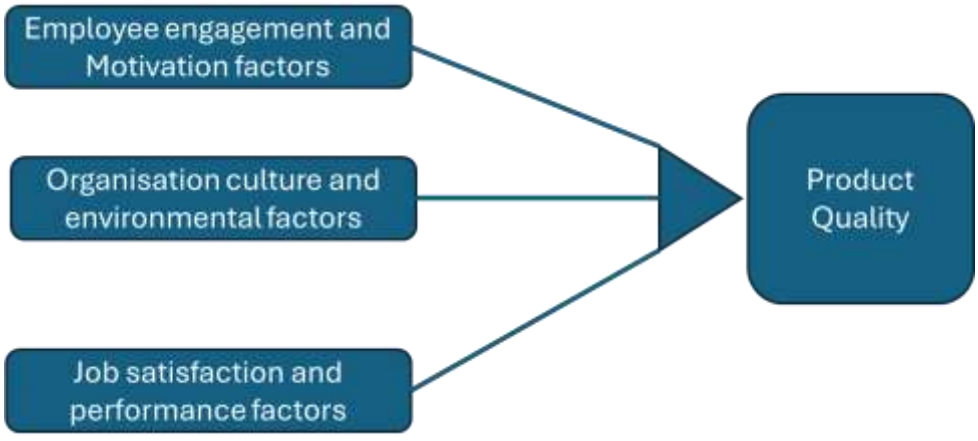

Figure 1:2: Conceptual framework

Source: Researcher's own construct

1.9 Process inputs and product quality

Product quality is a critical factor for success in the manufacturing industry, hence there is an increasing emphasis on sustainable process management (Takata et al. 2004). Sjarifudin and Kurnia (2022: 159) define product quality as the degree to which a product meets specified requirements and customer expectations, and attest that product quality is a critical aspect of manufacturing, where consumer expectations are high.

As explained by Nadar (2023:31), a process consists of inputs that are combined into value added activities and results in outputs. Ebrahim, Rasib, and Muhamad (2015) elucidate that the inputs of an organisation's processes are classified as man, machine, method, money and material. Sjarifudin and Kurnia (2022: 159); and Safitri, Sutrimo, Huda and Erdi (2023: 9) suggest that the 5M's framework is used in quality management and problem-solving to identify potential causes of process defects. Issah, Bluwey and David (2024: 135) attest that the 5Ms are commonly utilised in TQM and various quality improvement techniques to analyse and enhance processes within an organisation, as these assist in pinpointing areas that require focus to improve overall quality and operational efficiency. The study focused on man, material, method, money and machine factors in a manufacturing environment. The goal of the study was to ascertain if the initiatives being made by the organisation to improve product quality was effective and how employees can contribute towards improving and maintaining high product quality levels. This research applied a quantitative approach to collect and analyse the research data. The data was collected using a self-administered questionnaire. The population comprised one hundred and fifty shop floor employees in the manufacturing plant. A probability sampling strategy was used to select a sample for the study.

1.10 Research design

In this study, a quantitative approach was applied to collect and analyse the research data collected. A cross-sectional survey was undertaken. The data was collected using a self-administered questionnaire. Statistical analysis was used to yield the information required to meet the objectives of this study.

1.11 Population\target population

The population group was made up of senior management, middle management, and operational staff in the relevant departments. There were seven grouped main business units that comprised the manufacturing staff complement at SkyBlu Technologies (Pty) Ltd, based in Mount Edgecombe, Durban, namely finance and administration, sales and marketing, human resources, engineering, production, quality, and logistics and materials. The operational staff were directly involved in the manufacture of products and were part of the “Man” element of manufacturing. The target population for this study consisted of one hundred and fifty employees from the seven main manufacturing departments in the company. Based on the table by Sekaran and Bougie (2016) the sample size required for this research was one hundred and eight employees.

1.12 Sampling method

Probability sampling was used, which allowed extrapolation from items observed to items not observed. The assurance of random sampling was that it used a random table or an equivalent computer program to choose units. The list of employee names was requested from the Human Resources department. The more participants in a study, the more protected the results of the study are from the influences of “random error” that a researcher can not control (Robert 2015:1). This ensured that every employee in the sample size had a known zero and unknown zero chance of being selected, allowing for a margin of sampling error and a level of confidence in the results gathered. The simple random sampling method was used to constitute the sample. By using the simple random sampling method, each member of the population had an equal chance of being chosen for the sample.

1.13 Measuring instrument

A questionnaire consisting of thirty questions was used as the measuring instrument with a five-point Likert scale, in order to gather tendency responses regarding

perceptions of a particular variable. The questionnaire comprised a systematically compiled and organised series of statements that intended to elicit the information required to provide insight into the nature of the problem under study. By using a questionnaire, large amounts of information were collected from a significant number of employees.

1.14 Data analysis

The data was analysed using the SPSS statistical software package (Version: 29) and the necessary statistical test was conducted. Descriptive and inferential statistics was used to analyse the data.

1.15 Pretesting

The pre-testing was given to ten individuals from the population group to pre-test how the responses would be populated and the effectiveness of the Likert scale in capturing the responses received from the population group targeted. The pre-testing conducted on ten individuals allowed the questionnaire to be assessed and revised before the final version was administered. The employees involved in the pre-testing were not included in the final survey.

1.16 Delimitations/scope

The study focuses on a manufacturing facility based in Mount Edgecombe, Durban, South Africa and is reflective on the product quality and awareness thereof within the organisation. The data collected reflects on the current conditions and understanding of quality and its implications for the shop-floor employees.

1.17 Limitations

The study's sample was drawn exclusively from the business located in Durban, which may lead to results that reflect the experiences and perceptions of this specific

population rather than a more diverse cross-section of the manufacturing sector nationwide.

1.18 Validity and reliability/trustworthiness

Validity is the appropriateness of a data collection instrument to evaluate the concept of the study (Sekaran and Bougie 2013). To ensure validity, the questionnaire was scrutinised by an academic in the field, a practitioner and a statistician.

According to Ruel (2019: 63) measurement reliability refers to the consistency of responses to survey questions, ensuring that if the same person answers a question multiple times, the data collected will be reliable and dependable. Internal consistency for this research study was assessed using the split-half measure of similarity (Cronbach Alpha).

1.19 Anonymity and confidentiality

Individuals were approached to requesttheir involvement in the study. An informed consent form was included on the first page of the questionnaire, along with an introductory letter. This clearly ensured the anonymity of the responses received, that the information would only be used for the study, and that no names would be disclosed.

1.20 Ethical considerations

A gatekeeper's letter of consent was obtained from the organisation's director before engagement with the workforce. Once the letter of consent was received from the director, a meeting was held with management to discuss the purpose, aims and objectives of the study. All participation in this study was voluntary and this was clearly stated on the questionnaire.

1.21 Structure of the thesis

Chapter 1 presents the introduction to the study. This chapter includes the background, problem statement and motivation, focus, research objectives, research questions and the methodology of the research.

Chapter 2 constitutes the literature review, It covers the Man, Machine, Method, Money and Materialelements of quality in manufacturing. In-depth reviews of quality were conducted to understand these factors and their application within a manufacturing environment.

Chapter 3 explains the research methodology employed in the study. It explains the population group, data collection methods, sampling methods, ethical considerations, analysis of data as well as validity and reliability.

Chapter 4 presents a discussion of the statement of findings, interpretation and discussion of the data.

Chapter 5 constitutes a summary of the study, conclusions and recommendations.

2: CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The preceding chapter provided an introduction of the study that focused on the research study, background of electronics manufacturing in South Africa, research statement, research objectives, research questions, the conceptual framework, research methodology applied, delimitations of the study and the significance of the study.This chapter reviews the literature by various scholars and industry experts.

The chapter commences with the definition of quality and, thereafter, the dimensions are explored. The discussion focuses on linking employee factors and its influence on product quality.

2.2 Key components of quality

The following discussion focuses on defining quality and the key concepts of quality that support employee factors in product quality outputs.

2.2.1 Quality definition

Solin and Curry (2022:778) highlight the elusiveness of the concept of quality, noting that in response to a request from Scott Paton, former editor-in-chief of Quality Digest, for reader perspectives on this complex topic, over 80 diverse definitions were submitted, illustrating a wide spectrum of interpretations from "the sublime to the ridiculous". In 1985, Garvin remarked that the definition of quality remained a source of confusion and that “Even different groups within the same company may disagree on what makes a quality product” (Garvin, 1985:3). As if the concept of quality per se were not vague enough, the notion of perceived quality seems only to exacerbate the problem. Morgan spoke of a “quality perception gap” between manufacturers and consumers (Morgan, 1985, as cited in Steenkamp, 1989:58) Table 2.1 shares definitions and perceptions of quality by various quality gurus and authors.

Table 2.1: Quality perceived and defined by various quality gurus and authors

Source: Adapted from Solin and Curry (2022:781) and Oakland (2014: 4).

No.	Author	Quality Perceived...
1	Holbrook and Corfman (1985: 34) as cited in Fiore and Damhorst (1992: 169) Crochemore (2000) as cited in Petiot et al. (2009: 29)	Craftsmanship
2	Crosby (1989)	Conformance
3	Maxfield et al. (2002)	Aesthetics and specification
4	Juran (2010)	Fitness for purpose
5	Garvin (1984: 32), Nelson (1970), Tellis and Wernerfelt (1987), as cited in Akdeniz et al. (2013: 730)	A quality aspect that consumers rely on when they lack complete information about a product's features, known as information asymmetry.
6	Feigenbaum (1961)	The total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product and service in use will meet the expectation of the customer.
7	Deming (1982)	Quality should be aimed at the needs of the consumer, present and future.
8	Zeithaml (1988:3)	A consumer's judgment about a product's overall excellence or superiority
9	Steenkamp (1989: 107)	A quality aspect that consumers rely on when they lack complete information about a product's features, known as information asymmetry.
10	Castleberry and McIntyre (1992: 75)	A person's belief in a product's quality comes from analysing relevant cues, shaped by past experiences, available alternatives and expectations.
11	Mitra and Golder (2006:1)	The overall subjective judgment of quality relative to the expectation of quality
12	Pycraft et al. (2010)	Consistent conformance to customer's expectations
13	Stevenson (2002)	The ability of a product or service to constantly meet or exceed customer expectations
14	Grutter (2010)	Quality is satisfying customer expectations
15	Stevenson (2018)	The ability of a product or service to constantly meet or exceed customer expectations

Thus, Solin and Curry (2022:781) argue that the definition of product quality relies on a customer-based perspective rather than on a manufacturing-based one, suggesting

that quality judgments should be based on customer needs instead of on manufacturing specifications and conformance.

2.2.1 Customers perception of quality

As economic globalisation expands, marketers encounter new opportunities and increased competition. Therefore, managers are prompted to consider complex factors such as technical, legal, human resource, political, and economic aspects, along with a country's global image, when selecting production locations. These significantly affect consumer perceptions of quality and the cues that influence their product evaluations (Ting 2012:529). In a research study conducted by Putra, Hartoyo and Simanjuntak (2017: 1125), the results indicated that the higher the quality of the products received by customers, the more positive their attitudes toward the brand. Additionally, the findings indicated that perceptions of product quality significantly influence sales volume.

2.2.2 Product quality

Dana and Donorianto (2024: 681) argue that high-quality products that meet consumer expectations, enhance trust and loyalty, reduce returns, and improve an organisation's reputation, making product quality essential for customer satisfaction and market strength. As stated by Yaroslavovych and Nataliya (2023: 82), quality is not just a desirable outcome; it is essential for the long term sustainability of an organisation and the following importance of product quality is highlighted:

i. Customer's brand loyalty builds trust and is important for retaining existing customers and gaining additional customers;
ii. Poor quality deliverables lead to product non-conformances that result in avoidable cost associated with reverse supply chain such as sorting, reworking, scrapping and replacing orders;
iii. A track record of consistently providing quality products results in creating a positive image of the organisations quality culture;
iv. Producing quality products ensures regulatory and legislative compliance that averts the consequences of legal action against an organisation;

v. Organisations that produce high quality products gain a competitive edge that ensures a greater market share.

2.2.3 The evolution of quality

Muruganandham, Venkatesh, Devadasan, and Harisha (2023:291) views TQM as a key quality approach that over the past century emphasised employee engagement, training, and zero defects. Figure 2.2.illustrates the evolution of TQM.

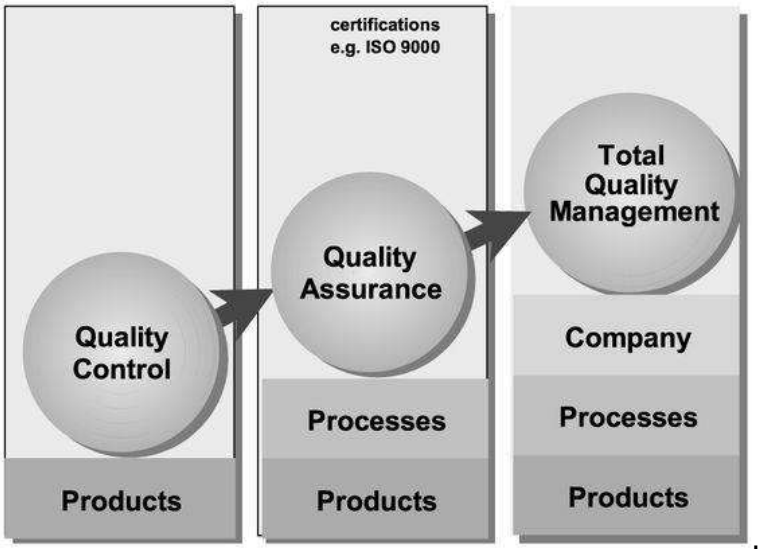

Figure 2:1: Evolution of TQM
Source: Patel and Pitroda (2021:124)

2.2.3.1 Quality control

According to Patel and Pitroda (2021:122) Quality Control (QC) is a process through which organisations evaluate the consistency of all variables involved in their outputs. Ali, Shah, Arif,Tlija and Siddiqi (2024:1) advocate that quality control is a crucial process that ensures products meet standards and customer expectations, enhances loyalty and satisfaction, detects defects to prevent costly recalls, ensures compliance with regulations to avoid legal issues, and helps protect business reputations by minimising product failures through early process non-conformance detection. Guoa et al. (2020: 7550) state that enterprises use closed-loop quality management during product realisation through a system that includes internal audits, electronic

management of quality documents, and a double audit process, employing turtle chart analysis and the PDCA cycle for continuous improvement in quality control.

2.2.3.2 Quality assurance

Quality assurance (QA) is a proactive approach to preventing errors in manufacturing and service delivery, focusing on meeting quality standards through systematic assessment and process control, distinct from quality control which addresses defects after they occur. Additionally, QA is related to quality control which also focuses on the performance of the process (Patel and Pitroda 2021:123).

2.2.3.3 Total quality management

Shahabuddin (2024: 319) describes TQM as an essential quality strategy aimed at supplying goods and services that fully satisfy both internal and external customers by meeting their explicit and implicit expectations. Ajirowo (2024: 206) is of the view that TQM is a management philosophy that focuses on continuous improvement, customer satisfaction, and employee engagement throughout an organisation's operations, making the role of motivated staff essential. Additionally, Issah, Bluwey and David (2024: 135) elaborate that TQM is both a philosophy and a framework of guiding principles that form the foundation of a successful organisation, helping industrial entities thrive in today's competitive economy. According to Patel and Pitroda (2021:123), TQM is a continuous process aimed at identifying and reducing production defects, optimising supply chain operations, enhancing customer service, and ensuring that employees receive adequate training. TQM is a quality management approach that focuses on continual improvement of products, services and processes to satisfy customer expectations. It also promotes employee ownership of work and active participation that can boost job satisfaction, motivation, and employee engagement, ultimately resulting in higher levels of product and service quality (Lehyani and Zouari 2023: 95). The researcher highlights that the TQM approach necessitates employee engagement, which is the central focus of this study.

Hence, TQM emphasises shared responsibility for the overall quality of the final product among all participants in the manufacturing process, and this holistic approach focuses on improving the quality of an organisation's products by consistently

enhancing internal operations. Within the TQM framework, the specifications established will reflect both internal expectations and applicable technical standards. Industry requirements may vary and necessitate compliance with specific laws and regulations relevant to the company's operations (Lehyani and Zouari 2023: 95).

Sjarifudin and Kurnia (2022: 159); and Baudin and Netland (2023: 61) identify the following key principles of TQM and describe it as a comprehensive management approach that focuses on continuous improvement in all aspects of an organisation. TQM requires the participation of all employees and emphasises the culture of quality, with the goal of enhancing product quality and customer satisfaction.

i. Customer Focus: TQM prioritises understanding and meeting customer needs and expectations. Organisations strive to deliver products and services that satisfy customers, leading to increased loyalty and repeat business.
ii. Continuous Improvement: TQM promotes a culture of ongoing improvement in processes, products, and services. Organisations use various tools and methodologies, such as Plan-Do-Check-Act (PDCA) cycles, to identify areas for enhancement and implement changes.
iii. Employee Involvement: All employees, from top management to frontline workers, are encouraged to participate in quality improvement initiatives. Empowering employees to take ownership of their work fosters a sense of responsibility and commitment to quality.
iv. Process-Centric Approach: TQM emphasises the importance of understanding and managing processes to achieve quality outcomes. Organisations analyse their processes to identify inefficiencies and areas for improvement, ensuring that every step contributes to the overall quality.
v. Data-Driven Decision-Making: TQM relies on data and statistical analysis to inform decision-making. Organisations collect and analyse data related to quality metrics, customer feedback, and process performance to guide improvements.
vi. Integrated System: TQM views the organisation as an interconnected system where all functions and departments work together towards common quality goals. This holistic approach ensures that quality is embedded in every aspect of the organisation.

vii. Leadership Commitment: Strong leadership is essential for successful TQM implementation. Leaders must demonstrate a commitment to quality, provide resources for improvement initiatives, and create an environment that supports a culture of quality.

viii. Supplier Quality Management: TQM extends beyond the organisation to include suppliers. Building strong relationships with suppliers and ensuring that they meet quality standards is crucial for maintaining overall product quality.

The researcher notes that while all the key principles of TQM are important, this study underpins employee involvement in achieving high product quality.

According to Baudin and Netland (2023: 61), organisations can enhance their operational efficiency, reduce waste, improve customer satisfaction, and ultimately achieve a competitive advantage in the marketplace by adopting TQM principles. Sjarifudin and Kurnia (2022: 159) suggest that recognising and rewarding employees for their contributions to quality improvement fosters a culture of excellence. Celebrating successes and acknowledging efforts can motivate employees to continue striving for higher levels of product quality.

Mittal, Gupta, Kumar, Antony, Cudney and Furterer (2023:1410) explain that TQM provides a framework for achieving a company's vision by establishing long-term objectives and strategies that deliver value to stakeholders in terms of quality, cost, and delivery. Collaborating to identify and address problems allows employees to strengthen relationships and enhance communication and coordination. This results in a more efficient and effective workplace, as well as increased job satisfaction and engagement (Lehyani and Zouari 2023: 95).

According to Lehyani and Zouari (2023: 95), successful implementation of TQM requires leadership focus on employee engagement, as this influences job satisfaction which subsequently fosters greater employee creativity and proactive behaviours. According to Muruganandham, Venkateshb, Devadasanc and Harisha (2023:291), one of the most influential approaches in the past century has been Total Quality Management (TQM). The researcher notes that TQM has evolved and the effectiveness hinges on employee engagement, which is essential for driving continuous quality improvement within organisations.

2.3 Process approach

The process approach is a fundamental principle of ISO 9001:2015, It requires organisations to systematically define and manage their processes, while prioritising employee engagement to foster collaboration and continuous improvement.This approach ultimately aligns employee and organisational objectives to enhance efficiency and drive better outcomes (South African National Standard ISO 9001 2015: vii). Guoa, Zhanga, Zhub, Qua, Zoue, Chene, Rena, and Hed (2020: 7549) explain that ISO 9001:2015 promotes a process approach in quality management systems to enhance effectiveness and customer satisfaction. It emphasises the need for risk identification and management, particularly in multivariety and small-batch production, despite the absence of a comprehensive control approach. Figure 2.2. illustrates an anatomy of a process

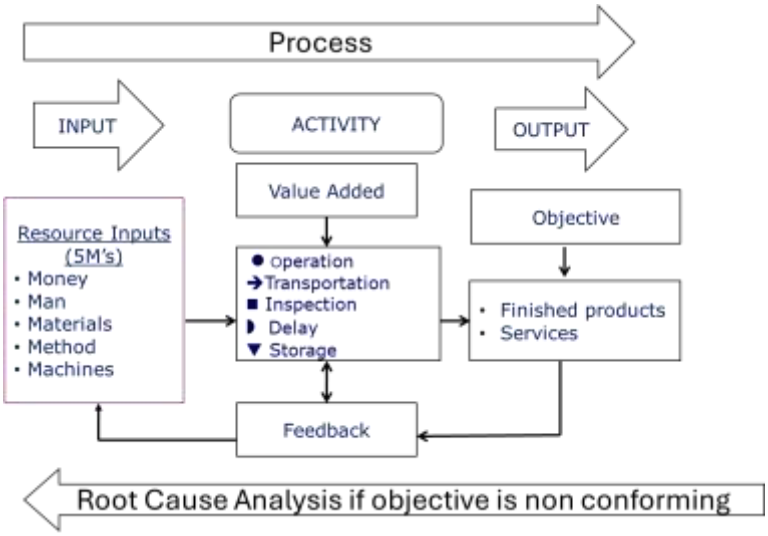

Figure 2:2: Anatomy of a process
Source: (Nadar 2023:31)

As illustrated in figure 2.2, Nadar (2023:31) explains that an organisation consists of various interconnected processes that care composed Man, Material, Method, Machine and Money, These elements work together as a system to achieve desired product quality outcomes in alignment with an organisation's strategic goals.Therefore, as illustrated in figure 2.2, Man (employees) are a crucial element of the process approach that impacts on product quality. Consequently, it is important to consider the factors that influence Man's ability to achieve product quality. This research study focuses on the factors that influences Man to achieve the desired product quality output.

2.4 Root cause analysis

In a study by Barsalou (2023:1), the author outlines that a Root Cause Analysis (RCA) is conducted to determine the underlying causes of problems. This process involves defining the problem, analysing it, and identifying its root cause to prevent future occurrences. Lee, Chechur and Lanyashin (2018: 2160) describe RCA as a collective term for various approaches, tools, and techniques used across different fields to define problems, understand the causal mechanisms leading to undesirable conditions, and identify underlying causes to prevent recurrence through structured procedures. In context of the research organisation, there are various situations that may necessitate an RCA. For instance, investigations into the corrosion of absorber tower walls, and issues such as cut, torn, and pinched gloves in a safety glove box used for handling radioactive materials, demonstrate the use of RCA to pinpoint the root causes of damaged packaging. Additionally, the study details an investigation into the leakage of a vehicle fuel line.The cause-and-effect diagram emerged as the most widely used quality tool during an RCA, followed by the Pareto chart. Following these were the control chart, flow chart, histogram, scatter plot, and run chart. While the classic seven quality tools have been extensively covered in the literature, much of this discussion focuses on their applications rather than on an evaluation of the tools most utilised by quality professionals for RCA.

2.5 Quality tools

According to Sutrisno (2022: 72); and Sjarifudin and Kurnia (2022: 176), employees significantly influence quality management and improvement processesby playing a crucial role in the implementation and effectiveness of quality tools. Additionally, ttention is drawn to the following seven tools of quality that are essential techniques used for quality monitoring, control and improvement:

i. Check Sheet: This is a structured check form with a list of Critical to Quality dimensions to check for quality acceptance or rejection.
ii. Pareto Chart: It is a bar graph that ranks non-conformance from the highest to lowest contribution, prioritising the most significant issues that need attention.

iii. Cause-and-Effect Diagram (Fishbone Diagram): As depicted in Figure 2.3 below, this is a visual tool for identifying potential causes and effects of a quality non-conformance. Grațiela and Iner (2023:163) describe the Ishikawa diagram, created by Kaoru Ishikawa in 1986, as a quality management tool that visually organises and prioritises potential causes of a specific problem to help identify root causes in processes, facilitating brainstorming for solutions.

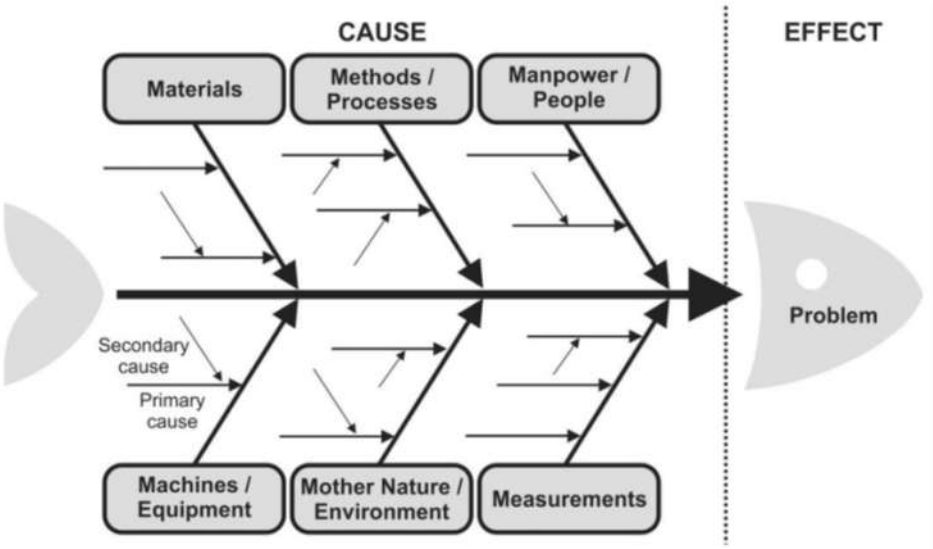

Figure 2:3: The Ishikawa diagram aka Fishbone diagram

Source: (Grațiela and Iner, 2023.)

iv. Flowchart: It is a diagram that represents a process chart, showing the steps and the path to be followed based on decision points.

v. Histogram: This is a graphical representation of the distribution of numerical data based on the data frequency.

vi. Control Chart: It is a statistical tool used to monitor the data trend of processes over time at a predermined frequency.

vii. Scatter Diagram: This is a graph that shows the correlation between two variables to determine the relationship.

According to Sutrisno (2022: 72), these quality tools assist organisations to monitor processes, analyse data, identify problems, and implement effective solutions to improve quality and performance.Additionally, Barsalou (2023:5) states that the classic seven quality tools can be used on their own, but they are also essential in problem-

solving and quality improvement processes such as PDCA (Plan-Do-Check-Act), Design for Six Sigma, and Six Sigma.

2.6 Quality management systems

Sjarifudin and Kurnia (2022: 159) define Quality Management Systems (QMS) as organised frameworks that organisations implement to oversee and enhance their processes, products, and services.These frameworks ensure compliance with customer and regulatory standards, while they facilitate consistent quality and continuous improvement. Patel and Pitroda (2021:126) explain that a QMS is a collection of interconnected business processes designed to consistently meet customer expectations and align with organisational goals. It encompasses defined objectives, effective strategies, documented procedures, and necessary resources for implementation, while evolving from basic statistical quality control methods to emphasise teamwork and continuous improvement. Muruganandham, Venkatesh, Devadasan, and Harisha (2023:291) argue that achieving continuous quality improvement through QMS, has developed since the introduction of the BS 5750 standard in 1979 and the ISO 9000 series in 1987, culminating in the ISO 9001:2015 standard for which millions of organisations have sought certification.

2.7 Cost of quality

Sansalvador and Brotons-Martinez (2023:5) emphasise that organisations are increasingly recognising the importance of measuring and managing Total Quality Cost (TQC). Influential figures like Crosby, Juran, and Deming have analysed its behaviour to determine an optimal quality investment level that balances cost reduction with achieving ideal quality. Dimitrantzoua et al. (2022:1721) state that measuring and reporting the Cost of Quality (CoQ) is essential for assessing a firm's quality and performance, as it helps identify and reduce unnecessary costs, enhancing profitability and competitiveness. Sansalvador and Brotons-Martinez (2023:5) state that a strong accounting system is essential for accurately allocating quality expenditures. However, despite various approaches to collecting quality cost data, few organisations implement comprehensive Cost of Quality (CoQ) models and formal costing methods,

thus highlighting the increasing awareness among organisations of the need to effectively measure and manage Total Quality Cost (TQC). The researcher is of the view that employee factors influence product quality, as effective employee training, engagement, and accountability can reduce defects and rework, thereby lowering overall quality costs.

2.8 Quality 4.0

Quality 4.0, part of Industry 4.0, is a contemporary approach to quality management that utilises digital technologies and data-driven methods to improve quality processes in manufacturing and other sectors. It addresses the changing technological landscape and the growing demand for enhanced product quality, efficiency, and transparency (Wolniak and Grebski 2023: 631). Employee involvement goes beyond simply engaging employees; it also involves equipping employees for the Quality 4.0 digital transformation. which highlights the essential yet often underestimated importance of creating an environment that prioritises employee learning and adaptability (Fadilasari, Ghatak, Garza-Reyes, Joshi and Kandasamy 2024: 19). Industry 4.0 facilitates quality 4.0 by offering digital platforms and collaborative tools that enable employees to engage actively in quality management to enhance product quality output (Wolniak and Grebski 2023: 631).

According to Baudin and Netland (2023: 61), Quality 4.0 is the integration of advanced technologies and digital transformation into quality management practices within manufacturing and other industries. This integration represents a shift from traditional quality management approaches to more innovative, data-driven methods that leverage the capabilities of Industry 4.0 technologies. Baudin and Netland (2023: 61) suggest the following key aspects of Quality 4.0:

i. Technological Integration: IoT (Internet of Things),devices and sensors connected to the internet can collect real-time data on production processes, enabling continuous monitoring of quality metrics. This allows for immediate detection of deviations and proactive quality management .
ii. Big Data and Analytics: The ability to analyse large volumes of data from various sources helps organisations identify trends, root causes of quality issues, and

opportunities for improvement. Predictive analytics can forecast potential quality problems before they occur.

iii. Artificial Intelligence (AI): AI algorithms can enhance decision-making processes by analysing data patterns and providing insights that human operators may overlook. AI can also automate quality inspections and assessments, improving accuracy and efficiency.

iv. Real-Time Monitoring and Feedback: Quality 4.0 emphasises the importance of real-time data collection and analysis. This allows for immediate feedback on production quality, enabling quick adjustments to processes to maintain standards. Continuous monitoring helps in identifying anomalies and trends, allowing organisations to implement corrective actions before defects occur, thus reducing waste and rework .

v. Customer-Centric Quality Management: Quality 4.0 shifts the focus from merely meeting internal quality standards to enhancing customer satisfaction. By utilising customer feedback and data analytics, organisations can better understand customer needs and expectations, leading to improved product quality and service delivery. Engaging customers in the quality process, for example through feedback loops and co-creation, can lead to products that better meet market demands .

vi. Agility and Flexibility: The integration of digital technologies allows organisations to be more agile in their quality management practices. They can quickly adapt to changes in production requirements, customer preferences, and market conditions. Quality 4.0 promotes a culture of continuous improvement, where organisations are encouraged to innovate and refine their processes regularly based on real-time data and feedback .

vii. Collaboration and Communication: Enhanced communication tools and platforms facilitate collaboration among teams, departments, and with external partners. This interconnectedness is crucial for effective quality management, as it allows for shared insights and collective problem-solving. Cross-functional teams can leverage diverse expertise to address quality challenges more effectively, fostering a holistic approach to quality management .

viii. Sustainability and Compliance: Quality 4.0 also incorporates sustainability practices, ensuring that quality management aligns with environmental and social governance (ESG) goals. This includes minimising waste, optimising

resource use, and ensuring compliance with regulations. Organisations are increasingly held accountable for their quality practices, so integrating sustainability into quality management can enhance brand reputation and customer loyalty.

ix. Training and Development: As organisations adopt Quality 4.0 practices, there is a need for ongoing training and development of employees to ensure they are equipped with the necessary skills to utilise new technologies and methodologies effectively. Fostering a culture of quality awareness and continuous learning is essential for the successful implementation of Quality 4.0 initiatives.

