

**A study of Co-implementation of Total Quality Management
and Sustainability Practices**

by

Muhammad Nasir Abdullahi

G20589310

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Declaration

I declare that while registered as a candidate for the research degree, I have not been a registered candidate or enrolled student for another award of the University or other academic or professional institution.

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ABSTRACT

The global campaign on sustainability has compelled organisations to collectively address a wide range of issues beyond their traditional goal of maximising profits. In an effort to address the effects of their activities on the environment, organisations have attempted to adopt sustainability practices. However, they are still struggling with the implementation of these practices. Total Quality Management (TQM) practices, on the other hand, have been researched extensively and empirically proven to have positive impacts on organizational performance. Given the seeming similarity between TQM and Sustainability adoption processes, the central question of this research is if organisations can leverage on their experience in TQM implementation to facilitate and enhance implementation of sustainability practices.

This research therefore seeks to present and analyse a conceptual framework that will provide a better understanding of the relationship between TQM and sustainability practices and their impacts on organisational performance when co-implemented. To address this, an extensive literature review was carried out which highlighted the key intersections between TQM and sustainability practices. Based on the assumption that organisations that implement TQM are better at adopting sustainability practices, a further delineation of the relevant theoretical insights and the existence of synergies between TQM and sustainability practices were highlighted.

The empirical data for this research was drawn from a wide range of organisations operating in the United Kingdom. A survey of 880 organisations was conducted of which a total of 137 valid responses were used for the data analyses.

Results obtained from structural equation modelling (SEM) confirmed the existence of synergies between TQM and sustainability practices and suggest that the co-implementation of TQM and sustainability practices has a positive and significant impact on organisational performance. This supports the view that TQM organisations have considerable advantage at implementing sustainability practices. Furthermore, empirical evidence revealed that top management commitment, one of the TQM principles, plays the role of a mediator in the relationship between sustainability practices and organisational performance. This suggests that the greater the involvement of the leadership team in an organisation the greater the sustainability adoption which will in turn lead to improved organisational performance.

The research enriches the literature on sustainability practices and offers stakeholders insights into the relationship between TQM and sustainability practices and how they can leverage the experience from the co-implementation to effectively pursue strategies that will aid the adoption of sustainability practices and improve organisational performance.

TABLE OF CONTENT

Declaration	ii
ABSTRACT	iii
TABLE OF CONTENT	v
LIST OF FIGURES	ix
LIST OF TABLES	x
ACKNOWLEDGEMENT	xiii
LIST OF ABBREVIATIONS	xiv
CHAPTER 1: INTRODUCTION	1
1.1. Introduction and Background Information	1
1.2. Introduction	1
1.3. Research Problem Statement	3
1.4. Aim of the Study	4
1.5. Objectives of the Study	5
1.6. Research Questions	5
1.7. Significance of the Study	6
1.8. Research Methodology	6
1.9. Flow of the Thesis	7
1.10. Summary	7
CHAPTER 2: LITERATURE REVIEW	8
2.1. Introduction	8
2.2. Origin of Sustainability	8
2.3. The Brundtland Report	11
2.4. Development of Sustainability Post Brundtland Report	15
2.4.1. Rio earth summit	15
2.4.2. Kyoto conference	17
2.4.3. The millennium development goals (MDG)	17
2.4.4. The Paris agreement	18
2.5. Sustainable Development Paradigm	20
2.6. The Triple Bottom Line (TBL) of Sustainability	22
2.7. Sustainability Strategies	25
2.7.1. Green building	25
2.7.2. Renewable sources of energy	26

2.7.3. Waste reduction and recycling	28
2.7.4. Sustainable Transportation	29
2.7.5. Off-setting Carbon Emissions	31
2.8. Sustainability Performance Measurement	32
2.8.1. Sustainability performance indicators	33
2.8.2. Corporate social responsibility and sustainability	38
2.9. Enablers and Inhibitors of Sustainability	39
2.9.1. Inhibitors of Sustainability	40
2.9.2. Enablers of sustainability	44
2.10. Total Quality Management	48
2.10.1. Meaning and definition	48
2.10.2. Evolution of Total Quality Management	48
2.10.3. Total quality management concept	51
2.10.4. Total Quality Management Principles	52
2.10.5. Total quality management fundamental issues	60
2.11. Critical Success Factors and Inhibitors of TQM	61
2.12. The Role of TQM on Organisational Performance	65
2.13. Benefits and Critique of TQM	67
2.14. The Link between TQM and Sustainability	68
2.15. Sustainability Practices in the Context of TQM	71
2.16. Organisational Performance	72
2.16.1. Impact of TQM on organisational performance	73
2.16.2. Impact of corporate social responsibility on organisational performance	75
2.17. Synergy Between TQM and Sustainability Practices	76
2.18. Conceptual Framework for the Study	78
2.19. Relationships Between the Variables and Hypothesis Development	82
2.20. Summary	84
CHAPTER 3: RESEARCH METHODOLOGY	87
3.1. Introduction	87
3.2. Research Philosophy	87
3.2.1. Ontology: objectivism versus subjectivism	87
3.2.2. Epistemology	89
3.3. Research Approach	93

3.4. Research Design	93
3.4.1. Quantitative research method	95
3.4.2. Qualitative research method	97
3.4.3. Mixed research approach	100
3.5. Justification for the use of Quantitative Research Method	104
3.6. Scale Development and Validity	105
3.7 Research Methods	106
3.7.1. Confirmatory factor analysis (CFA)	106
3.7.2. Regression analysis	108
3.7.3. Mediation analysis	108
3.8. Data Collection and Sample Frame	109
3.9. Design of the Questionnaire	110
3.10. Pilot Testing	114
3.11. Questionnaire Administration and Response Rate	115
3.12. Demographic Characteristics of Respondents	118
3.13. Summary	125
CHAPTER 4: SURVEY BY QUESTIONNAIRE	126
4.1. Introduction	126
4.2. Measurements and Validation of Constructs	126
4.2.1. Normality test	127
4.2.2. Non-Response Bias Analysis	130
4.2.3. Reliability Analysis	134
4.2.3.1. Reliability analysis	134
4.2.3.2. Reliability analysis - top management commitment (TMC)	135
4.2.3.3. Reliability analysis - customer focus (CF)	136
4.2.3.4 Reliability analysis - people management (PM)	136
4.2.3.4 Reliability analysis - supplier quality management (SQM)	138
4.2.3.5 Reliability analysis - continuous improvement (CI)	140
4.2.3.6 Reliability analysis - organisational performance (OP)	141
4.2.3.7 Reliability analysis - sustainability strategies (SS)	142
4.2.3.8 Reliability analysis - sustainability practices (SP)	143
4.3 Multicollinearity Test	145
4.5 Descriptive Statistics	147
4.5.1 Total Quality Management	147
4.5.2 Descriptive Statistics – Organisational Performance	150
4.5.3 Descriptive Statistics – Sustainability	152

4.6. Effect of TQM as Enabler on Co-implementation	156
4.6.1 Regression analysis	157
4.7. Impact of Co-implementation on Organisational Performance	159
4.7.1 Regression analysis	160
4.8 Mediation Analysis	162
4.9. Multiplicative Effects of TQM and Sustainability on Organisational Performance.	166
4.9.1. Structural equation modeling (SEM)	168
4.9.2. Model fit tests	174
4.9.3. Model 2: Mediation effect of TQM	175
4.9.4. Model 3: Combined effect of TQM and sustainability	180
CHAPTER 5: DISCUSSION	183
5.1. Introduction	183
5.2. Discussion of the Findings	183
5.3. Level of Co-implementation of TQM and Sustainability	184
5.4. Effect of Enabler on Co-implementation of TQM and Sustainability Practices	188
5.5. Effect of Co-implementation on Organisational Performance	190
5.6. Mediation Effect of TQM on the Relationship Between Sustainability Practices and Organisational Performance	192
CHAPTER 6: CONCLUSION	194
6.1. Introduction	194
6.2. An Overview of the Research	194
6.3. Research Questions	195
6.3.1. Research question 1. What are the key enablers of sustainability practice?	195
6.3.2. Research question 2. What is the level of co-implementation of TQM and sustainability practices in the UK?	196
6.3.3. Research question 3. Are TQM compliant organisations more successful in sustainability adoption compared to their non-TQM compliant counterparts?	197
6.4. Contributions to Knowledge	199
6.5. Limitations and Future Research Suggestions	201
6.6. Summary	202
APPENDICES	204
REFERENCES LIST	221

LIST OF FIGURES

Figure 2. 1 The following conceptual framework is developed to illustrate the relationship between the study variables	84
Figure 3. 1 A classification of ontology and epistemology in research	95
Figure 3. 2 Survey instrument development	105
Figure 3. 3 Illustration of a multiple mediation design. (A) \times affects Y. (B) \times is hypothesised to exert an indirect effect on Y through M1, M2, ... Mj (Preacher and Hayes, 2008).	109
Figure 4. 1 Histogram plotting of dependent variables	128
Figure 4. 2 Normal Q-Q plot for the residuals	129
Figure 4. 3 Polar graph – aggregate ratings	155
Figure 4. 4 TQM enablers model for co-implementation	157
Figure 4. 5 CFA model	167
Figure 4. 6 Conceptual framework	169
Figure 4. 7 SEM model	170
Figure 4. 8 SEM model – model 1 (TQM on sustainability)	170
Figure 4. 9 SEM model – model 2 (sustainability on TQM)	175
Figure 4. 10 SEM model – model 3	180

LIST OF TABLES

Table 2. 1 ISO standards comparison (adapted from Castka and Balzarova (2008))	70
Table 2. 2 Summary of the influence of CSR on organisational performance	75
Table 3. 1 Differences between qualitative and quantitative research	98
Table 3. 2 Analysis of response rate across core business area	117
Table 3. 3 Respondents profile	118
Table 3. 4 Size of organisation	120
Table 3. 5 Years spent implementing TQM	121
Table 3. 6 Departments TQM is implemented	122
Table 3. 7 Departments TQM is implemented in relation to size of organisation	123
Table 3. 8 Sustainability Strategies Adopted in Relation to Size of Organisation	124
Table 4. 1 Test for normality – Shapiro-Wilk	130
Table 4. 2 Distribution of respondents by wave	131
Table 4. 3 Non-response bias test	133
Table 4. 4 Reliability analysis - top management commitment (TMC)	135
Table 4. 5 Reliability analysis - customer focus (CF)	136
Table 4. 6 Reliability analysis - people management (PM)	136
Table 4. 7 Reliability analysis - revised people management (PM)	137
Table 4. 8 Reliability analysis - supplier quality management (SQM)	138
Table 4. 9 Reliability analysis - supplier quality management (SQM)	139
Table 4. 10 Reliability analysis - continuous improvement (CI)	140
Table 4. 11 Reliability Analysis - Organisational performance (OP)	141
Table 4. 12 Reliability analysis - sustainability strategies (SS)	142
Table 4. 13 Reliability analysis - sustainability practices (SP)	143
Table 4. 14 Summary of Cronbach's Alpha reliability test for all sub-constructs	145
Table 4. 15 Multicollinearity test	146
Table 4. 16 Descriptive statistics - total quality management	147
Table 4. 17 Descriptive statistics - organisational performance	150
Table 4. 18 Descriptive statistics - sustainability	152
Table 4. 19 Mean, standard deviation, correlations and factor loadings	156

Table 4. 20 Results of regression analysis on TMC and sustainability practices	158
Table 4. 21 Results of regression analysis on CI and sustainability practices	158
Table 4. 22 Mean, standard deviation and factor loadings for organisational performance constructs	159
Table 4. 23 Regression analysis: TQM, sustainability and organisational performance	160
Table 4. 24 Regression analysis: co-implementation and organisational performance	161
Table 4. 25 Impact of co-implementation of TQM and sustainability practices on organisational performance	162
Table 4. 26 Mediation of the effects of the sustainability practices on organisational performance	163
Table 4. 27 Bootstrap estimates of paths and estimated standard error for TQM	163
Table 4. 28 Mediation of the effects of the TQM principles	164
Table 4. 29 Bootstrap estimates of paths and estimated standard error	165
Table 4. 30 SEM regressions – model 1	171
Table 4. 31 Squared multiple correlations – model 1	171
Table 4. 32 Total effects – model 1	172
Table 4. 33 Direct effects – model 1	173
Table 4. 34 Indirect effects – model 1	173
Table 4. 35 Model fit – model 1	174
Table 4. 36 SEM regressions – model 2	176
Table 4. 37 Squared multiple correlations – model 2	176
Table 4. 38 Total effects – model 2	177
Table 4. 39 Direct effects – model 2	178
Table 4. 40 Indirect effects – model 2	178
Table 4. 41 Model fit tests – model 2	179
Table 4. 42 SEM regressions – model 3	181
Table 4. 43 Model fit tests – model 3	181
 Table 5. 1 Size of organisation	 184
Table 5. 2 Years spent implementing TQM	185
Table 5. 3 Departments TQM is implemented	185

Table 5. 4 Sustainability adoption	187
Table 5. 5 Correlation of TQM values and sustainability practices	188
Table 5. 6 Impact of co-implementation of TQM and sustainability practices on organisational performance	190
Table 5. 7 Mediation of the effects of the sustainability practices on organisational performance	193

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LIST OF ABBREVIATIONS

AS:	Absorbed Sustainability
AMT:	Advanced Manufacturing Technology
ANOVA:	Analysis of Variance
BP:	British Petroleum
CAPEX:	Capital Expenditure
CBA:	Cost Benefit Analysis
CC:	Carbon Credit
CDS:	Commission on Sustainable Development
CERES:	Coalition for Environmentally Responsible Economics
CEO:	Chief Executive Officers
CES:	Centre for Environmental Strategy
CEQ:	Council on Environmental Quality
CFA:	Confirmatory Factor Analysis
CSR:	Corporate Social Responsibility
CSRI:	Corporate Social Responsibility Indicators
CWRT:	Centre for Waste Reduction Technologies
DOS:	Director of Studies
ESI:	Economic Sentiment Indicator of the European Commission
EFP:	Ecological Footprint
EFQM:	European Foundation for Quality Management
EPI:	Environmental Performance Indicators
EFPP:	Environmentally Friendly Practices
GHGE:	Greenhouse Gas Emission
GHG:	Greenhouse Gas
GSCM:	Green Supply Chain Management
GRI:	Global Reporting Initiative
GDP:	Gross Domestic Product
GNP:	Gross National Product