The integration of technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing has revolutionised quality control, evolving it from a manual inspection system to sophisticated, data-driven systems that utilise smart factories and advanced monitoring, while AI and machine learning further enhance adaptability and autonomy to meet changing industry and consumer demands (Ali, Shah, Arif,Tlija and Siddiqi 2024:2).

The recent convergence of lean production and Industry 4.0, known as Lean Automation, emphasises integrating automation technology with lean principles to enhance flexibility and reduce information flow times in order to better meet future market demands (Kolberg and Zuhlke 2015:1871). Hence, Quality 4.0 represents a transformative approach to quality management that leverages advanced technologies, real-time data, and a customer-centric focus to enhance product quality and operational efficiency. By embracing these principles, organisations can achieve higher levels of quality performance and competitiveness in the modern marketplace. The researcher notes that successful implementation of Quality 4.0 depends on employee engagement, highlighting the role employees play in influencing Quality 4.0.

2.9 Lean philosophy

Bukola, Feldman, and Rampersad (2021:1211) noted that lean manufacturing originated in the 1950s when Toyota's Eiji Toyoda and Taiichi Ohno studied U.S. automotive practices, leading to the Toyota Production System in 1965 and the term

"lean" in 1990. This methodology focused on waste elimination, value addition, and employee empowerment to enhance operational performance.By fostering a culture of efficiency and responsiveness, lean manufacturing enables companies to adapt to shorter product life cycles and increasing customisation, all while maintaining competitiveness in a challenging global market (Buer, Semini, Strandhagen and Sgarbossa, 2021:1976). Buer et al (2021:1977) also state that lean manufacturing, which originated in 1948 and functions independently of IT systems, has often been viewed by academics and industry experts as incompatible with IT due to concerns that computerised material planning can drive up costs, decrease transparency, and lead to overproduction, while lean manufacturing emphasises decentralised control, employee autonomy, and the quick resolution of problems by targeting their root causes. Netland (2016: 2433) states that when lean manufacturing principles are effectively implemented throughout a business, they lead to improved overall performance. However, applying these principles selectively in certain areas tends to yield lower success rates. Bakke and Claudio (2023: 239) attest that lean production, which originated in the 1950s without considering modern advancements in Information and Communications Technology (ICT), relies on a fixed Kanban system for work orders and inventory management. However, it struggles to adapt to changes in demand and production processes, thus limiting its effectiveness in fast-paced environments, but the shift to a virtual e-Kanban has begun to address these challenges by integrating lean principles with ICT.

Trstenjak and Cosic (2019: 14) explain that integrating Industry 4.0 with lean management is crucial for maximisingbenefits. The digitalisation inherent in Industry 4.0 requires substantial organisational changes that can face resistance due to investment concerns and worker apprehension. Consequently, careful management of the transition to autonomous systems is essential. Lean philosophy, although not universally adopted, offers tools that can alleviate the adverse effects of digitalisation on physical processes and human resources, thus highlighting the importance of clearly defining lean's role in the context of Industry 4.0. The researcher’s perspective is that employees play a critical role in lean manufacturing and product quality by actively identifying and eliminating waste, improving processes, and ensuring adherence to quality standards through their engagement and commitment to continuous improvement. Kumar, Hasan, Srivastava, Akhtar, Yadav and Choubey (2022: 1188) argue that whilst lean philosophy relates to the reduction of waste,

organisations must ensure that the conformance of quality is maintained. The following discussion expands on the conformance of quality.

2.10 Conformance to quality

Conformance to quality can be defined as the degree to which a service or product meets the pre-determined Critical to Quality (CTQ) standards, given that an organisation's services and products are a function of its internal processes, as well as its supplier's processes (Waxer 2020: 1). Figure 2.4 illustrates three process variation scenarios in the form of Gaussian curves relative to specification limits and targets (Waxer 2020: 1).

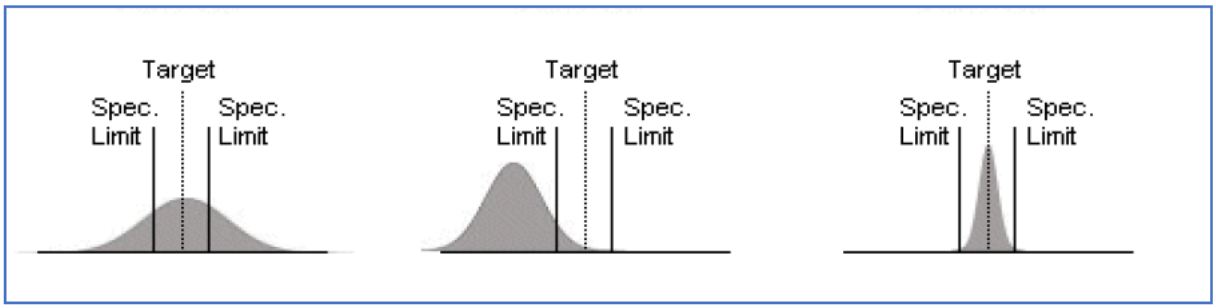

Figure 2:4: Conformance to quality requirements

Source: Waxer (2020: 1)

Figure 2.4 shows that in the scenario on the extreme left, the variation exceeds the specification, and is not acceptable. The middle scenario reflects a process that is positioned predominantly on the left side of the specification limits and target, and is not acceptable. The scenario on the right illustrates a process that is centred between the specification limits, and will deliver a product or service that conforms to the specification limits and target, until an assignable cause acts on the process (Waxer 2020: 1).

2.11 Six sigma

According to Baudin and Netland (2023: 68), Six Sigma seeks to minimise process variation and defects. It aims for near perfection at 3.4 defects per million opportunities, by utilising statistical methods for process analysis and improvement through its

Define, Measure, Analyse, Improve, and Control (DMAIC) framework. This framework encompasses all the phases, while emphasising data-driven decision-making to identify root causes and assess improvement effectiveness.

2.12 Lean six sigma

Quality 4.0 naturally builds upon the principles and methodologies of Six Sigma, fostering employee engagement in quality improvement initiatives (Wolniak and Grebski 2023: 631). Lean and Six Sigma are complementary methodologies. While lean focuses on eliminating waste and improving flow, Six Sigma emphasises reducing variation and improving quality; together a comprehensive approach to process improvement is provided (Baudin and Netland 2023: 61).

It is essential for senior management to foster a culture of innovation and efficiency by providing employees with opportunities to drive change.Such change may include providing resources like training budgets and management committing to integrating Lean Six Sigma (LSS) which focuses on reducing waste, and improving product and service quality through data-driven decision-making into the business strategy. This approach has been identified as a key factor for overall organisational success (Magod ,Daniyan and Mpofu 2022: 192). The next discussion focuses on Just-in-Time manufacturing.

2.13 Just in time

Kiichiro Toyota, founder of TMC, believed that success in assembly line manufacturing relied on Just-in-Time (JIT) operations. These operations minimise inventory and improve product quality by acquiring materials as needed, reducing defects, stabilising production, fostering a flexible workforce, and aligning material receipts with usage. These practices result in significant savings on storage and handling costs, while reducing spoilage and obsolescence through strong supplier relationships and small deliveries (Bhatt 2021:20). In addition, Shokoufi and Rezaeian (2020: 216) explain the JIT production system as one which aims to fully make customer's order on time. However, any product non-conformance can upset the flow. The following discussion will focus on the Plan, Do, Check, Act (PDCA) cycle (Sjarifudin and Kurnia (2022: 159)

as a systematic approach to continuous improvement that helps organisations implement changes effectively.

2.14 Plan, Do, Check, Act cycle

The TQM approach necessitates an organisation’s leadership to concentrate the entire quality system on satisfying customer quality requirements by empowering employees to utilise the Plan, Do, Check, Action (PDCA) approach for continuous improvement of the quality management system (Shahabuddin 2024: 320). Sjarifudin and Kurnia (2022: 159) ascertain that the PDCA approach contributes to quality improvement by providing a systematic framework for identifying and addressing quality issues. Tthe following are the key contributions:

i. Identification of product quality non-conformances: The PDCA cycle helps in systematically identifying the causes of defects in the production process. By analysing data and using root causes quality tools, such as fishbone diagrams and five whys, the defect rate can be reduced or eliminated and contribute to the quest for zero defects.
ii. Implementation of solutions: Once the causes are identified, the "Do" phase allows for the implementation of corrective actions. This includes applying the seven quality tools to address specific issues, which can lead to a reduction in defect rates.
iii. Monitoring and Evaluation: The "Check" phase involves monitoring the results of the implemented solutions to evaluate their effectiveness. This continuous feedback loop ensures that any new issues can be identified and addressed promptly.
iv. Continuous Improvement: The "Act" phase encourages organisations to standardise successful strategies and make further improvements based on the findings from the previous steps. This creates a culture of continuous improvement within the organisation, enhancing overall quality and efficiency.
v. Overall, the PDCA approach fosters a structured method for quality management, enabling organsations to enhance product quality, reduce waste, and enhance customer satisfaction.

2.15 The 5M inputs of a process

2.15.1 Man / employee

Safitri, Sutrimo, Huda and Erdi (2023: 1) assert that the "Man" element in a process is crucial in product quality output, as it involves employees' skills, awareness, motivation, communication, and engagement., Addressing related issues can significantly improve product quality and reduce defects, thereby enhancing an organisation's competitive advantage. Baudin and Netland (2023: 38) highlight the following employee factors that play a significant role in influencing product quality in manufacturing:

i. Skills and Training: The level of training and expertise that employees possess directly affects their ability to perform tasks accurately and efficiently. Well-trained employees are more likely to produce high-quality work and adhere to quality standards.

ii. Engagement and Motivation: Employees who are engaged and motivated tend to take greater pride in their work, leading to higher quality outputs. When employees feel valued and connected to their work, they are more likely to pay attention to detail and strive for excellence.

iii. Experience: Experienced employees often have a better understanding of the manufacturing processes and can identify potential issues before they affect product quality. Their familiarity with the equipment and procedures can lead to more consistent quality.

iv. Communication Skills: Effective communication among team members is crucial for maintaining quality. Employees need to share information about processes, potential problems, and quality standards to ensure everyone is aligned and working towards the same goals.

v. Problem-Solving Abilities: Employees who possess strong problem-solving skills can quickly address issues that arise during production, preventing defects and maintaining quality. Their ability to think critically and adapt to unforeseen challenges is essential.

vi. Work Environment: A positive and safe work environment encourages employees to perform at their best. Factors such as safety, ergonomics, and overall

workplace culture can influence employee morale and, consequently, product quality.

vii. Teamwork and Collaboration: Manufacturing often requires teamwork. Employees who work well together can share knowledge and support each other in maintaining quality standards. A collaborative environment fosters a sense of responsibility for the overall product quality.

viii. Adherence to Procedures: Employees must follow established procedures and quality control measures. Consistent adherence to these guidelines is essential for maintaining product quality throughout the manufacturing process.

According to Baudin and Netland (2023: 38), organisations can enhance their manufacturing processes and improve the overall quality of their products by focusing on these employee factors. This notion is also supported by Sjarifudin and Kurnia (2022: 159) who suggest that employee factors play a vital role in the success of organisations. By focusing on these factors and creating a supportive work environment, organisations can enhance employee performance and, consequently, product quality.

2.15.2 Material

The "Material" element in product quality control, which encompasses the quality, handling, storage, and specifications of raw materials and components used in production, is critical because the quality of these materials directly influences the final product's quality (Safitri, Sutrimo, Huda and Erdi 2023: 1). In a Just-in-Time production system, maintaining a smooth and precise flow of raw materials is crucial, as work zones should only contain materials necessary for current tasks, since cluttered workstations and excess supplies can lead to process issues. Therefore, Work In Progress (WIP) product quality is essential to ensure that there is no disruption in flow (Eisner 2023:2). Panjaitan, Ramadhana, and Davin (2024: 77) emphasise that the quality of materials is critical to product quality, as substandard materials can lead to defects that negatively impact consumer satisfaction, result in increased return rates, and ultimately damage a brand’s reputation. Thus, the importance of selecting high-quality materials to ensure product reliability and foster long-term customer loyalty and overall product quality is highlighted.

2.15.3 Method

Eisner (2023:1) attests that standardised methods, processes, and procedures are essential for delivering a high-quality finished productUtilising documented procedures, standard operating practices, schedules, worksheets, diagrams, and checklists to outline sequence and interaction for each process ensures consistency regardless of who performs the work. According to Dambrough (2016:38), any attribute related to quality that is worthy of being monitored or managed needs to be measured, which means manufacturers must select an appropriate measuring device. Statistical Process Control (SPC) charts are an effective way to monitor and control the quality process. Saraswat, Kumar and Sain (2015:28) explain that Value Stream Mapping (VSM) is utilised to evaluate the current state of a product's value stream and design a future state that minimises waste, enhances lead time, and optimises workflow, while serving as a guide for implementing lean manufacturing principles by illustrating the ideal flow of information and materials.

2.15.2 Machine

The "Machine" element in quality control encompasses the equipment and machinery used in production, as well as their maintenance, operation, and technological aspects. These are crucial since the performance and condition of these machines directly impact the quality of the manufactured products (Safitri, Sutrimo, Huda and Erdi 2023: 6). Mahendran, Amarnath, Rajkumar, Nirmal, Karthikeyan, and Rajeskumar (2022: 604) suggest that to improve employee engagement, organisations must adapt their culture and adopt advanced technologies. By embracing man-machine collaboration as an innovative model supported by a proposed framework based on industry trends and case studies, they can cultivate a more engaged and productive workforce, driving creativity and financial success.

2.16 Employee factors that influence product quality

Human resources are essential for achieving quality objectives and business success.Ttherefore, organisations must understand factors affecting employee performance and implement innovative HR practices to maximise performance

(Kutpudeen and Tahir 2024:1328). An organisation's performance is connected to product quality, which depends on employee dedication; therefore, organisations seeking competitive advantages through Total Quality Management must thoroughly evaluate the factors that affect employee commitment (Dirna, Dwijatenaya and Nur 2023: 69). Aljumah, Shahroor, Nuseir and El Refae (2022: 1) categorise commitment into three types: continuance commitmentis characterised by an employee's long tenure and investment in achieving organisational goals; affective commitment reflects the emotional attachment an individual feels toward the organisation; and normative commitmentoccurs when employees experience a moral obligation to remain with the organisation. Hence, the behaviour of employees to produce high quality products is based on the employee factors that influence product quality.

2.16.1 Employee engagement and motivation factors

2.16.1.1 Employee engagement

Khawaja and Karimi (2024: 729) define employee engagement as the emotional commitment and psychological investment employees have in their jobs, work colleagues, and organisation. It is a crucial factor for organisational success, innovation, and sustainability, serving as a crucial mediator between motivational drivers, leadership practices, and organisational outcomes. Additionally, Mwesigye and Kibalirwandi (2024: 1) define employee engagement as the level of enthusiasm, commitment, and involvement that employees display towards their job and organisation, encapsulating the Human Resource (HR) notion of an employee's dedication and enthusiasm for their job. Employee engagement is a crucial factor for organisational competitiveness, encompassing both physical presence and a psychological commitment to their roles, which drives higher productivity, enhances product quality, fosters loyalty, and improves overall workplace performance (Moletsane, Tefera and Migiro 2019:114). Olaoluwa and Okon (2018: 252) attest that irrespective of the sophistication of an organisation's fourth industrial revolution technology and leadership style, engaged employees are essential for achieving objectives, as a productive workforce significantly enhances performance and competitive advantage.

According to a study conducted by Lehyani and Zouari (2023:100), the results indicated that implementing a holistic TQM approach, fosters employee engagement and this, in turn, results in a higher level of product and service quality.This notion is supported by Moletsane, Tefera and Migiro (2019:114) who suggest that employees' physical presence at work does not automatically indicate that they are fully engaged. Disengaged employees will result in unsatisfactory product quality output. Kutpudeen and Tahir (2024: 1328) affirm that HR practices are crucial for improving organisational performance and highlight that employee involvement practices are specifically designed to enhance engagement and empower employees to make valuable contributions to the organisation.

According to a study conducted by Salas-Vallina and Fernandez (2017:636), the relationship between inspirational leadership, employee engagement and participative decision-making was investigated. The finding indicated that participative decision-making resulted in a positive contribution to product quality. In another study conducted by Geue (2018:278) that involved exploratory factor analysis in order to measure positive practices within the workplace, the relationship between positivity, inspiration and employee engagement was examined.The findings revealed that positivity will promote employee engagement within a team and those factors will promote improved product quality. Meeting employee engagement needs leads to increased productivity and a decrease in product non-conformances, enhancing the organisation’s competitive position (Moletsane, Tefera, Migiro 2019: 115). Mwesigye and Kibalirwandi (2024: 1) suggest that employees are more likely to be engaged and committed to product quality initiatives when they feel that their contributions are appropriately recognised and rewarded, which includes both tangible rewards such as financial incentives and promotions, and intangible rewards like professional recognition and personal satisfaction. Hence, the researcher notes that employee engagement impacts on TQM product quality outcomes.

2.16.1.2 Employee motivation

Motivation is defined as the emotional mindset that compels an individual to concentrate on the achievement of specific organisational goals and objectives (Ajirowo 2024: 204). External activities are influenced by various factors, with

motivation being the most critical, as it directly impacts behaviour, job satisfaction, productivity, and organisational growth by addressing employees' needs for affiliation and recognition, making motivated employees valuable assets in today’s competitive business environment (Bose and Mohanty 2024:19). A lack of staff motivation within organisations impacts the quality of employees' efforts and their enthusiasm for achieving organisational goals; moreover, effective motivation is crucial for the continuous improvement of tasks and activities (Ajirowo 2024: 204).

Recognition and reward systems are essential for motivating employees and appreciating their contributions towards QA initiatives (Mwesigye and Kibalirwandi 2024:4). A study by Khaskheli and Ali (2023:33) found that factors such as timely payments, advance salaries, annual increments, and pay equity significantly affect work motivation, with equity and higher salaries being the most impactful; thus, salary influences work motivation and ultimately affects product quality.

2.16.1.3 Leadership

Abhishek, Mittal and Bhat (2024:1-2) define leadership as the ability of a person, group, or organisation to “lead”, influence, or mentor other people, teams or entire organisations. Yaroslavovych and Nataliya (2023: 82) attest that sustaining product quality long term demands a dynamic approach, and effective leadership is crucial as leaders set the tone by establishing clear quality expectations, modeling desired behaviours, and fostering a supportive environment. Atiku, Itembu-Naunyango and Oladejo (2024:2) define inclusive leadership as a strategic approach that meets employees' emotional and psychological needs by fostering a respectful environment for individuals of all backgrounds, enhancing engagement, promoting diversity, encouraging participation, and ensuring psychological safety through open communication, fairness, and empathetic listening.

Leadership styles that inspire and motivate employees have been shown to reduce job stress, improve workforce competencies, and enhance good governance.Such leadership styles significantly impact employee productivity, job satisfaction, and commitment, while also highlighting their critical role in shaping organisational culture, fostering a positive work environment, and motivating staff to tackle the unique challenges of the workplace (Abhishek, Mittal and Bhat 2024:1-2). Joseph, Mwenda,

and Wachira (2024: 20) assert that effective leadership fosters greater employee commitment, as organisational behaviour plays a crucial role in achieving TQM. An employee's work productivity relies on transformational leadership that is characterised by an inspiring vision, supportive communication, and empowerment. It has been demonstrated that to boost employee engagement, an environment of trust, autonomy, and shared responsibility must be fostered (Khawaja and Karimi 2024: 727). Dirna, Dwijatenaya and Nur (2023: 69) note that leadership is a key factor in determining the success or failure of organisational performance, influenced by factors such as assertiveness, self-awareness, self-image, and effective communication habits.

Recognising and addressing the need for proactive change is essential for achieving superior results.Human resource management increasingly emphasises workforce planning, recruitment, and performance evaluation, as leaders must adapt their strategies to effectively manage the challenges posed by shifting workforce demographics, rapid technological advancements, and evolving employee expectations (Sokolic, Croitoru, Florea, Robescu and Cosac 2024: 54). Alhempi, Ola, Junaidi, Satriada, Supeno and Endri (2022:372) state that human resources occupy a strategically pivotal role within a company, emphasising that the human element is fundamental in carrying out activities and achieving organisational goals, as people serve as planners, executors, and decision-makers.Therefore, a company's success is not solely dependent on its technological infrastructure, but also on the caliber, potential, and active engagement of its human resources. Both leaders and employees must diligently contribute and optimally fulfill their responsibilities to drive the organisation towards its objectives and ensure sustained success.

Abhishek, Mittal and Bhat (2024:1-2) explicitly describe the following attributes of leadership styles:

i. Democratic Leadership Style: Democratic leadership is a collaborative and consultative leadership style in which the leader makes decisions based on feedback from the team. Each team member is given the chance to offer input on the direction of ongoing projects, but the leader is ultimately in charge of making the final decision.
ii. Autocratic Leadership Style: The exact opposite of democratic leadership is autocratic leadership. In this scenario, the team leader acts as their

representative and makes all decisions without consulting them. The leader determines all that must be done and has total authority. Before a decision is taken, the staff is not consulted.

iii. Laissez-Faire Leadership: A hands-off or passive style of leadership describes a laissez-faire leadership. Leaders give their team members the resources, knowledge, and instruments they need to complete their responsibilities. This “let them be” style of leadership involves a leader stepping back and allowing team members to operate independently, freeing them up to plan, organise, decide, solve issues, and finish the tasks that have been allocated.

iv. Transformational Leadership: iv. Transformational Leadership encourages, inspires, and motivates employees to be innovative and bring about the change that will determine the organisation’s future success.

v. Transactional Leadership: Transactional leadership analyses success based on the organisation’s system of rewards and penalties, prioritises results, and adheres to the structure already in place. Within a company, transactional leaders hold official roles of authority and accountability. By encouraging collective performance and controlling individual performance, this kind of leader keeps things predictable.

Ababneh (2020: 8) emphasises that the true significance of an organisation's leadership is in fostering a workplace culture of employee engagement that underpins TQM initiatives.

2.16.1.4 Employee training

Competence, as defined by Dirna, Dwijatenaya and Nur (2023: 70), is a combination of skills, knowledge, and behaviour. It plays a crucial role in determining an organisation's success, as it relies on the competencies of its employees. By investing in employee development, organisations can foster a culture of ongoing learning and improvement (Lehyani and Zouari 2023: 95). According to Sutrisno (2022: 7), training enhances employee skills and knowledge, improving productivity and work quality, while also fostering retention by making individuals feel valued and providing career advancement opportunities.Additionally, continuous development ensures employees

can adapt to changes in technology, industry standards, and organisational goals, thereby contributing to TQM initiatives and maintaining competitiveness in the market.

2.16.1.5 Employee job status, roles and responsibilities

In a manufacturing environment, maintaining and improving product quality is a collective responsibility that involves clearly defined employee roles. It fosters a culture of quality that enhances standards and boosts customer satisfaction (Baudin and Netland 2023: 55).

2.16.1.6 Employee job recognition

Baudin and Netland (2023: 55) suggest that employee job recognition is a vital component of workplace culture. It enhances morale, motivation, and job satisfaction by acknowledging contributions through both formal methods, like awards and bonuses, and informal practices, such as verbal praise and thank-you notes. Sutrisno (2022: 7) supports this notion by suggesting that employee job recognition is the acknowledgment and appreciation of an employee's contributions, efforts, and achievements within an organisation.

2.16.2 Organisational culture and environmental factors

2.16.2.1 Culture

Organisational culture consists of the core principles, philosophies, and beliefs that guide an organisation. It significantly shapes performance outcomes by influencing employee attitudes and behaviours, emotional connections, social networks, and adherence to norms (Hasanah, Alviliani, Anwar and Maryam 2024:680). Khawaja and Karimi (2024: 729) assert that an organisation’s culture provides the foundation for fostering, maintaining, and integrating employee engagement into an organisation’s activities.A culture that values transparency, accountability, and inclusivity, fosters a sense of belonging and commitment among employees, resulting in enhanced engagement and voluntary effort. Baudin and Netland (2023: 38) suggest that TQM involves the participation of all employees and emphasises a culture of quality throughout the organisation.

According to Dula and Tang (2021:22), in the global markets, organisations strive to develop a culture that provides a competitive edge by energising their workforce and making employees feel integral to the company's vision, which in turn empowers them to excel and maintain high levels of productivity. A cultural shift is essential for integrating digital tools into quality management, necessitating a change in mindset at all organisational levels. Resistance to change, limited digital literacy, and fear of new technologies can impede the adoption of digital practices in quality management (Fadilasari, Ghatak, Garza-Reyes, Joshi and Kandasamy 2024: 4). Dimitrantzoua, Psomasa, Bourantaa and Kafetzopoulosb (2022:1720) introduce the Culture Values Framework (CVF) in their research study as a recognised Organisational Culture (OC) Model that represents the following four types of organisation cultures:

i. Group culture: Eemphasis is placed on flexibility and the internal organisation and pertains to human relations.
ii. Developmental culture**:** The focus is on flexibility; however, it is oriented to creativity and adaptation to the external environment. Emphasis is on individuality, risk taking and anticipating the future.
iii. Rational culture**:** The focus is on the external environment, but it is control-oriented. The major concern is getting the job done.
iv. Hierarchical culture**:** Ths type of culture relies on stability and control along with an internal focus. It emphasises rules and regulations, and standardisation to achieve control and stability.

Meharil, Birbirsa and Dinber (2024:2) state that organisational culture is driven by an organisation’s diversity. It is a multifaceted and continuously evolving concept that includes a wide range of individual differences such as gender, ethnicity, sexual orientation, religious beliefs, and physical abilities and is of paramount importance for modern organisations. Diversity, Equity and Inclusions (DEI) initiatives have their origins in historical social movements such as the women’s suffrage movement, the anti-slavery movement of the early 19th century, the struggle against apartheid in South Africa, and the U.S. civil rights movement, all which arose in response to racial injustices and the subjugation of women and people of color. These efforts gained traction in corporations and organisations following the civil rights movement (Hellerstedt and Uman 2024:24). Ethnicity, a fundamental aspect of identity and a pivotal economic force in international business, plays a crucial role in shaping social

cohesion, generalised trust, and the composition of the labour force. With its impact on political and economic development becoming a central focus for academics, policymakers, and the general public, modern organisations must adapt their human resource management practices to effectively navigate and leverage increasingly diverse teams within this dynamic context (Nweiser and Dajnoki 2024:568).

Nweiser and Dajnoki (2024:568) assert that the acceptance of ethnic diversity, driven by globalisation and workforce diversity programs like affirmative action, has accelerated growth in diverse cities. This has occured by enhancing productivity through varied problem-solving, fostering ethnic minority entrepreneurship, and attracting talent, visitors, and businesses. Meharil, Birbirsa and Dinber (2024:2) suggest that effective management of diversity not only significantly influences workplace ethics, conflict resolution, and overall organisational performance, but also necessitates the creation of an inclusive environment where every individual feels genuinely valued and respected. Ignoring or inadequately addressing diversity can lead to serious negative consequences for organisational operations. Failure to comply with international legal standards impedes the potential benefits of a diverse workforce. Thus, a proactive and strategic approach to diversity management, supported by both international and national labour policies that uphold Equal Employment Opportunity, is essential for fostering fair, equitable, and productive workplaces where individuals are treated with fairness and recognised for their unique contributions and perspectives (Meharil, Birbirsa and Dinber 2024:2).

Cultivating dependable employees necessitates careful consideration of variables such as organisational culture and emotional intelligence, with studies indicating that a positive organisational culture and high levels of emotional intelligence are strongly associated with improved employee performance (Hasanah, Alviliani, Anwar and Maryam 2024:680). Hence, a deep understanding of organisation culture fosters a unified sense of purpose among employees, enhancing product quality, overall organisational performance and success.

Baudin and Netland (2023: 38) maintain that TQM involves the participation of all employees and emphasises a culture of quality throughout the organisation.

2.16.2.2 Work environment

The work environment significantly influences employee performance, indicating that establishing a positive work environment is crucial for achieving organisational goals, as evidenced by a study conducted by Dirna, Dwijatenaya and Nur (2023: 70), where the results demonstrated that the work environment has a positive and significant impact on performance. Kumar, Hasan, Srivastava, Akhtar, Yadav and Choubey (2022: 1188) contend that a supportive work environment that encourages employee engagement, visual management and standardisation is crucial for successfully implementing quality principles.

2.16.2.3 Communication

In today's interconnected and technologically advanced world, communication is essential for building relationships, sharing information, and fostering understanding. It plays a key role in achieving personal, educational, and professional goals while navigating the complexities of diverse cultures and global contexts (Sarwari 2024:2). Damghanian and Ghaleroudkhani (2022:157) emphasisethat communication, which reflects the complex nature of human relationships, is crucial in organisations. The quality of communication significantly impacts success and productivity by facilitating effective coordination, clear execution of orders, meaningful engagement, and collaboration, making adept communication management essential for achieving organisational goals and fostering a positive work environment. Coffelt, Grauman, and Smith (2019:419) note that while employers frequently highlight the importance of communication skills in job descriptions, often specifying types like interpersonal, written, or oral and using qualifiers such as excellent or strong,these skills can be highly specific to certain industries and organisational cultures, making it challenging for employees to adapt their expertise to different tasks or contexts.

A well understood communication process will create and sustain an organisation's competitive advantage. This is guided by the thought that an informed employee is an empowered employee (George 2011:1). Robbins et al. (2009:1) describebarriers such as distortions, ambiguities and incongruities in communication which contribute to potential higher levels of uncertainty.

2.16.2.4 Work-life balance

Rathnweera and Jayathilaka (2021:1) highlight that working from home can enhance work-life balance and job satisfaction under strict contractual arrangements. It is essential for organisations to proactively address employee concerns to optimise human resources, as achieving work-life balance is crucial for both employees and organisations in allowing time for personal commitments.Chigeda, Ndofirepi and Steyn (2022:26) contend that employees divide their time between work and family responsibilities. How they manage these demandsor work-life balance varies among individuals and is crucial for avoiding role conflict, as failing to achieve this balance can negatively impact overall well-being, performance, and job-related attitudes such as satisfaction, engagement, and commitment.

McAlpine, Skakni, and Pyhalto (2022:2192) observe that the term "work-life balance" has gained traction since the late 1990s, particularly post 2000, yet it often misrepresents the reality of work-life conflict, highlighting the struggle to keep paid work from overwhelming personal lives. This discourse typically equates "work" with paid employment, often associated with men, while "life" refers to family and caregiving responsibilities, linked to women, resulting in much of the literature examining how each partner's contributions to the "life" aspect affect work.

2.16.2.5 Provision of resources

Moletsane, Tefera, and Migiro (2019:115) suggest that providing resources enhances job and employee engagement, leading to improved quality of products and services. Baudin and Netland (2023: 55) explain that the provision of resources encompasses the allocation and management of physical, human, financial, and informational inputs essential for production. Thus, organisations are enabled to enhance operational capabilities, improve product quality, and achieve greater success in a competitive marketplace.

2.16.2.6 Employee ethics

According to a study conducted by Dirna, Dwijatenaya and Nur (2023: 70), work ethics is defined as the adherence to organisational rules and standards of conduct. The study indicated that employee discipline has a positive and significant impact on employee and organisational performance. Employee ethics are the moral principles that shape workplace behaviour, promoting values like honesty and respect, which foster a positive environment and improve performance, while ethical lapses can damage the organisation's reputation (Zachary 2023: 19).

2.16.3 Job satisfaction and performance factors

2.16.3.1 Job satisfaction

Olaoluwa and Okon (2018: 252) suggest that job satisfaction is the emotional and intellectual fulfillment derived from different aspects of an employee's job and a higher level of job satisfaction results in a higher level of achieving TQM objectives. Hasanah, Alviliani, Anwar, and Maryam (2024:680) highlight that when employees are satisfied in their roles, they experience greater ease and contentment which boosts retention, reduces turnover intentions, and enhances individual performance. Simultaneously, traits like happiness and approachability are fostered that contribute to the organisation's overall success and strategic goals through positive perceptions of organisational culture and effective emotional intelligence management.

2.16.3.2 Performance management

Awah (2023:3) defines performance management as a structured and systematic approach to managing enterprises, processes, employees, departments, and organisationsby incorporating objective setting, performance evaluation, reward strategies, and career planning to ensure that individuals collaborate effectively to achieve the organisation's desired results. Dirna, Dwijatenaya and Nur (2023: 69) contend that performance management is a process used by an organisation to align employee efforts with organisational goals and is significantly influenced by leadership actions that aim to motivate and develop teams, provide guidance, recommend or implement training and development programs, and facilitate consultations.

According to research done by Hasanah,Alviliani, Anwar and Maryam (2024:680), performance is the result of a precisely defined and meticulously calculated process governed by specific clauses or agreements. The theory of performance, often referred to as "job performance," is a psychological framework that explains how individuals behave and operate in their workplace to achieve the goals set for them. Employee performance is influenced by a variety of factors, including targets, quality, time management, and compliance with standards, while previous research has consistently shown that organisational culture plays a substantial role in shaping employee performance. Furthermore, Hasanah, Alviliani, Anwar, and Maryam (2024:680) indicate that substantial evidence shows a positive correlation between higher emotional intelligence and improved performance, emphasising the significant relationship between emotional intelligence and work performance, and underscoring the importance of these factors in optimising overall organisational success. According to a research study conducted by Zulkarnaen (2023:1952), it was determined that management control systems enhance work quality and overall performance by aligning organisational goals with team and individual objectives, which motivate employees and ensure that their outputs meet expected quality and quantity standards, ultimately demonstrating a positive impact on employee performance.

2.16.3.3 Recognition

Chantal, Manyange and Asuman (2022:35) contend that extensive research demonstrates that employee appreciation programs significantly enhance motivation and performance. Recognition both financial and non-financial fosters work satisfaction, creativity, and productivity, boosts morale and engagement, encourages innovative contributions, improves communication and collaboration, reduces absenteeism and turnover, enhances product quality, and ultimately drives organisational success and profitability. Olaoluwa and Okon (2018: 252) proposethat recognition requires the awareness of individual contributions to product quality and is essential for enhancing employee performance, making reward and recognition important factors in an organisation’s success, especially in TQM programs.

According to Martins, Ros, Valerio and Faisca (2019:879), social recognition is crucial for interpersonal relationships, as it involves the ability to infer others' mental states,

such as beliefs, desires, intentions, and emotions, a well as to anticipate their behaviour and understand emotional cues, which is vital for fostering healthy personal and professional connections andmay even be essential for survival. Burke (2022:119) notes that managers often utilise employee recognition programs as motivational tools, with a key aspect being "recognition visibility," which ranges from private acknowledgments to public announcements. My research further investigates how the strength of social bonds between recognised employees and their observers influences the effect of recognition visibility on employee behaviour. Wang (2017:966) found that recognition programs can boost both productive and counterproductive behaviours, influenced by Dark Triad personality traits. Individuals lower in these traits are more likely to engage in counterproductive behaviours, while those higher in these traits tend to enhance productivity, indicating that recognition programs can have both positive and negative effects depending on personality. Furthermore, Bergin and Jimmieson (2020:149) explain that recognition is essential for fulfilling the need for social esteem at work. Praise and recognition manifested through thanks, compliments, positive feedback, and other gestures of acknowledgment and appreciation are key components of the behavioural skill set of supportive managers and are similar to the transformational leadership aspect of "individualised consideration,". They also play a crucial role in enhancing employee well-being and fostering a culture that values contributions and acknowledges efforts.

Wang (2017: 966) emphasises the importance of organisational leaders fostering a culture of recognition as a strategic means to enhance overall performance and meet corporate objectives:

i. Vision and Purpose: The capacity to establish and effectively convey a distinct vision and purpose for the group or organisation is a fundamental aspect of leadership. A leader should be able to clearly communicate the organisation’s mission, values, and goals to the team and should possess a thorough understanding of them. This motivates the group to strive for a single objective and aids in giving it direction.
ii. Decision-Making Abilities: The capacity to act swiftly and decisively is a crucial aspect of leadership. Leaders must be able to make judgments that will benefit the team or organisation despite the many hurdles and problems they confront. Strong decision-making abilities are essential for a great leader, and these

include the capacity to evaluate the complex information, assess the benefits and drawbacks of various choices, and make choices that are consistent with the objectives and core values of the company.

iii. Emotional Intelligence: Understanding and controlling one's own emotions as well as those of others is a sign of emotional intelligence. It is an essential quality of a successful leader, since it fosters an environment that is both productive and happy at work. It is more probable for a leader with high emotional intelligence to be understanding and sympathetic to the sentiments and emotions of their team. Additionally, they control their emotions well, even under pressure, which can reduce tension in the team and prevent confrontations. The researcher notes that employee recognition positively impacts product quality by motivating staff to take pride in their work and strive for excellence.

2.17 Conclusion

In today's competitive market environment, quality is defined as meeting or exceeding customer expectations through consistent performance and reliability. Quality 4.0 enhances traditional quality management practices by leveraging digital technologies and data analytics, leading to more informed decision-making. Lean and Lean Six Sigma methodologies streamline processes, eliminate waste, and focus on continuous improvement, thus ensuring efficient operations that uphold high quality standards. Quality management systems provide structured frameworks for maintaining and improving product and service quality, while Total Quality Management emphasises a holistic approach that involves all employees in the pursuit of excellence. Adopting a process approach ensures that every stage of production contributes to the overall quality. Employee factors, including training, engagement, and accountability, are pivotal in driving these quality initiatives forward. By integrating these concepts, organisations can foster a culture of quality that ultimately enhances customer satisfaction and business success.

3: CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology employed in this study, providing a systematic framework for understanding the approaches, techniques, and procedures used to gather and analyse data. The aim of this research was to examine the “Employee factors influencing product quality within manufacturing at SkyBlu Technologies (Pty) Ltd, Durban”.

A quantitative research approach was selected due to its emphasis on objective measurement and statistical analysis, enabling the exploration of relationships between variables in a structured manner. This methodology allowed for the collection of numerical data that can be statistically tested to draw valid conclusions, thereby contributing to the existing body of knowledge in the field of Operations and Quality Management.

The chosen quantitative research design is well-suited for addressing the research questions and hypotheses outlined in the earlier sections. By employing a self administered questionnaire, the aim of the study was to gather comprehensive data from a diverse sample, ensuring that the findings are both reliable and generalisable.

In this section, the researcher detailed the population and sampling techniques, data collection methods, instruments used, and the statistical analyses that were conducted.Ethical considerations will also be addressed to ensure the integrity and credibility of the research process.

3.2 Research aim

The aim of this study was to examine factors influencing product quality within Manufacturing at SkyBlu Technologies (Pty) Ltd, Durban.

The research aim and objectives are repeated in this chapter for ease of reference.

3.3 Research objectives

i. To ascertain the extent of employee's understandings of quality.
ii. To ascertain if the employees understand their job specific quality requirements.
iii. To ascertain the extent to which quality objectives are clearly defined.
iv. To ascertain the extent to which resources are provided in support of the organisation's product quality strategy.
v. To determine employee factors that influences product quality.
vi. To develop a strategy to improve product quality.

3.4 Research paradigm

Patterson, Labreche, Morcom, and Amant (2023:1) describe a paradigm as a dynamic framework of cognitive, emotional, physical, and spiritual beliefs that influences the research process and reflects societal values and scientific advancements, shaping how knowledge is constructed and understood across different fields. According to Yong, Husin and Kamarudin 2021: 5857), research paradigms are essential as they guide scientific inquiry and discovery through underlying assumptions and principles and serve the following multiple purposes for researchers:

i. Highlights key issues within a discipline,
ii. Facilitates the development of models and theories to address these challenges,
iii. Establishes criteria for necessary research tools, such as methodologies and data collection methods, and
iv. Outlines principles and procedures for tackling similar problems in the future.

3.5 Ontology

Ylonen and Aven (2023:581) state that ontology examines the nature and relationships of beingUnderstanding society and risk requires acknowledging our knowledge of the world and the complex dynamics of these areas, which are shaped by our perceptions and interpretations of reality. Berryman (2019: 271) further elaborates on this definition explaining that ontology covers what we believe can exist, and what we consider to be

fundamental or basic.Welch (2020: 196) adds that ontological inquiry involves an informed, deliberate, and receptive method of inquiry.

3.6 Epistemology

According to Ylonen and Aven (2023:581), epistemology is a vital branch of philosophy that delves into the nature of knowledge, rigorously exploring its fundamental presuppositions and foundational concepts, as well as examining the extent to which knowledge can be claimed, the justifications required to support such claims, and the criteria used to assess the validity and reliability of knowledge in various contexts and disciplines. Berryman (2019:272) explains that epistemology is used to describe ways of knowing, how we know what we know and who can be a knower. According to Welch (2020: 197), epistemology inquiry relates to knowledge and various aspects of data that permits accepted wisdom.

Table 3.1 presents the fourfold typology of sociological theories.

Table 3.1: Fourfold typology of sociological theories

Strategy	Ontology	Epistemology
Empiricism	Realist ontology: Reality exists outside us.	The only source of knowledge derives from sense experience (observations). Knowledge about the Reality is gained via systematic observation, data gathering and the use of rigorous methods, including technical devices. Realism: classical empiricism sees the directcorrespondence between the reality and observed things. Nominalism: the modern version of empiricismemphasises the uniqueness of things and denies universalism.
Subjectivism	Idealist ontology: Reality consists of the meanings that people attribute to things and that they create in interaction with other people. Social reality is a human construction	Idealism: Individuals' meanings and beliefs give knowledge about the reality.
Rationalism	Idealist ontology: Reality consists of an objective structure of ideas and belief systems, which constrain humans. Ideas and meanings are not attributes of individuals.	Knowledge is gained independently of sense experience. We need to find a logic, patterns or rationality that guide human thinking and rationality.
Substantialism	Realist (Materialist) ontology: Reality consists of social structures.	To gain knowledge, we need to approach and analyse economic and social structures which constrain human action, and social practices.

Source Ylonen and Aven (2023:581)

The empirical strategy is best described as the foundation of this research study, as it emphasises the collection and analysis of observable data to derive conclusions and draw insights based on real-world evidence rather than on purely theoretical assumptions.

3.7 Research design

A quantitative approach was used for this research study. The quantitative research method employed data collection and statistical analysis using a survey with closed-ended statements. A descriptive study was carried out to identify, describe, and understand the characteristics of the organisation, involving the collection of quantitative data through satisfaction ratings on a 5-point Likert scale, as recommended by Sekaran and Bougie (2016: 137).

3.8 Study population

Population refers to the entire group of people that the researcher wishes to investigate (Sekaran and Bougie 2016: 294). The researcher established that 150 people made up the population of SkyBlu Technologies (Pty) Ltd in Durban. (Quality Management Committee 2024: 1).

3.9 Research sample

Patten and Newhart (2018: 5) explain that researchers utilise samples from a population because including every member is often impractical, particularly with large populations, and they infer that findings from the sample likely reflect the characteristics of the entire population. The sample included employees from Finance and Administration, Sales and Marketing, Human Resources, Engineering, Production (Shop Floor), Quality, and Logistics and Materials. Additionally, participants spanned a range of job categories such as Senior Management, Middle Management, and Operational Staff, which ensured a comprehensive representation of the workforce's views on product quality within the manufacturing environment.

A random probability sampling method was used for this research study. Shukla (2020: 1) defines the random probability sampling method as a sampling method where every unit in the population has an equal chance of being selected for the sample. The organisation consists of 150 employees spread across seven main departments. According to the sampling table by Sekaran and Bougie (2016: 294), the necessary sample size for this research was 108.

3.10 The Research Instrument

The research instrument consisted of 45 items, with a level of measurement at a nominal or an ordinal level. The questionnaire was divided into two sections and four questions which measured various themes as illustrated in Table 3.2:

Table 3.2:Research questionnaire format

B1	Employee's perception about quality	
B2	Job specific quality requirements	
B3	Quality resources and objectives	
B4.1	Employee factors that influence product quality	Employee Engagement and Motivation Factors
B4.2		Organisation Culture and Environment Factors
B4.3		Job Satisfaction and Performance Factors
B4.4		Employment and Technology Factors

Source:Researcher's own construct

3.10.1 The quantitative research survey

The survey was developed based on the research objectives as outlined earlier in chapter one. It was intended to obtain responses across all departments within the manufacturing facility. The survey contains statements or phrases where participants had to indicate the extent to which they agreed or disagreed on a five-point Likert scale ranging from a value of (1) "strongly disagree" to a value of (5) "strongly agree".

3.10.2 The quantitative method description

The research survey instrument consisted of 45 items, with a level of measurement at a nominal or an ordinal level. The survey was divided into two sections which measured various themes as illustrated below:

3.10.3 Section A - Biometric data (6 items)

i. Gender
ii. Age
iii. Race
iv. Type of Employement

v. Job Category
vi. Department

3.10.4 Section B – 39 statements

The 39 statements were designed to gauge employees' perceptions of the various factors that influence product quality in the manufacturing processes at SkyBlu Technologies (Pty) Ltd in Durban. The aim of the statements was to capture a comprehensive understanding of how employees view the elements affecting product quality, providing valuable insights into the internal dynamics of the organisation and how they impact overall manufacturing outcomes.

3.11 Piloting quantitative method survey

The survey was pre-tested with a group of ten participants at a location that is not affiliated with the study. This initial testing aimed to assess whether any further adaptations were necessary regarding the language used, clarity of the questions, and overall interpretation by respondents. The insights gained from this pre-testing phase were valuable for refining the survey instrument. However, it is important to note that the data collected during this pre-testing process was not included in the final analysis of the study.

3.12 Executing the quantitative method survey

Quantitative method surveys were physically distributed to random respondents across the manufacturing plant at SkyBlu Technologies (Pty) Ltd . The researcher hand-delivered the questionnaires to 126 individuals, across different departments, for completion. Collection boxes were placed within each department. Respondents completed the survey questionnaires and posted these in the collection boxes to maintain anonymity. Data collection occurred over a period of 2 months. A total of 113 completed responses was received of the 126 survey questionnaires issued, resulting in a response rate of 89.68%. The analysis and interpretation are discussed in chapter four of this dissertation.

3.13 Data analysis

The analysis was performed using the Statistical Package for the Social Sciences (SPSS) software (version 29.0), where the necessary statistical tests were conducted. Descriptive statistics were employed to summarise the datasets effectively, providing a clear overview of the collected data. All relevant technical and general aspects, including demographics and respondent age analyses, were examined alongside data dispersion and the position of the mean for each group. The SPSS program facilitated the calculation of central frequencies, as well as the mean and standard deviations of the datasets. Detailed descriptive statistics for variables such as gender, race, age, and job category included measures like standard deviations, means, and central frequencies. Inferential techniques were also applied, utilising correlation analyses and chi-square tests, which were interpreted through their corresponding p-values. The quantitative data was analysed with the SPSS (version 29) statistical software, utilising both descriptive and inferential statistics. Inferential statistics involves using statistical analysis on observed data to draw conclusions about phenomena that cannot be directly observed (Seaman 2018:819).

3.14 Data reliability

The reliability of a measurement tool ensures that it produces consistent results, reflecting the stability and dependability of the instrument in assessing the intended concept (Sekaran and Bougie, 2016: 203). In this study, reliability was established by taking multiple measurements from the same subjects, employing Cronbach's coefficient alpha to calculate the reliability coefficient. A coefficient of 0.70 or higher is deemed "acceptable" (Bland and Altman, 1997: 572).

3.15 Data validity

Data validity ensures that the appropriate aspects are being measured (Sekaran and Bougie, 2016: 204). Patten and Newhart (2018: 123) further elaborate that validity refers to the extent that the data is measured in comparison to what it is designed to measure. The principles and requirements of ISO Quality Systems combined with the research objectives, formed the foundation for developing the five-point Likert scale

survey. Face validity indicates that the items used effectively measure the intended concept, while content validity ensures that there is a sufficient and representative set of items related to that concept (Sekaran and Bougie, 2016: 206). To assess both content and face validity, industry experts from the manufacturing sector, the researcher's supervisor, and peers specialising in quality management were consulted. Their feedback was instrumental in making the necessary adjustments.

3.16 Ethical considerations

The anonymity and confidentiality of all participants were upheld to ensure that the study was conducted ethically. Additionally, this research proposal received approval from the DUT Institutional Research Ethics Committee before the study began.

The study was carried out in accordance with the following guidelines:

(i) Collaborative Partnership: The research respected the perspectives of the participants, and the outcomes benefited both the researcher and SkyBlu Technologies (Pty) Ltd.

(ii) Respect for Social Values: The study honored the social values of the target population and aimed not to negatively impact society.

(iii) Voluntary Participation: Industry participants were informed that their participation was entirely voluntary and that they could withdraw from the research at any time if they chose to do so.

(iv) Risk-Benefit Analysis: The potential benefits of the study were deemed to outweigh any risks posed to the participants.

(v) Transparency:The researcher provided all participants with relevant background information about the study and shared the written approval of the research proposal from the DUT Institutional Research Ethics Committee prior to the start of the study.

3.17 Exclusions

This study excluded employees from the company's repair center located in Gauteng, South Africa, which constitutes less than 10% of the company's workforce and the

repair center employees deal only with field returns and do not have any influence on product quality within Skyblu manufacturing. While this exclusion was made to streamline the research focus and maintain a manageable scope, it does present certain limitations regarding the comprehensiveness of the findings.

In summary, while excluding the repair center allowed for a more focused study, it also highlights the need for caution when interpreting the findings and considering the broader implications for the company as a whole.

3.18 Limitations

While the topic of this research can be generalised across various manufacturing industries in South Africa, the primary focus of this study was specifically on the manufacturing sector of one business in Durban.

The study's sample was drawn exclusively from one business located in Durban, which may lead to results that reflect the experiences and perceptions of this specific population rather than a more diverse cross-section of the manufacturing sector nationwide.

3.19 Conclusion

This chapter offered a detailed overview of the research methodology for the dissertation, outlining the research design, the estimated population size of SkyBlu Technologies (Pty) Ltd, sampling methods, and data collection strategies for quantitative research. It highlighted the rationale behind the selected methodologies, encompassing data analysis, reliability, validity, pilot testing protocols, and ethical considerations pertinent to the study. The research was framed within an objective positivism paradigm and adopted a holistic systems approach supported by a conceptual framework.

The following chapter will provide a detailed analysis of the collected data, showcasing a variety of tables and graphical representations that illustrate the quantitative findings. Additionally, it will include comprehensive interpretations of the results, highlighting the

insights and implications that emerged from the research. This thorough examination aims to enhance understanding of the data and its relevance to the study's objectives.

4: CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter provides an analysis and discussion of the findings derived from the questionnaires administered in this study. The questionnaire served as the primary data collection tool and was distributed to employees at SkyBlu Technologies (Pty) Ltd, Durban. Data gathered from the responses was processed using SPSS version 29.0 for analysis. The results are presented through descriptive statistics in the form of graphs, cross-tabulations, and other visual figures that summarise the quantitative data.

The analysis focuses on employee perceptions of factors influencing product quality within the manufacturing environment, including aspects such as job satisfaction, employee engagement, motivation, leadership, and the organisational culture and environment. These dimensions were explored through the use of a five-point Likert scale to capture the extent to which participants agree or disagree with various statements related to product quality. The key objective of this study was to use the results of the study to develop strategies to enhance product quality within SkyBlu Technologies (Pty) Ltd, Durban.

4.2 The sample

The organisation comprises 150 employees who are distributed across seven main departments. Using the sampling table by (Sekaran and Bougie, 2016: 294), the required sample for this research was 108. However, a total of 126 questionnaires were distributed to employees at SkyBlu Technologies (Pty) Ltd, Durban. Of these, 113 completed questionnaires were returned, yielding a response rate of 89.68% of the 126 distributed. This response rate provides a sufficiently robust sample for the analysis of employee perceptions regarding the factors influencing product quality. The

diversity in responses enables a thorough analysis of the factors affecting product quality across different roles and job functions within the organisation.

4.3 Reliability statistics

The two key aspects of precision in any research instrument are reliability and validity. Reliability, defined as the consistency of a measure obtained through multiple assessments of the same subjects, is typically deemed acceptable with a coefficient of 0.70 or higher, such as Cronbach's alpha, indicating that the questionnaire items effectively measure the same underlying construct with a satisfactory level of consistency (Surucu and Maslakcı 2020: 2695). Table 4.1reflects the Cronbach's alpha score for all the items included in the questionnaire, providing an indication of the internal consistency of the various constructs being measured.

Table 4.1: Cronbach's alpha score

	Section		Number of Items	Cronbach's Alpha
B1	Employee's perception about quality		5	0.601
B2	Job specific quality requirements		5	0.835
B3	Quality resources and objectives		5	0.829
B4.1	Employee factors that influence product quality	Employee Engagement and Motivation Factors	6	0.879
B4.2		Organisation Culture and Environment Factors	6	0.939
B4.3		Job Satisfaction and Performance Factors	6	0.937
B4.4		Employment and Technology Factors	6	0.883
All items included			39	0.946

Source:Researcher's own construct

The reliability analysis of the questionnaire, as reflected by Cronbach's alpha values, indicates strong internal consistency across most sections. Section B1, focusing on employees' perceptions about quality, yielded a Cronbach's alpha of 0.601, which is acceptable for a newly-developed construct. Job-specific quality requirements (B2), and quality resources and objectives (B3) showed higher reliability scores of 0.835 and 0.829, respectively. Employee engagement and motivation factors (B4.1) scored 0.879, while organisational culture and environment factors (B4.2) achieved an excellent reliability score of 0.939. Job satisfaction and performance factors (B4.3) had a similarly high alpha of 0.937, and employment and technology factors (B4.4) were also reliable with a score of 0.883. Overall, the questionnaire demonstrated excellent

internal consistency, with a Cronbach's alpha of 0.946 for all 39 items, indicating a highly reliable instrument for assessing the factors influencing product quality within the organisation.

4.4 Factor analysis

Babu and Gajanan (2022: 169) describe factor analysis as a method used for data reduction that entails identifying a large number of variables that can be represented by a smaller set of “factors” or “components”. The important aspects of factor analysis include:

i. Variable Selection: Determining which variables to include in the analysis.
ii. Factor Model Choice: Choosing the appropriate model for the analysis.
iii. Factor Retention: Deciding how many factors to keep from the analysis.
iv. Rotation Methods: Selecting techniques to enhance the clarity of factor interpretation.
v. Interpretation: Making sure the factors are well-defined and represent distinct constructs with minimal intercorrelation.

The matrix Table 4.3 is preceded by a summarised Table 4.2 that reflects the results of KMO and Bartlett's Test. The KMO and Bartlett's Test table below shows two tests that indicate the suitability of data for structure detection. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is a statistic that reflects the proportion of variance in the variables attributable to underlying factors, with high values close to 1.0 suggesting that factor analysis may be beneficial, while values below 0.50 indicate that the results of the factor analysis are likely to be of limited usefulness (Watkins 2018: 226).

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. Small values (less than 0.05) of the “significance level” indicates that a factor analysis may be useful with the data.

Factor analysis is done only for the Likert scale items. Certain components are divided into finer components. This is explained below in the rotated component matrix. Table 4.2 presents KMO and Bartlett's Test.

Table 4.2 : KMO and Bartlett's Test

	Section		Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity		
				Approx. Chi-Square	df	Sig.
B1	Employee's perception about quality		0.659	41.506	10	< 0.001
B2	Job specific quality requirements		0.814	244.181	10	< 0.001
B3	Quality resources and objectives		0.759	215.694	10	< 0.001
B4.1	Employee factors that influence product quality	Employee Engagement and Motivation Factors	0.834	365.698	15	< 0.001
B4.2		Organisation Culture and Environment Factors	0.813	576.563	15	< 0.001
B4.3		Job Satisfaction and Performance Factors	0.870	586.730	15	< 0.001
B4.4		Employment and Technology Factors	0.817	339.610	15	< 0.001

Source:Researcher's own construct

All the necessary conditions for conducting factor analysis have been met, indicating that the data is suitable for this analytical method.The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were conducted to assess the suitability of the data for factor analysis. The KMO values range between 0 and 1, with values closer to 1 indicating that the sample is adequate for factor analysis. A value of 0.6 or higher is considered acceptable. The Bartlett's Test of Sphericity examines whether the correlation matrix is an identity matrix, indicating that factor analysis may be inappropriate if significant correlations are absent. A significant result ($p < 0.05$) suggests that the data is suitable for factor analysis.

In this study, KMO values for all sections exceeded the acceptable threshold of 0.6, with Section B1 (Employee's perception about quality) having a KMO of 0.659, indicating moderate adequacy. Sections B2 (Job specific quality requirements) and B3 (Quality resources and objectives) yielded KMO values of 0.814 and 0.759, respectively, showing good sampling adequacy. Similarly, the KMO values for the subsections of B4 were high: B4.1 (Employee Engagement and Motivation Factors) at 0.834, B4.2 (Organisation culture and environment factors) at 0.813, B4.3 (Job satisfaction and performance factors) at 0.870, and B4.4 (Employment and technology factors) at 0.817. These subsections reflected strong adequacy for factor analysis.

Bartlett's Test of Sphericity was highly significant for all sections ($p < 0.001$), confirming that the correlation matrices were not identity matrices and that factor analysis was appropriate for these data sets. These results indicate that factor analysis could be reliably conducted across all sections of the questionnaire.The next section discusses

the rotated component matrix. Tables 4.3 to 4.9 present the Rotated Component Matrixes.

4.5 Rotated component matrix

Table 4.3 presents the rotated component matrix B1.

Table 4.3: Rotated component matrix B1

B1	Component	
	1	2
Quality is satisfying the requirement of the customer	0.751	-0.015
Quality is evaluated against product specifications	0.652	0.255
Quality is everyone's responsibility within the company	0.533	0.171
Quality is sometimes compromised to achieve production targets	0.055	0.947
All critical quality checks in the production process are monitored and controlled as specified	0.716	-0.256

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalisation
a. Rotation converged in 3 iterations

Source:Researcher's own construct

Table 4.4 presents the rotated component matrix B2.

Table 4.4: Rotated Component Matrix B2

B2	Component
	1
Job work instructions help to build a quality product	0.775
Work instructions provide a clear guideline for task completion to ensure quality objectives are achieved	0.874
Work instructions are updated and available by the company for specific job functions	0.899
Roles and responsibilities are clearly defined by using work instructions	0.813
Non-conforming products are segregated	0.577

Extraction Method: Principal Component Analysis
a. 1 component extracted

Source:Researcher's own construct

Table 4.5 presents the rotated component matrix B3.

Table 4.5: Rotated component matrix B3

B3	Component
	1
The organisation has developed a product quality strategy and has identified the resources required	0.789
Quality objectives are clearly defined for each job role and department	0.824
Necessary resources are always available for me to do my job to achieve my quality objectives	0.856
The tools and equipment are in good working condition and calibrated	0.707
Scheduling tool maintenance enhances product quality	0.678

Extraction Method: Principal Component Analysis
a. 1 component extracted

Source:Researcher's own construct

Table 4.6 presents the rotated component matrix B4.1

Table 4.6: Rotated component matrix B4.1

B4.1	Component
	1
Employee Engagement influences product quality	0.859
Employee Motivation influences product quality	0.878
Leadership influences product quality	0.813
Training, advancement, growth and motivation influences me to achieve product quality	0.798
Job status, roles and responsibilities influences me to achieve product quality	0.756
Job Recognition influences product quality	0.728

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Source:Researcher's own construct

Table 4.7 presents the rotated component matrix B4.2

Table 4.7: Rotated Component Matrix B4.2

B4.2	Component
	1
Organisational culture influences product quality	0.873
Work environment influences product quality	0.900
Communication influences product quality	0.849
Work- Life Balance influences product quality	0.885
Provision of resources influences product quality	0.860
Work Ethics influences product quality	0.904

Extraction Method: Principal Component Analysis

a. 1 component extracted

Source:Researcher's own construct

Table 4.8 presents the rotated component matrix B4.3

Table 4.8: Rotated Component Matrix B4.3

B4.3	Component
	1
Job satisfaction influences product quality	0.939
Performance management influences product quality	0.803
Job security motivates me to produce quality products	0.898
A safe environment motivates me to produce quality products	0.915
Health and safety motivate me to produce quality products	0.908
Higher salary/wage motivates me to produce quality products	0.784

Extraction Method: Principal Component Analysis

a. 1 component extracted

Source:Researcher's own construct

Table 4.9 presents the rotated component matrix B4.4

Table 4.9: Rotated Component Matrix B4.4

B4.4	Component
	1
Employment type (Contract, permanent and staff) influences quality	0.836
Working hours (Shift, Overtime) impacts on product quality	0.837
Team collaboration impacts on product quality	0.801
Technology influences product quality	0.844
Organisation uses the latest technology to enhance product quality	0.674
Production automation impacts product quality	0.800

Extraction Method: Principal Component Analysis

a. 1 component extracted

Source:Researcher's own construct

The principal component analysis was used as the extraction method, and the rotation method was Varimax with Kaiser Normalisation. This is an orthogonal rotation method that minimises the number of variables that have high loadings on each factor. It simplifies the interpretation of the factors.