HDI:	Human Development Index
ICHEME:	Institution of Chemical Engineers
IEA:	International Energy Agency
IIASA:	International Institute for Applied System Analysis
IISD:	International Institute of Sustainable Development
ISO:	International Organisation for Standardization
JIT:	Just-In-Time Production
KPI:	Key Performance Indicators
K-S:	Kolmogorov-Smirnov
LBS:	Lancashire Business School
LTDs:	Limited Liability Companies
MBNQA:	Malcolm Bridge National Quality Award
MD:	Managing Director
MMR:	Mixed Methods Research
NRBV:	Natural Resources Based View
NGO:	Non-Governmental Agencies
NEF:	New Economics Foundation
OECD:	Organisation for Economic Cooperation and Development
PCA:	Principal Component Analysis
PLCs:	Public Limited Liability Companies
ROI:	Return on Investments
SA:	Social Accountability
SC:	Supply Chain
SCM:	Supply Chain Management
SPSS:	Statistical Package for the Social Sciences
SQM:	Supplier Quality Management
SS:	Sustainability Strategy
SSCM:	Sustainable Supply Chain Management
SMEs:	Small and Medium Enterprises

SEM:	Structural Equation Model
SPI:	Sustainability Performance Index
TBL:	Triple Bottom Line
TQM:	Total Quality Management
UCLAN:	University of Central Lancashire
UN:	United Nations
USCEQ:	United State Council on Environmental Quality
UNGA:	United Nations General Assembly
UNSC:	United Nations Scientific Conference
UNCED:	United Nation Conference on Environment and Development
UNCOSOCA:	United Nation Committee on Economic and Social Affairs
UNCSD:	United Nation Commission on Sustainable Development
UNFCCC:	United Nation Framework Convention on Climate Change
UNESCO:	United Nation Economic and Social Council
UNEP:	United Nations Environmental Programmes
UNIDO:	United Nations Industrial Development Organisation
UNIEF:	United Nation International Environment Forum
UNCHE:	United Nation Conference on the Human and Environment
WBCSD:	World Business Council on Sustainable Development
WCED:	World Commission on Environment and Development
WHO:	World Health Organisation
WS:	Weak Sustainability
WER:	World Economic Report

CHAPTER 1: INTRODUCTION

1.1. Introduction and Background Information

This chapter lays the foundation for this thesis by expounding the contextual background, identifying the research problem and defining the methodology adopted for the research. The research aims and objectives together with the structure of the thesis are also presented in this chapter.

1.2. Introduction

In recent years, there has been a shift from governments addressing the issue around sustainability practices to business organisations taking over the discussion (Hahn and Scheermesser, 2006). The increasing effect of climate change, customer demands, government regulations and the continuous discussions on the effect of business activities on the planet have compelled organisations to expand their focus beyond the traditional objective of maximising profit for the shareholders to a more inclusive outlook that takes into consideration of a wider stakeholder approach that will ensure a long-term competitive advantage (Fairfield et al., 2011). It is important to note that the strategic role organisations play in economic development has placed them in a pivotal position in the realization of global sustainability. It is often suggested that without the cooperation and support of business organisations, global sustainability will be elusive (Bansal, 2002). A number of scholars have argued that the attainment of economic and social development is based on the ability of organisations and the society at large to embrace sustainability (Kylili, Fokaides and Jimenez, 2016; Barkemeyer, Holt, Preuss and Tsang, 2014; Ehrenfeld, 2005). Having acknowledged their role in the attainment of sustainability, organisations are taking advantage of sustainability practices as an invaluable tool in improving their organisational performance. The incorporation of sustainability practices presents organisations with a competitive advantage to drive through innovation that will bring about fundamental organisational changes in terms of structure and culture. These changes result in the creation of new products, reduction of waste, reduction of cost and improved risk management strategies (Azapagic, 2003). Figge (2005) and Moneva and Ortas (2010) have argued that the integration of sustainability practices in an organisation increases shareholder value, improves social well-being and also ensures that organisational sustainability is maintained.

Initially, the concept of sustainability was focused solely on the ecological pillar where the dominant discussions were on the implications of human activities on the environment. Hart (1997), argues that to focus on the control of pollution as the means to attaining sustainability is a misconception of what sustainability is truly about. There is now a consensus that the current understanding of the relationship between sustainability and business organisation has moved away from the earlier narrow understanding of sustainability in the context of environmental concerns to a more inclusive view. Consequently, the increasing drive to compete, government regulations and the ever-increasing customer demands have given rise to a wide range of definitions of sustainability. Asif et al. (2011) explained that to understand sustainability, the different aspects (social, environmental and economic) must be treated as a sub-set that must be integrated to achieve sustainability. This follows the “triple bottom line” (TBL) concept, a term coined by Elkington (Elkington, 1999). The concept proposed that the integration of environmental (planet), social (people), and financial (profit) aspects into the structure and culture of an organisation will improve the value of the organisation in the long-term and also ensure organisational sustainability (Dyllick and Hockerts, 2002; Holliday, 2001).

With the current development in the relationship between sustainability practices and organisation, the scope of TQM has seen tremendous change to accommodate a wider stakeholder in order to meet the increasing challenges organisation encounters today (Klefsjö et al., 2008). This multiple stakeholder approach presents organisations with new challenges as to how to manage, integrate and implement these different aspects of sustainability. Although elements of sustainability practices like CSR have already been integrated into TQM, however, true sustainability requires equal commitment of the three aspects of sustainability into the organisational strategy.

The primary focus of TQM is to meet and exceed the needs and expectations of the customer as well as the organisation. And as the needs of customers are changing to include the ecological and social aspects of sustainability, it has been argued that the scope of TQM must change to accommodate such needs (Zink, 2007). Having acknowledged the congruence between TQM and sustainability, researchers have proposed the integration of the two concepts.

1.3. Research Problem Statement

A growing number of studies (Zairi and Peters, 2002; Wagner, 2010; Chang and Kuo, 2008; Orlitzky et al., 2003) have reached a consensus that the integration of sustainability practices can improve organisational performance. With this understanding and considering the complexity of the implementation process, researchers (Zhao, 2004; Isaksson, 2006; Asif et al., 2011) have suggested the integration of social and environmental aspects of sustainability into quality management. This suggestion has been a welcome development. However, in spite of the numerous studies on the need to integrate sustainability practices into business operations, the implementation remains a challenge to business organisations. Organisations have struggled to translate and apply the sustainability practices into the day-to-day business operations (Scherrer et al., 2007).

Following the understanding that there is existence of synergies between TQM and sustainability, this study proposes to leverage on the experience from TQM implementation to lay a foundation for the implementation of sustainability strategies into business operations.

TQM has evolved from the early days of quality management where the focus was on inspection, then to quality control and to quality assurance. The evolution has seen TQM develop into a management system that focuses on customers and processes. Boys et al. (2005) explains that today's understanding of TQM transcends beyond the focus on processes and customers as the immediate user of the product or service to include other aspects of organisational performance such as environment, social, finance and safety. This is consistent with previous assertions by Garvare and Isakson (2001) who argued that the concept of customer focus in business has been broadened to accommodate a wider group of stakeholders rather than shareholders. Following the stakeholder theory, Freeman (1984) argued that the responsibility of an organisation does only stop with its shareholder but extends to other interest parties like customers, employees, suppliers and the community. This shows that the sustainability of an organisation depends on the ability of the organisation to meet the demands of the various stakeholders involved. With this understanding, organisations recognise the significance of satisfying the expectations of multiple stakeholders. This highlights the synergy that exists between TQM and sustainability as previously discussed by Asif et al. (2011); Zink (2007); McAdam and Leonard (2003); Garvare and Isaksson (2001). However, it is important to note that although these authors have discussed the existence of these synergies, the literature is largely conceptual and lacking empirical data.

Organisations have come to recognise that pursuing sustainability practices can provide a competitive advantage and also help improve organisational performance (Maletic et al., 2011; Fairfield et al., 2011). A number of studies (Garvare and Isaksson, 2001; Sharma, 2003; Maletic et al., 2011; Fairfield et al., 2011) have highlighted different sustainability practices that can improve organisational performance. However, the successful implementation of these practices has remained a challenge due to lack of understanding of how these practices can be integrated into existing management systems. Therefore, the understanding of how to systematically integrate sustainability practices within management systems particularly TQM has been highlighted as the main problem in this study.

This study examines the synergies that exist between TQM and sustainability practices and whether TQM can support the integration of sustainability into the day-to-day operations of an organisation. It also seeks to fill the gap in knowledge in relation to how co-implementation can enhance organisational performance. Considering the lack of empirical evidence in current literature, data from this study will provide empirical evidence on the effect of co-implementation on organisational performance and what specific synergies between TQM and sustainability that impact organisational performance. To achieve what this study has set out, it is significant to understand the different processes and elements of sustainability practices and how they individually improve organisational performance. Therefore, there is a need to develop a conceptual framework to aid better understanding.

To understand this complex relationship, this study has proposed a conceptual framework that will aid in explaining how the co-implementation of TQM and sustainability practices impacts organisational performance leading to increased competitive advantage.

1.4. Aim of the Study

The recognition that sustainability has become a mainstream issue with a significant role to play in the future of modern economies will help organisations understand why its integration into business activities is vital. With this view, this study aims to examine how different practices within TQM and sustainability combine (synergy) to influence organisational performance. While previous studies (Moneva and Ortas, 2010; Wagner et al., 2010; Chang and Kuo, 2008; Melnyk et al., 2003; Orlitzky et al., 2003) have either examined TQM and the environment as a subset of sustainability or TQM in the context of corporate social responsibility (CSR). There is lack of

empirical evidence in the current literature that examines the relationship between TQM and sustainability practices and their resulting impact on organisational performance.

Therefore, the overall aim of this study is to examine what impact co-implementation practices or synergies between TQM and sustainability have on organisational performance. The following research objectives have been developed to help empirically test the various practices on organisational performance.

1.5. Objectives of the Study

1. To Investigate the theoretical underpinning of TQM, sustainability practices and organisational performance based on current literature
2. To investigate the synergies between TQM and sustainability practices and how they impact organisational performance
3. To identify the key drivers (enablers) of the co-implementation of TQM and sustainability practices
4. To investigate the mediating role of TQM principle on the relationship between sustainability and organisational performance
5. To investigate the multiplicative effects of co-implementation of TQM and sustainability on organisational performance

1.6. Research Questions

In view of the preceding aim and objectives, the following research questions have been formulated:

1. What are the key drivers of co-implementation of TQM and sustainability practices?
2. What is the level of co-implementation of TQM and sustainability practices in the UK?
3. Are TQM compliant organisations more successful in sustainability adoption compared to their non-TQM compliant counterparts?
4. What is the impact of co-implementation on organisational performance?

1.7. Significance of the Study

The findings of the proposed study will be significant to business organisations, academicians and various governments. To the business organisations, the findings will avail information on the extent of co-implementation of TQM and sustainability and resulting effects on the performance of the organisation. The business entities will be able to determine the enabling effect of the two concepts on each other so as to make a sound decision on their implementation. To the government, the information will be relevant in devising policies concerned with the regulation of business activities management of the manufacturing processes of organisations, in a way that their activities have minimal negative implications on the environment. There is limited information on the relationship between TQM and Sustainability in the existing literature, as such, the findings of the proposed study will fill this gap in literature as well as inform researchers on the possible causal relationship observed between the two concepts.

1.8. Research Methodology

To answer the research questions stated earlier, this study adopted a quantitative research method. As such, the ontological perspective was objectivity while the epistemology perspective was positivism. The study was based on the philosophy that reality can be determined objectively without any form of interference from the researcher. Also, the research was developed based on the assumption that the findings can be determined objectively to allow for generalizability of the information acquired into other settings. Quantitative research design was adopted in the study since the research questions were to be determined objectively.

Survey was used as the method of data collection. Through the use of questionnaires as a data collection tool, the researcher formulated closed-ended questions to be answered by the study participants. The questions were formulated based on the research questions of the study such that the responses to the questionnaire questions will ensure that quality findings and responses for the study objectives are attained. The questionnaire was pilot tested and results from the pilot study were used to review the final questionnaire used for this study.

The sampling frame obtained from CSRHub consisted of organisations across different sectors. Questionnaires were mailed to sample organisations as this was considered to be easy and efficient to carry out. Other reasons for adopting mail questionnaires was for its acceptability in the corporate environment and also its ability to reach a large number of respondents over a

limited period of time. Considering that TQM and sustainability are managerial responsibilities, the top management of the sample organisations were the main target respondents. Statistical Package for Social Science (SPSS) software was used to analyse the data collected.

1.9. Flow of the Thesis

The first chapter of the thesis presents the general introduction to the study, problem statement and justification and the research aim and objectives. The second chapter gives a critical review of literature regarding the theoretical underpinning on the concepts of TQM and sustainability practices in relation to organisational performance. Also, synergies between TQM and sustainability practices were identified and how they relate organisational performance in different contexts. The third chapter of the study gives the methodological approaches that were implemented in the study. The philosophical basis of the study, the methodological approaches and design adopted in the study are discussed. Also, the third chapter provided the conceptual framework that illustrates the relationship observed between the study variables. In Chapter five, discussions on the findings from both literature review and empirical tests were presented. Chapter six ends the study by discussing the limitations, future research recommendations and general conclusions.

1.10. Summary

This chapter presents the background information on the research under study. The chapter gives introductory information on the concept of total quality management and sustainability. The problem statement and its justification are also provided to ascertain the relevance of the study. The research objectives and questions to be attained in the study are also presented. A discussion on the significance of the study and the flow of the thesis is also presented in this chapter.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This section presents a critical review of the literature on the concept of TQM and sustainability. The review gives the theoretical underpinning of the different papers relating to the relationship between TQM and sustainability and the resulting implications on the performance of an organisation. The section begins with a discussion on the concept of sustainability and TQM, followed with the critical analysis of the link between the two concepts.