Factor analysis or loading shows inter-correlations between variables. Items or 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 in all sections, except for B1, loaded strongly onto a single component. This indicates that the items in these sections were highly consistent and effectively measured the intended construct. The strong alignment of these statements with a single factor suggests that each section reliably captured the underlying concept it was designed to assess, demonstrating the robustness of the questionnaire in these areas.

In Section B1, factor analysis revealed that the items measuring employees' perceptions about quality loaded on two distinct components, suggesting two underlying dimensions. Based on the factor loadings, the first component, which includes items such as "Quality is satisfying the requirement of the customer," "Quality is evaluated against product specifications," and "Quality is everyone's responsibility within the company", can be interpreted as Customer-Focused Quality Standards. This component reflects an emphasis on ensuring that quality meets customer expectations and aligns with company-wide responsibilities.

The second component, which is dominated by the item "Quality is sometimes compromised to achieve production targets" with a high loading of 0.947, suggests a contrasting dimension, which could be named Production Constraints on Quality. This factor reflects situations where production pressures may lead to compromises in maintaining quality standards. Together, these two components provide insights into the balance between maintaining quality for customer satisfaction and the practical challenges faced in meeting production targets.

4.6 Section A: Biographical data

This section provides a summary of the biographical characteristics of the respondents. It includes key demographic information such as gender, age, race, type of employment, job category, and department. This data is essential for understanding the composition of the sample and for contextualising the results in terms of the diversity of the workforce at SkyBlu Technologies (Pty) Ltd, Durban. The biographical data allows for analysis of how demographic factors may influence perceptions of product quality within the organisation.Table 4.10 presents the overall gender distribution.

Table 4.10: Overall gender distribution

	Frequency	Percent
Male	66	58.4
Female	47	41.6
Total	113	100.0

Source:Researcher's own construct

Overall, the ratio of males to females is approximately 3:2 (58.4% : 41.6%) (p = 0.074). Out of a total of 113 respondents, 66 (58.4%) were male, and 47 (41.6%) were female. This provides a balanced representation of gender in the sample, which is important for ensuring that the perspectives on product quality within the organisation are considered from both male and female employees. The age distribution is shown in Figure 4.1.

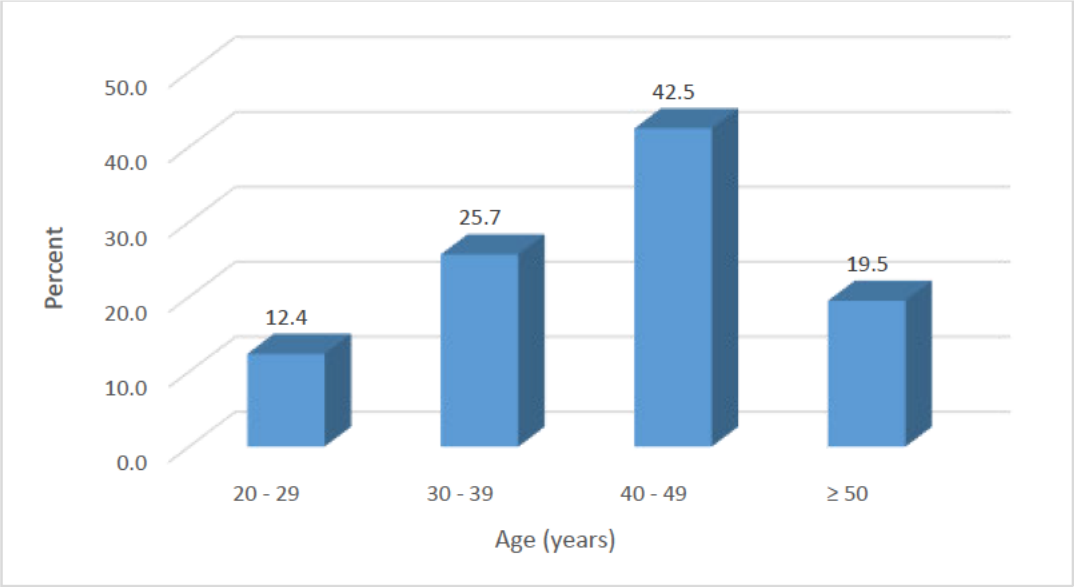

Figure 4:1: Age distribution

Source:Researcher's own construct

The largest age group is those between 40 and 49 years, representing 48 respondents (42.5%). This is followed by the 30 to 39 age group, with 29 respondents (25.7%), and those aged 50 and above, with 22 respondents (19.5%). The youngest age group, between 20 and 29 years, accounts for 14 respondents (12.4%). This distribution indicates that the majority of the workforce surveyed is in the mid-career age range, with a smaller proportion of younger and older employees ($p < 0.001$). The racial composition of the sample is reflected in Table 4.11 and in Figure 4.2.

.

Table 4.11: Racial composition of the sample

		Frequency	Percent
African		43	38.1
Coloured		2	1.8
Indian		63	55.8
White		4	3.5
Other		1	0.9
Total		113	100.0

Source:Researcher's own construct

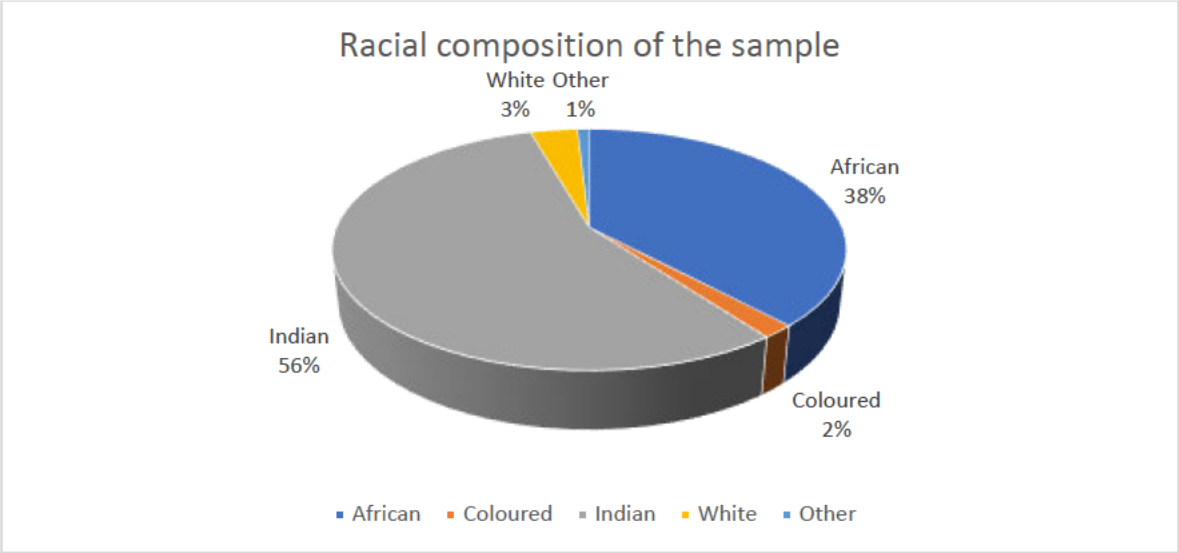

Figure 4:2: Racial composition of the sample

Source:Researcher's own construct

The majority of respondents, 63 (55.8%), identified as Indian, followed by 43 respondents (38.1%) who identified as African. A smaller proportion of respondents identified as White (4 respondents, 3.5%), Coloured (2 respondents, 1.8%), and Other (1 respondent, 0.9%). This distribution reflects a diverse sample, with the Indian and African populations making up the majority ($p < 0.001$). Table 4.12 summarises the type of employment among the respondents.

Table 4.12 presents the Respondents type of employment

Table 4.12: Respondents type of employment

	Frequency	Percent
Contract	67	59.3
Permanent	46	40.7
Total	113	100.0

Source:Researcher's own construct

The majority, 67 respondents (59.3%), are employed on a contract basis, while 46 respondents (40.7%) hold permanent positions ($p = 0.048$). This distribution indicates a significant proportion of the workforce are on contracts, which could influence their perspectives on job security, engagement, and other factors related to product quality within the organisation..The respondents' job categories are summarised in Table 4.13 and illustrated in Figure 4.3.

Table 4.6 presents the respondents job categories

Table 4.13: Respondents job categories

	Frequency	Percent
Senior Management	7	6.2
Middle Management	14	12.4
Operational Staff	92	81.4
Total	113	100.0

Source:Researcher's own construct

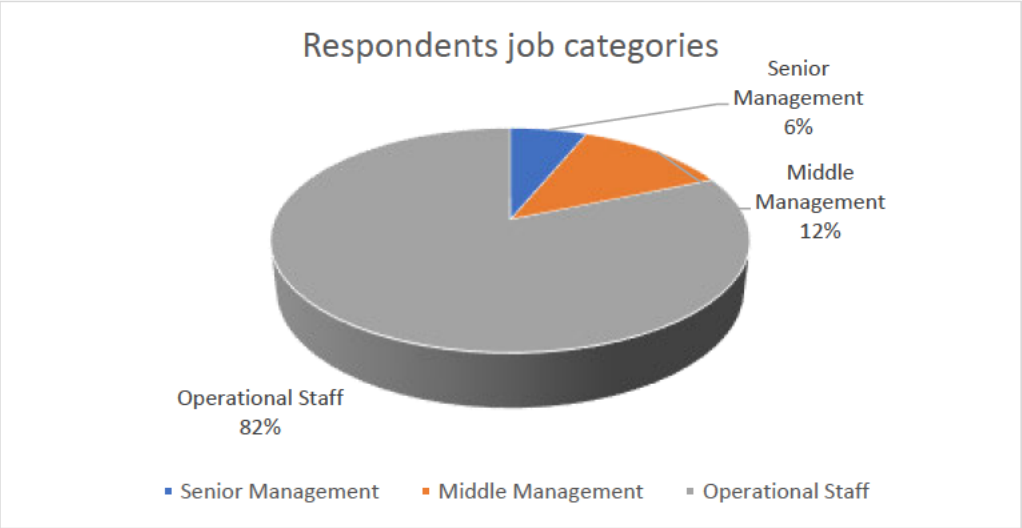

Figure 4:3: Respondents job categories

Source:Researcher's own construct

The majority, 92 respondents (81.4%), are classified as Operational Staff, followed by 14 respondents (12.4%) in Middle Management, and 7 respondents (6.2%) in Senior Management. This distribution shows that most respondents are directly involved in operational roles within the organisation ($p < 0.001$).Figure 4.4 summarises the distribution of respondents across different departments.

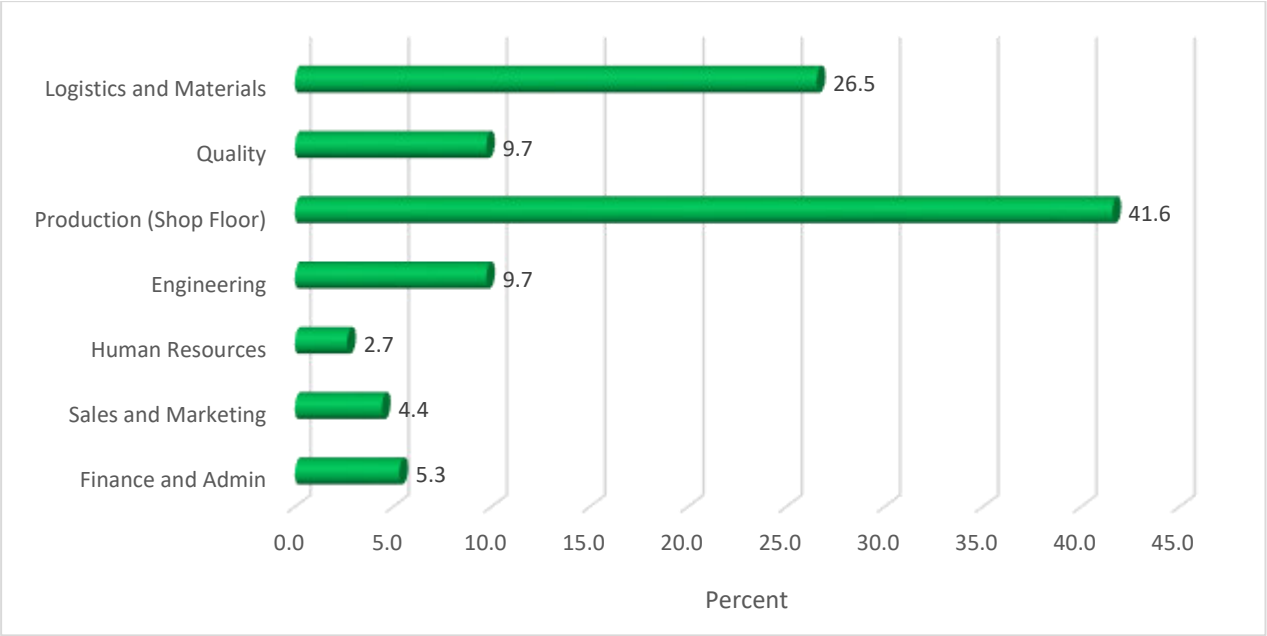

Figure 4:4:Distribution of respondents across different departments

Source:Researcher's own construct

The majority of respondents, 47, are from the Production (Shop Floor) department, followed by 30 respondents from Logistics and Materials. Engineering and Quality departments each have 11 respondents, while Finance and Admin, Sales and Marketing, and Human Resources have 6, 5, and 3 respondents, respectively. This distribution indicates that a significant proportion of the sample comes from the production and logistics areas ($p < 0.001$).

4.7 Section analysis

The following section analyses the respondents' scoring patterns for each variable within the respective sections of the study. The results are initially presented using summarised percentages for the variables comprising each section. Subsequently, the results are examined in greater depth, focusing on the relative importance of the statements to provide insights into the key factors influencing employee perceptions of product quality.

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 hypothesis states that there is a significant

difference between the levels of agreement and disagreement. The results are shown in the scoring table.

The highlighted sig. values (p-values) are less than 0.05 (the level of significance); therefore, it implies that the distributions were not similar, that the differences between the way respondents scored (agree, not sure, disagree) were significant.

4.8 Section B

This section explored the various factors influencing employee perceptions of product quality within SkyBlu Technologies (Pty) Ltd, Durban. It is divided into several key areas, each focusing on specific aspects related to quality in the workplace, such as job-specific requirements, quality resources, employee engagement, organisational culture, and the impact of employment and technology. By examining these factors, this section aims to identify the critical variables that affect product quality from the employees' perspective. The analysis will provide insights into how these perceptions can inform strategies to improve product quality and overall organisational performance.

4.9 Section B1: Employee’s perception about quality

This section focuses on the employees' perceptions regarding the overall quality standards within the organisation. It examines how employees view key aspects such as meeting customer requirements, adherence to product specifications, and the collective responsibility for maintaining quality across the company. Additionally, this section explores whether quality is sometimes compromised due to production pressures and the extent to which quality checks are monitored and controlled. The aim of this section is to gain an understanding of how employees perceive the quality processes and how these perceptions may impact their commitment to upholding product quality within SkyBlu Technologies (Pty) Ltd.The scoring patterns of Section B1: Employee’s perception about quality are summarised in Table 4.14 and illustrated in Figure 4.5.

Table 4.14: Scoring patterns of Section B1: Employee's perception about quality

		Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
Quality is satisfying the requirement of the customer	B1.1	0	0.0%	1	0.9%	4	3.6%	28	25.2 %	78	70.3 %	< 0.001
Quality is evaluated against product specifications	B1.2	4	3.5%	2	1.8%	2	1.8%	28	24.8 %	77	68.1 %	< 0.001
Quality is everyone's responsibility within the company	B1.3	1	0.9%	0	0.0%	2	1.8%	21	18.8 %	88	78.6 %	< 0.001
Quality is sometimes compromised to achieve production targets	B1.4	19	17.1 %	21	18.9 %	5	4.5%	27	24.3 %	39	35.1 %	< 0.001
All critical quality checks in the production process are monitored and controlled as specified	B1.5	0	0.0%	3	2.7%	6	5.4%	36	32.1 %	67	59.8 %	< 0.001

Source:Researcher's own construct

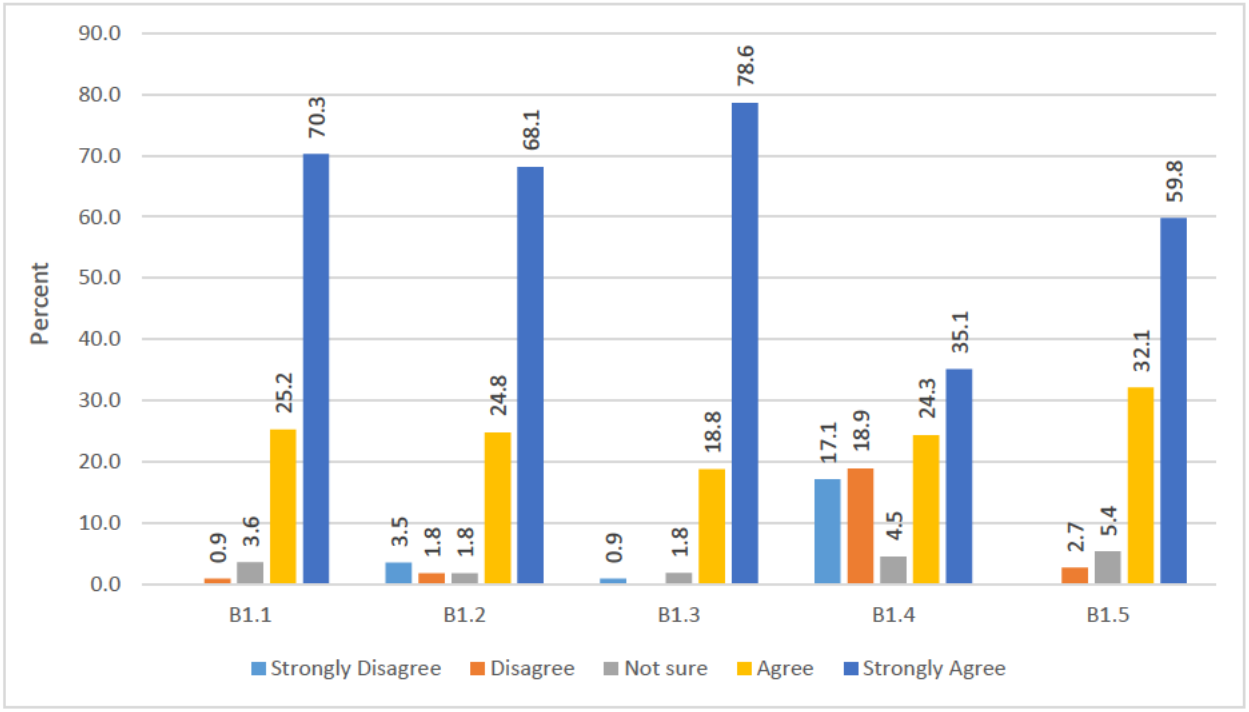

Figure 4:5: Scoring patterns Section B1: Employee's perception about quality

Source:Researcher's own construct

The following patterns were observed:

i. All of the statements show (significantly) high levels of agreement whilst other levels of agreement are lower (but still greater than levels of disagreement).
ii. There are no statements with highlevels of disagreement.
iii. The significance of the differences is tested and shown in Table4.14.

Factor analysis reveals two distinct themes within employees' perceptions of quality. The first, Customer-Focused Quality Standards, shows a strong alignment with customer satisfaction, responsibility, and the monitoring of quality. This is supported by the high levels of agreement for statements such as "Quality is satisfying the requirement of the customer" (70.3% strongly agreeing) and "Quality is everyone's responsibility within the company" (78.6% strongly agreeing). These responses suggest that employees largely believe in the organisation's commitment to meeting customer requirements and ensuring collective responsibility for quality. The positive trend in agreement across these items reflects the workforce's confidence in quality standards and monitoring processes.

The second theme, Production Constraints on Quality, highlights areas where production pressures may challenge the maintenance of high-quality standards. This is evident in the mixed responses to the statement "Quality is sometimes compromised to achieve production targets", where 35.1% of respondents agreed, while 36% (17.1% strongly disagreeing and 18.9% disagreeing) indicated disagreement. This shows a potential tension between maintaining quality and meeting production deadlines, with a notable portion of the workforce perceiving that quality can be compromised under pressure.

Understanding these patterns can guide the organisation in addressing areas where employees feel that quality might be compromised due to production demands, while reinforcing the strong positive perceptions related to customer-focused quality assurance and monitoring systems.

Overall the general trend is that employees have a strong perception that quality is everyone's responsibility; however, there are employees that perceived that quality is compromised.

4.10 Section B2: Job specific quality requirements

This section focuses on the employees' perceptions of job-specific quality requirements within SkyBlu Technologies (Pty) Ltd. It examines how well-defined job roles, work instructions, and processes contribute to achieving quality objectives. Key aspects include the availability and clarity of work instructions, the segregation of non-conforming products, and the overall support provided to employees to meet their quality targets.

The aim of this section is to assess whether employees feel that their specific job functions are adequately supported by clear guidelines and resources necessary for maintaining product quality. Understanding these perceptions will provide insights into how job-specific processes either enhance or hinder the achievement of quality objectives, thereby highlighting areas for improvement in operational processes. This analysis helps determine if employees perceive the tools and instructions they are given as sufficient for upholding product quality in their daily tasks.Table 4.15 and Figure 4.6 reflect the scoring patterns of B2: Job specific quality requirements.

Table 4.15: Scoring pattern 4.11 on B2: Job specific quality requirements

		Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
Job work instructions help to build a quality product	B2.1	0	0.0 %	2	1.8 %	2	1.8 %	27	24.3 %	80	72.1 %	< 0.001
Work instructions provide a clear guideline for task completion to ensure quality objectives are achieved	B2.2	1	0.9 %	0	0.0 %	4	3.6 %	19	17.1 %	87	78.4 %	< 0.001
Work instructions are updated and available by the company for specific job functions	B2.3	0	0.0 %	5	4.6 %	3	2.8 %	27	24.8 %	74	67.9 %	< 0.001
Roles and responsibilities are clearly defined by using work instructions	B2.4	2	1.8 %	3	2.7 %	3	2.7 %	34	30.6 %	69	62.2 %	< 0.001
Non-conforming products are segregated	B2.5	0	0.0 %	4	3.8 %	6	5.7 %	30	28.3 %	66	62.3 %	< 0.001

Source: Researcher's own construct

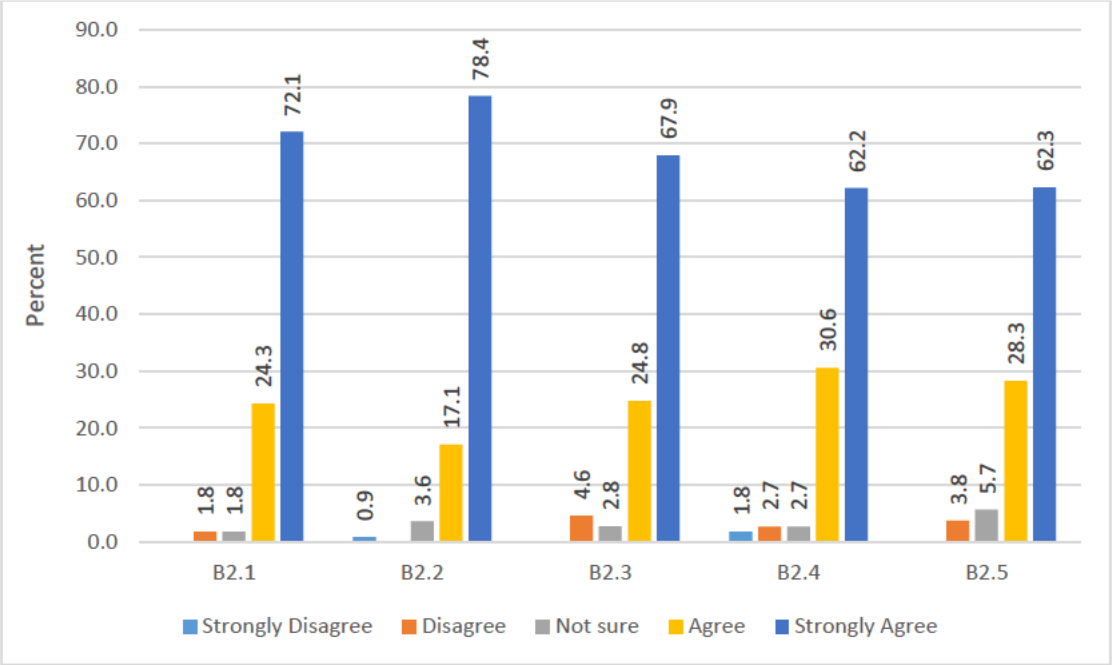

Figure 4:6: Scoring pattern: B2: Job specific quality requirements

Source:Researcher's own construct

The responses for Section B2, which focuses on job-specific quality requirements, reveal strong overall agreement among employees regarding the adequacy of work instructions and their role in maintaining quality. The majority of respondents (72.1%) strongly agreed that work instructions help build a quality product (B2.1), with only a small percentage (1.8%) disagreeing or being unsure. Similarly, 78.4% of respondents strongly agreed that work instructions provide a clear guideline for task completion to ensure quality objectives are met (B2.2). This strong agreement suggests that employees feel well-supported by clear and effective instructions in performing their duties.

The statement "Work instructions are updated and available by the company for specific job functions" (B2.3) also received a high level of agreement, with 67.9% strongly agreeing. However, there is a slightly higher level of disagreement (4.6%) for this statement compared to others, indicating that a few employees may feel the updating of instructions could be improved.

When asked whether roles and responsibilities are clearly defined by using work instructions (B2.4), 62.2% strongly agreed, while a small percentage (5.4%) were unsure or disagreed, suggesting that most employees feel their roles are clearly communicated through the instructions provided.

Finally, 62.3% of respondents strongly agreed that non-conforming products are appropriately segregated (B2.5), indicating a strong belief in the effectiveness of quality control measures.

The significance of these results, confirmed by p-values below 0.001, demonstrates that the majority of employees consistently perceive job-specific instructions and processes as critical to maintaining high-quality standards. These responses indicate that, overall, employees feel their tasks are well-defined and supported by clear, updated instructions, contributing to the achievement of quality objectives within SkyBlu Technologies (Pty) Ltd.

4.11 Section B3: Quality resources and objectives

This section evaluates the perceptions of employees regarding the availability and adequacy of resources, tools, and defined objectives that support the achievement of product quality at SkyBlu Technologies (Pty) Ltd. It focuses on key areas such as the development of a product quality strategy, the clarity of quality objectives for each job role, the availability of necessary resources, the condition of tools and equipment, and the role of scheduled maintenance in enhancing product quality.

The aim of this section is to assess how well employees feel equipped to meet their quality targets, whether the organisation has clearly communicated its quality objectives, and if the resources provided are sufficient to uphold the desired quality standards. Understanding these perceptions will help identify strengths and potential areas for improvement in how the organisation supports its workforce in maintaining high levels of product quality. This section is critical for determining whether employees believe they have the necessary tools and clear objectives to perform their roles effectively in contributing to product quality.Table 4.16 and Figure 4.7 reflect the scoring patterns of B2: Job specific quality requirements.

Table 4.16: Section B3: Quality resources and objectives

		Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
The organisation has developed a product quality strategy and has identified the resources required	B3.1	1	0.9 %	0	0.0 %	11	9.8 %	37	33.0%	63	56.3%	< 0.001
Quality objectives are clearly defined for each job role and department	B3.2	1	0.9 %	4	3.6 %	8	7.1 %	34	30.4%	65	58.0%	< 0.001
Necessary resources are always available for me to do my job to achieve my quality objectives	B3.3	2	1.8 %	7	6.3 %	10	9.0 %	37	33.3%	55	49.5%	< 0.001
The tools and equipment are in good working condition and calibrated	B3.4	3	2.8 %	3	2.8 %	13	12.1%	39	36.4%	49	45.8%	< 0.001
Scheduling tool maintenance enhances product quality	B3.5	1	0.9 %	1	0.9 %	2	1.9 %	39	36.1%	65	60.2%	< 0.001

Source:Researcher's own construct

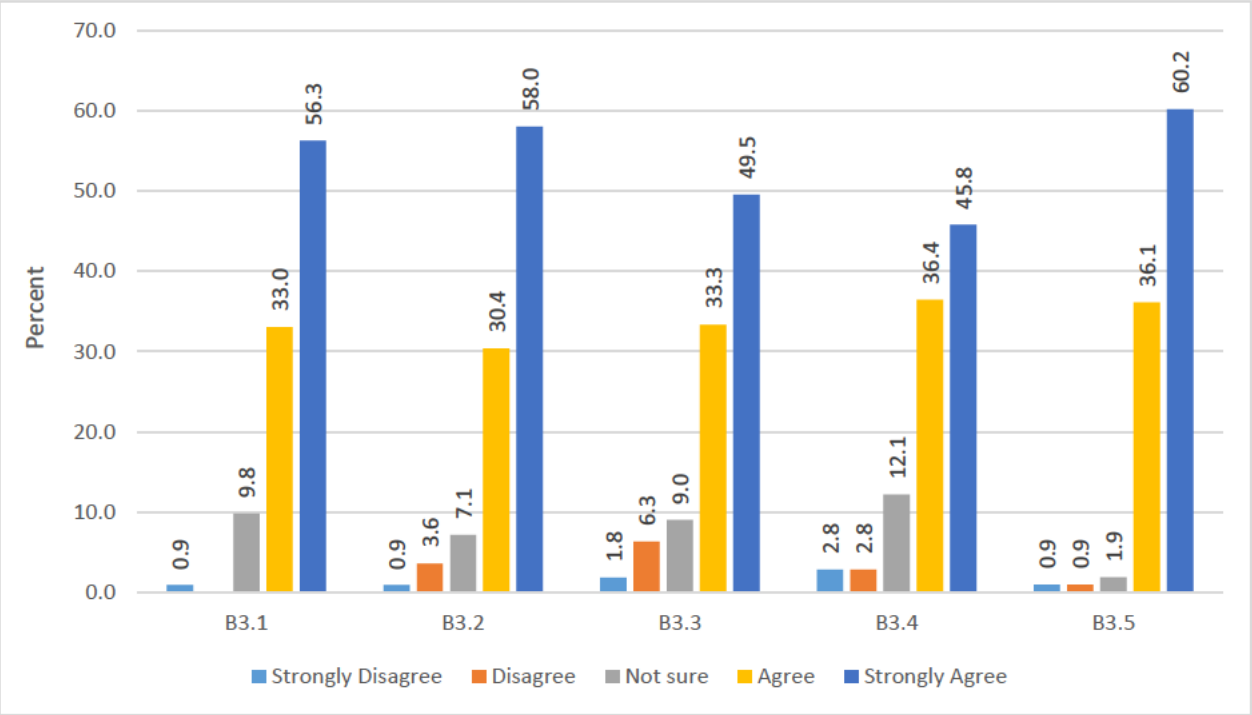

Figure 4:7: Section B3: Quality resources and objectives

Source:Researcher's own construct

The analysis of Section B3 reveals generally positive perceptions among employees regarding the quality resources and objectives provided by SkyBlu Technologies (Pty) Ltd. A clear pattern emerges from the data, indicating that the majority of respondents

feel that the organisation has developed a robust product quality strategy. With 56.3% of respondents strongly agreeing that the company has identified the necessary resources to support this strategy, there is a clear consensus that the organisation has made significant efforts in defining and implementing quality-related initiatives. Only a very small percentage of respondents (0.9%) strongly disagreed, which suggests that the overall confidence in the company's approach to quality is high.

Another prominent trend is the widespread belief that quality objectives are well defined for each job role and department. Most respondents (58.0%) strongly agreed with this statement, demonstrating a shared understanding of the goals related to quality across the workforce. However, a small number of respondents (7.1%) expressed uncertainty, while 4.5% disagreed, indicating that while communication of quality objectives is generally effective, there may be a need to ensure that all employees are fully aware of their specific responsibilities in this area.

In terms of resource availability, the results show a more mixed response. While nearly half of the respondents (49.5%) strongly agreed that the necessary resources are always available to help them meet their quality objectives, a notable portion (17.1%) either disagreed or were unsure. This suggests that while resource provision is generally perceived positively, there are some concerns about consistency, with certain employees feeling that they lack the tools or support required to meet the company’s quality standards.

The condition of tools and equipment also elicited varied responses. While a significant number of employees (45.8%) strongly agreed that tools are in good working condition and properly calibrated, a smaller but still notable group (14.9%) expressed doubts or dissatisfaction. This suggests that, although the organisation’s equipment is largely seen as adequate, there are some perceptions of inadequacy that may need to be addressed to ensure that all employees feel equally supported by the available tools.

Finally, there was strong agreement on the importance of scheduled tool maintenance, with 60.2% of respondents strongly agreeing that maintenance enhances product quality. This trend highlights a general recognition among employees of the critical role that proper equipment maintenance plays in maintaining high-quality standards, with very few respondents expressing disagreement.

In summary, while the overall results are positive, showing strong support for the company's quality resources and objectives, there are areas, such as the availability of resources and the condition of tools, where some employees perceive gaps. Addressing these concerns could further strengthen the organisation’s ability to maintain and improve quality standards across its workforce.

4.12 Section B4: Employee factors that influence product quality

This section examines the various employee-related factors that impact product quality within SkyBlu Technologies (Pty) Ltd. Employee perceptions are grouped into four key areas: engagement and motivation, organisational culture and environment, job satisfaction and performance, and employment and technology. These factors are crucial for understanding how employees' attitudes, workplace environment, job satisfaction, and the tools they use influence their ability to maintain and enhance product quality.

4.13 Section B4.1 Employee engagement and motivation factors

This section explores the impact of employee engagement and motivation on product quality at SkyBlu Technologies (Pty) Ltd. Employee engagement refers to the level of commitment and emotional investment employees have in their work, while motivation drives their efforts to meet and exceed quality expectations. Both engagement and motivation are crucial for maintaining high product standards, as motivated and engaged employees are more likely to take ownership of quality processes, pay attention to detail, and contribute to continuous improvement. Understanding how these factors influence product quality helps identify areas where the organisation can foster greater involvement and drive among its workforce, ultimately enhancing overall performance and quality outcomes. This section aims to provide insights into the extent to which employees' motivation and engagement contribute to their ability to maintain product quality. Table 4.17 and Figure 4.8 illustrates employee engagement and motivation factors.

Table 4.17: Section B4.1 Employee engagement and motivation factors

		Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
Employee Engagement influences product quality	B4.1.1	1	0.9 %	1	0.9 %	5	4.6 %	31	28.7 %	70	64.8 %	< 0.001
Employee Motivation influences product quality	B4.1.2	2	1.8 %	1	0.9 %	4	3.6 %	27	24.3 %	77	69.4 %	< 0.001
Leadership influences product quality	B4.1.3	2	1.8 %	0	0.0 %	6	5.5 %	24	22.0 %	77	70.6 %	< 0.001
Training, advancement, growth and motivation influences me to achieve product quality	B4.1.4	1	0.9 %	2	1.9 %	1	0.9 %	27	25.2 %	76	71.0 %	< 0.001
Job status, roles and responsibilities influences me to achieve product quality	B4.1.5	5	4.9 %	4	3.9 %	2	1.9 %	30	29.1 %	62	60.2 %	< 0.001
Job Recognition influences product quality	B4.1.6	4	3.8 %	5	4.7 %	5	4.7 %	23	21.7 %	69	65.1 %	< 0.001

Source:Researcher's own construct

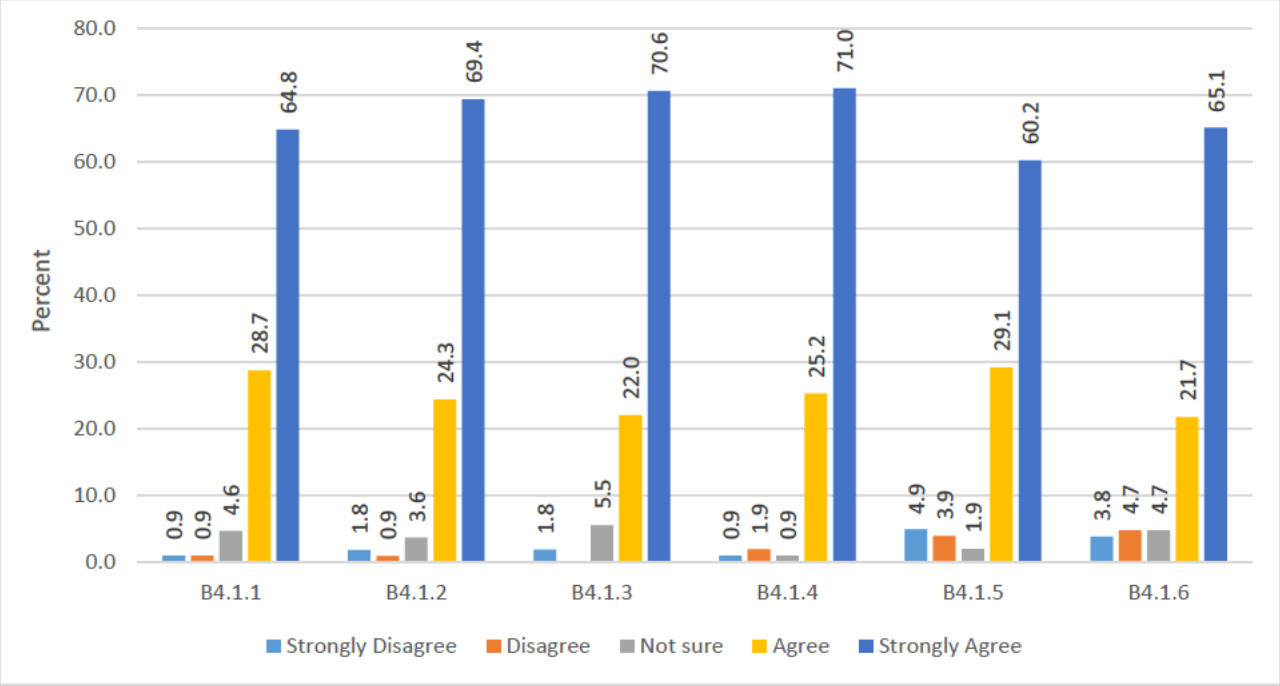

Figure 4:8: Section B4.1 Employee engagement and motivation factors

Source:Researcher's own construct

The results for Section B4.1, which examines the role of Employee Engagement and Motivation Factors in influencing product quality, reveal strong trends of agreement among the respondents.

A significant majority of employees perceive engagement and motivation as critical to maintaining quality standards. For instance, 64.8% of respondents strongly agree that employee engagement influences product quality (B4.1.1), with a further 28.7% agreeing, thus highlighting a strong consensus on the importance of engagement. Similarly, 69.4% strongly agree that employee motivation influences product quality (B4.1.2), further emphasising the importance of a motivated workforce.

The influence of leadership on product quality (B4.1.3) also receives strong support, with 70.6% strongly agreeing. Leadership is viewed as a significant driver of product quality, suggesting that employees believe effective leadership fosters an environment where quality is prioritised.

71.0% of respondents strongly agreed with the statement “Training, advancement, growth, and motivation influences product quality” (B4.1.4) sees, underlining the critical role that development opportunities play in enhancing product quality. Employees view opportunities for growth and training as integral to their ability to meet quality standards.

In terms of job structure, 60.2% of respondents strongly agreed that job status, roles, and responsibilities (B4.1.5) influence product quality. However, there is a small proportion of disagreement and uncertainty indicating that while the majority feel empowered by clear roles, there are some who may need better clarification of responsibilities.

Lastly, job recognition (B4.1.6) is seen as another key factor, with 65.1% of respondents strongly agreeing that it positively affects product quality, highlighting the value employees place on recognition and its direct link to their quality of work.

Across all statements in this section, the chi-square p-values (< 0.001) indicate statistically significant differences in responses, reinforcing the validity of these trends. These findings suggest that employee engagement, motivation, leadership, training, and recognition are perceived as vital elements that directly contribute to product quality.

4.14 B4.2 Organisation culture and work environment factors

This section delves into how the organisational culture and work environment influence product quality at SkyBlu Technologies (Pty) Ltd. Organisational culture encompasses the shared values, beliefs, and practices within the company, while the work environment includes factors such as communication, work-life balance, resource provision, and ethical standards. Both elements are crucial in shaping employees' attitudes towards their work and their commitment to maintaining high-quality standards. A positive organisational culture and supportive work environment can foster collaboration, enhance job satisfaction, and encourage adherence to quality objectives, whereas a misaligned culture or inadequate environment could impede quality efforts. This section aims to assess employees' perceptions of these factors and how they impact their ability to uphold and improve product quality. Table 4.18 and Figure 4.9 illustrates organisation culture and environment factors.

Table 4.18: B4.2 Organisation culture and environment factors

		Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
Organisational culture influences product quality	B4.2.1	1	1.0 %	4	3.8 %	4	3.8 %	33	31.7 %	62	59.6 %	< 0.001
Work environment influences product quality	B4.2.2	2	1.9 %	1	1.0 %	3	2.9 %	24	23.1 %	74	71.2 %	< 0.001
Communication influences product quality	B4.2.3	1	0.9 %	2	1.9 %	3	2.8 %	26	24.5 %	74	69.8 %	< 0.001
Work- Life Balance influences product quality	B4.2.4	3	2.9 %	0	0.0 %	3	2.9 %	34	33.3 %	62	60.8 %	< 0.001
Provision of resources influences product quality	B4.2.5	1	1.0 %	0	0.0 %	4	3.8 %	37	35.6 %	62	59.6 %	< 0.001
Work Ethics influences product quality	B4.2.6	2	1.9 %	1	0.9 %	2	1.9 %	32	29.6 %	71	65.7 %	< 0.001

Source:Researcher's own construct

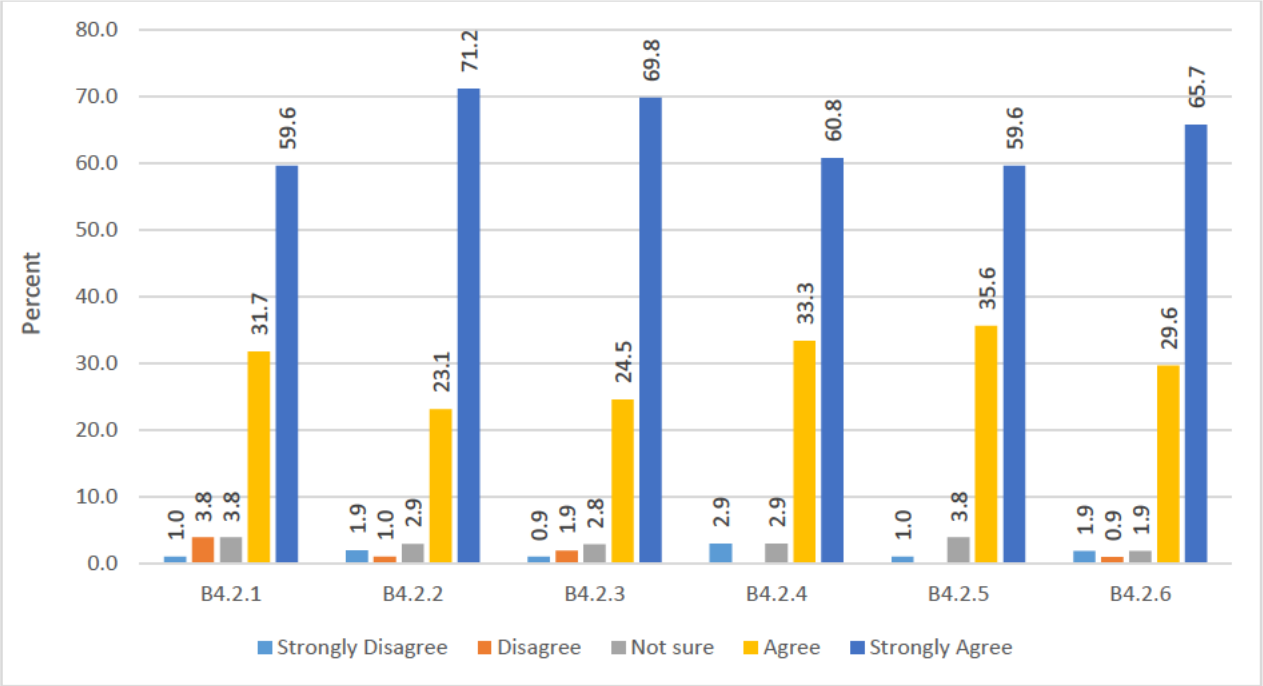

Figure 4:9: B4.2 Organisation culture and environment factors

Source:Researcher's own construct

The results from Section B4.2, which focuses on Organisation Culture and Environment Factors, reveal that employees generally perceive the organisational culture and work environment as key drivers of product quality.

A significant majority of respondents believe that organisational culture (B4.2.1) positively influences product quality, with 59.6% strongly agreeing and 31.7% agreeing. Only a small minority (1.0%) strongly disagreed, indicating that most employees view the shared values and practices within the organisation as supportive of maintaining quality standards.

The work environment (B4.2.2) is also perceived to have a strong impact on product quality, with 71.2% of respondents strongly agreeing. This suggests that the general conditions under which employees operate, such as workspace, resources, and management practices, are seen as conducive to upholding quality. Very few respondents disagreed (1.9%), reflecting overall satisfaction with the work environment's role in maintaining high standards.

Similarly, communication (B4.2.3) is seen as a crucial factor influencing quality, with 69.8% strongly agreeing and 24.5% agreeing. This demonstrates a broad consensus that clear and effective communication across the organisation plays a key role in achieving product quality.

Work-life balance (B4.2.4) is another important factor, with 60.8% of respondents strongly agreeing that it influences product quality, and 33.3% agreeing. This indicates that employees believe a balance between their personal and professional lives supports their ability to contribute to high-quality work. Only a small fraction of respondents (2.9%) disagreed or were unsure, reflecting a largely positive view.

When considering the provision of resources (B4.2.5), 59.6% strongly agreed that having adequate resources directly influences product quality, and 35.6% agreed. This shows that employees generally feel well-resourced to meet quality expectations, with minimal disagreement or uncertainty (1.0%).

Finally, work ethics (B4.2.6) are also highly valued, with 65.7% of respondents strongly agreeing that ethical practices influence product quality, and 29.6% agreeing. This underscores the importance employees place on integrity and ethical conduct in maintaining high standards of quality.

In all aspects, the chi-square p-values (< 0.001) demonstrate that these trends are statistically significant. Overall, the results indicate that organisational culture, communication, work-life balance, resource provision, and ethics are all seen as crucial components that positively impact product quality within SkyBlu Technologies (Pty) Ltd.

4.15 B4.3 Job satisfaction and performance factors

This section examines the relationship between job satisfaction, employee performance, and product quality at SkyBlu Technologies (Pty) Ltd. Job satisfaction refers to how content employees are with their roles, responsibilities, and work environment, while performance relates to how effectively they meet their job requirements. High levels of job satisfaction are often linked to better performance, which in turn contributes to improved product quality. Employees who are satisfied with their jobs tend to be more motivated, engaged, and committed to delivering high-quality work. This section aims to assess the extent to which job satisfaction influences employee performance and, ultimately, product quality within the organisation. By understanding this relationship, the organisation can better support its workforce and maintain high standards of quality. Table 4.19 and Figure 4.10 illustrates the organisation‘s job satisfaction and performance factors.

Table 4.19: B4.3 Job satisfaction and performance factors

		Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
Job satisfaction influences product quality	B4.3.1	2	1.9 %	4	3.7 %	4	3.7 %	29	27.1 %	68	63.6 %	< 0.001
Performance management influences product quality	B4.3.2	2	1.9 %	4	3.7 %	6	5.6 %	24	22.4 %	71	66.4 %	< 0.001
Job security motivates me to produce quality products	B4.3.3	2	1.9 %	3	2.9 %	3	2.9 %	27	25.7 %	70	66.7 %	< 0.001
A safe environment motivates me to produce quality products	B4.3.4	3	2.8 %	2	1.9 %	4	3.8 %	28	26.4 %	69	65.1 %	< 0.001
Health and safety motivate me to produce quality products	B4.3.5	2	1.9 %	3	2.8 %	5	4.7 %	30	28.0 %	67	62.6 %	< 0.001
Higher salary/wage motivates me to produce quality products	B4.3.6	3	2.8 %	5	4.7 %	5	4.7 %	25	23.4 %	69	64.5 %	< 0.001

Source:Researcher's own construct

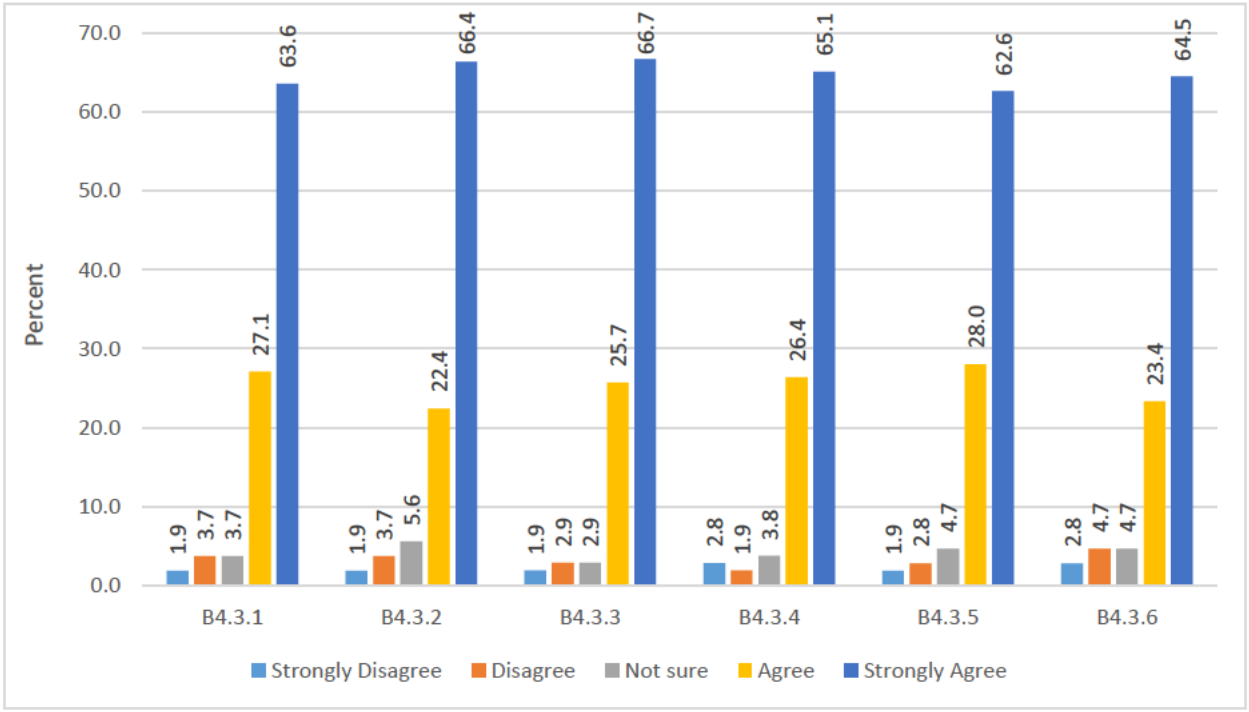

Figure 4:10:B4.3 Job satisfaction and performance factors

Source:Researcher's own construct

The results from Section B4.3, which focuses on Job Satisfaction and Performance Factors, reveal strong agreement among employees that job satisfaction and performance-related factors significantly influence product quality.

The majority of respondents, 63.6%, strongly agreed that job satisfaction influences product quality (B4.3.1), while 27.1% agreed, highlighting that employees who are content in their roles are more likely to contribute positively to product quality. Only a small percentage (5.6%) either disagreed or were unsure, suggesting that the link between job satisfaction and quality is well recognised across the workforce.

Similarly, 66.4% of respondents strongly agreed that performance management influences product quality (B4.3.2), with 22.4% agreeing. With only a minor disagreement (1.9%), it is evident that employees believe structured performance management systems help them maintain high-quality standards..

Regarding job security (B4.3.3), 66.7% of respondents strongly agreed that it motivates them to produce quality products, while 25.7% agreed. This suggests that employees who feel secure in their jobs are more motivated to contribute to quality outcomes, with only a small proportion (5.8%) expressing uncertainty or disagreement.

The importance of a safe environment in motivating employees to produce quality products (B4.3.4) is also evident, with 65.1% strongly agreeing and 26.4% agreeing. The minimal disagreement (2.8%) indicates that a safe workplace is widely recognised as essential for maintaining product quality.

In terms of health and safety (B4.3.5), 62.6% strongly agreed that these factors motivate them to produce quality products, and 28.0% agreed. These results highlight that employees place high value on health and safety measures, recognising their impact on product quality.

Finally, 64.5% of respondents strongly agreed that a higher salary or wage motivates them to produce quality products (B4.3.6), with 23.4% agreeing. This suggests that financial compensation plays a key role in driving employees to maintain high-quality standards, although a small proportion (7.5%) either disagreed or were unsure.

The chi-square p-values (< 0.001) for all items indicate statistically significant differences in responses. Overall, the results suggest that job satisfaction, performance management, job security, a safe work environment, health and safety

measures, and competitive compensation are all perceived as key factors that positively influence product quality within SkyBlu Technologies (Pty) Ltd.

4.16 B4.4 Employment and technology factors

This section explores how employment conditions and the use of technology influence product quality at SkyBlu Technologies (Pty) Ltd. Employment factors include aspects such as the type of employment (e.g., contract or permanent), working hours, and team collaboration, while technology factors focus on the tools, systems, and automation processes available to employees. Both employment conditions and technological advancements play a crucial role in enabling employees to perform their duties efficiently and effectively, thereby contributing to the overall quality of the products. This section seeks to assess employees' perceptions of how these factors impact their ability to maintain and improve product quality, providing insights into whether current employment practices and technological tools are sufficient to support quality standards. Table 4.19 and Figure 4.10 illustrates the organisation's Employment and technology factors.

Table 4.20:B4.4 Employment and technology factors

		Strongly Disagree		Disagree		Not sure		Agree		Strongly Agree		Chi Square p-value
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	
Employment type (Contract, permanent and staff) influences quality	B4.4.1	4	3.8%	7	6.6 %	8	7.5%	27	25.5 %	60	56.6 %	< 0.001
Working hours (Shift, Overtime) impacts on product quality	B4.4.2	5	4.7%	5	4.7 %	0	0.0%	35	33.0 %	61	57.5 %	< 0.001
Team collaboration impacts on product quality	B4.4.3	3	2.8%	2	1.9 %	1	0.9%	31	29.2 %	69	65.1 %	< 0.001
Technology influences product quality	B4.4.4	2	1.9%	4	3.8 %	2	1.9%	34	32.1 %	64	60.4 %	< 0.001
Organisation uses the latest technology to enhance product quality	B4.4.5	1	0.9%	9	8.4 %	8	7.5%	40	37.4 %	49	45.8 %	< 0.001
Production automation impacts product quality	B4.4.6	3	2.8%	4	3.8 %	4	3.8%	28	26.4 %	67	63.2 %	< 0.001

Source:Researcher's own construct

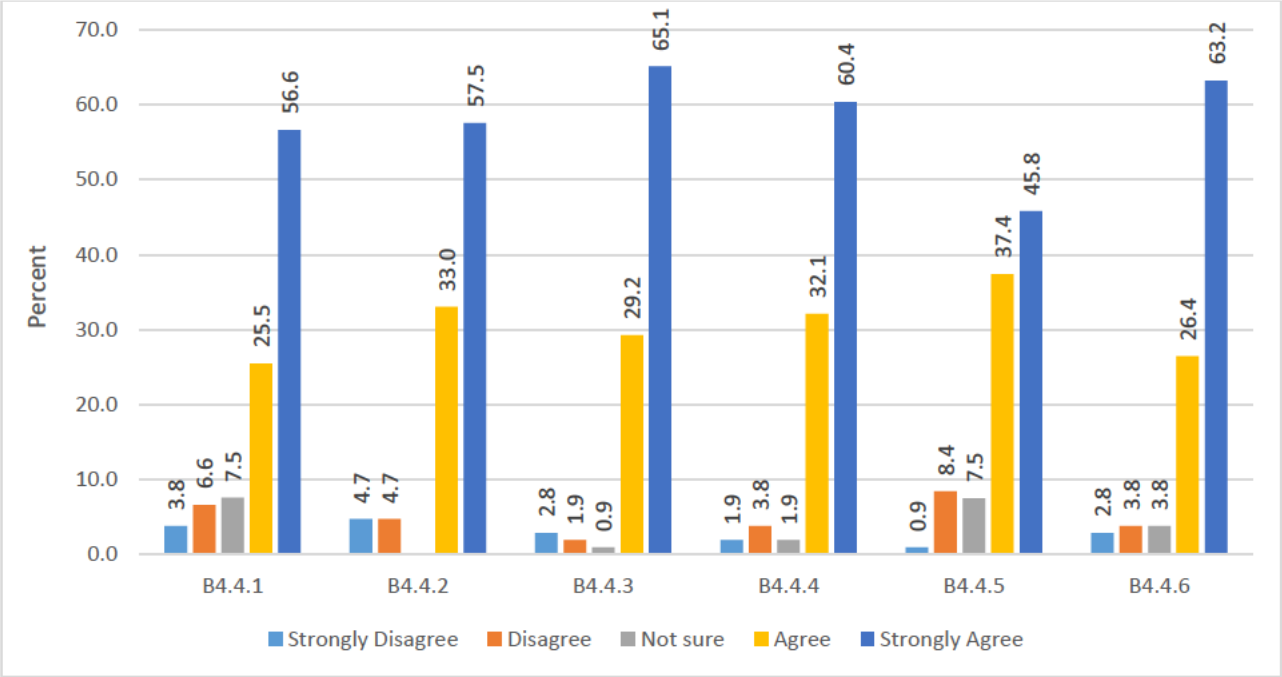

Figure 4:11: B4.4 Employment and technology factors

Source:Researcher's own construct

The results from Section B4.4, which explore Employment and Technology Factors, highlight that both employment conditions and technological tools significantly influence product quality at SkyBlu Technologies (Pty) Ltd.

Regarding employment type (B4.4.1), the majority of respondents (56.6%) strongly agree that the type of employment (contract, permanent, or staff) influences product quality, while 25.5% agree. A small percentage (10.4%) either disagreed or were unsure, indicating that most employees believe that their employment status affects their ability to maintain quality standards.

Working hours (B4.4.2), such as shifts and overtime, are also perceived to have a considerable impact on product quality, with 57.5% strongly agreeing and 33.0% agreeing. Only 4.7% of respondents disagreed, showing that the structure of work hours is seen as an important factor in ensuring consistent quality output.

Team collaboration (B4.4.3) is another crucial factor, with 65.1% strongly agreeing and 29.2% agreeing that collaboration among team members influences product quality. This overwhelming agreement (94.3% combined) indicates that employees recognise the importance of teamwork in achieving high standards of quality.

The influence of technology on product quality (B4.4.4) is also significant, with 60.4% strongly agreeing and 32.1% agreeing. Only a small percentage (5.7%) expressed

disagreement or uncertainty, suggesting that most employees see technology as a key factor in maintaining quality.

In terms of whether the organisation uses the latest technology (B4.4.5) to enhance product quality, 45.8% strongly agreed and 37.4% agreed, though a slightly higher proportion (15.9%) of respondents either disagreed or were unsure. This suggests that while many employees feel the company is utilising modern technology effectively, there may be some who believe more could be done in this area.

Finally, the role of production automation (B4.4.6) in influencing product quality is widely recognised, with 63.2% strongly agreeing and 26.4% agreeing. Only 6.6% of respondents expressed disagreement or uncertainty, indicating a general consensus that automation has a positive impact on product quality.

The chi-square p-values (< 0.001) confirm that the observed differences in responses across all factors are statistically significant. Overall, the results demonstrate that both employment conditions (such as job type and working hours) and technology (including collaboration, tools, and automation) are perceived as critical drivers of product quality. However, there is room for improvement in ensuring that all employees feel that the latest technology is being fully leveraged to support quality outcomes.

4.17 Section summary

The analysis of the scoring patterns across the sections of the study reveals several trends regarding employee perceptions of product quality at SkyBlu Technologies (Pty) Ltd. A chi-square goodness-of-fit test was used to determine the significance of the distribution of responses, with all statements showing significant differences, as indicated by p-values less than 0.05. This analysis demonstrates clear patterns in how employees evaluate various factors influencing product quality.

In Section B1, which explores employees' overall perceptions of quality, the results show strong agreement that the organisation prioritises customer satisfaction, adherence to product specifications, and collective responsibility for quality. Over 70% of respondents strongly agreed with statements like "Quality is satisfying the requirement of the customer" and "Quality is everyone’s responsibility within the company." However, there is a noticeable tension around production pressures, with

some employees agreeing that quality may be compromised to meet production targets. This duality suggests that while employees believe in the company's quality objectives, operational challenges can sometimes strain adherence to these standards.

Section B2 focuses on job-specific quality requirements, and the responses indicate that employees feel well-supported by clear work instructions and processes. High levels of agreement (over 70% in many cases) reflect strong satisfaction with how work instructions guide employees in meeting quality objectives. However, slight concerns about the updating of instructions and the clarity of roles indicate that there may be opportunities to improve communication and resources to ensure consistency in quality efforts across departments.

In Section B3, the analysis of quality resources and objectives highlights generally positive perceptions regarding the availability of resources and the clarity of quality goals. While most respondents agreed that the necessary resources are in place, the data shows a more mixed response regarding the condition of tools and equipment. Some employees expressed concerns about the adequacy and maintenance of tools, indicating that further investment in equipment maintenance could enhance their ability to meet quality standards.