2.2. Origin of Sustainability

Sustainable development or sustainability refers to the social and economic development that is capable of meeting the needs of the current generation without curtailing the ability for the future generation to meet their needs (WCED, 1987). Based on this widely adopted definition of sustainability, it is considered that sustainability is built on three pillars: social, ecological and economic development (Elkington, 1999). While the three pillars are vital in understanding the emergence of the concept of sustainability today, the origin of sustainability did not start with the inclusion of all the three pillars (Holden, Linnerud and Banister, 2014). In fact, in the early stages of the development of the concept, more emphasis was on the ecological part. However, the series of conferences and publications recorded over the years have indicated a stepwise introduction of the three different pillars, thus concluding that the economic, ecological and social aspects are vital when discussing the concept of sustainability.

The term sustainability first appeared in a publication that looked at the ability of the earth to sustain its population. The essay titled, “The Principles of Population” was published in the year 1798 by Thomas Malthus. The author articulated that the population growth was unsustainable since the growth observed as exponential while the growth of the earth’s resources was arithmetic (Mebratu, 1998). The information presented was that the higher growth rate of the world’s population means that at some point the available resources on the earth’s surface will be depleted causing plague, war, and famine. According to the author, there, therefore, need for proper management and control of the available resources to ensure the needs of the growing population are continually met.

Another publication was done by Garret Hardin (Hardin, 1968) that also tackled the problem of increasing population growth and depletion of natural resources. The publication was titled “The Tragedy of the Commons” and it explained the importance of a moral stance to maintain public resources (Hardin, 1968). The author indicated that the technological advances that have been initiated in the world were not enough in ensuring the future needs of the population are met (Keeble, 1988). Rather, a combination of technology and alternative sources must be employed to avoid the increasing effect on the environment due to the continued failure of sustaining the environment (Hardin, 1968). The author also asserted that the available public resources would definitely be depleted shortly, it was thus important that the community is educated on the benefits of sustainability to ensure they are fully engaged on the same (Hardin, 1968).

No significant publications on sustainability were reported before the year 1960. According to Munn (1992), groups that focused on addressing environmental issues became active in the year 1960. The public concern rose on the probable depletion of resources channelled the conversion of the environmental groups into full political forces that could boldly articulate the environmental and ecological problems. These groups did not just focus on communicating through written reports, but also held meetings and seminars to enlighten the public on the importance and the need for environmental conservation. The implications were heightened level of public concern on the environmental issues that contributed to the formation of the many conferences and conventions held after that to address the environmental issues raised by the groups.

The first major conference held on sustainability was the United Nations Conference held in the year 1972 in Stockholm. The conference was held to discuss issues relating to the human environment as observed by the interest groups. The conference was attended by representatives from 19 international organisations and 113 states (UNGC, 2019). Those in attendance articulated the association between development and the environment, indicating that they were intrinsically interlinked despite the existence of any form of conflict between the two concepts. The experts in attendance came up with 26 principles that can be implemented to address the issues observed in the human environment. The third principle was most relevant to the issue of sustainability since it pointed out the need to always maintain the capacity of the earth to avail renewable resources. The principle was developed based on the previous assertions by the scholars on the significance of sustainable development.

While the conference identified the most crucial principles that will assure the achievement of sustainability when fully implemented, it did not give clear strategies to meet the principles, a criticism that has been put forth by many scholars who reviewed the report. Nevertheless, the conference led to the execution of many other conventions that were concerned with sustainable development (Keeble, 1988). The creation of the United National Environmental Program (UNEP) was as a result of the United Nations conference. UNEP had a mission of providing leadership and assisting in the formation of partnerships in control and management of the environment. Through availing relevant information, inspiration and offering support to individuals and the nation at large, UNEP was expected to ensure that their activities offer quality of life to the current generation without compromising the needs of the future generation (Paul, 2008). More nations and individuals will thus be involved in the fight towards the attainment of sustainable development.

There were limited activities on sustainability in the period of 1970 and 1980. According to Munn (1992), the significance of the environment declined during this period due to the emergence of other issues that were considered more important. The economic recession occurred during the same time causing higher levels of inflation and loss of jobs. More focus was directed towards improving the economic performance of most nations, other than addressing the ecological concerns. According to Holden, Linnerud and Banister (2014), it was clear that the initial attempts on achieving sustainability only focused on the ecological pillar as opposed to the social and economic pillars. Moving forward, it was expected that the social and economic aspects be integrated into the fight towards the attainment of sustainability.

The book titled “Limits to Growth” by Malthus further emphasized the significance of incorporating the economic pillar when pushing for a sustainable economy. The author expounded on the concept of “limits to growth” where he articulated that when the growth trends in both the earth’s population and the depletion of resources are maintained, the limits to growth will be accomplished in the next 100 years (Mebratu, 1998). The scholar indicated that the period towards the attainment of “limit to growth” can, however, be limited if the growth trends are altered to achieve ecological and economic stability. Also, the author indicates that the social well-being of the people and its stability must be assured to limit the attainment of no growth. The book becomes controversial during its introduction. Nevertheless, its contents have remained relevant and have always been used when tackling issues of sustainability (Holden,

Linnerud and Banister, 2014). Its ability to recognize the need to combine an economic and ecological approach when addressing environmental issues further made it more relevant today than ever.

The next most notable event on the origin of sustainability was the conservation strategy held by UNEP. Upon its formation, the UNEP formulated a World Conservation Strategy which aimed at identifying the long-term solutions for environmental conservation and the integration of the ecological and development goals (Mebratu, 1998). The UNEP strategy was the first to incorporate the term development in sustainability and thus advocated for the achievement of sustainable development in any economy. The strategy indicated that the desired form of development should provide quality life to humans while conserving and preserving the diversity and quality of the earth's resources. The main goal of the strategy was to communicate the importance of achieving a form of development that is highly sustainable. The strategy was, however, not without any form of drawbacks (Mebratu, 1998). Critics have indicated that it focused more on conservation of the environment and failed to provide a holistic approach towards the achievement of sustainable development. According to Paul (2008), a holistic view of the term sustainability was provided in the Brundtland report that mainly drew its conclusion from the assertions made in the previous publications and conferences. The Brundtland report was developed based on the idea that economic and the environment aspects should be mutually related and reinforced, thus justifying its ability to avail a holistic view on sustainability.

2.3. The Brundtland Report

After the Stockholm Conference and the world conservation strategy, a need for the creation of an independent organisation to address the environmental challenges arose. The leaders of the world saw the failures reported from the previous conferences and thus advocated for an independent organisation that will ensure every aspect of sustainability are discussed (Hueting, 1990). During this period, the developed nations have pledged to reduce their environmental impact; on the other hand, the developing nations were somewhat discouraged from embarking on the same since they had not reached the economic levels already attained by the developed nations. As a result, the developing economies were faced with two options:

- 1- to accept a slowdown in economic growth or
- 2- to continue business as usual with negative effects on the environment (Paul, 2008).

To address these environmental challenges, the United Nations saw the need for the creation of an independent organisation, thus leading to the birth of the Brundtland Commission.

The organisation was created in the year 1983 and formally known as the World Commission on Environmental and Development (WCED) since the commission was first headed by Harlem Brundtland, it borrowed its name from the chairman (Keeble, 1988). The main aim of the commission was to develop shared sustainability goals to be executed by a united international community. The commission's role was to identify the sustainability problems as reported in various parts of the world, create awareness of the identified issues and offer recommendations on the most suitable approaches that can be implemented to address the identified challenges (Mebratu, 1998). The commission came up with its first report in the year 1987, the Brundtland report, a report that has been appreciated as the first document to talk about sustainable development and the three pillars of sustainability. This explains its wide adoption and reference when talking about the development of sustainability and when addressing sustainability challenges.

The first volume of the Brundtland report “our common future” was created in response to the conflicts on sustainability that arose from the earlier conventions. There were conflicts on whether sustainability should focus on ecological issues and address the global economic challenges as well. The accelerating environmental degradation also fostered the need for new approaches in addressing the environmental issues (Hueting, 1990). The report was therefore made to offer principles and recommendations that will see the harmonization of ecological prosperity with the economic growth of the nation. The findings articulated in the report details the strategies that can be implemented to enhance the economic performance without any harm to the environment. Also, the recommendations were expected to address the urgent needs of the developing nations that needed a balance between human quality of life and environmental well-being. In essence, the contents of the Brundtland report mainly redefined the economic development concept as an important idea in the attainment of sustainable development.

A holistic meaning to the term “sustainable development” was also provided in the Brundtland report. According to the report, sustainability is defined as a type of development that accomplishes the needs of the present population without curtailing the ability of the future population to meet their wants (Mebratu, 1998). The report pointed out that sustainable development consists of two main concepts of need and limitation. The needs of the people must

be given a maximum priority, while the idea of limitation as a result of the state of socialization and technological advancements must be addressed to ensure the current and future generations can adequately meet their needs. Most researchers have ascertained that the central idea in the Brundtland report was the achievement of equity in the allocation of resources and in accomplishing the needs of various individuals (Hueting, 1990; Mebratu, 1998). Apart from incorporating the aspect of economic growth and development in the definition of sustainability, the Brundtland report, also highlights the social aspect of the concept, through the element of needs and equity. A more holistic view of the definition of sustainability concept was thus introduced at the release of the Brundtland report.

The main mission of the Brundtland Commission was to unite nations in pursuing the sustainable development goals. To this effect, the report thus communicated the approaches that ought to be implemented to maintain unity amongst the nations of the world while ensuring that the sustainability issues are adequately addressed. The report advocated for the creation of global equity that focuses on redistribution of resources to poorer countries to encourage economic growth in all nations of the world (Sepp, Lättemäe and Randveer, 2002). Also, the report delved on the need for environmental conservation and maintenance to ensure that the higher economic growth is not achieved at the expense of suitable environmental performance. Every country should be able to attain full economic performance as well as enhance its economic base. The report asserts that the attainment of equity in economic development and resource creation is a sure way of achieving sustainability.

The Brundtland report also highlighted three main principles of sustainable development, economic growth, protection of the environment and social equity. According to the report, when any of the principles is weak, then the possibility of the whole economy becoming unsustainable. Environmental sustainability refers to the ability of the ecology to support an indefinite extraction of natural resources (Mebratu, 1998). Social sustainability refers to the functioning level of a social system such as family or a nation. A higher level of social sustainability is evident when there is maximum level of cohesion within the system. Problems such as endemic poverty, widespread diseases, wars, low employment rates as suggested by Wackernagel and Yount (2000) are likely to lower the level of social sustainability. Lastly, economic sustainability refers to the possibility of an economy to support an indefinite level of economic production. While social sustainability challenges are mostly experienced in the developing world, the issues

of economic and environmental sustainability have remained pervasive in most parts of the world. According to Lélé (1991) since the great economic recession of the year 2008, the biggest challenge reported is economic growth. The challenge has adversely interfered with the ability of the different nations to progress towards the attainment of full environmental sustainability thus the need for the nations to come together to achieve the three pillars of sustainability.

The report was effective in highlighting the approaches that need to be undertaken by the various nations to attain sustainability. According to Hueting (1990), the report was divided into three major parts including, the common sustainability problems of the nations, their common concerns and the common endeavours that will see their concerns addressed. The approach was appropriate in ensuring the nations understand the issues at hand before implementing the proposed strategy that will resolve the identified challenges. The Brundtland report evoked the ideals of economic and social growth to ensure that a holistic approach is upheld when maintaining a higher ecological performance (Lélé, 1991). The reports assert that the previous approaches in addressing sustainability required an adjustment. To completely reform and achieve a higher resources base, there is a mandate to adopt resource-efficient technologies that will foster the advancement in economic growth, offer maximum benefit to humanity and protect the environment for the generations to come.

The main strength of the Brundtland report over other publications on sustainability was its comprehensive definition of the term “sustainability” and the identification of its principles. The report emphasized the need to meet the wants of the population while not compromising on intergenerational equity (Mebratu, 1998). Rather than handling the environmental issues separately, the report advocated for the adoption of an interrelated and interconnected approach when dealing with the issues. The hybrid status-quo approach recommended for addressing the environmental concerns makes the report distinct from other previous publications.

The Brundtland report also re-conceptualized the traditional ideals of a population and natural resource growth. The growth limitations as postulated in earlier publications have been re-conceptualized; the growth can also be infinite. However, the report indicates that the growth is dependent on the efficient use of resources through effective technological advancements and reorganisations of the society (Mebratu, 1998). According to the report, such changes will improve lifestyles while fostering growth of the economy and protection of the environment.

Most of the stakeholders were able to agree with the merits of the report; this supported the adoption of the recommended strategies to accomplish an enhanced sustainable development.

Despite the Brundtland report promoting significant awareness on the concept of sustainability, some critics argue that the assertions in the report were over-optimistic and vague. According to Keeble (1988), the commission believed that an optimistic discussion would be more acceptable thus offered recommendations that were unrealistic. Hueting (1990) also asserts that the report has taken a haphazard stance on issues on population, urban development, and indigenous people. To appease the various interested parties, the report has ended up floating in ideas and views that are marred with heightened levels of vagueness. However, despite the criticism, the Brundtland report is still widely acknowledged for shedding more light on sustainability issues and pinpointing the initial strategies that can be implemented for the development of a sustainable economy. According to Mebratu (1998), the optimism was necessary to avoid pessimism and convince the stakeholders to venture into the fight against environmental degradation and resource depletion. The Brundtland report laid the framework for continuing further discussions, initiatives, and programs on sustainable development.