Section B4 delves into the employee factors influencing product quality, with four sub-sections addressing engagement, organisational culture, job satisfaction, and technology. In B4.1, strong engagement and motivation are seen as key drivers of product quality, with significant agreement on the importance of leadership, training, and recognition in fostering a high-quality work environment. Similarly, B4.2 shows that organisational culture and a supportive work environment are viewed as critical to maintaining quality. High levels of agreement on the influence of communication, work-life balance, and ethical standards reinforce the importance of these factors in shaping product quality.

Section B4.3 explores job satisfaction and performance factors, with respondents highlighting the importance of job security, performance management, and a safe work environment in motivating them to produce quality products. These results show that employees who feel secure, well-supported, and valued in their roles are more likely to contribute to the company's quality goals.

Finally, in B4.4, the influence of employment conditions and technology on product quality is evident. Employees largely agree that employment type, working hours, and team collaboration significantly impact their ability to maintain quality. Additionally, the use of technology and production automation is viewed positively, although some respondents believe that further investment in the latest technology could enhance quality outcomes.

In summary, the results of the study reveal that employees at SkyBlu Technologies (Pty) Ltd generally perceive strong support for product quality, driven by well-defined processes, clear objectives, and a positive organisational culture. However, some areas, such as production pressures, resource availability, and technology implementation, present opportunities for improvement. Addressing these areas could further strengthen the company's efforts to maintain and enhance product quality across its workforce.

4.18 Crosstabulations

A highly effective method for exploring the relationship between two variables is to create a cross tabulation, which displays how the distribution of one variable aligns within the categories of another and the chi-square statistic offers a strong indication of whether there is a significant relationship between two variables (Longest 2020: 131). A chi-square test of independence was conducted to examine whether a statistically significant relationship exists between the variables in the "rows" and "columns". The null hypothesis posits that there is no association between the variables, while the alternate hypothesis suggests the presence of an association. The Pearson's Chi-Square Test and Fisher's Exact Test were employed for analysis. For the Pearson's Chi-Square Test, a p-value (Asymptotic Significance [2-sided]) < 0.05 indicates a significant relationship between the variables. Similarly, for the Fisher's Exact Test, a p-value (Exact Sig. [2-sided]) < 0.05 suggests a significant relationship, while a p-value > 0.05 indicates no significant relationship. Cross tabulations were performed between the biometric data from Section A and the Likert scale statements in Section B.Table 4.21 summarises the results of the Fisher Values Table vs Biographical

Table 4.21: Fisher values table vs biographical

Statements	Gender	Age (years)	Race	Type of Employment	Job Category	Department
Quality is satisfying the requirement of the customer	0.445	0.892	0.656	0.686	0.193	0.059
Quality is evaluated against product specifications	0.239	0.038	0.192	0.031	0.299	0.004
Quality is everyone's responsibility within the company	0.590	0.107	0.281	1.000	0.613	0.157
Quality is sometimes compromised to achieve production targets	0.176	0.136	0.685	<0.001	<0.001	0.056
All critical quality checks in the production process are monitored and controlled as specified	0.564	0.638	0.089	0.157	0.136	0.002
Job work instructions help to build a quality product	0.785	0.555	0.010	0.675	0.401	0.059
Work instructions provide a clear guideline for task completion to ensure quality objectives are achieved	0.741	0.851	0.016	0.402	0.539	0.035
Work instructions are updated and available by the company for specific job functions	0.311	0.540	0.225	0.038	0.146	0.002
Roles and responsibilities are clearly defined by using work instructions	0.245	0.149	0.381	0.004	0.030	0.006
Non-conforming products are segregated	0.035	0.102	0.227	0.015	0.473	<0.001
The organisation has developed a product quality strategy and has identified the resources required	1.000	0.151	0.214	0.184	0.140	0.007
Quality objectives are clearly defined for each job role and department	0.729	0.074	0.017	0.002	0.005	<0.001
Necessary resources are always available for me to do my job to achieve my quality objectives	0.810	0.166	0.005	0.051	0.025	0.002
The tools and equipment are in good working condition and calibrated	0.728	0.762	0.529	0.126	0.185	0.052
Scheduling tool maintenance enhances product quality	0.843	0.807	0.983	0.295	0.338	0.313
Employee engagement influences product quality	0.070	0.908	0.929	0.455	0.738	0.009

Statements	Gender	Age (years)	Race	Type of Employment	Job Category	Department
Employee motivation influences product quality	0.129	0.796	0.312	0.294	0.550	0.025
Leadership influences product quality	0.010	0.886	0.707	0.804	0.876	0.020
Training, advancement, growth and motivation influences me to achieve product quality	0.539	0.221	0.119	0.500	0.059	0.056
Job status, roles and responsibilities influences me to achieve product quality	0.276	0.881	0.192	0.046	0.034	0.002
Job recognition influences product quality	0.121	0.754	0.048	0.303	0.558	0.002
Organisational culture influences product quality	0.602	0.750	0.318	0.406	0.631	0.026
Work environment influences product quality	0.295	0.781	0.761	0.117	0.474	0.084
Communication influences product quality	0.476	0.639	0.127	0.158	0.147	0.188
Work- Life balance influences product quality	0.706	0.356	0.380	0.305	0.770	0.060
Provision of resources influences product quality	0.790	0.304	0.596	0.614	0.784	0.260
Work ethics influences product quality	0.747	0.697	0.014	0.626	0.462	0.021
Job satisfaction influences product quality	0.591	0.572	0.580	0.301	0.503	0.010
Performance management influences product quality	0.257	0.411	0.006	0.183	0.051	<0.001
Job security motivates me to produce quality products	0.482	0.280	0.320	0.026	0.190	<0.001
A safe environment motivates me to produce quality products	0.896	0.892	0.094	0.050	0.078	0.105
Health and safety motivate me to produce quality products	0.837	0.096	0.213	0.123	0.014	0.030
Higher salary/wage motivates me to produce quality products	0.269	0.534	0.113	0.879	0.027	0.028
Employment type (Contract, permanent and staff) influences quality	0.853	0.654	0.090	0.027	0.160	<0.001

Statements	Gender	Age (years)	Race	Type of Employment	Job Category	Department
Working hours (Shift, Overtime) impacts on product quality	0.234	0.809	0.011	0.445	0.898	0.060
Team collaboration impacts on product quality	0.560	0.424	0.220	0.786	0.535	0.345
Technology influences product quality	0.920	0.927	0.129	0.603	0.453	0.570
Organisation uses the latest technology to enhance product quality	0.627	0.089	0.007	0.009	0.035	<0.001
Production automation impacts product quality	0.366	0.209	0.003	0.191	0.019	0.075

Source:Researcher's own construct

Based on the themes and patterns extracted from the data and the accompanying Fisher p-value table, certain trends emerge, particularly in relation to the influence of different biographical factors (like gender, age, race, employment type, job category, and department) on various aspects of product quality.

4.18.1 General trends in fisher's p-value table:

i. Influence of Age: The p-value results show significant associations between age and numerous quality-related factors. For example, the variable "Quality is evaluated against product specifications" has a p-value of 0.038 for age, indicating that the age of respondents plays a significant role in their perception of how strictly quality is evaluated. As seen in the frequency table, older respondents (aged 40-49) are more likely to strongly agree that quality is evaluated against specifications compared to younger respondents (20-29), who showed more disagreement.

ii. Gender Influence: Gender appears to have a significant impact on perceptions related to quality in certain aspects. For instance, variables like "Job recognition influences product quality" and "Leadership influences product quality" show notable differences in agreement based on gender, with p-values showing significant relationships. In these cases, male respondents reported stronger agreement on these leadership and recognition factors.

iii. Departmental Differences: The department of employment also plays a crucial role in perceptions of product quality. For instance, the variable "Roles and responsibilities are clearly defined by using work instructions" shows a significant p-value with respect to department, indicating that employees in different departments experience varying levels of clarity in their work instructions, which subsequently impacts product quality.

4.18.2 Specific observations:

i. Work Instructions and Job Roles: Employees across departments have varying levels of satisfaction regarding the clarity and updates of work instructions, which are essential for maintaining product quality. Certain departments like Production or Engineering may perceive more frequent updates or clearer instructions, while others like Finance or Logistics may feel less supported in this regard.

ii. Leadership Impact: Employees' perceptions of leadership's influence on product quality seem to vary based on job category. For instance, operational staff may feel less positively impacted by leadership compared to middle or senior management, possibly due to differences in communication or recognition structures across job levels.

In conclusion, the Fisher's p-value table reveals significant biographical influences, with age, gender, and departmental differences being the most pronounced in shaping employees' perceptions of various factors related to product quality. This suggests that strategies to enhance product quality should be tailored to address the specific needs and perceptions of these different demographic and departmental groups.

Table 4.22 illustrates the p-value between “Quality is evaluated against product specifications” and “Age (years)”. This means that there is a significant relationship between the age of the respondents that did play a significant role in terms of how respondents viewed quality being evaluated against product specifications.

Table 4.22: p-value between “Quality is evaluated against product specifications” and “Age”

			Age (years)				Total
			20 - 29	30 - 39	40 - 49	≥ 50	
Quality is evaluated against product specifications	Strongly Disagree	Count	0_a	2_a	1_a	1_a	4
		% within Age (years)	0.0%	6.9%	2.1%	4.5%	3.5%
	Disagree	Count	2_a	0_b	0_b	$0_{a, b}$	2
		% within Age (years)	14.3%	0.0%	0.0%	0.0%	1.8%
	Not sure	Count	1_a	1_a	0_a	0_a	2
		% within Age (years)	7.1%	3.4%	0.0%	0.0%	1.8%
	Agree	Count	3_a	10_a	8_a	7_a	28
		% within Age (years)	21.4%	34.5%	16.7%	31.8%	24.8%
	Strongly Agree	Count	$8_{a, b}$	16_b	39_a	$14_{a, b}$	77
		% within Age (years)	57.1%	55.2%	81.3%	63.6%	68.1%
Total		Count	14	29	48	22	113
		% within Age (years)	100.0%	100.0%	100.0%	100.0%	100.0%

Source:Researcher’s own construct

Respondents aged 40-49, (81.3%) strongly agreed that quality is evaluated against product specifications, which is notably higher than other age groups. In contrast, only 57.1% of those aged 20-29 strongly agreed, while respondents in the 30-39 and 50 and older categories showed 55.2% and 63.6% strong agreement, respectively.

Interestingly, the disagreement is concentrated among the younger respondents, with 14.3% of the 20-29 age group disagreeing, while none of the other age groups indicated disagreement.

This variation across age groups highlights a potential age-related difference in the perception of how rigorously quality is evaluated against specifications. The chi-square test confirms that this difference is statistically significant, which means there is an association between age group and responses to this statement. All p-values more than 0.05 do not have a significant relationship.

4.19 Correlations

Bivariate correlation was also performed on the (ordinal) data. The results (available in the appendix) indicate the following patterns:

i. Positive values indicate a directly proportional relationship between the variables.
ii. Negative value indicates an inverse relationship.
iii. All significant relationships are indicated by a * or **.

For example, the correlation analysis reveals a positive relationship between the statements "Quality is evaluated against product specifications" and "Health and safety motivate me to produce quality products", with a correlation coefficient of 0.555 ($p < 0.001$). This indicates that as employees' perceptions of the importance of quality evaluations against specifications increase, their motivation to produce quality products driven by health and safety considerations also tends to rise, and vice versa. The significant p-value ($p < 0.001$) confirms that this correlation is statistically meaningful, suggesting that health and safety factors play a crucial role in shaping employees' commitment to maintaining quality standards.

4.20 Structural Equation Model

Hinson and Utke (2023: 87) note that Structural Equation Modeling (SEM) is an often underutilised empirical method in archival research that enables researchers to examine the relationships between constructs, comprising two main components: a measurement model that identifies common factors from observed variables and a path model that links these factors.

Structural Equation Modeling (SEM) is a multivariate analysis method that simultaneously estimates complex relationships among observed and latent variables, accounting for measurement error (Hair, Hult, Ringle, Sarstedt, Danks and Ray: 2021:3). In this study, SEM is employed to explore the relationships between various factors influencing product quality within SkyBlu Technologies (Pty) Ltd. The model aims to identify and quantify how factors such as employee engagement, organisational culture, job satisfaction, and technology impact product quality. By using SEM, the study not only assesses individual relationships between variables, but also

considers the combined effects, offering a holistic view of how different aspects of the workplace contribute to the overall quality of products.

Structural Equation Modeling (SEM) offers robust insights by accounting for measurement errors and latent constructs, enhancing the reliability and validity of conclusions while refining theoretical frameworks and informing targeted strategies for product quality improvement through its dual graphical and mathematical modeling components (Zou and Cheng 2024: 3).

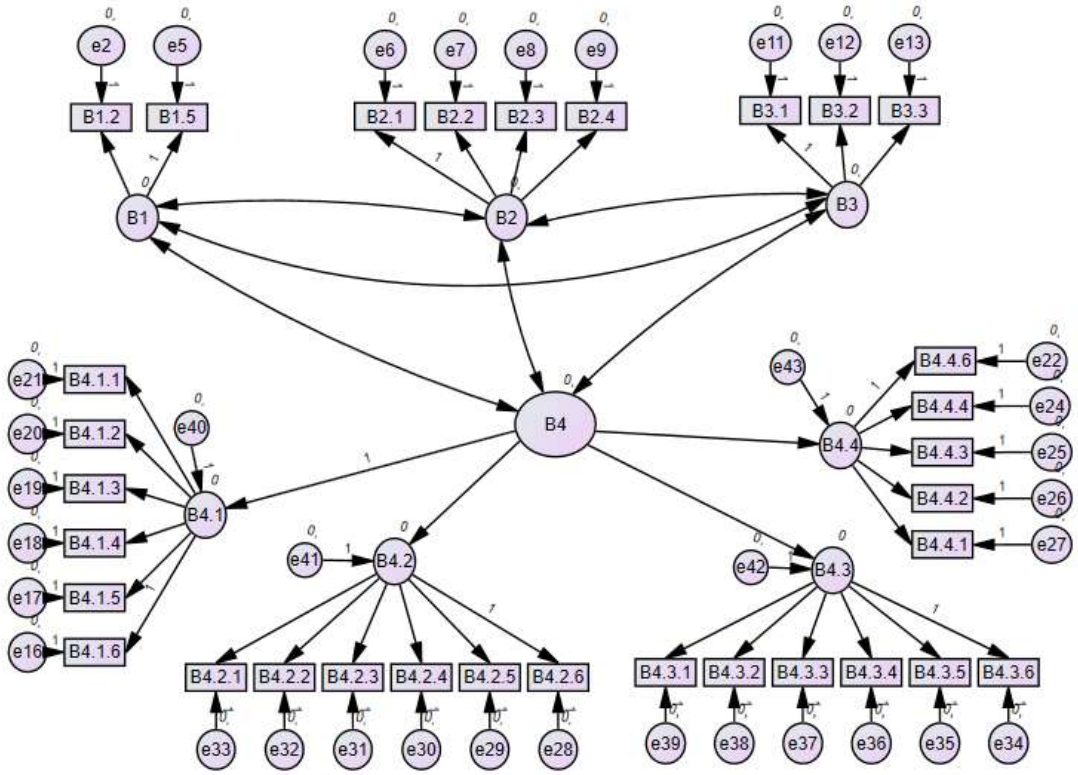

Figure 4:12: Structural equation model
Source:Researcher's own construct

The path diagram for the modified SEM is shown above. 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 dimensions are as coded under reliability. In the analysis of the default model, the results indicated that a minimum had been achieved. The chi-square value was calculated to be 1450.494, with 454 degrees of freedom. The probability level was

reported at .000, suggesting a statistically significant outcome. This finding underscores the effectiveness of the model in explaining the underlying data structure.

This Chi-square tests the null hypothesis that the overidentified (reduced) model fits the data as well as 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 is < 0.001.

However, it is 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 significant,it is nota problemlematic, as long as the other indicators of fit are good. Table 4.23 presents the maximum likelihood estimates of regression weights: (Group number 1 - Default model).

Table 4.23: Regression weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
B4.1	<---	B4	1.000				
B4.2	<---	B4	.945	.116	8.124	***	par_25
B4.3	<---	B4	1.035	.152	6.813	***	par_26
B4.4	<---	B4	.929	.143	6.489	***	par_27
B1.2	<---	B1	.860	.156	5.522	***	par_1
B2.2	<---	B2	1.059	.101	10.511	***	par_2
B2.3	<---	B2	1.475	.138	10.654	***	par_3
B2.4	<---	B2	1.407	.152	9.262	***	par_4
B3.2	<---	B3	1.080	.122	8.832	***	par_5
B3.3	<---	B3	1.418	.144	9.841	***	par_6
B4.1.6	<---	B4.1	1.000				
B4.1.5	<---	B4.1	1.037	.148	7.019	***	par_7
B4.1.4	<---	B4.1	.748	.098	7.600	***	par_8
B4.1.3	<---	B4.1	.879	.109	8.057	***	par_9
B4.1.2	<---	B4.1	.886	.103	8.636	***	par_10
B4.4.6	<---	B4.4	1.000				
B4.4.4	<---	B4.4	.946	.103	9.227	***	par_11
B4.4.3	<---	B4.4	.935	.109	8.539	***	par_12
B4.4.2	<---	B4.4	1.215	.133	9.130	***	par_13
B4.4.1	<---	B4.4	1.238	.140	8.835	***	par_14
B4.2.6	<---	B4.2	1.000				
B4.2.5	<---	B4.2	.895	.073	12.234	***	par_15
B4.2.4	<---	B4.2	1.169	.084	13.937	***	par_16
B4.2.3	<---	B4.2	.975	.080	12.234	***	par_17
B4.2.2	<---	B4.2	1.119	.078	14.379	***	par_18
B4.2.1	<---	B4.2	1.144	.088	13.039	***	par_19
B4.3.6	<---	B4.3	1.000				
B4.3.5	<---	B4.3	1.056	.106	9.925	***	par_20
B4.3.4	<---	B4.3	1.115	.109	10.222	***	par_21
B4.3.3	<---	B4.3	1.052	.104	10.135	***	par_22
B4.3.2	<---	B4.3	.924	.104	8.876	***	par_23
B4.3.1	<---	B4.3	1.180	.109	10.846	***	par_24
B4.1.1	<---	B4.1	.870	.104	8.389	***	par_28

			Estimate	S.E.	C.R.	P	Label
B1.5	<---	B1	1.000				
B2.1	<---	B2	1.000				
B3.1	<---	B3	1.000				

Source:Researcher's own construct

The variables loaded strongly along their various factors (significant p-values indicated by *** $p < 0.001$). These verify the External Factor Analysis (EFA) obtained under factor analysis. Table 4.24 presents Standardised Regression Weights group 1.

Table 4.24: Standardised regression weights: (Group number 1 - Default model)

			Estimate
B4.1	<---	B4	.921
B4.2	<---	B4	.993
B4.3	<---	B4	.932
B4.4	<---	B4	.859
B1.2	<---	B1	.520
B2.2	<---	B2	.888
B2.3	<---	B2	.899
B2.4	<---	B2	.805
B3.2	<---	B3	.785
B3.3	<---	B3	.866
B4.1.6	<---	B4.1	.699
B4.1.5	<---	B4.1	.722
B4.1.4	<---	B4.1	.777
B4.1.3	<---	B4.1	.824
B4.1.2	<---	B4.1	.888
B4.4.6	<---	B4.4	.766
B4.4.4	<---	B4.4	.845
B4.4.3	<---	B4.4	.791
B4.4.2	<---	B4.4	.838
B4.4.1	<---	B4.4	.815
B4.2.6	<---	B4.2	.900
B4.2.5	<---	B4.2	.836
B4.2.4	<---	B4.2	.886
B4.2.3	<---	B4.2	.833
B4.2.2	<---	B4.2	.895
B4.2.1	<---	B4.2	.860
B4.3.6	<---	B4.3	.754
B4.3.5	<---	B4.3	.885
B4.3.4	<---	B4.3	.908
B4.3.3	<---	B4.3	.902
B4.3.2	<---	B4.3	.807
B4.3.1	<---	B4.3	.951
B4.1.1	<---	B4.1	.863
B1.5	<---	B1	.718
B2.1	<---	B2	.785
B3.1	<---	B3	.804

Source:Researcher's own construct

The parameters are estimated by maximum likelihood (ML) methods, which is an iterative procedure that attempts to maximise the likelihood that obtained values of the criterion variable will be correctly predicted. All of the coefficients were above the suggested value of 0.600. Statements that loaded poorly or that were redundant were omitted from the model.

4.20.1 Discussion on Model Validity and Reliability

The Structural Equation Modelling (SEM) results include model fit indices, but a more detailed discussion of their implications for validity and reliability is necessary to enhance the analysis. The validity of a model refers to its ability to measure the intended constructs accurately, while reliability assesses the consistency of the measurement.

4.20.1.1 Model Validity

The SEM model was assessed using multiple fit indices, each providing a different perspective on model performance. The key indicators included:

Chi-Square (χ^2)/Degrees of Freedom (DF) Ratio

The χ^2/DF ratio was 3.195, which falls within the acceptable range (≤ 5) suggested by Kline (2016). This indicates that while the model is not a perfect fit, it still represents a reasonable approximation of the data structure.

Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI)

The CFI and TLI values were 0.723 and 0.678, respectively. Ideally, these values should be ≥ 0.90 for a good model fit (Hu & Bentler, 1999). The fact that they are below this threshold suggests that while the model explains a significant amount of variance, it does not achieve an optimal fit, indicating that some relationships in the model may need refinement.

Root Mean Square Error of Approximation (RMSEA)

The RMSEA value was 0.140, which is above the recommended threshold of ≤ 0.08 (MacCallum, Browne, & Sugawara, 1996). This suggests that the model has a higher degree of error than is ideal, implying that the observed data do not fit the hypothesised model as well as expected. One potential reason could be the complexity of

relationships in the data, requiring the inclusion of additional moderating or mediating variables to improve model fit.

4.20.1.2 Reliability Analysis

Reliability was assessed using Cronbach's alpha, a widely used measure of internal consistency. The results indicate strong reliability across most constructs:

Overall Cronbach's Alpha: 0.946

This value suggests excellent internal consistency across all constructs in the study.

Individual Constructs:

Employee Perception about Quality (B1): α = 0.601 (Moderate)

Job-Specific Quality Requirements (B2): α = 0.835 (High)

Quality Resources & Objectives (B3): α = 0.829 (High)

Employee Engagement & Motivation (B4.1): α = 0.879 (High)

Organisational Culture & Environment (B4.2): α = 0.939 (Excellent)

Job Satisfaction & Performance (B4.3): α = 0.937 (Excellent)

Employment & Technology (B4.4): α = 0.883 (High)

While most constructs demonstrated strong reliability, the Employee Perception about Quality (B1) construct had a lower Cronbach's alpha (0.601). This suggests that the items within this section may not be measuring a single construct as effectively as others.

4.20.1.3 Implications for Model Validity and Reliability

The findings suggest that while the SEM model provides a reasonable representation of the data, there are areas for improvement:

4.20.1.3.1 Potential Refinements for Model Fit:

Including additional moderating or mediating variables (e.g., organisational support, leadership style) could improve model performance.

The RMSEA suggests that some observed variables may need to be restructured, possibly by re-examining cross-loadings or removing weakly correlated items.

4.20.1.3.2 Refinement of Employee Perception about Quality (B1):

The low Cronbach's alpha in this section suggests that additional validation work is required, possibly by rewording or removing ambiguous items to improve consistency.

4.20.1.3.3 Overall Interpretation:

The model is statistically reliable and explains significant variance in the data, but refinements would enhance both construct validity and overall model fit.

4.20.2 Further Exploration of Significant Relationships

The SEM results highlight key significant relationships, but further exploration is required to understand why these relationships exist and what their practical implications are. A more detailed discussion will improve the study's contribution to knowledge and practical application.

4.20.2.1 Key Relationships Identified in the SEM Model

The SEM analysis confirmed several significant relationships, particularly between:

4.20.2.1.1 Employee Engagement & Motivation (B4.1) → Product Quality

Standardised Regression Weight: 0.921.

Interpretation: Employees who feel engaged and motivated are more likely to contribute positively to product quality.

Supporting Theory: Herzberg's Two-Factor Theory (1959) states that motivation factors (e.g., job recognition, career growth) play a vital role in improving job performance. Practical Implication: Organisations should enhance engagement initiatives through training, recognition programs, and career development opportunities.

4.20.2.1.2 Organisational Culture & Environment (B4.2) → Product Quality

Standardised Regression Weight: 0.993

Interpretation: A positive organisational culture significantly impacts employees' commitment to maintaining quality standards.

Supporting Theory: Schein's Organisational Culture Model (1992) suggests that shared values, leadership, and communication strongly influence workplace behaviours.

Practical Implication: The organisation should foster an environment where quality is embedded in the corporate culture, ensuring that employees at all levels prioritise high standards.

4.20.2.1.3 Job Satisfaction & Performance (B4.3) → Product Quality

Standardised Regression Weight: 0.932

Interpretation: Employees who are satisfied with their jobs perform better and contribute to high-quality production.

Supporting Theory: Self-Determination Theory (Deci & Ryan, 1985) argues that employees with high autonomy and job satisfaction are more committed to excellence.

Practical Implication: Organisations should improve performance management strategies, providing clear goals, performance incentives, and support for employee well-being.

4.20.2.1.4 Employment & Technology Factors (B4.4) → Product Quality

Standardised Regression Weight: 0.859

Interpretation: The type of employment, working hours, and access to modern technology play a key role in product quality.

Supporting Theory: The Technology Acceptance Model (Davis, 1989) explains how employees' acceptance of new technology influences workplace efficiency and quality.

Practical Implication: Employers should invest in technological advancements that streamline quality control, automation, and employee training in digital tools.

4.20.2.2 Interpretation of Why These Relationships Exist

4.20.2.2.1 Motivation and Engagement Drive Quality

Employees who feel valued and engaged are more likely to take ownership of their work, leading to higher quality outcomes.

Organisations that recognise contributions and provide opportunities for growth encourage a culture of continuous improvement.

4.20.2.2.2 Organisational Culture Shapes Attitudes Toward Quality

Employees internalise workplace values—if management prioritises strict quality control, employees will align their behaviours accordingly.

Transparent communication, ethical leadership, and a shared commitment to quality foster a more quality-conscious workforce.

4.20.2.2.3 Job Satisfaction and Security Encourage Performance

Employees in stable roles are more committed to delivering quality work compared to those in temporary or uncertain positions.

Performance management systems that provide fair evaluations, clear expectations, and incentives enhance job satisfaction, leading to improved product quality.

4.20.2.2.4 Technology Facilitates Efficiency and Consistency

Automation and advanced quality monitoring systems help reduce human error, ensuring consistent product quality.

Employees with access to modern tools and clear work instructions are more effective in maintaining high production standards.

4.20.2.3 Practical Recommendations

To leverage these insights, organisations should:

- Implement employee recognition programmes to enhance motivation.
- Foster a quality-focused organisational culture through leadership training.
- Provide job security and structured performance evaluations to improve employee satisfaction.
- Invest in cutting-edge technology to enhance automation and quality control.

4.21 Model fit summary

The suggested acceptable value for relative chi-square, CMIN/DF, should not be greater than 5 which is used to reduce dependency on sample size. However, the cut-off point 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 4.25 presents CMIN.

Table 4.25: CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	106	1450.494	454	.000	3.195
Saturated model	560	.000	0		
Independence model	32	4122.876	528	.000	7.808

Source:Researcher's own construct

According to Longest (2020: 131), CMIN is a Chi-square statistic that compares the tested model and the independence model to the saturated model, with a CMIN/DF ratio of 3.195, which is below the acceptable value of 5. It indicates that the fit of the data to the model has been sufficiently improved by dropping one or more paths, thereby satisfying the CMIN condition. Table 4.26 presents the baseline comparisons.

Table 4.26: Baseline comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.648	.591	.728	.678	.723
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Source:Researcher's own construct

Despite not fully meeting the typical threshold values, the model's fit indices suggest a degree of acceptability in certain areas. The Normed Fit Index (NFI) is 0.648, which, although below the commonly accepted threshold of 0.90, still indicates that the model captures a moderate portion of the covariance in the data compared to the independence model. Similarly, the Relative Fit Index (RFI) value of 0.591 is lower than ideal but shows some level of improvement over the independence model.

The Incremental Fit Index (IFI) of 0.728 and the Tucker-Lewis Index (TLI) of 0.678 are also below the recommended value of 0.90, yet they reflect moderate model improvement compared to the baseline model. The Comparative Fit Index (CFI), with

a value of 0.723, further supports this moderate degree of fit, suggesting that the model is not entirely misaligned with the data.

While these values fall short of ideal thresholds, they collectively suggest that the model shows some alignment with the observed data. There may still be room for refinement to improve overall model fit, but the results provide a foundation for further analysis and potential model adjustments. Table 4.27 presents RMSEA.

Table 4.27: RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.140	.132	.148	.000
Independence model	.247	.240	.254	.000

Source:Researcher's own construct

The Root Mean Square Error of Approximation (RMSEA) for the default model is 0.140, with a 90% confidence interval ranging from 0.132 to 0.148, and a PCLOSE value of 0.000. While RMSEA values below 0.08 are typically considered acceptable, the value of 0.140 indicates a poorer fit for the model. This suggests that the model has some issues in terms of approximating the population covariance matrix, with a larger degree of error than is ideal.

However, when compared to the independence model, which has an RMSEA of 0.247, the default model demonstrates an improvement. The independence model's RMSEA is considerably higher, suggesting that the default model provides a better approximation of the data than a completely uncorrelated model.

Though the RMSEA for the default model does not meet the desired threshold, it shows that the model is not entirely misaligned with the data and could be further refined to achieve better fit. The PCLOSE value of 0.000 indicates that the hypothesis of a close fit is rejected, suggesting that the model requires modification to improve its approximation of the true population parameters.

4.22 Regression analysis

The level of significance relates to the strength of the relationships. The covariances and correlations are tested in Table 4.28.and Table 4.29, respectively.

Covariances: (Group number 1 - Default model)

Table 4.28: Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
B1	<-->	B3	.313	.059	5.305	***	par_29
B1	<-->	B2	.275	.051	5.426	***	par_30
B2	<-->	B3	.246	.047	5.173	***	par_31
B4	<-->	B1	.312	.068	4.588	***	par_32
B4	<-->	B2	.271	.057	4.723	***	par_33
B4	<-->	B3	.263	.061	4.281	***	par_34

Source:Researcher's own construct

Correlations: (Group number 1 - Default model)

Table 4.29: Correlations: (Group number 1 - Default model)

			Estimate
B1	<-->	B3	.940
B1	<-->	B2	.976
B2	<-->	B3	.779
B4	<-->	B1	.812
B4	<-->	B2	.746
B4	<-->	B3	.612

Source:Researcher's own construct

Null hypothesis: There is no correlation between each of the dimensions.
Alternate hypothesis: There is a significant correlation.