2.4. Development of Sustainability Post Brundtland Report

2.4.1. Rio earth summit

The development and understanding of sustainability concept did not end with the release of the Brundtland report; more conventions were further formed to create awareness on the same. The UN Conference on Environment and Development (UNCED) was the next convention after the Brundtland report. The conference was held in Brazil, Rio de Janeiro in the year 1992 an event that hosted more than 114 heads of states from different parts of the world (Vogler, 2007). Dubbed the “Rio Earth Summit” the principal theme of the conference was environment and sustainable development. As such, the heads of states and experts in attendance discussed the connection between the environment and development. The North-South nations presented their bargains to the UN seeking for development aid and technology transfer to allow them to achieve a higher level of economic growth while fostering a higher performance in environmental sustainability (Paul, 2008). The main output of the project was the Commission on Sustainable Development and Rio Declaration Agenda 21, documents that were mainly concerned with the

attainment of sustainable development, thus outline the approaches that can be adopted by the stakeholders to achieve sustainability

The Declaration Agenda 21, the main document of the summit articulated the commitment of the world leaders towards the attainment of sustainability. According to Rogers, Jalal and Boyd (2012), the document contained different healthy practices that can be adopted by nations to achieve sustainable development in any part of the world. The Agenda 21 activities were categorized under environmental and development themes that included, quality of life, protection of the global resources, management of settlement, economic sustainability and competent use of natural resources (Vogler, 2007). The document points out that the severe poverty in different parts of the world and the lower standards of living are as a result of poor management of resources. As such, the management of resources and the environment as a whole must be practiced in developing nations to enhance the quality of human life and to use the available resources efficiently. An agreement was made that all nations develop a sustainable development strategy that will guide their implementation of the recommended approaches to foster the attainment of sustainable development.

In line with the recommendations highlighted in the Agenda 21 document, the UK government formed a social exclusion unit that sought to enhance the importance of social dimension when handling sustainability issues. The idea was to develop sustainable communities in the region that will not only focus on ecological sustainability but will also encompass the aspect of social inclusion (Rogers, Jalal and Boyd, 2012). The social exclusion unit expanded an understanding of the social issues, thus enhancing the ability of the nation to address them. The incorporation of the summit recommendations on the UK nation's sustainability development thus contributed to its management of social issues about sustainability.

Even though sustainable development was the main idea in the Rio Conference, some disagreements emerged amongst the member states. Most nations did not agree on its meaning and implications. According to Hulme (2016) the UNCED provided preliminary guidelines on implementing strategies for sustainable development. The principles and plan of actions were laid down; however, critics have argued that the implementation of the principles required that some changes be made within the economies. According to them, living within the recommended economic limits and observing equity in the allocation and use of resources can only be achieved

when the political, social and economic environments are flexible and can be directed towards the attainment of sustainability.

2.4.2. Kyoto conference

The Kyoto conference held in the year 1997 on climate change further enhanced the need by the nations to achieve sustainable development. According to Vogler (2007) specific targets on sustainable development were set during the conference to guide the actions of the member nations in environmental conservation. The nations involved agreed to reduce their greenhouse gases emission levels leading to the development of a framework referred to as the Kyoto Protocol that detailed the specifics to be undertaken over the years. The United States proposed to stabilize its emissions while other industrialized nations agreed to cut their release of the gases into the environment. For the period 2008-2012, it was expected that the respective states would reduce their emission of the greenhouse gases by 5% (Vogler, 2007). Nevertheless, the desired level of reduction was never attained even after the adoption of the Kyoto protocol by some countries. According to Paul (2008) the complexity of the negotiations between the stakeholders created confusion over compliance, thus the high level of compliance. Also, the protocol only highlighted the basic rules for compliance without providing the detailed and important laws that the nations were required to uphold. Even though approximately 84 nations signed the protocol with an ambition of ratifying it, other nations were reluctant to take the bold approach. The US refused to ratify while others likely the EU ratified the protocol but failed to reduce their greenhouse gases emission levels. The US contribution towards the emission of carbon dioxide has continually increased over the years. The situation of climate change is therefore likely to be worse in the future generations.

2.4.3. The millennium development goals (MDG)

With minimal prospects being achieved on environmental conservation another summit was held in the US to address the challenges. The Millennium Summit held in New York in the year 2000 led to the formation of Millennium Development Goals (MDGs) that mainly used the year 1990 as the benchmark and have a timeline of the year 2015 (Vogler, 2007). The goals were mainly on eradication of poverty, promotion of equality, reducing child mortality, improving health, eradication of diseases, promoting environmental sustainability and creation of partnerships that will foster development. The MDGs presented a more practical way of attaining equilibrium between the environmental, social and economic aspects of sustainability by addressing all

aspects of human life, economic growth, and environmental conservation. Nevertheless, the world still must deal with the indifference between nations and build trust amongst the people, with the government and business community for the millennium goals to be fully implemented. According to Vogler (2007), a high level of trust is needed to be adopted between nations of the MDGs to alleviate poverty and combat diseases.

Later, the World Summit on Sustainable Development (WSSD) was held in the year 2002 to build strong relationships amongst the nations and achieve the level of trust needed for the MDGs to be fully implemented. The main aim of the summit was to form relationships between the US, Non-governmental organisations and the governments to assist in resource mobilization needed for addressing the global challenges on poverty, health, and environment (Green et al., 2005). The MDGs were reconfirmed during the summit and other goals added to promote sustainability further. The added goals focused on reducing the negative implications of chemicals, preventing the loss of biodiversity, and minimizing the percentage of individuals lacking access to good sanitation. The summit was regarded as more appropriate in exploring the relationship observed between a quality environment and economic development (Lightfoot and Burchell, 2005). The WSSD filled the gaps observed in the Agenda 21 and the MDGs by creating a paradigm to address emerging issues in the world including basic sanitation, and the effects of harmful chemicals on individuals and the environment. Also, the WSSD talked of the conservation of the water bodies by assuring their cleanliness and protecting the lives of the creatures in the water bodies. The Johannesburg Summit portrayed a trend since the year 1992, on the significance of the social and economic pillars of sustainability (Wapner, 2003). The summit mainly emphasized on implementation of different strategies as opposed to a discussion on the concept of sustainability, thus named “the implementation summit.”

2.4.4. The Paris agreement

The most recent discussion on sustainability was held in Paris at the 21st conference of the United Nations Framework Convention on Climate Change (United Nations, 2015). The main mission of the conference was to negotiate an agreement on climate change reduction. The 196 parties that attended the conference formulated goals on limiting the extent of global warming (to below 2 degrees Celsius) and reduction of temperature increase to below 1.5 degrees Celsius (United Nations, 2015). The conference ended with the formation of an agreement, “The Paris

Agreement” a document that provided directions on how to ensure that the issue of climate change is addressed.

Parties were required to sign and adopt the agreement through acceptance, ratification, accession or approval. Also, the nations were expected to formulate their plan on the approaches that they will undertake to reduce climate change. The absence of pre-formulated strategies for accomplishing sustainability ensured that the parties make specific goals and targets that can be achieved. While most parties have shown interest in signing and accepting the agreement, others are yet to see its importance (Jayaraman and Kanitkar, 2016). In the year 2017, the US President announced their intention of withdrawing the United States from the agreement. The assertion did not only go contrary to the importance of global unity when handling the issues of sustainability but was also seen as lack of good intentions towards achieving global sustainability (Nieto, Carpintero and Miguel, 2018). The announcement received heightened condemnation both locally and internationally prompting the president to reconsider his position.

On the contrary, the French government has signed and accepted the agreement on reduction of climate change. The environmental minister, Nicolas Hulot in the year 2017, announced their plan to abolish diesel and petrol vehicles. The five-year plan was developed by the Paris agreement to ensure they produce and use vehicles that emit minimal carbon dioxide into the environment by the year 2040. The nation was also in the process of abolishing the use of coal for the production of electricity. In fact, the environmental minister reported that the use of coal and fossil fuels would be completely abolished by the year 2022 (Peters et al., 2017). The approach is expected to significantly reduce the amount of greenhouse gases being released by the nation thus contributing significantly towards minimizing the levels of climate change.

The Paris agreement if adopted can realize the global vision of sustainable development. As at February 2018, 195 parties had signed the agreement. Nevertheless, whether all of them will implement the pledges made in the agreement is unpredictable. Critics have also pointed out that the pledges are mere promises rather than explicit commitments. As such, the possibility of all the member states honouring their pledges are minimal (Hulme, 2016). In fact, Nieto, Carpintero and Miguel (2018) have indicated that most of the parties were still using fossil fuel as their primary source of energy in the year 2018, one and a half years after signing the agreement. Also, the nations are yet to enact the policies they made to reduce their emission of greenhouse gases. Unless the pledges made in the agreement are converted into strict

commitments, the possibility of reducing carbon dioxide and other greenhouse gases emission is negligible.

2.5. Sustainable Development Paradigm

Sustainable development attained its meaning from the United Nations Commission on Environment and Development led by Brundtland. The subsequent policies on sustainable development suggested the implementation of various approaches that will emphasize on increasing production without having negative implications on the environment. The challenge of breaking and ascertaining the direct link between economic growth and protection of the environment following the use of resources and generation of wastes has made it difficult for the attainment of sustainability (Khator, 1998). Based on the Brundtland report, it was expected that there be limited consumption of resources and controlled release of wastes in a way that the current actions of individuals do not compromise the ability of the future generation to get access to adequate resources and a clean environment. According to Drexhage and Murphy (2010) whether the Brundtland report did not take into consideration the fact that the environment does not contain unlimited resources and that the environment cannot absorb all wastes generated from human actions, sustainable development should focus on minimization of wastes and conservation of resources.

Since the emergence of the sustainable development concept, a number of policies have been initiated to address the issues of environmental challenges. The UN conferences held in different countries were all done to communicate the approaches that can be jointly implemented by the countries of the world to support the attainment of sustainable development. Today, development and sustainability remain much the same as they were in the early years of the emergence of the sustainability concept. The situation has been worse in the developing and underdeveloped countries that are currently under great environmental distress.

According to Schuftan (2003) the world today consists of more poor and hungry people than was never experienced before. The level of environmental degradation and pollution are equally higher. Similar view has been held by Barkemeyer et al (2014) that posited that the governments of different nations have established policies to guide the attainment of sustainability, yet no significant positive results have been reported. The global economies post the United Nations conference on Environmental Development and the Rio Summit though no convincing

observations have been observed on matters sustainable development. As Drexhage and Murphy (2010) posited, the hard work that has been fostered by non-governmental organisations and the different governments is not enough in the fight against environmental degradation. To achieve sustainable development, a lot needs to be done. It is important that people move away from just the formulation of policies to their full implementation of the desired levels of sustainable development is to be accomplished.

Conferences such as the world summit on social development, International Women Conferences, the world food summit and several other conferences have been purported to represent a turning point towards the attainment of sustainable development. According to Schuftan (2003) the bottom line is that the turning point has remained illusory and the attainment of sustainable development is still a dream. With lack of proper records on the steps made towards the attainment of sustainable development, the possibility of realizing sustainability with the current policies in place is negligible. This called for the shift towards a new paradigm of sustainability.

The creation of a new sustainable development paradigm is likely to guide the steps of various economies towards the attainment of the much-desired sustainability. However, more questions and challenges have arisen on whether the new paradigm will be feasible and more effective than the previous paradigm of sustainable development. Barkemeyer et al (2014) have asserted that there is a need for the economies to change the terms of campaign for the attainment of sustainability, otherwise the campaigners and the said campaigns will tire barring the entire world from conserving their resources for the future generation. There is a need for more risks and innovations in an effort to accomplish sustainability. Becoming addicts of new information and racing with time is important so that the environmental issues are addressed in time before they overcome the communities (Dutta, Lawson and Marcinko, 2012). There is a need for the government and the NGOs to come in conflict with the values and ideas of the public to initiate strategies that are more likely to address the challenges evident in the environment. There is a need to debunk the assumption that non environmentally friendly activities resulting in the pollution and degradation of the environment are independent of one another and focus on an integrated approach that addresses all the probable barriers to the attainment of sustainable development.

The new sustainable development paradigm has integrated three pillars that form the basis for change. The ethical, political and scientific pillars are believed to be effective in assisting the world identify and choose strategies for the attainment of a truly sustainable development process. According to Drexhage and Murphy (2010) social issues in an economy have ethical, political and scientific dimensions. Also, the social problems can be explained by underlying theories and praxis. In this regard, the sustainable development approaches and processes have to be based on scientific evidence, political and ethical positions. The three pillars take into consideration the correlation between social and political forces in their contributions towards the development of the social problems evident in the society.

Dutta, Lawson and Marcinko (2012) in their analysis have reported that it is imperative to incorporate the scientific, ethical and political aspects of the social issues in order to amicably address them. In order to avoid becoming victims of political naivety, carrying out political and social assessment of the situation followed with the development of well-informed strategies to address the situation will guide the governments and businesses alike towards the attainment of sustainable development.

While the new paradigm of sustainable development promises the making of positive steps towards the attainment of sustainability, greater challenges are experienced in the process of getting to the new paradigm from the old paradigm. This paradigm shift is in line with the theory proposed by Elkington that recommends that organisations should focus not only on profit but also on the environmental and social concerns. This paradigm shift is known as the triple bottom line (TBL) sustainability paradigm. The new sustainable development paradigm dictates that environmental, economic and social (and political) factors in development are inseparable. Thus, the attainment of sustainable development requires that all the three aspects are taken into consideration. To get an understanding of this new development, it is significant to explore the triple bottom line of sustainability as explained in the next section.

2.6. The Triple Bottom Line (TBL) of Sustainability

The Triple Bottom Line concept was first introduced by Elkington (1997) as a construct that expresses the issue of environmental conservation in a more expanded manner to integrate the economic and social lines in sustainable development. The construct mainly emerged after the conviction that a shift towards a new paradigm in sustainable development was needed.

According to Norman and MacDonald (2004) TBL gives a framework for determining the performance of organisations focusing on the social, economic and environmental bases. It also provided a practical framework for sustainable development where the performance is measured in terms of the social, economic and environmental value of the organisation towards the economy.

The economic aspect of the TBL framework refers to the implications of the organisational activities or human actions on the economic system. The capability of the economy to evolve and survive into the future to meet the needs of the future generations is also highlighted in the TBL framework (Rogers and Hudson, 2011). The growth reported by an organisation and its consequent implications on the environment also marks the economic basis of the TBL framework. In essence, the economic basis focuses on the economic value provided by an organisation or human activities to the environment in a manner that it develops it and enhances its capability to support the generations of the future generation.