Kim (2018: 2234) explains that covariance and correlation are fundamental statistical measures describing the relationship between two variables, covariance in original units and correlation as a unitless, standardised measure If the covariance between two constructs is significant, their correlation is likely to be significant as well, since correlation is a standardised form of covariance that indicates both the strength and direction of the relationship.

The regression analysis examines the relationships between latent variables by testing the covariance and correlation values. The level of significance is used to determine the strength of these relationships. The covariances between the constructs in the default model are all significant, with p-values < 0.001, supporting the rejection of the

null hypothesis that there is no correlation between the dimensions. The alternate hypothesis, which posits a significant correlation between the dimensions, is accepted.

The covariance estimates for relationships such as B1 <--> B3 (Estimate = 0.313, C.R. = 5.305), B1 <--> B2 (Estimate = 0.275, C.R. = 5.426), and B4 <--> B1 (Estimate = 0.312, C.R. = 4.588) demonstrate significant positive associations between these constructs. These values indicate that changes in one dimension are associated with proportional changes in another.

In terms of correlations, all r-values are positive and reflect strong relationships between the variables. For example, the correlation between B1 and B3 is 0.940, and between B1 and B2 is 0.976, indicating near-perfect correlations. Similarly, B4 shows strong correlations with the other variables, such as B1 (r = 0.812) and B3 (r = 0.612).

Overall, the analysis confirms that all relationships between the latent variables are statistically significant, with strong, directly proportional associations. This suggests that the dimensions studied—such as quality perceptions, job-specific requirements, resources, and employee factors—are highly interconnected, and improvements in one area are likely to positively impact others within the organisational context.

4.23 Overall findings

The results indicate that employees at SkyBlu Technologies generally perceive product quality as being influenced by multiple factors, including job-specific requirements, the adequacy of quality resources, employee engagement, organisational culture, and technology use. High levels of agreement were recorded across several dimensions, with respondents acknowledging the importance of well-defined work instructions, leadership, and collaboration in achieving product quality. However, areas of concern, such as production pressures, the condition of tools and equipment, and gaps in resource availability, were also highlighted.

4.24 Employee perceptions of product quality (Section B1)

The analysis of employee perceptions regarding quality in the workplace (Section B1) revealed strong agreement on the importance of meeting customer requirements and

adherence to product specifications. Statements such as "Quality is satisfying the requirement of the customer" and "Quality is everyone's responsibility within the company" showed high levels of agreement, with over 70% of respondents strongly agreeing. This reflects a positive perception of the company's quality assurance processes and collective responsibility for quality.

However, the tension between maintaining quality and meeting production targets was evident in responses to the statement "Quality is sometimes compromised to achieve production targets." While 35.1% agreed that quality could be compromised under pressure, a nearly equal percentage (36%) disagreed, reflecting a divide among employees. This finding suggests that operational pressures may challenge the company's ability to maintain consistent quality standards.

4.25 Job-specific quality requirements (Section B2)

Section B2 examined how employees perceive job-specific quality requirements, focusing on the clarity of work instructions and their contribution to achieving quality objectives. Most respondents strongly agreed that work instructions are clear and effective in guiding their tasks, with 78.4% strongly agreeing that work instructions provide a clear guideline for achieving quality objectives.

The slightly lower levels of agreement regarding the updating and availability of work instructions (67.9% strongly agreeing) suggest that improvements in communication and regular updates to guidelines may be needed. Overall, the findings indicate that employees feel well-supported in their roles through defined processes and work instructions.

4.26 Quality resources and objectives (Section B3)

The analysis of Section B3, which focused on quality resources and objectives, revealed mixed perceptions. While 56.3% of respondents strongly agreed that the organisation has developed a product quality strategy, and 58.0% agreed that quality objectives are clearly defined for each role, concerns were raised about the condition and availability of tools. Only 45.8% strongly agreed that tools are in good working condition, with a notable proportion expressing doubts or dissatisfaction. These

findings indicate that while employees generally feel supported by clear objectives and a strategic focus on quality, the adequacy and maintenance of tools require attention.

4.27 Employee engagement, organisational culture, and job satisfaction (Section B4)

Section B4 examined several factors, including employee engagement, organisational culture, and job satisfaction, and their influence on product quality. The results showed that employee engagement and motivation are perceived as critical drivers of quality, with 64.8% strongly agreeing that engagement influences product quality and 69.4% strongly agreeing that motivation plays a key role. Similarly, leadership, training, and recognition were viewed as essential for fostering a high-quality work environment.

In terms of organisational culture, 59.6% of respondents strongly agreed that the culture within the organisation positively impacts product quality. Communication, work-life balance, and ethical standards were also highlighted as important factors that influence employees' ability to maintain quality.

4.28 Employment conditions and technology (Section B4.4)

The influence of employment conditions and technology on product quality was examined in Section B4.4. The majority of respondents agreed that employment type, working hours, and team collaboration significantly impact their ability to maintain quality. Additionally, the use of technology and production automation was viewed positively, with 60.4% of respondents strongly agreeing that technology influences product quality.

However, some employees expressed concerns about the adequacy of technology, with only 45.8% strongly agreeing that the organisation uses the latest technology to enhance quality. This suggests that while technology is seen as beneficial, there may be opportunities for further investment in modernising technological tools and processes.

4.29 Structural equation modelling

The Structural equation modelling (SEM) analysis provided further insights into the relationships between the various factors influencing product quality. The model revealed strong positive correlations between constructs such as employee engagement, organisational culture, and job satisfaction, all of which were found to significantly influence product quality. The covariance and correlation values confirmed that changes in one area, such as leadership or job satisfaction, are associated with proportional changes in another, such as employee engagement or quality outcomes.

While some model fit indices, such as the Normed Fit Index (NFI) and Comparative Fit Index (CFI), fell below ideal thresholds, the overall model showed a moderate degree of alignment with the observed data. The analysis highlighted areas where improvements could be made to better understand and model the relationships between the factors influencing product quality.

4.30 Conclusion

The findings of this study indicate that employee perceptions of product quality at SkyBlu Technologies (Pty) Ltd are largely positive, with strong support for the company's quality assurance processes, work instructions, and leadership. However, the results also highlight areas where improvements could be made, particularly in the availability and maintenance of resources, the use of technology, and the management of the tension between production pressures and quality standards.

Addressing these areas will help SkyBlu Technologies (Pty) Ltd further enhance its product quality and create a work environment that supports continuous improvement. The use of SEM has provided valuable insights into the complex relationships between the various factors influencing product quality, offering a foundation for developing targeted strategies that align employee engagement, organisational culture, and technological advancements with the company's quality goals.

5: CHAPTER FIVE
SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

The previous chapter presented the data, analysis and interpretation, and this chapter presents the summary of the research findings, recommendations and conclusion.

The research objectives and questions were thoroughly investigated using literature and the quantitative survey instrument, and the following discussion will summarise the research findings, offer recommendations, and present the conclusion.

5.2 Summary of findings

5.2.1 Section B1: Employee's perception about quality

Research objective: To ascertain the extent of employee's understandings of quality.

Research question: What are employees perception about quality?

The findings reflect that employees largely understand the organisation's commitment to fulfilling customer requirements and upholding collective responsibility for quality. This finding demonstrates employees' confidence in quality standards and monitoring processes. Sutrisno (2022: 7) alludes that employee perception plays a critical role in the success of quality management initiatives and overall organisational performance. The organisation needs to ensure that this reflection of quality is maintained.

5.2.2 Section B2: Job-specific quality requirements

Research objective: To ascertain if the employees understand their job specific quality requirements.

Research question: To what extent do employees understand their job specific quality requirements?

Findings concerning job-specific quality requirements show a strong consensus among employees about the sufficiency of work instructions and their importance in upholding

quality. As stated by Sutrisno (2022: 10), work instructions and procedures are essential components of quality management and operational efficiency within an organisation that provide clear guidelines for employees on how to perform tasks and processes consistently and effectively. The organisation must continue to promptly update work instructions and procedures to ensure that employees are informed of any changes to their job requirements.

5.2.3 Section B3.1: Quality objectives

Research objective: To ascertain the extent to which quality objectives are clearly defined.

Research question: To what extent are quality objectives clearly defined?

The research findings indicated that employees generally hold positive perceptions about the quality objectives set by the organisation, suggesting that employees recognise the importance of these quality objectives and feel aligned with the company's commitment to quality.

5.2.4 Section B3.2: Quality resources

Research objective: To ascertain the extent to which resources are provided in support of the organisation's product quality strategy.

Research question: To what extent are resources provided in support of the organisation's product quality strategy?

The findings of the study suggest that although employees generally feel supported by clear objectives and a strategic emphasis on quality, there are concerns regarding the adequacy and upkeep of tools. Effective resource allocation, which involves distributing sufficient man, method, machine, money and materials to achieve organisational goals, is crucial for quality management, as insufficient resources can result in delays, quality problems, and product failures (Sutrisno 2022: 10).Therefore, the organisation must ensure that adequate resources are allocated to maintain a high level of product quality.

B4: Employee factors that influence product quality

Research objective: To determine employee factors that influences product quality.

Research question: What are the employee factors that influence product quality?

5.2.4.1 Section B4:1: Employee engagement and motivation factors

The research finding reflects that employees view engagement and motivation as essential for upholding quality standards and strongly believe that these factors directly impact product quality. Employee engagement and motivation are key factors that drive engagement and foster a commitment to the ongoing improvement of an organisation's product quality (Ajirowo 2024: 209).

The research finding suggests that employees view leadership as a key factor in driving product quality, indicating that employees believe effective leadership creates an environment that prioritises quality. Atiku, Itembu-Naunyango, and Oladejo (2024:2) describe leadership as an essential aspect of organisational effectiveness., Inclusive leadership plays a critical role in enhancing employee engagement by fostering a strong sense of belonging, which in turn boosts productivity, product quality, and sustainability, while promoting diverse perspectives and collaboration, driving innovative problem-solving, and creating a psychologically safe environment where employees feel valued and empowered to share their ideas openly.

5.2.4.2 Section B4.2:Organisation culture and environment factors

Employees regard the organisational culture and work environment as crucial factors in driving product quality, with most believing that the shared values and practices within the organisation support the maintenance of quality standards. Dula and Tang (2021:22) suggest that to ensure optimal performance and long-term success, an organisation must cultivate a strong culture and supportive leadership, effectively adapt to evolving workforce needs and customer demands, and balance strategic guidance from executives with employee commitment to achieve excellence and maintain a competitive edge. Hence, fostering a positive organisational culture can directly enhance product quality by aligning employees with common goals because when employees feel valued and engaged, their commitment to upholding quality

standards increases significantly. Hence, investing in a supportive work environment can lead to continuous improvement and innovation in product quality.

The findings indicate that employees consider opportunities for growth and training essential for their ability to meet quality standards. Sutrisno (2022: 9) suggests that training and development are essential components of human resource management that focus on enhancing the skills, knowledge, and competencies of employees to improve their performance and contribute to achieving product quality objectives leading to organisational success.

The findings reflect that job status, roles, and responsibilities impact product quality; however, a small number of respondents expressed disagreement or uncertainty, suggesting that while most feel empowered by clear roles, some may require better clarification of their responsibilities. To address the uncertainty around job roles and responsibilities, it is recommended that the organisation implement regular training sessions and workshops focused on job clarity. This could include creating detailed role descriptions and conducting one-on-one meetings between managers and employees to discuss expectations. Additionally, a feedback mechanism could be established that would allow employees to voice concerns and suggest improvements, fostering a more empowered and informed workforce.

The research findings revealed that the work environment has a significant impact on product quality. Most respondents strongly agreed that the overall conditions in which employees operate, including workspace, resources, and management practices, are conducive to maintaining product quality.

The findings suggest that clear and effective communication throughout the organisation is vital for achieving product quality. Therefore, it is essential to establish open channels for dialogue among teams to facilitate the sharing of information and best practices. This can include regular meetings, feedback sessions, and collaborative platforms that encourage active participation. By prioritising communication, the organisation can enhance teamwork and ensure that everyone is aligned in their commitment to quality. Ultimately, fostering a culture of transparency will lead to improved outcomes and a more engaged workforce.

The findings indicated that employees feel that maintaining a balance between their personal and professional lives enhances their capacity to produce high-quality work.

Therefore, the organisation should promote policies that support work-life balance, such as flexible scheduling and remote work options. By prioritising employee well-being, the organisation can reduce burnout and increase job satisfaction. Additionally, fostering a supportive environment where employees feel valued in both their personal and professional pursuits can lead to higher levels of motivation and productivity. Ultimately, a balanced approach will benefit both the employees' and the organisation's overall performance.

The findings show that work ethics are highly regarded, with most respondents agreeing or strongly agreeing that ethical practices impact product quality. Therefore, it is crucial for the organisation to promote a culture of integrity and ethical behaviour among its employees. Establishing clear ethical guidelines and providing training on ethical decision-making can further reinforce these values. Additionally, recognising and rewarding ethical behaviour can motivate employees to uphold high standards of quality in their work. Ultimately, prioritising ethics not only enhances product quality but also builds trust and loyalty within the organisation.

5.2.4.3 Section B4.3 Job satisfaction and performance factors

The findings highlighted a strong consensus among employees that job satisfaction and performance-related factors have a significant impact on product quality. Furthermore, conducting regular assessments of job satisfaction can help identify areas for improvement, ensuring that employees remain content and productive. Ultimately, prioritising job satisfaction will lead to better product quality and overall organisational success.

The findings suggest that performance management significantly affects product quality, suggesting that employees view structured performance management systems as essential for upholding high-quality standards. Ultimately, a robust performance management system will not only support high-quality outcomes but also contribute to employee development and engagement.

The findings revealed that the respondents strongly believe that job security motivates them to produce high-quality products. Therefore, the organisation should focus on creating a stable work environment that assures employees of their roles. When employees feel secure in their positions, they are more likely to invest effort into their

work and strive for excellence. Additionally, transparent communication about the organisation's stability and future can further reinforce this sense of security. Ultimately, prioritising job security will lead to increased motivation and improved quality outcomes across the organisation.

Respondents strongly agreed that health and safety factors motivate them to produce high-quality products. Therefore, it is essential for the organisation to prioritise and enhance health and safety measures in the workplace. By creating a safe environment, employees are more likely to feel secure and focused, which positively influences their productivity. Furthermore, providing regular training and resources related to health and safety can empower employees to take an active role in maintaining these standards. Ultimately, investing in health and safety not only protects employees but also significantly contributes to the overall quality of the products they produce.

The findings indicated that higher salaries or wages motivate them to produce high-quality products. While most employees recognise the impact of salary on their performance, there was a small percentage who either disagreed or felt uncertain. This highlights the need for a more comprehensive approach. However, financial compensation is an important factor in encouraging employees to uphold high standards. Additionally, offering non-monetary incentives, such as recognition and professional development opportunities, can further enhance motivation. Ultimately, a balanced compensation strategy that combines financial rewards with other forms of recognition can foster a more committed and productive workforce.

5.2.4.4 Section B4.4: Employment and technology factors

The findings reflect that respondents strongly believe that the type of employment affects product quality. Hence, it is important for the organisation to consider how different employment arrangements, such as full-time, part-time, or contract work, impact overall performance. By aligning employment types with specific quality objectives, the organisation can enhance productivity and ensure that all employees are effectively contributing to quality standards.

The findings indicated that respondents believe that shifts and overtime significantly affect product quality, indicating that the structure of work hours is viewed as a crucial factor in maintaining consistent quality output. Therefore, the organisation should

carefully evaluate work schedules to optimise employee performance and product quality. Implementing flexible scheduling options may help balance workloads and reduce fatigue, leading to better results. Additionally, providing adequate breaks and support during extended hours can further enhance employee well-being and productivity.

The findings suggest that team collaboration is another vital factor, with most respondents agreeing that cooperation among team members affects product quality. Hence, this strong consensus demonstrates that employees understand the significance of teamwork in reaching high-quality standards. To foster a collaborative environment, the organisation should promote open communication and regular team-building activities. Additionally, creating opportunities for cross-functional collaboration can enhance problem-solving and innovation. Ultimately, investing in teamwork will not only improve product quality, but also strengthen employee relationships and morale.

The findings indicated that respondents agreed that the organisation employs the latest technology to improve product quality, although a portion either disagreed or felt uncertain. Therefore, while many employees recognise the effective use of modern technology, there is a perception that further advancements could be beneficial. Addressing the concerns of those who are unsure may involve providing additional training or information on the technology being used. Additionally, gathering feedback on specific technological needs could help the organisation enhance its capabilities and ensure that all employees feel supported in their roles.

The role of production automation in affecting product quality is widely acknowledged, reflecting a general agreement that automation positively influences quality outcomes (Kolberg and Zuhlke, 2015:1871) Hence, this consensus suggests that investing in automated processes could further enhance product consistency and efficiency. Organisations should consider integrating advanced automation technologies to streamline operations and reduce human error. Additionally, providing training on how to effectively utilise these technologies can empower employees and maximise the benefits of automation.

. Recommendations

The following are recommendations that emanated from this study.

5.2.5 Section B1: Employee's perception about quality

Research objective: To ascertain the extent of employee's understandings of quality.

Research question: What are employees perception about quality?

The researcher recommends that the organisation considers the following to enhance employees' perception about quality.

i. Ensure that the strategic quality goals and objectives of the organisations are clear and that employees are aligned to them;
ii. Provide ongoing quality training and awareness on global quality best practices, organisation's strategic goals and the importance of quality in their work;
iii. Create awareness regarding product non-conformances and the internal and external impact of producing poor quality products;
iv. Encourage employees to participate in root cause analysis exercises to foster quality awareness and accountability;
v. Establish recognition programs that reward employees for their efforts in upholding and enhancing quality;
vi. Create open communication channels for quality improvement and quality non-conformance reporting; and,
vii. Provide leadership to drive quality initiatives.

5.2.6 Section B2: Job-specific quality requirements

Research objective: To ascertain if the employees understand their job specific quality requirements.

Research question: To what extent do employees understand their job specific quality requirements?

The researcher recommends that the organisation implement the following measures to enhance job-specific requirements for improving product quality:

i. Ensure that job roles and responsibilities are clearly defined and communicated. Thus, ensuring employees understand the expectations for their specific tasks;
ii. Maintain the quality management system by ensuring that there are updated detailed work instructions available to meet quality standards consistently;

iii. Provide job-specific training that focuses on quality requirements, tools, and techniques relevant to each job to ensure employee competency;
iv. Implement and monitor process quality objectives;
v. Implement employee performance evaluation system to communicate, monitor and correct job performance;
vi. Create open communication channels to ensure that there is a clear understanding and feedback of job-specific requirements;
vii. Conduct regular system audits to ensure that job specific requirements are available
viii. Provide leadership to provide resources for job-specific requirements;
ix. Promote employee teamwork and implement a formal root cause analysis programme using the seven quality tools as a basis to enhance the level of product quality; and,
x. Invest in training and development programs for employees. By providing employees with the latest skills and knowledge, the organisation can ensure that everyone understands the best practices in production and product quality control. Continuous training helps employees stay updated on new technologies and methodologies, leading to improved efficiency and effectiveness. Furthermore, fostering a culture of learning can motivate employees, encouraging them to take ownership of their work and strive for excellence. Ultimately, prioritising training and development not only elevates product quality, but also contributes to achieving strategic intent and overall organisational success.

5.2.7 Section B3.1: Quality objectives

Research objective: To ascertain the extent to which quality objectives are clearly defined.

Research question: To what extent are quality objectives clearly defined?

The researcher suggests that the organisation adopt the following measures to ensure that product quality objectives are achieved:

i. Establish clear Specific, Measureable, Achievable, Relevant and Time-bound (SMART) quality objectives;

ii. Ensure that quality objectives are aligned with the strategic goals of the organisation;
iii. Implement a system to track, correct, improve and align quality objectives;
iv. Ensure that the organisation quality management systems include policies, procedures, and documentation to guide processes to ensure quality objectives are met;
v. Provide awareness training and create an open communication channel to ensure that quality objectives are clearly understood;
vi. Provide the necessary training to ensure that employees are equipped with the required skills and knowledge to meet quality objectives;
vii. Foster an organisation culture that encourages employees to meet quality objectives; and,
viii. Implement quality tools and adopt methodologies such as Six Sigma or Lean to systematically identify inefficiencies and implement improvements, ensuring that quality objectives are consistently met.

5.2.8 Section B3.2: Quality resources

Research objective: To ascertain the extent to which resources are provided in support of the organisation's product quality strategy.

Research question: To what extent are resources provided in support of the organisation's product quality strategy?

The researcher recommends that the organisation implement the following measures to ensure that quality resource requirements are satisfied:

i. Evaluate the organisation's quality resources against global best practices;
ii. Conduct a resource requirement assessment;
iii. Allocate a resource budget to achieve desired product quality objectives;
iv. Conduct regular maintenance on machinery and quality measurement tools;
v. Calibrate quality measurement tools at the required frequency;
vi. Ensure that there are sufficient resources to achieve quality requirements;
vii. Create supplier partnership to ensure that quality requirements are satisfied; and,
viii. Monitor and evaluate resources to ensure optimum performance.

5.2.9 B4:Employee factors that influence product quality

Research objective: To determine employee factors that influences product quality

Research question: What are the employee factors that influence product quality?

The researcher proposes the following recommendations for employee factors that impact product quality in order to improve overall quality:

5.2.9.1 Section B4:1: Employee engagement and motivation factors

i. Ensure that the organisation practises diversity to enrich perspectives, foster innovation, and create inclusive environments that reflect teamwork with a wide range of experiences and ideas;
ii. Implement a reward system that recognises employee achievements to promote motivation;
iii. Promote work-life balance iniatives that encourage employee engagement and motivation; and,
iv. Implement quality improvement teams to empower employees to contribute to product quality enhancement.

5.2.9.2 Section B4.2:Organisation culture and environment factors

i. Encourage a positive quality culture that encourages teamwork, open communication, and mutual respect among employees;
ii. Emphasise the importance of product quality at each quality critical control point;
iii. Ensure that leadership demonstrate a commitment to quality;
iv. Promote employee engagement and teamwork;
v. Encourage safety and well-being in the workplace, as a positive environment can boost employee engagement and attention to quality; and,
vi. Empower employees to contribute to achieving quality objectives.

5.2.9.3 Section B4.3 Job satisfaction and performance factors

i. Conduct employee job performance reviews to establish job satisfaction and performance levels;

ii. Ensure clear and fair policies are implemented;
iii. Ensure that there are equal opportunities provided to all employees, promoting job satisfaction;
iv. Promote HR policies that do not discriminate amongst employees; and,
v. Provide training to develop employees to enhance job performance.

5.2.9.4 Section B4.4: Employment and technology factors

i. Encourage a culture of continuous product quality improvement;
ii. Explore global technological advancements;
iii. Identify opportunities for improvement;
iv. Allocate a budget for technological improvements;
v. Use automation to minimise human error and ensure precision in production, leading to higher quality outputs;
vi. Implement Quality 4.0 technology to leverage advanced data analytics tools to monitor quality metrics in real time, enabling proactive identification of issues;
vii. Integrate Internet of Things (IoT) devices to facilitate real-time tracking of production processes, ensuring immediate feedback and adjustments;
viii. Employ AI and machine learning algorithms to predict potential quality failures and optimise processes based on historical data; and,
ix. Adopt the philosophy of Lean Six Sigma to reduce waste and process variation. Sjarifudin and Kurnia (2022: 159), contend that successful Lean Six Sigma initiatives necessitate the involvement of employees at all levels, as training and empowering them to identify problems and suggest improvements foster a culture of continuous improvement. The researcher is of the opinion that implementing lean six sigma principles will enhance employee engagement and teamwork that will result in a higher level of product quality.

5.2.10 Proposed organisation strategy

Research objective: To develop a strategy to improve product quality.

Figure 5.1 depicts the quality strategy that is proposed by the researcher.

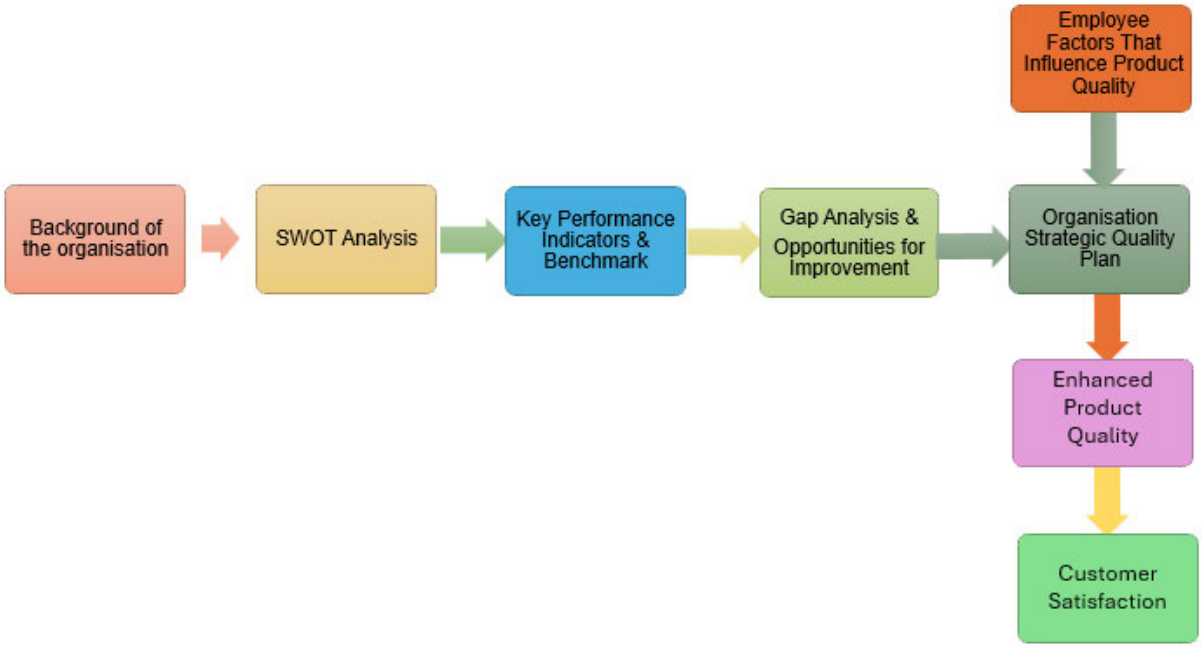

Figure 5:1: Proposed quality strategy

Source:Researcher's own construct

The following depicts the researcher's proposed quality strategy illustrated in figure 5.1:

i. Contextualise the organisation's current position, highlighting interested parties and global best practices;
ii. Conduct a quality management Strengths, Weaknessess, Opportunities and Threats analysis of the organisation;
iii. Evaluate organisation's quality Key Performance Indicators (KPI's) against global benchmarks;
iv. Identify gaps and opportunities for improvement;
v. Develop a quality strategic plan considering the employee factors that influence quality and the recommendations presented by the researcher; and,
vi. Include this strategy as part of the organisation's annual quality management review.

5.3 Research limitations

The study's sample was drawn exclusively from the business located in Durban, which may lead to results that reflect the experiences and perceptions of this specific population, rather than a more diverse cross-section of the manufacturing sector nationwide.

5.4 Conclusion

This chapter brought the study to a conclusion by presenting the findings in alignment with the research objectives. The recommendations that emanated from the study were itemised and expounded on for practical implementation.

Employee factors play a crucial role in influencing product quality, as their skills, training, and engagement directly impact production processes. A well-trained workforce is more skilled at identifying non-conformances and implementing quality assurance and control measures, leading to fewer errors and higher product quality standards. Moreover, fostering a culture of accountability and continuous improvement encourages employees to take ownership of their work, resulting in enhanced quality outcomes. Communication and collaboration among team members also contribute to better problem-solving and innovation in quality management. Ultimately, investing in employee development and creating a supportive environment can significantly elevate product quality and drive organisational success.

Using a combination of behavioural influential factors together with quality tools, root cause analysis and Lean Six Sigma will not only enhance the quality culture of the organisation, but will also result in a higher level of product quality, customer satisfaction, and, ultimately, a more competitive position of the organisation.

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MANAGEMENT SCIENCES: FACULTY RESEARCH ETHICS COMMITTEE (FREC)

10 August 2021
Student No: 20607443
FREC REF: 40/18FREC

Dear Mr V Packreeappen

RECERTIFICATION: MASTER IN PHILOSOPHY IN QUALITY

TITLE: EMPLOYEE FACTORS INFLUENCING PRODUCT QUALITY WITHIN ELECTRONICS MANUFACTURING AT ALTECH UEC, DURBAN

Please be advised that the FREC Committee has reviewed your proposal and the following decision was made: **Ethical Level 2**

Date of FRC Approval: 30 May 2018

The Faculty Research Ethics Committee has granted your request for recertification for a period of One year (From 10th August 2021), 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.

_____

Prof JP Govender
Chairperson: FREC

SkyBlu SKYWORTH

22 January 2019

Faculty of Management Sciences
Post Graduate Research Methodology
Durban University of Technology
Durban

Attention: Dr. Manduth Ramchander

Dear Dr. Ramchander,

LETTER OF CONSENT TO UNDERTAKE RESEARCH IN THE ELECTRONIC MANUFACTURING INDUSTRY, AS PART OF A MASTERS QUALIFICATION.

To whom it may concern

Skyblu Technologies (Pty) Ltd, do hereby grant Mr. V Packreeappen permission, to conduct research on the staff or as employee/s of Skyblu Technologies (Pty) Ltd, as part of his Master's studies in Management Sciences.

We do request that all sensitive information which will be attained during the research studies be treated as confidential to Skyblu Technologies (Pty) Ltd. We are pleased to be informed that the research is focused on **"Employee Factors influencing product quality"** within the organisation of Skyblu Technologies (Pty) Ltd, which will in return assist greatly in measurement of quality initiatives undertaken by the organisation and assist with improving on these initiatives.

We do wish Mr. V Packreeappen all the success in completing his research study.

Yours sincerely,

Mr. Sundrasen E Govender
General Manager

Mr. Vernon Packreeappen
Researcher

V.Packreeappen 20607443 MPhil Dissertation Post Examine Feedback TurnItIn.docx

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JUNITHA NAIDOO

LINGUISTICS SPECIALIST AND ADVANCED TEXTUAL EDITOR

Masters in Education (UP), BA Honours in Applied Linguistics (UNISA),
Bachelor of Paedagogics (English and Education)(UKZN)

Mobile: 083 457 4589 **Email**: junithanaidoo@gmail.com

EDITING CERTIFICATE

To whom it may concern,

This is to confirm that I, **Junitha Naidoo (**the **"Editor")**, have edited the attached Masters Dissertation entitled,

"*Employee Factors Influencing Product Quality Within Manufacturing at Skyblu Technologies (Pty) Ltd. Durban***"**

submitted by the author, **Vernon Packreeappen (**the **"Author")**, for English language usage.

Neither the Author's intentions nor the research content in the Masters Dissertation has been altered in any way during the editing process. The Author retains the right to accept or reject any comments or suggestions made during the editing process. The Editor shall bear no liability for any alterations made to the document after the completion of the editing process and the delivery of the final edited version to the Author.