The social aspect of TBL framework focuses on the implications of human activities and business practices on human capital and the community. The aim is to determine whether the activities provide value to the community or give back to the society (Mish and Scammon, 2010). Activities such as provision of health care, fair wages among others can have positive social impact to the community. On the contrary, the disregard of social responsibilities can negatively affect the performance of a business entity and consequently interfere with the attainment of sustainability. Goel (2010) has pointed out that there are significant costs associated with the failure to adhere to the desired social responsibility practices. The social aspect of TBL framework focuses on the social interactions between individuals and the community as well as addressing issues related to social responsibility.

The environmental basis of the TBL framework entails the analysis of the practices that do not have adverse implications on the environment. The environmental line of TBL framework focuses on the implementation of activities that do not cause environmental pollution or degradation (Mish and Scammon, 2010). Under this aspect of the framework, the attainment of sustainability is dependent on the ability of human beings and business entities to be engaged in actions that have minimal emissions of greenhouse gases and that focus on the protection of the environment while improving the well-being of the stakeholders.

The TBL framework has been adopted in sustainable development, to understand the underlying sustainability issues and as an approach in addressing the issues identified. However, there is limited research on the concept of TBL and its use in sustainable development. Mish and Scammon, (2010) in their study asserted that TBL approach in sustainable development acknowledges three main pillars of sustainability, social equity, environmental stewardship and economic development. The researchers indicated that the three pillars play an equal role in promoting sustainability and thus their management can lead to the attainment of a better outcome, than focusing on the management of a single aspect of sustainability.

While it is theoretically asserted that the management of the three pillars highlighted in the TBL framework is essential in attaining sustainable development, most studies indicate that they are rarely implemented. In fact, most studies show that the implementation of the sustainability initiatives is dependent on the costs involved and the relevance of the bases to the implementing corporation. Jepson (2003) in his study involving certified planners obtained that the economic developers present within the group showed a lower rate of involvement in the ecological sustainability process, contrary to other persons with different specialization. Similar findings were obtained by Zeemering (2009) who reported that the economic development officials included in the study did not conceptualize the concept of sustainability thus did not see the importance of prioritizing the need to address social and environmental issues, thus only focused on the economic aspect of sustainability.

More recently Grodach (2011) analysed the barriers to sustainable development amongst the economic developers. His findings revealed that economic developers rarely mention or incorporate the aspects of TBL framework in their management of social and environmental issues. They emphasize and pay attention towards the development of the economy at the expense of social equity and protection of the environment. This explains why to date the issues of sustainability have remained unresolved despite the many policies and strategies put in place in different economies. The theoretical assertions of TBL framework if taken into consideration can lead to the management of the issues and challenges that hinders the attainment of sustainable development. Nevertheless, as in most scenarios, the implementation of the theoretical assertions in practice is illusory.

2.7. Sustainability Strategies

The increase in issues and challenges associated with sustainable development has instigated the need for implementation of various strategies to curb the menace. The strategic goals and policies of the 19th century was never implemented to ensure that the issues of sustainability are addressed. More sophisticated strategies are thus needed to address the challenges that have not just doubled but have increased in intensity. Climate change, increasing rates of environmental degradation and the higher rates of pollution have presented the need for the adoption of different strategies to aid in attaining sustainable development. Green building, renewable sources of energy, reduction of waste, efficient transportation, procurement of climate friendly goods and reduction of carbon emissions are some of the strategies that have been implemented to support the attainment of sustainable development (Robinson, 2007). A critical review of literature on the implementation of the strategies is advanced herein. The review also encompasses a discussion on the challenges and perceived benefits that have been reported so far.

2.7.1. Green building

Building and construction activities accounts for 40% of the carbon dioxide emitted into the atmosphere. Emission of carbon dioxide and other greenhouse gases is one of the major causes of global warming and climate change. To attain sustainability, it is imperative that the emissions of the greenhouse gases are controlled to minimum levels. The major sustainability changes experienced in the building and construction process include depletion of resources, degradation of land, release of higher volumes of solid wastes and pollution of the environment (Mansfield, 2009). The increasing issues in real estate led to the emergence of the term “green building” that has equally been referred to as “sustainability building” or “sustainable practices” (Robinson, 2007). Regardless of the term used, Green building refers to the responsible construction process, through efficient use of natural resources and the construction of environmentally friendly structures. The efficient use of natural resources, energy and reduction of the amount of waste released into the environment are approaches that must be embraced for one to attain green building. Also, protection of human life and minimizing environmental degradation are actions required during the construction process to ensure a highly sustainable building is attained (Robinson, 2007; Mansfield 2009; Sayce, 2010).

According to Karolides (2002) green building has significant benefits to both the persons involved in the construction process and the community at large. To the community, green building leads to significant reduction in the emission of greenhouses and consumption of energy, which if not controlled would cause depletion that will adversely affect human life. According to McManus (2012) green building if well implemented can improve the environmental pollution through a 30% reduction in carbon dioxide emissions and by minimizing water usage and wastes output by 40% and 70% respectively. Despite the perceived benefits, there are significant challenges encountered in the implementation of green building. According to Kamal and Gani (2016) lack of an integrated design that will take into consideration the green features and requirements is the major challenge in achieving a sustainable construction process. Most of the construction processes still involve different parties that work independently to accomplish the overall construction aim. As such, the implementation of a green practice requires the consultation of all, an endeavour that is not easily undertaken either purposefully or unwillingly. Also, the resistance to change amongst the constructors further delays the attainment of sustainable buildings (Sinha, Gupta and Kutnar, 2013). The uncertainty and risks involved in use of additional capital to achieve efficient use of resources is an action that not all persons will undertake willingly. Kibert (2016) has also asserted that limited information on how to go about building a sustainable building and its perceived benefits also makes more people reluctant to embrace the technology and the designs recommended in achieving a green building. Unless the challenges involved in the implementation of the green building concepts are addressed the attainment of sustainable buildings and consequently sustainable development is impossible.

2.7.2. Renewable sources of energy

Renewable energy sources have a higher potential of contributing to the environmental, economic and social sustainability of energy across the globe. Apart from enhancing the access to energy to a larger population, renewable sources of energy minimize the amount of carbon dioxide released into the environment, thus contributing towards the conservation of the environment and the natural resource, energy (Jaramillo-Nieves and Del Río, 2010). Also, Tester (2005) reports that the renewable source of energy offers a harmony between equitable accessibility of energy to all people while preserving the natural resource for future development, thus the social role of the renewable source of energy in attaining sustainability.

The increasing world's pollution has led to the continual use of fossil-based fuels that have created significant challenges such as emission of greenhouse gases, depletion of natural resources, fluctuations in the costs of energy, conflicts and other environmental concerns. The effects of fossil fuel used have prevented the world from achieving sustainability based on the economic, social and environmental concerns raised.

Renewable energy sources are considered the most outstanding alternatives for fossil-based fuel. According to Tiwari and Mishra (2011) as at the year 2012, renewable sources of energy were used to supply energy to more than 30% of the energy users in the US. The sources of renewable energy had increased, and they supplied more than 22% of the total energy generated in the earth's surface, thus enhancing the ability of renewable sources of energy to act as an alternative for fossil fuel.

Since renewable energy sources exist naturally, they must be sustainable to support the attainment of sustainable development. The energy sources must not cause severe damages to the environment, through emission of wastes or harmful gases, also, the energy sources must be able to supply adequate amounts of energy to the various users without depletion (Edenhofer et al., 2011). Most of the renewable sources of energy fail to attain the sustainability definition, thus forming their major challenge. According to Twidell and Weir, (2015) the discontinuity evident in their generation following their seasonal nature is a major challenge. Most renewable energy sources are climate-based thus their exploitation needs proper planning and control leading to their discontinuity nature (UNFC, 2015). The emergence of new technologies has promised an improvement in the optimization of renewable energy sources, nevertheless, a lasting solution is yet to be attained. Renewable sources of energy such as wind, solar, biomass and wave and tide are yet to be fully optimized thus have remained seasonal and discontinuous.

Despite the challenges experienced in the use of renewable sources of energy, they are generally regarded as clean sources of energy. They not only minimize the amount of waste gases being released into the environment, but they also lower the depletion rates of natural resources since they are renewable. The renewable sources of energy are equally sustainable since they allow for the fulfilment of the current needs of people while sustaining the needs of the future generation. A potential opportunity for reducing the amount of greenhouse gases emitted into the environment and for managing global warming lies with the use of renewable sources of energy. Due to the uncertainties that comes with the use of these renewable sources of energy

Panwar, Kaushik and Kothari (2011) have recommended the need for further research on technologies that can be implemented to enhance the optimization of the renewable energy sources such that they completely replace the conventional sources of energy, that have contributed majorly to the environmental issues that are currently reported.

2.7.3. Waste reduction and recycling

Wastes contribute significantly towards soil degradation and pollution of the environment. Waste management is thus important in the conservation of the environment and in supporting the attainment of sustainable development. Previous studies on waste management a sustainability strategy have emphasized on the 3 Rs as effective approaches that can be implemented in waste management. Reduce, reuse and recycle are the main approaches adopted under waste management to achieve sustainability (Song, Li and Zeng, 2015; Zaman, 2015). In their study Severo et al., (2015) reported that manufacturing corporations are normally faced with the challenge of adequately managing their waste. The failure of the organisations to implement an effective waste management program has not only led to environmental pollution but has also had adverse implications on the performance of the organisations. A successful recycling program saves on costs of production thus contributing positively towards the performance of an organisation. Nevertheless, as Pan et al., (2015) indicates an understanding and evaluation of the performance of an organisation in relation to waste management is vital to ascertain areas requiring improvement or changes for an effective approach in waste recycling to be implemented.

Reduction is another strategy that can be employed by corporations in waste management. Reduction mainly entails the efficient use of production raw materials such that minimal wastes are generated. According to Piercy and Rich (2015) instead of waiting to manage unnecessary waste, corporations can embark on waste minimization as a strategy to reduce the adverse social and environmental impacts associated with the release of excess wastes. The USA in their fight to achieve sustainable development has communicated the benefits of waste reduction towards the attainment of zero waste (Song, Li and Zeng, 2015). The national campaign on the importance of re-use of materials and recycling of wastes are mainly to ensure that minimal wastes are released into the landfills to control their adverse effects on the land and in the environment as a whole.

From a different perspective Ding et al., (2016) asserted that waste reduction is a procedure that can be implemented by a corporation to save on costs and improve their performance. Elimination of unnecessary wastes means that there is judicious use of raw materials such that the production costs are significantly reduced. Reduction of waste thus leads to significant benefits to the organisation involved and supports the attainment of sustainable development.

Zaman, (2015) looked at the approaches that can support maximum reduction in the amounts of waste being released into the environment. The study mainly focused on the approach that can be adopted by manufacturing firms to minimize the amounts of waste being released into the environment. The study findings indicated that elimination of by-products and re-use of materials are approaches that can be implemented in waste reduction. Also, recycling of the emerging waste materials either onsite or externally can lead to significant reduction in the amount of wastes. Recovery of energy from the wastes through incineration is another approach that can be adopted to reduce waste as well as generate maximum value from them in the form of energy (Pan et al., 2015). Recycling and reuse of wastes are strategies that can be adopted independently in waste management, however, the two approaches in combination with the others mentioned above can be useful in reduction of wastes being released into the environment, thus contributing towards the attainment of sustainable development.

2.7.4. Sustainable Transportation

Sustainable transportation or green transportation as it is commonly referred is a means of transportation that has low impact on the environment (Schneider, 2011). To achieve sustainable transportation, the present and future must be balanced. In the twenty-first century, transportation has become one of the major sources of air pollution and greenhouse gas emissions around the world. Extensive freight transport is the most visible supply chain and logistics activity that has a damaging effect on the environment. The two most critical issues in freight transportation that are pertinent to sustainability include the emission of greenhouse gases and high dependency on fossil fuels (Brown, 2009). The main aim of freight transport is to achieve economic benefits while attaining competitiveness in the global market. Attainment of sustainable development in the context of freight transportation is the attainment of a balance between accomplishing competitiveness and assuring protection and conservation of natural resources.

While highlighting the probable damages of freight transportation on the environment (Varma and Clayton, 2010) indicates that freight transportation is the largest and fastest growing emitter of greenhouse gases within the transportation category. According to their findings, domestic freight transportation contributed 47% of the greenhouse gases emitted within the transport sector, a value that was relatively higher than the amount reported by all the other categories of domestic passenger vehicles. Similar findings were presented by the National Highway Traffic Safety Administration (2010) in their report detailing the implications of freight transportation on the environment. The report indicates that heavy-duty vehicles were the highest contributor towards the emission of greenhouse gases in the US transport industry.

Since most of the movements of goods in the USA and in other parts of the world are driven by fossil fuels, the use of these fossil fuel dependent sources of energy by the heavy-duty vehicle is equally higher. Helmer and Gough (2010) in their research reported that more than 95% of the heavy vehicle in the USA transport sector is powered by diesel. The heavy dependence on fossil fuels justifies the economic sustainability challenges portrayed by the vehicles plying the freight transportation sector (McCormack and Edwards, 2011).

Freight transportation is an economic and commercial-driven activity that is influenced by the demands in the market and the needs of the consumer. Also, the effectiveness of the freight transportation process has become a source of competition for the nations involved. According to Nijkamp et al (2000) the success of most developed economies such as the USA has been attributed to reliability of the freight transportation system. Lind (2009) recognized the vital contribution of freight transport in the global competition that has instigated the developed world and the emerging economies to improve their infrastructure to attain a higher level of competition.

A significant conflict exists in the improvement of freight transportation and attainment of sustainable development. While it is known that the expansion of freight transportation will lead to depletion of natural resources and pollution of the environment, most economies are reluctant to consider other means of economic growth, since freight transport is believed to be a major contributor in the economy (Field, 2009). Its abolition will not only interfere with the competitiveness of the nation in the global market but will also prevent the accomplishment of the consumer needs. As such, the future sustainability of freight transportation will entail maintaining a balance between freight transportation and conservation of the environment

(Lacefield, 2010). To this end, Vanek (2019) suggested the use of alternative energy sources to eliminate the emission of greenhouse gases into the environment. The balance will ensure that organisations remain competitive while maintaining a low impact on the environment.