Yours faithfully,

Junitha Naidoo

14 November 2024

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STATISTICIAN DECLARATION FOR CONSULTATION

This is to confirm that I have given appropriate recommendations relating to the student's research:

Student Name	Vernon Packreeappen
Student number	20607443
Title	Employee Factors influencing product quality at Skyblu Technologies (Pty) Ltd, Durban
Department	Operations and Quality Management
Faculty	Management Sciences

14 November 2024

Dr R. Gengan
(BBA, BA(Hons), MBL, DPhil)

Date

Correlations

			Quality is satisfying the requirement of the customer	Quality is evaluated against product specifications	Quality is everyone's responsibility within the company	Quality is sometimes compromised to achieve production targets	All critical quality checks in the production process are monitored and controlled as specified	Job work instructions help to build a quality product	Work instructions provide a clear guideline for task completion to ensure quality objectives are achieved	Work instructions are updated and available by the company for specific job functions	Roles and responsibilities are clearly defined by using work instructions	Non-conforming products are segregated	The organisation has developed a product quality strategy and has identified the resources required	Quality objectives are clearly defined for each job role and department	Necessary resources are always available for me to do my job to achieve my quality objectives	The tools and equipment are in good working condition and calibrated	Scheduling tool maintenance enhances product quality	Employee Engagement influences product quality	Employee Motivation influences product quality	Leadership influences product quality	Training, advancement, growth and motivation influences me to achieve product quality	Job status, roles and responsibilities influences me to achieve product quality
Spearman's rho	Quality is satisfying the requirement of the customer	Correlation Coefficient	--																			
		Sig. (2-tailed)																				
		N	111																			
	Quality is evaluated against product specifications	Correlation Coefficient	0,548**	--																		
		Sig. (2-tailed)	0.000																			
		N	111	113																		
	Quality is everyone's responsibility within the company	Correlation Coefficient	0,370**	0,363**	--																	
		Sig. (2-tailed)	0.000	0.000																		
		N	111	112	112																	
	Quality is sometimes compromised to achieve production targets	Correlation Coefficient	0.110	0,196*	0.053	--																
		Sig. (2-tailed)	0.251	0.039	0.580																	
		N	110	111	111	111																
	All critical quality checks in the production process are monitored and controlled as specified	Correlation Coefficient	0,390**	0,479**	0,342**	0.046	--															
		Sig. (2-tailed)	0.000	0.000	0.000	0.629																
		N	111	112	112	111	112															
	Job work instructions help to build a quality product	Correlation Coefficient	0,316**	0,449**	0,452**	0.046	0,473**	--														
		Sig. (2-tailed)	0.001	0.000	0.000	0.633	0.000															
		N	110	111	111	111	111	111														
	Work instructions provide a clear guideline for task completion to ensure quality objectives are achieved	Correlation Coefficient	0,307**	0,463**	0,633**	-0.001	0,502**	0,662**	--													
		Sig. (2-tailed)	0.001	0.000	0.000	0.994	0.000	0.000														
		N	109	111	110	109	110	109	111													
	Work instructions are updated and available by the company for specific job functions	Correlation Coefficient	0,330**	0,523**	0,398**	0.124	0,552**	0,635**	0,700**	--												
		Sig. (2-tailed)	0.000	0.000	0.000	0.197	0.000	0.000	0.000													
		N	108	109	109	109	109	109	108	109												
	Roles and responsibilities are clearly defined by using work instructions	Correlation Coefficient	0,203*	0,373**	0,343**	0.166	0,458**	0,495**	0,579**	0,718**	--											
		Sig. (2-tailed)	0.033	0.000	0.000	0.082	0.000	0.000	0.000	0.000												
		N	110	111	111	110	111	110	110	109	111											
	Non-conforming products are segregated	Correlation Coefficient	0,374**	0,482**	0,419**	0.174	0,414**	0,352**	0,459**	0,491**	0,512**	--										
		Sig. (2-tailed)	0.000	0.000	0.000	0.076	0.000	0.000	0.000	0.000	0.000											
		N	105	106	106	105	106	105	106	104	106	106										
	The organisation has developed a product quality strategy and has identified the resources required	Correlation Coefficient	0,437**	0,414**	0,289**	0.123	0,603**	0,342**	0,428**	0,410**	0,521**	0,461**	--									
		Sig. (2-tailed)	0.000	0.000	0.002	0.198	0.000	0.000	0.000	0.000	0.000	0.000										
		N	111	112	112	111	112	111	110	109	111	106	112									
	Quality objectives are clearly defined for each job role and department	Correlation Coefficient	0,355**	0,440**	0,322**	0.178	0,659**	0,408**	0,516**	0,500**	0,527**	0,398**	0,663**	--								
		Sig. (2-tailed)	0.000	0.000	0.001	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
		N	110	112	111	110	111	110	110	108	110	105	111	112								
	Necessary resources are always available for me to do my job to achieve my quality objectives	Correlation Coefficient	0,303**	0,338**	0,261**	0,313**	0,455**	0,419**	0,495**	0,526**	0,494**	0,367**	0,705**	0,625**	--							
		Sig. (2-tailed)	0.001	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
		N	110	111	111	110	111	110	109	108	110	105	111	110	111							
	The tools and equipment are in good working condition and calibrated	Correlation Coefficient	0,264**	0,313**	0,243*	0.181	0,410**	0,316**	0,378**	0,503**	0,521**	0,265**	0,445**	0,506**	0,540**	--						
		Sig. (2-tailed)	0.006	0.001	0.012	0.063	0.000	0.001	0.000	0.000	0.000	0.007	0.000	0.000	0.000							
		N	106	107	107	106	107	106	106	105	107	103	107	106	106	107						
	Scheduling tool maintenance enhances product quality	Correlation Coefficient	0,494**	0,452**	0,342**	0,195*	0,422**	0,403**	0,464**	0,517**	0,503**	0,387**	0,515**	0,447**	0,488**	0,600**	--					
		Sig. (2-tailed)	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
		N	107	108	108	107	108	107	107	106	108	104	108	107	107	105	108					
	Employee Engagement influences product quality	Correlation Coefficient	0,407**	0,477**	0,352**	0.114	0,419**	0,342**	0,375**	0,381**	0,403**	0,516**	0,565**	0,478**	0,472**	0,471**	0,601**	--				
		Sig. (2-tailed)	0.000	0.000	0.000	0.242	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000					
		N	107	108	108	107	108	107	106	106	107	102	108	107	108	105	105	108				
	Employee Motivation influences product quality	Correlation Coefficient	0,293**	0,388**	0,391**	0,233*	0,276**	0,334**	0,450**	0,441**	0,450**	0,410**	0,411**	0,394**	0,467**	0,515**	0,594**	0,751**	--			
		Sig. (2-tailed)	0.002	0.000	0.000	0.015	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
		N	109	111	110	109	110	109	109	107	109	104	110	110	109	107	107	108	111			
	Leadership influences product quality	Correlation Coefficient	0,305**	0,375**	0,404**	0.089	0,302**	0,387**	0,470**	0,345**	0,424**	0,452**	0,442**	0,353**	0,368**	0,348**	0,566**	0,754**	0,812**	--		
		Sig. (2-tailed)	0.001	0.000	0.000	0.360	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
		N	108	109	109	108	109	108	107	106	108	103	109	108	108	107	106	107	109	109		
	Training, advancement, growth and motivation influences me to achieve product quality	Correlation Coefficient	0,394**	0,300**	0,397**	0.128	0,273**	0,344**	0,419**	0,309**	0,282**	0,305**	0,350**	0,416**	0,400**	0,299**	0,545**	0,596**	0,526**	0,573**	--	
		Sig. (2-tailed)	0.000	0.002	0.000	0.190	0.004	0.000	0.000	0.001	0.003	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000		
		N	106	107	107	106	107	106	105	104	106	101	107	106	106	104	104	104	106	106	107	
	Job status, roles and responsibilities influences me to achieve product quality	Correlation Coefficient	0,268**	0,376**	0,294**	0,250*	0,232*	0,291**	0,326**	0,317**	0,219*	0,216*	0,330**	0,511**	0,431**	0,283**	0,435**	0,576**	0,545**	0,487**	0,596**	--
		Sig. (2-tailed)	0.006	0.000	0.003	0.011	0.018	0.003	0.001	0.001	0.027	0.033	0.001	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	
		N	102	103	103	103	103	103	101	101	102	97	103	102	103	100	100	101	102	102	103	103
	Job Recognition influences product quality	Correlation Coefficient	0,205*	0,400**	0,297**	0,350**	0,244*	0,264**	0,380**	0,348**	0,285**	0,276**	0,331**	0,517**	0,432**	0,281**	0,406**	0,474**	0,551**	0,472**	0,507**	0,764**
		Sig. (2-tailed)	0.036	0.000	0.002	0.000	0.012	0.006	0.000	0.000	0.003	0.005	0.001	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000
		N	105	106	106	105	106	105	104	103	105	100	106	105	105	103	103	103	105	105	106	102
	Organisational culture influences product quality	Correlation Coefficient	0,211*	0,394**	0,217*	0,239*	0,263**	0,359**	0,326**	0,301**	0,328**	0,276**	0,339**	0,490**	0,391**	0,323**	0,473**	0,529**	0,480**	0,458**	0,505**	0,541**
		Sig. (2-tailed)	0.033	0.000	0.027	0.015	0.007	0.000	0.001	0.002	0.001	0.005	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
		N	103	104	104	103	104	103	102	101	103	100	104	103	103	102	102	101	103	103	104	100
	Work environment influences product quality	Correlation Coefficient	0,214*	0,401**	0,385**	0.151	0,247*	0,424**	0,497**	0,358**	0,339**	0,338**	0,374**	0,470**	0,389**	0,330**	0,464**	0,587**	0,613**	0,638**	0,684**	0,598**
		Sig. (2-tailed)	0.030	0.000	0.000	0.128	0.011	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
		N	103	104	104	103	104	103	102	101	103	99	104	103	103	103	101	102	104	104	104	100
	Communication influences product quality	Correlation Coefficient	0,278**	0,293**	0,367**	0.086	0,380**	0,499**	0,595**	0,400**	0,355**	0,294**	0,415**	0,528**	0,396**	0,408**	0,435**	0,541**	0,494**	0,578**	0,641**	0,469**
		Sig. (2-tailed)	0.004	0.002	0.000	0.384	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	105	106	106	105	106	105	104	103	105	100	106	105	105	103	103	103	105	105	106	102
	Work- Life Balance influences product quality	Correlation Coefficient	0,277**	0,479**	0,438**	0,229*	0,361**	0,515**	0,471**	0,440**	0,433**	0,344**	0,460**	0,515**	0,375**	0,398**	0,628**	0,632**	0,680**	0,622**	0,544**	0,609**
		Sig. (2-tailed)	0.005	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	101	102	102	101	102	101	101	100	102	98	102	101	101	102	100	100	102	102	102	98
	Provision of resources influences product quality	Correlation Coefficient	0,371**	0,394**	0,410**	0.104	0,319**	0,538**	0,614**	0,521**	0,468**	0,272**	0,429**	0,534**	0,410**	0,382**	0,647**	0,436**	0,556**	0,516**	0,552**	0,553**
		Sig. (2-tailed)	0.000	0.000	0.000	0.297	0.001	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	103	104	104	103	104	103	103	102	104	99	104	103	104	102	102	102	103	103	104	101
	Work Ethics influences product quality	Correlation Coefficient	0,319**	0,445**	0,469**	0.110	0,468**	0,563**	0,621**	0,487**	0,421**	0,428**	0,491**	0,648**	0,512**	0,423**	0,542**	0,625**	0,579**	0,649**	0,609**	0,546**
		Sig. (2-tailed)	0.001	0.000	0.000	0.262	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	106	108	107	106	107	106	106	104	106	101	107	107	106	104	104	104	107	106	107	103
	Job satisfaction influences product quality	Correlation Coefficient	0,379**	0,457**	0,379**	0,211*	0,320**	0,375**	0,503**	0,420**	0,294**	0,242*	0,363**	0,505**	0,410**	0,336**	0,497**	0,516**	0,591**	0,532**	0,528**	0,642**
		Sig. (2-tailed)	0.000	0.000	0.000	0.030	0.001	0.000	0.000	0.000	0.002	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	106	107	107	106	107	106	105	104	106	101	107	106	106	104	104	104	106	106	107	103
	Performance management influences product quality	Correlation Coefficient	0,310**	0,483**	0,323**	0,237*	0,502**	0,449**	0,596**	0,423**	0,463**	0,296**	0,459**	0,591**	0,451**	0,445**	0,538**	0,512**	0,513**	0,539**	0,485**	0,506**
		Sig. (2-tailed)	0.001	0.000	0.001	0.015	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	105	107	106	105	106	105	105	103	105	100	106	106	106	103	103	104	106	105	106	103
	Job security motivates me to produce quality products	Correlation Coefficient	0,275**	0,511**	0,317**	0.154	0,485**	0,395**	0,502**	0,518**	0,399**	0,404**	0,425**	0,568**	0,485**	0,417**	0,473**	0,601**	0,571**	0,534**	0,372**	0,576**
		Sig. (2-tailed)	0.005	0.000	0.001	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	104	105	105	104	105	104	103	102	104	99	105	104	104	103	102	103	105	105	105	101
	A safe environment motivates me to produce quality products	Correlation Coefficient	0,429**	0,538**	0,388**	0,205*	0,398**	0,423**	0,480**	0,459**	0,358**	0,448**	0,418**	0,439**	0,421**	0,274**	0,505**	0,541**	0,433**	0,562**	0,552**	0,497**
		Sig. (2-tailed)	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000
		N	105	106	106	105	106	105	104	103	105	100	106	105	106	103	103	104	105	105	106	103
	Health and safety motivate me to produce quality products	Correlation Coefficient	0,425**	0,555**	0,344**	0,263**	0,422**	0,334**	0,448**	0,370**	0,390**	0,366**	0,491**	0,584**	0,490**	0,295**	0,487**	0,544**	0,410**	0,527**	0,512**	0,509**
		Sig. (2-tailed)	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
		N	106	107	107	106	107	106	105	104	106	101	107	106	106	104	104	104	106	106	107	103
	Higher salary/wage motivates me to produce quality products	Correlation Coefficient	0,288**	0,483**	0,249**	0.156	0,328**	0,334**	0,366**	0,278**	0.116	0.088	0,267**	0,382**	0,292**	0,246*	0,358**	0,441**	0,429**	0,405**	0,366**	0,550**
		Sig. (2-tailed)	0.003	0.000	0.010	0.110	0.001	0.000	0.000	0.004	0.234	0.383	0.005	0.000	0.002	0.012	0.000	0.000	0.000	0.000	0.000	0.000
		N	106	107	107	106	107	106	105	104	106	101	107	106	106	104	104	104	106	106	107	103
	Employment type (Contract, permanent and staff) influences quality	Correlation Coefficient	0,383**	0,411**	0,257**	0,276**	0,412**	0,290**	0,355**	0,369**	0,231*	0,263**	0,337**	0,576**	0,509**	0,352**	0,424**	0,429**	0,413**	0,382**	0,408**	0,564**
		Sig. (2-tailed)	0.000	0.000	0.008	0.004	0.000	0.003	0.000	0.000	0.018	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	105	106	106	105	106	105	104	103	105	101	106	105	105	104	103	103	105	105	106	102
	Working hours (Shift, Overtime) impacts on product quality	Correlation Coefficient	0,262**	0,356**	0,273**	0,312**	0,340**	0,342**	0,383**	0,309**	0,204*	0,250*	0,340**	0,477**	0,426**	0,268**	0,386**	0,465**	0,492**	0,501**	0,439**	0,678**
		Sig. (2-tailed)	0.007	0.000	0.005	0.001	0.000	0.000	0.000	0.001	0.037	0.012	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000
		N	105	106	106	105	106	105	104	103	105	100	106	105	105	103	103	103	105	105	106	102
	Team collaboration impacts on product quality	Correlation Coefficient	0,334**	0,334**	0,440**	0,207*	0,295**	0,454**	0,515**	0,318**	0,330**	0,375**	0,360**	0,568**	0,445**	0,211*	0,492**	0,402**	0,411**	0,497**	0,520**	0,551**
		Sig. (2-tailed)	0.000	0.000	0.000	0.034	0.002	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.032	0.000	0.000	0.000	0.000	0.000	0.000
		N	106	106	106	105	106	105	104	103	105	100	106	105	105	103	103	103	105	105	106	102
	Technology influences product quality	Correlation Coefficient	0,407**	0,440**	0,484**	0.167	0,373**	0,378**	0,578**	0,445**	0,336**	0,304**	0,434**	0,549**	0,421**	0,322**	0,559**	0,449**	0,534**	0,475**	0,495**	0,532**
		Sig. (2-tailed)	0.000	0.000	0.000	0.089	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
		N	105	106	105	104	105	104	104	102	104	99	105	105	105	102	102	103	105	104	105	102
	Organisation uses the latest technology to enhance product quality	Correlation Coefficient	0,288**	0,377**	0,274**	0,264**	0,544**	0,365**	0,414**	0,493**	0,491**	0,401**	0,551**	0,756**	0,568**	0,480**	0,481**	0,525**	0,348**	0,332**	0,412**	0,465**
		Sig. (2-tailed)	0.003	0.000	0.005	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
		N	106	107	106	105	106	105	105	103	105	100	106	106	105	103	103	103	106	105	106	102
	Production automation impacts product quality	Correlation Coefficient	0,231*	0,276**	0,353**	0,276**	0,390**	0,412**	0,498**	0,379**	0,354**	0,358**	0,455**	0,561**	0,503**	0,242*	0,523**	0,389**	0,381**	0,438**	0,499**	0,455**
		Sig. (2-tailed)	0.017	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000
		N	106	106	106	105	106	105	104	103	105	100	106	105	105	103	103	103	105	105	106	102

			Job Recognition influences product quality	Organisational culture influences product quality	Work environment influences product quality	Communication influences product quality	Work- Life Balance influences product quality	Provision of resources influences product quality	Work Ethics influences product quality	Job satisfaction influences product quality	Performance management influences product quality	Job security motivates me to produce quality products	A safe environment motivates me to produce quality products	Health and safety motivate me to produce quality products	Higher salary/wage motivates me to produce quality products	Employment type (Contract, permanent and staff) influences quality	Working hours (Shift, Overtime) impacts on product quality	Team collaboration impacts on product quality	Technology influences product quality	Organisation uses the latest technology to enhance product quality	Production automation impacts product quality
Spearman's rho	Job Recognition influences product quality	Correlation Coefficient	--																		
		Sig. (2-tailed)																			
		N	106																		
	Organisational culture influences product quality	Correlation Coefficient	0,599**	--																	
		Sig. (2-tailed)	0.000																		
		N	103	104																	
	Work environment influences product quality	Correlation Coefficient	0,592**	0,711**	--																
		Sig. (2-tailed)	0.000	0.000																	
		N	103	102	104																
	Communication influences product quality	Correlation Coefficient	0,500**	0,584**	0,760**	--															
		Sig. (2-tailed)	0.000	0.000	0.000																
		N	105	103	104	106															
	Work- Life Balance influences product quality	Correlation Coefficient	0,678**	0,696**	0,661**	0,615**	--														
		Sig. (2-tailed)	0.000	0.000	0.000	0.000															
		N	101	100	102	102	102														
	Provision of resources influences product quality	Correlation Coefficient	0,665**	0,579**	0,579**	0,686**	0,815**	--													
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000														
		N	103	101	101	103	100	104													
	Work Ethics influences product quality	Correlation Coefficient	0,578**	0,548**	0,650**	0,751**	0,702**	0,688**	--												
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000													
		N	106	104	104	106	102	104	108												
	Job satisfaction influences product quality	Correlation Coefficient	0,707**	0,605**	0,733**	0,679**	0,695**	0,715**	0,608**	--											
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000												
		N	106	104	104	106	102	104	107	107											
	Performance management influences product quality	Correlation Coefficient	0,603**	0,532**	0,604**	0,729**	0,599**	0,621**	0,676**	0,714**	--										
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
		N	105	103	103	105	101	104	107	106	107										
	Job security motivates me to produce quality products	Correlation Coefficient	0,560**	0,562**	0,616**	0,570**	0,594**	0,532**	0,659**	0,793**	0,693**	--									
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000										
		N	104	102	103	104	101	102	105	105	104	105									
	A safe environment motivates me to produce quality products	Correlation Coefficient	0,448**	0,480**	0,589**	0,541**	0,571**	0,491**	0,616**	0,699**	0,627**	0,714**	--								
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
		N	105	103	103	105	101	104	106	106	106	104	106								
	Health and safety motivate me to produce quality products	Correlation Coefficient	0,465**	0,413**	0,508**	0,450**	0,482**	0,430**	0,613**	0,649**	0,676**	0,683**	0,863**	--							
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
		N	106	104	104	106	102	104	107	107	106	105	106	107							
	Higher salary/wage motivates me to produce quality products	Correlation Coefficient	0,395**	0,385**	0,488**	0,443**	0,476**	0,453**	0,445**	0,676**	0,528**	0,647**	0,592**	0,566**	--						
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
		N	106	104	104	106	102	104	107	107	106	105	106	107	107						
	Employment type (Contract, permanent and staff) influences quality	Correlation Coefficient	0,548**	0,484**	0,396**	0,410**	0,426**	0,385**	0,540**	0,596**	0,540**	0,654**	0,583**	0,628**	0,536**	--					
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
		N	105	104	104	105	102	103	106	106	105	104	105	106	106	106					
	Working hours (Shift, Overtime) impacts on product quality	Correlation Coefficient	0,669**	0,563**	0,501**	0,513**	0,587**	0,515**	0,582**	0,574**	0,567**	0,557**	0,508**	0,443**	0,551**	0,710**	--				
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000					
		N	105	103	103	105	101	103	106	106	105	104	105	106	106	105	106				
	Team collaboration impacts on product quality	Correlation Coefficient	0,553**	0,606**	0,490**	0,573**	0,589**	0,644**	0,715**	0,542**	0,602**	0,506**	0,576**	0,563**	0,357**	0,544**	0,623**	--			
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
		N	105	103	103	105	101	103	106	106	105	104	105	106	106	105	105	106			
	Technology influences product quality	Correlation Coefficient	0,578**	0,532**	0,548**	0,595**	0,702**	0,775**	0,650**	0,833**	0,654**	0,711**	0,677**	0,632**	0,620**	0,518**	0,556**	0,717**	--		
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
		N	104	102	102	104	100	103	106	105	106	103	105	105	105	104	104	105	106		
	Organisation uses the latest technology to enhance product quality	Correlation Coefficient	0,461**	0,504**	0,374**	0,462**	0,542**	0,506**	0,580**	0,489**	0,543**	0,609**	0,510**	0,571**	0,385**	0,571**	0,488**	0,523**	0,610**	--	
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
		N	105	103	103	105	101	103	107	106	106	104	105	106	106	105	105	106	106	107	
	Production automation impacts product quality	Correlation Coefficient	0,452**	0,555**	0,497**	0,520**	0,526**	0,551**	0,535**	0,527**	0,557**	0,448**	0,557**	0,550**	0,451**	0,447**	0,525**	0,698**	0,636**	0,569**	--
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		N	105	103	103	105	101	103	106	106	105	104	105	106	106	105	105	106	105	106	106

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Employee factors influencing product quality within manufacturing at Skyblu Technologies (Pty) Ltd. Durban

Dear Work Colleague

My name is Vernon (Gavin) Packreeappen and I am studying for my Master of Philosophy Degree in Quality Management and would appreciate if you can please complete this survey questionnaire, which measures employee's perception of employee factors influencing product quality within manufacturing at Skyblu Technologies (Pty) Ltd. Durban.

This survey questionnaire is solely for research purpose and will be anonymous and confidential. The results will be used to develop a strategy to enhance product quality within the Skyblu Technologies (Pty) Ltd. Durban manufacturing environment.

The questionnaire consists of two sections, please answer all questions.

Section A covers the participants' information.

Section B comprises of 39 statements addressing the research topic.

Section: A

1. Participant's information

Please cross the box you find most applicable

I. Gender

Male ☐

Female ☐

II. Age

20 – 29 ☐

30 – 39 ☐

40 – 49 ☐

50 & older ☐

III. Race

Black ☐

Coloured ☐

Indian ☐

White ☐

Other ☐

IV. Type of Employment

Contract ☐

Permanent ☐

Staff ☐

V. Job Category:

Senior Management ☐

Middle Management ☐

Operational Staff ☐

VI. Department:

Finance and Admin ☐

Sales and Marketing ☐

Human Resources ☐

Engineering ☐

Production (Shop Floor) ☐

Quality ☐

Logistics and Materials ☐

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 with the following statements.	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	**Employee's perception about quality**					
1.1	Quality is satisfying the requirement of the customer	1	2	3	4	5
1.2	Quality is evaluated against product specifications	1	2	3	4	5
1.3	Quality is everyone's responsibility within the company	1	2	3	4	5
1.4	Quality is sometimes compromised to achieve production targets	1	2	3	4	5
1.5	All critical quality checks in the production process are monitored and controlled as specified	1	2	3	4	5
2	**Job specific quality requirements**					
2.1	Job work instructions help to build a quality product	1	2	3	4	5
2.2	Work instructions provide a clear guideline for task completion to ensure quality objectives are achieved	1	2	3	4	5
2.3	Work instructions are updated and available by the company for specific job functions	1	2	3	4	5
2.4	Roles and responsibilities are clearly defined by using work instructions	1	2	3	4	5
2.5	Non-conforming products are segregated	1	2	3	4	5
3	**Quality resources and objectives**					
3.1	The organisation has developed a product quality strategy and has identified the resources required	1	2	3	4	5
3.2	Quality objectives are clearly defined for each job role and department	1	2	3	4	5
3.3	Necessary resources are always available for me to do my job to achieve my quality objectives	1	2	3	4	5
3.4	The tools and equipment are in good working condition and calibrated	1	2	3	4	5
3.5	Scheduling tool maintenance enhances product quality	1	2	3	4	5
4	**Employee factors that influence product quality**					
4.1	**Employee Engagement and Motivation Factors**					
4.1.1.	Employee Engagement influences product quality	1	2	3	4	5
4.1.2.	Employee Motivation influences product quality	1	2	3	4	5
4.1.3.	Leadership influences product quality	1	2	3	4	5

4.1.4.	Training, advancement, growth and motivation influences me to achieve product quality	1	2	3	4	5
4.1.5.	Job status, roles and responsibilities influences me to achieve product quality	1	2	3	4	5
4.1.6.	Job Recognition influences product quality	1	2	3	4	5
4.2.	**Organisation culture and environment Factors**					
4.2.1.	Organisational culture influences product quality	1	2	3	4	5
4.2.2.	Work environment influences product quality	1	2	3	4	5
4.2.3.	Communication influences product quality	1	2	3	4	5
4.2.4.	Work- Life Balance influences product quality	1	2	3	4	5
4.2.5.	Provision of resources influences product quality	1	2	3	4	5
4.2.6	Work Ethics influences product quality	1	2	3	4	5
4.3.	**Job Satisfaction and Performance Factors**					
4.3.1.	Job satisfaction influences product quality	1	2	3	4	5
4.3.2.	Performance management influences product quality	1	2	3	4	5
4.3.3.	Job security motivates me to produce quality products	1	2	3	4	5
4.3.4.	A safe environment motivates me to produce quality products	1	2	3	4	5
4.3.5.	Health and safety motivate me to produce quality products	1	2	3	4	5
4.3.6.	Higher salary/wage motivates me to produce quality products	1	2	3	4	5
4.4.	**Employment and technology factors**					
4.4.1.	Employment type (Contract, permanent and staff) influences quality	1	2	3	4	5
4.4.2.	Working hours (Shift, Overtime) impacts on product quality	1	2	3	4	5
4.4.3.	Team collaboration impacts on product quality	1	2	3	4	5
4.4.4.	Technology influences product quality	1	2	3	4	5
4.4.5.	Organisation uses the latest technology to enhance product quality	1	2	3	4	5
4.4.6.	Production automation impacts product quality	1	2	3	4	5

Questionnaires will be collected by a representative to ensure anonymity.

Thank you for your time in answering this questionnaire.

LETTER OF INFORMATION

Title of the Research Study: Employee factors influencing product quality within SkyBlu technologies (Pty) Ltd., Durban.

Principal Investigator/s/researcher: Vernon Packreeappen (Btech: Management)

Supervisor/s: Manduth Ramchander (Dtech)

My name is Vernon (Gavin) Packreeappen and I am studying for my Master of Philosophy Degree in Quality Management and would appreciate if you can please complete this survey questionnaire, which measures employee's perception of employee factors influencing product quality within manufacturing at Skyblu Technologies (Pty) Ltd. Durban.

This survey questionnaire is solely for research purpose and will be anonymous and confidential. The results will be used to develop a strategy to enhance product quality within the Skyblu Technologies (Pty) Ltd. Durban manufacturing environment.

The questionnaire consists of two sections, please answer all questions.
Section A covers the participants' information.
Section B comprises of 39 statements addressing the research topic.

This survey can be completed at a time and place convenient to you and should take about 15 to 20 minutes of your time. Please be advised that the ethical aspect of the research ensures the preservation of the identity of the participants. All information collected during the research project will be treated confidentially and will be coded so that you remain anonymous. This research project has ethics approval from the Faculty of Management Sciences Ethics Committee. The data collected will be used purely for academic purposes. Please note that

participation in this research is voluntary and participants can opt out of the study at any time. The information will be presented in a written report, in which your identity will not be revealed. I do not anticipate any risks associated with participating in this research project.

As a participant you are not expected to face any cost for participating in this study, neither will you receive any financial benefits.

If you have any questions about the research project or require further information you may contact the following:

Student Researcher: Vernon Packreeappen
Contact: 083 7844 627
Office: 031 880 1287
Email: gavin.packreeappen@myskyworth.com

Supervisor: Manduth Ramchander
Contact: 074 400 4400
Office: 031 373 5288
Email: manduthr@dut.ac.za

DUT In search Ethics Administrator: 0931 373 2375 or complaints can be reported Acting Director: Research and Postgraduate Support on researchdırector@dut.ac.za.

Thank you for your time,

Vernon Packreeappen

CONSENT

Full Title of the Study: Employee factors influencing product quality within SkyBlu technologies (Pty) Ltd., Durban.

Names of Researcher: Vernon Packreeappen

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher Vernon Packreeappen about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: FREC REF: 40/18FREC
- 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, _____ herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Vernon Packreeappen	14/11/2024	
_____	_____	
Full Name of Researcher	**Date**	
_____	_____	_____
Full Name of Witness (If applicable)	**Date**	**Signature**
_____	_____	_____
Full Name of Legal Guardian (If applicable)	**Date**	**Signature**

Zertifikat
Certificado
Certificat
Certificate

TRREE

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants

Certificat de formation - Training Certificate

Ce document atteste que - this document certifies that

Vernon Packreeappen

a complété avec succès - has successfully completed

Module 1 (2023) - Introduction to Research Ethics

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation

Release Date: 2024/11/11

CID : eLLD(yJKbe

Professeur Dominique Sprumont
Coordinateur TRREE Coordinator

APPROVED BY
SIWF FMH
ISFM

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