Hoffman (2009) has recommended the adoption of an efficient transportation system that advocates for the use of clean energy that will not only reduce the amount of carbon dioxide released into the environment but will also reduce the depletion rates of fossil fuels. This view is supported by Vanek (2019). Leveraging technology is another approach that can be implemented to attain efficient freight transportation. IT innovations are currently being undertaken to minimize the use of fossil fuels in freight transportation and to minimize their levels of carbon emissions (Coyle, Thomchick and Ruamsook, 2015). Sophisticated engine monitoring devices, computerized systems to measure fuel efficiency and alerts to give directions to reduce the chances of the driver missing direction are currently in place. The idea of the new technologies is to accomplish maximum efficiency during the transportation process.

Collaborative transportation also supports the execution of an efficient transportation process by allowing for sharing of trucks, such that continuous movements are reported. The benefit is that the trucks do not follow any route without carrying a full capacity load of goods thus ensuring there is proper management of time, costs and the possible implications of the transportation process on the environment (Broadus, Browne and Allen, 2015). In essence, attainment of sustainable transportation requires the achievement of a balance between the environmental and economic value of the activity, such that the environment is protected, and the economic growth is also promoted.

2.7.5. Off-setting Carbon Emissions

Carbon off-setting refers to the approach taken to counteract the carbon emissions with an equal reduction of carbon dioxide from the environment. Carbon off-setting technique is mainly implemented by corporations that desire to reduce the amount of greenhouse gases being released into the environment from their activities (Zhao, Escobedo and Gao, 2010). According to Jo (2002) when properly used, off-sets can be effective in assisting the corporations attain their sustainability goals. The approach does not take into consideration the effects of the corporations' activities on the environment but focuses on trapping any excess green gases from the environment irrespective of their source. Nevertheless, Escobedo et al (2010) have asserted

that a company should not rely solely on carbon off-setting as a strategy of minimizing the amount of greenhouse gases released into the environment. Rather, the focus should be on adopting other strategies including use of clean energy, minimization of wastes among others before engaging in carbon off-setting. Indeed Zhao, Escobedo and Gao, (2010) has communicated that carbon off-setting should be used as a strategy for tapping excess and unrecovered greenhouse gases from the environment. Depending independently on carbon off-setting as a greenhouse gases emission management strategy cannot yield good results that can promise the attainment of sustainability, since not all greenhouse gases will be consumed by the reduction in the amount of carbon dioxide in the environment.

The commonly adopted strategy in carbon off-setting is planting of trees. According to Jo (2002) trees will use higher volumes of carbon dioxide thus can be used to consume the carbon dioxide coming from a manufacturing plant in case of deficiency in the atmosphere. The approach has proved to be effective especially for corporations that have measured their carbon footprint, implemented other carbon dioxide management approaches and adopted the carbon off-setting strategy as a last resort to ensure that all the carbon emissions are controlled (Escobedo et al., 2010). In cases where avoidance and reduction of carbon dioxide emissions have failed, then off-setting is the only sure way that can be adopted to minimize the emission of greenhouse gases. Off-setting of carbon emissions offers immediate results and additional social and environmental benefits making it a more efficient way of reducing the amounts of greenhouse gases in the environment.

2.8. Sustainability Performance Measurement

As defined in the Brundtland report, sustainability refers to the ability of the economy and the environment to meet the needs of the current generation without compromising on the possibility of meeting the needs of the future generation. Sustainability measurement therefore is a holistic approach that does not only focus on being environmentally friendly but also encompasses the economic and social components of sustainability (Cheney et al., 2004). According to Epstein (2008) sustainability represents more than just conservation of the environment, waste management, protecting ecology or reducing energy use. In this regard the measurement of sustainability thus encompasses a holistic approach that measures all the

dimensions of performance touching on the economic, ecological and social aspects (Shaltegger and Wagner, 2006).

Most widely applicable sustainability measures focus only on the environmental parameters. Quantities such as the amount of greenhouse gases emitted into the environment, and the amount of natural resources used have been used as the main parameters to measure the sustainability levels of a corporation or an activity (DeSimone and Popoff, 2003). This form of measurement has however been disputed by Johnson (2008) who argued that it only focuses on one dimension of sustainability. According to the scholar, sustainability performance measurement should adopt a systematic approach that deals with the social, economic and environmental aspects of an organisation. Business strategies and researchers in the recent past have developed a framework for sustainability performance measurement that takes into consideration all the aspects of sustainability. Environmental and social performance of the organisation was the main approach suggested to measure the sustainability performance of an organisation. Later, the theorists included the concepts of corporate social responsibility as a measure of sustainability performance of an organisation (Hubbard, 2006). Despite the well-defined measure of sustainability performance, the measurement process still varies depending on what is to be measured and the nature of the organisation. As Waddock and Bodwell, (2007) pointed out, when the environmental and social performance that determines the sustainability performance levels keep changing, there is likely to be a variance in the approaches adopted in undertaking the sustainability measure. Thus, explains the existence of the different frameworks used in measuring sustainability.

2.8.1. Sustainability performance indicators

The quest to attain sustainability has led to the development of different frameworks and tools used in measuring the extent of sustainable development of a corporation. According to Cortanda and Woods, (2004) the frameworks are important not only in assisting the organisation, understand their extent of sustainable development but also in guiding the development of policies that can be implemented to improve the drive of the corporation towards accomplishing its sustainability goals. The approach of measuring the extent of sustainable development is not new to the presently existing organisations, but was also explored by Bauer, (1966) and Moore, (1968) who focused on formulating a framework for measuring the social development of an

organisation. By defining the social development indicators, the scholars were able to come up with a framework that measures the social progress of a corporation, thus were able to establish the national sustainability goals and priorities that need to be taken into consideration by the different companies.

Later, in the year 1970, the program for Organisation of Economic Cooperation and Development (OECD) came up with other social indicators for sustainability measurement. The purpose of the indicators was to measure the progress of sustainability development as reported by various countries across the world (OECD, 1982). The indicators were created in the form of a scale that was equally used in ranking the countries based on their social development performance. The measurement framework was not only used to identify the better performers in sustainable development, but also formed the basis for the formulation of policies that were promoted to improve the engagement of the various countries in the quest towards the accomplishment of global sustainability.

The Human Development Index (HDI) marks the next indicators that were developed for sustainability measurement. According to UNDP (2000) the HDI framework detailed the indicators necessary for measuring the level of human development as reported in different countries of the world. The framework was formulated in the form of a scale that measures the achievement of a nation in terms of human development in three significant dimensions, education attainment, longevity, and living standards. The HDI framework led to the emergence of other measurement scales including Human Poverty Index, Gender Empowerment Measure, and Gender-related Development Index amongst others (Iddrisu and Bhattacharyya, 2015). The basis for the formation of the scale that focused on measuring sustainability, was that sustainable development can only be attained when the needs of the current generation is adequately met. In this regard, the accomplishment of the said need was based on the level of human development that can be reported in a country.

While the approach was effective in measuring the extent of human development in the countries, it's effectiveness in sustainability measurement has been disputed by a number of scholars. The fact that the scales focused only on the social aspect of sustainability made it less reliable in the measure of sustainable development (Kylili et al., 2016). A need was thus presented for the design of a sustainability measurement framework that will not only emphasize

on the social component of sustainable development but will also take into consideration the economic and environmental aspects.

New and more complex sustainability measurement frameworks emerged after the 1992 UNCED that advocated for the integration of social, economic and environmental indicators in the sustainability measurement frameworks. The need presented led to the creation of a program in the year 1995 that brought together the UN, non-governmental and intergovernmental organisations to discuss and come up with indicators that can be implemented in measuring the sustainability levels reported in a country. According to Bateman, (2005) the Commission on Sustainable Development program defined and elucidated the methodologies of different indicators chosen to measure sustainability at the national level. The indicators were not just set for evaluation of the sustainability performance, but also to provide guidance in sustainability reporting such that a common goal is accomplished across the different nations.

The initial approaches to the development of sustainability measurement indicators were thematic in nature. However, the shortcomings of the thematic indicators led to the emergence of the systemic approach in sustainability measurement (Bossel, 1999). The systemic approaches to formulation of sustainability performance indicators, considers sustainability as a dynamic process that contains interrelated natural and human systems. As such, the change and the impact of the systems in each other and their involvement must be taken into consideration when coming up with indicators to measure the sustainability performance of an organisation. According to Holden, Linnerud and Banister, (2017) the thematic and the systemic approaches in developing sustainability indicators have similar requirements and characteristics. Clarity of purpose and the issues to be addressed are the major characteristics exhibited by both indicators. The purpose might be to measure the performance, assess progress, monitor or for evaluation purposes, thus the need to specify the intended purpose of every sustainability indicator. Also, Azapagic, (2004) has reported that an appropriate indicator should be reliable, relevant and feasible. The quality of data used in the development of the indicator determines its quality. As, there is a need to carry out extensive research to come up with a high-quality indicator that will objectively measure the sustainability attained by the nation. Additionally, Kylili et al (2016) has indicated that the sustainability scales must be adaptable and revisable to the needs of the users. Since different countries have varying systems of operations, it is important that the scales are

made adjustable such that changes can be easily made to ensure that it fits the contents and needs of the users.

Most thematic sustainability measurement indicators are applicable at the national levels. According to Holden, Linnerud and Banister (2017) different programs and authors have come up with indicators developed in the form of a scale that have been widely used for the measure of the level of sustainability development accomplished by a country. Indices such as the Economic Policy Stance Index (EPSI) have been used in the measuring of the economic performance of countries over an extended period. The index was used for measuring the nation's long-term ability to maintain a higher level of economic performance. The Regional Integration Index has also been used in the assessment of the economic performance of a country. The index mainly focused on analysing the economic performance of a country and its competitiveness within a specific region. Trade Competitiveness Index, Overall Sustainability Index and Economic Sustainability Index are other indices that have also been used in the measurement of sustainability performance at the nation level.

Regardless of the effectiveness of the indicators in ascertaining the level of sustainable development in the different countries, the indices cannot be adequately adopted at the corporate level. According to Searcy (2011) the difference in the systems or operations as evident at the corporate levels makes the thematic indices less effective in the measurement of sustainability at an organisational level. This led to the emergence of a systemic approach in the formulation of the performance indicators that can be used in evaluating the effectiveness of an organisation in achieving its sustainable development goals.

The development of sustainability performance measurement systems is becoming more pronounced in the corporate sector. Organisations are devoted to adopting sustainable practices in their attempt to manage the challenges and risks associated with environmental pollution and depletion of resources (Kylili et al., 2016). The reasons for the adoption of a sustainability performance measurement system may vary from one organisation to the next, however, the main focus of most corporations is to evaluate their performance and determine the effectiveness of the sustainable practices implemented in accomplishing the company's strategic goals.

Corporate sustainability performance measurement systems are developed based on the assumption that they are capable of determining the ability of the company to attain sustainability as a prerequisite of enhanced business performance. According to Lohman et al (2004), the specifications in the sustainability performance system may vary from one company to the next, however, Bititci et al., (2005) have asserted that the system should be highly integrated, informed, balanced and focus on the business processes. Different studies on the development of sustainability performance measurement systems in the context of specific corporate organisations have been presented (Keeble et al., 2003; Singh et al., 2007; Palme and Tiliman, 2008). These studies have suggested different performance management systems for various organisations operating in different sectors of the economy including manufacturing, mining, and aviation amongst other sectors. The global initiative has also been involved in the formulation of a sustainability performance measurement system that is specific to 15 different sectors within the economy. From the review of literature on the formulation of the sustainability performance management systems, it can be deduced that specificity is a major prerequisite to attain an effective measurement system. The fact that the authors come up with a performance measurement system applicable to individual corporations indicates the significance of specificity and applicability when developing a performance management system.

A typical sustainability performance management system allows a corporation to ensure that all its impacts and responsibilities are addressed. An effective system should ensure that all actions of the corporations on matters sustainability are measured, monitored and reported. Also, the system should ensure that the relevant stakeholders are included in the evaluation process. According to Maletič, (2013) collection of quality data needed in the formulation of the sustainability performance management systems also contributes to the effectiveness of the performance measurement process. The process of formulating a sustainability performance measurement system entails identification of the social, economic and environmental impacts of the company's activities followed with the formulation of a sustainable policy based on the impacts identified. The next step focused on the development of a sustainable performance action plan that entails a guide on the implementation of the policies needed to achieve sustainable development (Milic, Jovanovic and Krstic, 2008). The system is then operationalized, monitored and audited to determine its effectiveness in measuring the sustainability performance of the organisation.

According to Searcy (2011) the goal of a sustainability performance measurement system is to enhance the sustainability performance of the organisation, by monitoring its progress and identifying areas requiring changes. The effectiveness of the sustainable performance measurement systems is therefore paramount in ensuring a corporation accomplishes its sustainable development goals. Kylili, Fokaides and Jimenez, (2016) while exploring the importance of an effective sustainability performance measurement system, Holden, Linnerud and Banister (2017) pointed out that an effective system must be comprehensive, credible and integrated. Credible means that the system measures and monitors all actions and impacts of the organisation while integrated means that all the stakeholders are involved in the formulation of the performance measurement system. Comprehensive means that the system is capable of measuring all impacts and responsibility of the corporation, mainly social, environmental and economic impacts. Sustainability performance measurement systems are specific to a corporation due to the difference in the corporate systems and the probable impacts of the organisational activities on the environment and the society. As such, the formulation of a performance management system should be specific to a corporation; however, the involvement of all stakeholders in the formulation process is paramount.

2.8.2. Corporate social responsibility and sustainability

The concept of corporate social responsibility defines the ability of an organisation to promote sustainable activities that are out of profitability agenda. The CSR addresses the voluntary and non-voluntary responsibilities of organisations in working towards the attainment of sustainable development CSR (Enquist et. al, 2007). In the early 60's, an awareness of the need to manage environmental problems significantly motivated various stakeholders to embark on the conservation and management of the environment. Businesses were assigned responsibilities of ensuring that their impacts on the environment and society are properly managed. Despite the argument by Friedman's (1970) argument against other forms of responsibilities including sustainable development to only focus on increasing their profits the new vision that arose as a result of internationalization to ensure that all stakeholders take part in reducing the negative effects of business activities on the environment, intensified the assigned responsibility on every organisation to engage in sustainability practices (Elkington, 2001).

In a different study Carrol's (1991; 1979) dismissed the assertion of Friedman as fallacy and stressed the importance of CSR to businesses. He expressed the view that involvement of businesses in CSR will not only address the negative implications of their businesses on the environment but will also aid in building strong relationships with the external communities. Also, Grant (1991) dismissed Friedman's (1970) point of view and supported the idea of CSR.

The voluntary involvement of an organisation in strategies that promotes environmental conservation and social development is the main principle of (Enquist et.al. 2006). Based on the Triple Bottom Line of environmental, economic and social factors as opposed in the sustainability concept, a balance between the identified aspects in a corporate environment is likely to lead to better performance than just focusing on the profitability of the firm. Social and environmental efficiency is becoming more important in any business since the community has serious expectations on the corporate sustainability performance (Enquist et.al., 2006; Elkington, 1998). The rise in the interest of the national governments and international communities in fighting against climate change and environmental pollution has also fuelled the concerns on the role of corporations in conserving the environment. At the corporate level, the extent of corporate social responsibility can be used in evaluating the performance of the organisation in relation to sustainable development (DeSimone and Popoff, 2000). As much as CSR cannot be used for measuring performance at the national level, the voluntary engagement of organisations in sustainable practices is a better way of accomplishing their social obligations and ensuring that they take part in the conservation of and protection of the environment, other than contributing towards its destruction.

2.9. Enablers and Inhibitors of Sustainability

Most organisations hold the belief that sustainability is a "good thing" and it is the right goal to accomplish. The management of the various organisations also believes that sustainability is an integral part of the business and that working towards the attainment of the sustainability goals is an action that they must explore. However, regardless of the conviction that sustainability is desirable, very few companies attain the set sustainability goals. Going by the organisations' reports on sustainable development and their engagement in sustainability practices, it is noted that most companies fail to meet the set goals, even after contextualising the contents of the sustainability reports. The deduction is that most firms are willing to engage in the sustainability

practice, however, there are certain barriers or inhibitors that prevent their full accomplishment of the sustainability goals.

Garcia-Sabater and Marin-Garcia (2009) in his study looked at the drivers and inhibitors of sustainability. In a study that involves workers and management from different companies, mostly those dealing with manufacturing, the researcher obtained that economic and financial cost, lack of leadership, weak sustainability and short-term goals amongst others are the main inhibitors of sustainability.

2.9.1. Inhibitors of Sustainability

1. Lack of consensus on the definition of sustainability

Within the corporate community, there is lack of understanding regarding the definition of sustainability practices and its implementation (Berns et. al., 2009). A number of the definitions are within the context of corporate social responsibility or the environmental aspect of sustainability. Thus, with the lack of clarity on the definition of sustainability practices, there is a lack of strategic alignment of the organisation's short-term and long-term goals. This results in weak sustainability or failed implementation. Another challenge is the measurement process. The inability to assess progress due to lack of performance measurement standards has hindered the adoption of sustainability practices. According to Sharma (2000), an organisation's environmental strategies are determined by the interpretation of the manager's understanding of environmental issues. Therefore, sustainability strategies will be dependent on a manager's perspective.

2. Economic and financial cost

Many organisations view sustainability practices as a capital-intensive process that will increase overall cost without immediate financial benefits (Nidumolu et al., 2009). In the short-term, there is evidence that sustainability implementation increases the cost of business operation. However, according to Berns et. al., (2009), empirical evidence has shown that most organisations that implemented sustainability practices have reported increased financial performance in the long term. Additionally, organisations tend to focus more on the economic aspect of sustainability at the expense of the social and environmental aspects. Garvare and Johansson (2010), suggested

that for organisations to achieve sustainability, all the three aspects of sustainability must be treated with equal significance.

3. Weak sustainability

Going green in all activities of an organisation may be a positive approach towards the attainment of sustainability. Nevertheless, according to Grant and Marshburn, (2014) the green light may sometimes be seen as a signal that the concept of sustainability is misunderstood, thus an inhibitor to the attainment of sustainable development. Similar view has been presented by Le Roux and Pretorius (2016) who asserted that there is normally confusion about the meaning and what sustainability entails. There are two different schools of thoughts on the concept of sustainability. Some corporations think that the aspect of going green is enough in guiding the corporation towards the attainment of sustainable development. On the other hand, others assume that sustainability only encompasses the economic aspects. Since most people associate the concept of sustainability with going green, they focus more on the implementation of practices directed at controlling the negative implications of the company's activities on the environment. The focus in most cases is on the consumption of fewer amounts of natural resources and minimizing the amount of wastes released into the environment. While the understanding aid in the attainment of some aspects of sustainability, the full attainment of sustainability is hindered. As seen in the earlier discussion, sustainability does not only focus on the environmental aspect, but must also include the social and economic aspect in order to attain sustainable development. As such, the belief that going green leads to the attainment of sustainability have not only led to misunderstanding of the sustainability concept but have also hindered corporations that hold the same belief from the attainment of full sustainability.

4. Lack of leadership

The attainment of sustainability is dependent on how well the sustainable practices are executed by an organisation. The implementation of sustainability practices is a massive task that requires the direct involvement of the top management. The top management is responsible for providing leadership, direction and set the vision of the organisation. For sustainability practices to succeed, it must be integrated into the organisational culture and policies must be properly communicated to employees. Garcia-Sabater and Marin-Garcia, (2009) have reported that the

failure of the implementation of sustainability practices is attributed to lack of leadership and teamwork.

5. Lack of continuous improvement

Anchoring on the past performer is a sustainability inhibitor that impedes the ability of a corporation to enhance its sustainability performance. The anchoring holds organisations back and prevents them from implementing new sustainability practices that will improve their contribution towards the attainment of sustainable development. According to Le Roux and Pretorius, (2016) as much as an organisation can report a higher level of performance in a previous year, there is need to continue working towards the attainment of sustainability. If anything, there is a high impossibility of meeting all the sustainability goals set by a corporation within a year. As a result, an organisation should continually be working towards the attainment of the set sustainability goals. Making strategic decisions that are specific to the actions being undertaken by the organisation on a yearly basis is important in ensuring that the set sustainability goals are accomplished. As reported by Garcia-Sabater and Marin-Garcia, (2009) nature and the community at large is subjected to different kinds of change in every season. What was viewed as desirable in the previous year can be detrimental to the environment and the society in the subsequent years. As such, performing well in terms of sustainability management in a given year does not mean that the same level of performance will report in the subsequent years (Grant and Marshburn, 2014). Anchoring on the past sustainability development performance does not accrue any benefits to the organisation, but rather inhibits the ability of the organisation to engage in activities that will improve its level of sustainability.

6. Short-term goals

Organisations implementing sustainability practices tend to employ the firefighting approach. This refers to the attempt at responding to problems that will yield the desired result in the short term. Due to the capital-intensive nature of sustainability practices, a number of organisations tend to focus on short term solutions. The short-term response to sustainability issues is a major inhibitor of the attainment of sustainable development by corporations. According to Garcia-Sabater and Marin-Garcia, (2009) sustainability is a process that can only be adequately attained when organisations focus on the long-term goals of sustainability. Long-term solutions contrary to any sustainability problems arising within the company should thus be implemented for the

company to accomplish its sustainability goals. Nevertheless, as Scherrer, Daub and Burger, (2007) indicates, this is not the case observed in most situations. It is evident that most companies when faced with any issues that are sustainability-related focus on the adoption of a firefighting approach to take part in addressing the issue presented.

Firefighting is an ineffective approach that can be implemented to address the issues presented. The approach does not only prevent the practitioners from weighing and selecting the most suitable strategic approaches needed to address the situation, but also fails to give an opportunity for the identification

of the requirements needed in sustainability management (Stubbs and Higgins, 2012). Hast and quick reactions lead to the formulation of ineffective sustainability decisions that cannot support the attainment of the formulated sustainability goals. Also, the process of sustainability management is likely not to involve the entire stakeholders and may be lacking an appropriate budget. Sustainability cannot be attained within one day, making decisions or adopting an approach that pushes for swift address of the sustainability issues with the intention of abolishing the whole process, is a big hindrance in the attainment of sustainable development.

7. Lack of strategic communication

The nature of the strategic discourse determines the possibility of attaining sustainable development. According to Scherrer, Daub and Burger (2007) a faulty strategic discourse is likely to hinder the attainment of the set sustainability goals. Sustainability strategy must be part of the company's overall business strategy to indicate their level of commitment in accomplishing the set goals. Apart from including the sustainability strategy in the overall business strategic plan, the contents of the strategic approach and how it is communicated will determine whether the employees will work towards the accomplishment of the sustainable development goals. According to Stubbs and Higgins (2012) most strategies detailing the sustainability strategic goals and recommended practices are not known to all the employees of the company. In their study Le Roux and Pretorius (2016) indicated that more than 70% of the employees involved in an interview to determine the inhibitors of sustainability, asserted that they are not aware of the sustainability strategy set in place by the company. According to them, they are only sure of the overall organisation's goals towards conservation of the environment and protection of the natural resources. However, the details on the sustainability goals to be accomplished and the

practices to be implemented are not known to them. Grant and Marshburn (2014) while justifying the importance of a suitable sustainability strategy discourse communicated that formulating the sustainability strategy is not enough and does not guarantee the accomplishment of the set sustainability goals. There is a need for various sustainability practices to be implemented by the organisation's workforce. The effectiveness of the implementation process, that can only be achieved when there is clear communication between the management and the employees, determines the success in sustainability management. As such, a faulty strategic discourse and the management's failure to effectively communicate the content of the strategy are major barriers in the attainment of sustainable development.

2.9.2. Enablers of sustainability

Enablers of sustainable development refer to factors within the organisation that promotes enhanced sustainability. Regardless of the challenges experienced in the implementation of sustainability strategies and practices, the enabling factors are capable of assisting the company overcome most if not all the challenges. Organisations that have included the enabling factors in their operations are thus likely to report a higher level of sustainability. The critical review of literature on the enablers and drivers of sustainability is advanced below.

1. Information communication technology

The emergence and development of information technology has contributed significantly towards the attainment of sustainable development. According to Lehrer and Vasudev (2010) ICT is one of the significant enablers of sustainability especially in promoting green building activities. The ICT has allowed for the development of intelligent systems that are capable of managing carbon emissions from construction activities and in the built environment. Better building designs and introduction of automation have been supported by the advancements in information technology (Darby, 2010). The technologies have been vastly used in the developed economies leading to a more than 15% reduction in the amounts of carbon emissions (Bull, 2015). While the information technologies have been useful in the reduction of carbon emissions in the built environment of most developed countries, their usefulness in the developing economies has not been fully realized. According to Shirky (2008), most sophisticated technology emerged from the developed economies thus their implementation in the underdeveloped and developing countries have been minimal. However, with more research and adoption of the new

technologies in the emerging and developing economies, the advancement in information technology will greatly promote the execution of green building practices.

Information communication technology has also promoted information sharing amongst different corporations and individuals. According to Ghonim (2012) the emergence of the internet and social media platforms have enabled the ambassadors to create awareness on the benefits of sustainability thus convincing most organisations to engage in sustainability practices. Feedbacks on the level of sustainability already attained can also be made through the communication platforms that have been supported by the emergence and the development of information technology. ICT thus plays a significant role in promoting sustainable development.

2. Culture

Over the past decade, studies have reported culture as an important enabler of sustainability. The role of culture in economic development and poverty alleviation makes it a vital contributor towards sustainable development. According to Naor et al., (2008) culture mainly drives the social aspect of sustainability. A culture-led development and approach in sustainability ensures that the social needs of people are taken into consideration when executing any task. As such, the organisational impacts are controlled to prevent any adverse social effects on the individuals. Respecting the cultural values and beliefs of a given community leads to social development. Also, the involvement of the community's cultural dictates in the management process provides good insights in the selection of the environmental management practices, and identification of the ecological challenges that needs to be addressed (Husted, 2005). Thus, understanding the culture of a community is essential if sustainability is to be accomplished. It does not only focus on meeting the human social needs but also gives valuable insights on approaches to environmental conservation, reduction of biodiversity loss and it prevents the adverse effects of climate change. Culture contributes towards the attainment of sustainability through its link with biodiversity, its association with the consumption patterns and its role in influencing the sustainability management practices.

3. Leadership and Commitment

The top leadership in any organisation is responsible for knowledge management amongst the employees. These individuals are also charged with the direct responsibility of formulating and implementing policies. As such, the leadership of an organisation has a huge responsibility in the

formulation of sustainability policies and in managing the employees to guarantee the full implementation of the sustainable practices (Abebe and Onyisi, 2016). The leadership does not only make a suitable environment for knowledge management and sharing but also ensures the employees are highly committed in the implementation of the sustainability practices (Metcalf and Benn, 2013). Successful knowledge management and creation of awareness on the benefits of sustainable development will foster the implementation of sustainability. This can only be attained when the leaders are highly committed and are focused in ensuring that the sustainable goals are accomplished. Any organisation with a highly committed leadership will not just have a clear and integrated sustainability policy but will also effectively participate in the full implementation of the sustainable practices leading to sustainable development.

4. Resources

Implementation of sustainable practices requires additional resources from the management. Most sustainability practices are costly and require the implementation of new technologies. Companies will need additional resources to change towards the implementation of green resources that will have minimal negative implications on the environment (Reed, Lemak, and Mero, 2000). Apart from the physical resources, human resources are also needed to adjust to the new systems of operations. The implementation of green practices including renewable sources of energy, green building amongst others comes with additional costs for the company to attain sustainability.

Most profit-based companies are concerned with the maximization of their profits and enhancing their shareholder value. Incurring additional costs in sustainable practices means that the organisation will not be able to meet its obligations of proper management is not undertaken. Also, the possibility of most of the shareholders agreeing with the sustainability decisions are minimal, as such, the additional costs required in the execution of the sustainable activities may prevent the company from indulging in the same.

As much as higher amounts of resources will support the execution of sustainable practices, (3) from a different perspective has asserted that resources do not have to influence the implementation rate of sustainable practices. According to the scholar, simple actions that are likely to reduce the impacts of the organisation's actions on the environment and the community are in existence and can be adopted to support the attainment of sustainable development. Also,

the scholar argues that costs associated with the implementation of the sustainable practices cannot surpass the perceived benefits. As much as the availability of resources is considered an enabler of sustainability, it cannot be used to justify the failure by an organisation to participate in the processes that promotes the attainment of sustainable development.

5. Total Quality Management

Total quality management entails the customer-centric approach implemented in an organisation with the goal of improving total quality and delivering services and products that adequately meets the needs of the customers. TQM supports the enhancement of quality through the organisation's manufacturing process by ensuring that only the needed commodity is manufactured at a specific time. The effect of the approach is that there is minimal wastage in resources since the goods are manufactured depending on the needs and wants of the customers. Also, TQM advocates for the elimination of any form of defects along the production line. According to Robson et al (2002) the process of TQM focuses on identifying the probable defects at their initial stage and adopting corrective measures to ensure that there are minimal wastes out of the manufacturing process. Another principle of TQM requires that the needs of the customers and all the other stakeholders are taken into consideration during the manufacturing process. Through engagement of the employees in the manufacturing process and creation of a suitable working environment, the attainment of total quality is assured.

The adherence with the TQM principles supports the attainment of sustainability in an organisation. It has focus on the needs of the customers and efficient production process ensures that there is maximum efficiency in production and that minimal wastes are released into the environment, significant requirements in the attainment of sustainable development. The ethical considerations needed in meeting the needs of the current generation without compromising the wants of those who will leave in the future is also attained through maximization of product quality and minimization of resources wastage that leads to their conservation. The principle of TQM when effectively implemented can lead to the attainment of sustainable development.

2.10. Total Quality Management

2.10.1. Meaning and definition

Total quality management (TQM) is defined as a management approach that focuses on the attainment of long-term success through ensuring enhanced customer satisfaction. Simply put, TQM focuses on the continuous improvement of the organisation's products and processes with the goal of accomplishing the needs of the customers. According to Griffin (1998) making quality a concern and a responsibility of every individual in the workplace and ensuring that the consumers are the main focus of the organisation results in the attainment of TQM. For an organisation to implement a TQM approach in its management, it is mandatory that all the members of an organisation participate in improving processes, products, services, and the culture in which they work.

2.10.2. Evolution of Total Quality Management

The concept of TQM began in the 1920s as the scientific management principles became evident in the US industry. The business processes within the organisation and the planning of the strategic approaches become distinct leading to the formation of worker unions that were to fight against the poor working conditions bestowed in different institutions. According to Zhang et al (2000) experiments conducted during the times indicated how workers were subjected to unjustified harsh working conditions that had significant negative implications on their productivity.

In the 1930s, Walter Shewhart developed a method that could be used to control and manage quality in the organisations. The aim of the scholar was to ensure that the employees working in any business enterprises maintain the provision of quality services irrespective of the harsh working conditions. Further development led to the creation of a statistical method in the 1950s, by Edwards Deming that was used for teaching control mechanisms and techniques that can be employed by engineers and executives working in the various Japanese automotive companies.

The happenings in the 1950s can be considered the main origin of the TQM concept. According to Powell (1995) the formation of a union by Japanese scientists and engineers marked the initial point of the emergence of the TQM concept. The union consisted of scholars and government officials who were mainly focused on enhancing the productivity of the country. Scholars such as

Joseph Juran and Edwards Deming taught the statistical methods that could be implemented in quality control. Also, Arman Feigenbaum published a book on the concept of total quality control, a book that has been continuously used for the present understanding of the concept of TQM. During the same time, Phillip Crosby was engaged in teaching and promoting the need for zero defects in any manufacturing process. The implications were enhanced quality levels in the various manufacturing plants. As Zhu and Sarkis (2004) indicates, the many activities that occurred during the period and the seriousness of most scholars in creating awareness of the concept justifies why the period of 1950s is considered the main origin of the TQM concept.

In the 1960s, the Japanese named their strategy in quality management as “quality control”; it was during the same period that the term “quality management system” arose since it was used to define the approaches undertaken by the management to ensure that their operations and activities are conducted in an effective manner to attain maximum quality. The synthesis of the quality control concept by Kaoru Ishikawa during the same period further contributed to the creation of awareness and communication of the importance of the quality control concept (Zhu and Sarkis, 2004). In fact, the Japanese were able to ascend into quality leadership and ambassadors for the campaign on quality management in the various manufacturing firms.

Currently TQM is referred to as a broad philosophy and a systematic approach adopted in the management of an organisation’s quality. According to Hill and Huq (2004) the concept refers to the adherence to the quality standard such as ISO 9000 series and the ability of the organisation to manage its activities and processes in a way that enhanced consumer satisfaction is accomplished. Apart from adhering to the set quality standards, attaining a high quality in the operations of the organisation can be determined by a company receiving quality awards such as the Deming and the Malcolm Baldrige awards. Adhering to all the principles as outlined in the TQM framework also justifies that the organisation has attained maximum quality in its operations and processes.

Prior to the emergence of the TQM concept, most companies including the Japanese firms focused on quality control. According to Stuelpnagel (1993) most of the principles of TQM as identified today were adopted by the early companies prior to the emergence of the TQM concept. As such, it may not be easy to accurately establish the date of the emergence of the TQM concept. However, as Bemowski (1992) points out, the term TQM began with the Naval Air system commanders in the 1980s when they gave a description of the Japanese approach in

quality management and improvement. While the Japanese termed the process “quality control” the commanders offered a broader definition and saw it more as a management approach as opposed to a control approach. Perhaps, the emergence of the TQM concept can be the replacement of the term “control” with the word “management”.

The reasoning that quality is not just a control process within an organisation, it was important that the management term is incorporated to achieve the TQM concept. As reported by Deming’s (1982) control is not needed when the goal of the organisation is to achieve zero defect level in the manufacturing process. Holding the same view, Crosby (1979) also posited that the word control is not clearly understood since it can be used to mean control over the business activities, an assumption that is clearly not the goal of the TQM concept, thus the reason for labelling the concept as a management approach.

The concept of TQM emerged as a result of the actions and the management approach undertaken by the Japanese firms. In the United States, the development of quality management occurred following the penetration of the Japanese products into the United States economy. In the early 1970s, the Japanese products got entry into the United States market due to their enhanced level of quality and performance. Coupled with the writings of the early scholars who focused on communicating the importance of the concept to manufacture the knowledge on the TQM concept and its perceived benefits reached the United States market. The movement was explored to other nations leading to companies within the UK considering the implementation of the concept in their management process.

Significant researchers contributed towards the development of the TQM concept and creation of understanding of its principles and goals. As much as most scholars have provided near similar findings on the principles and benefits of the concepts, significant contradictions are evident in their belief on the origin of the concept. While most researchers who took their research in the 1960s believe that the concept emerged in the 1950s, following the description of the approach undertaken to describe the Japanese quality management systems, some argue that the concept was non-existing in those early years. Dale who undertook his study after the year 1981 believed that the concept TQM emerged in the UK, following the actions of the Department of National Quality Campaign. A similar discussion has also been put forth by John MacDonald’s who argued that he was the first scholar to use the term TQM in his communication, before it was picked and analysed by other scholars. Despite the contradictions on the origin of the term TQM, it can be

noted that quality related terms emerged in the early years. As much as the users and advocates for enhanced quality in organisation's did not stress the management concept when analysing quality, their intention and desire have been vividly outlined in the current TQM concept. As such, regardless of the different terms used in defining quality in the context of organisational operations, it can be deduced that they all upheld a similar meaning, ensuring that the company's processes are of higher quality that meets the set standards and assures the attainment of a higher level of customer satisfaction.

The use of the term TQM in literature was limited in the 1980s. As much as it can be argued that the concept emerged in the early years and was used by various scientists the use of the term by academic scholars cannot be justified. According to Benavides-Velasco, Quintana-García and Marchante-Lara (2014) a sample of papers written on quality management in the 1980s indicates that terms such as quality management, total quality, and total quality management are rarely used in the papers. However, in the 1990s, the concept of TQM became more widespread and reached its peak in 1993, when most companies wanted to improve the quality of their processes, presenting the need for more comprehensive information on the same. As much as there was a decline in the amount of papers on TQM after the year 1993, the campaigns on sustainability have led to the re-emergence of literature on TQM. Today, information on the importance of TQM, on enhancing performance and promoting sustainability are presented to create awareness on how to implement the concept, and its expected benefits to the organisation.

2.10.3. Total quality management concept

TQM is only one of many approaches to getting work done and accomplishing goals. Several experiences have shown that by using a TQM approach, organisations can increase their capacity to do work, increase the quality of work done and, at the same time, hold staffing levels and budgets at historical levels. This is possible because: The organisation recognizes that the vast majority of problems are caused by people doing the wrong things right: work that should never be done, even though it is done very well. The organisation recognizes that those problems are caused by ineffective systems and procedures. That recognition extends to the belief that the people who do the work are best able to fix these systems and procedures. The organisation recognizes that in order to unleash the talents of everyone in the company, people must be provided with opportunities to learn new skills and to practice those skills. The organisation also

believes that given the opportunity, people willingly participate in designing the organisation of the future.

Philip Crosby (1979) in his study reported that quality is neither intangible nor immeasurable. Rather, it is a strategic imperative that can be used to improve the bottom line. According to the scholar quality means "conformance to the set requirements," not "goodness. Defining quality as conformance to the set standards and requirements means that it is not subjective. Any product or service that conforms to the requirements is thus considered to be of a high quality.

The requirement that must be met to achieve the desired quality level is based on customer expectations and the integration of the work process flow. In most cases the customer expectations are expressed in terms of the convenience of the product or service offered, its comfort, ease of use, and aesthetics value. The suppliers are expected to use the knowledge of the manufacturing process and the needs of the customers to avail products that are highly acceptable.

The quality management literature constantly reminds researchers of the ambiguity that surrounds the meaning of TQM and the differences between TQM and quality associated activities such as quality assurance, quality control and quality management. This confusion leads, in many cases, to the use of these expressions interchangeably. Therefore, it is very important to have a clear definition and understanding of each of these concepts. Total quality management (TQM) is the system of activities directed at achieving delighted customers, empowered employees, higher revenues, and reduced costs (Juran, 1995). On the other hand, quality control refers to the constant check on the product to identify any form of defects. This is followed with the engagement of the quality assurance team that focuses on elimination of the defects.

2.10.4. Total Quality Management Principles

TQM is defined as a management approach that focuses on the accomplishment of maximum quality in business operations and enhanced level of customer satisfaction. Adopting a customer-focused approach in conducting any activity within the organisation guarantees the attainment of maximum satisfaction. Also, the engagement of employees in all the business processes and ensuring their improvement also supports the attainment of TQM. Zhu and Sarkis (2004) have also pointed out that TQM uses effective strategic approach, proper communication and a

disciplined quality culture, such that the resulting outcome of the business processes adequately meets the needs of the consumers. Different researchers have presented their views on the meaning and definition of the term “Total quality management”. While most of them have presented the definition on varying discourse, the meaning of the words presented remains the same.

TQM drawn from different scholarly studies is a philosophical management whose primary objective is to integrate all organisational operations including finance, production, marketing, customer service, organisational objectives and customer focus (Adam, Flores and Macias, 2001; Ho et al., 1999; Rampersad, 2001). TQM maintains that all institutions must continuously strive to improve operations by incorporating the knowledge as well as worker experiences for optimum output (Ho et al., 1999). It is an approach for organisations to continuous improvement of competitiveness, flexibility and effectiveness primarily for stakeholders’ benefit. TQM involves planning, organizing every individual activity that constitutes such principles as consumer focus, commitment from top management, training of employees, their involvement, management of operational processes, supplier team, continuous improvement, quality audit and leadership. According to Das et al., (2011) these practices offer competent and valuable ways through which organisations can not only improve their performance but also get the employees involved in decision making. Also, studies on the principles of TQM have identified different principles; however, the most notable principles in line with the definition presented are advanced below.

1. Customer-Focused

The first principle of TQM is the focus on customers. According to Wagner and Llerena (2008) customer-focus principle indicates that the consumers have the last say on the level of quality they desire. As such, the actions and processes of the organisations must be focused on achieving the quality as determined by the customers. Also, Matias and Coehlo (2002) have pointed out that regardless of the approaches implemented by the organisation to ensure it offers quality services and/or products the customer is the main determinant of quality. The employee training process, the improvement in production design, purchasing of new tools and upgrading the performance of technical systems are efforts that can be undertaken to enhance its quality, nevertheless, the customers have the authority to determine whether the efforts are worthwhile.

This principle represents the primary considerations when creating an organisational strategy is consumer needs. According to Samson and Terziovski (1999), consumer focus is the fundamental principle that firms consider when implementing TQM. While this is the case, many scholars have argued that customer focus traps organisations into working on captive markets with focus only in meeting the demand of an existing market and therefore see the business in terms of the existent consumer perception. As a result, these organisations may fail to pursue the search for innovative solutions by ignoring the untapped potential market (Lagrosen, 2001; Flynn, 1995; Das et al., 2011). TQM further combines the consumer knowledge with other information and uses the planning process to put in order future actions, managing the daily activities and achieving the organisation's objectives. The process of planning is the root that holds the TQM activities together. According to Das et al., (2011) the implementation of TQM by an organisation comes with the knowledge that consumers will only be satisfied if they receive the products and services that meet their demands at the right time, and with the prices they can afford. Organisations make use of process management techniques to come up with processes which control the total overheads. These processes through TQM consumer focus are stable and with capability to achieve customer expectations (Das et al., 2011).

Based on stipulations from ISO 9004:2000, the primary benefits of customer focus include increase in revenues and market share that comes from flexibility and fast responses to market demands; increased effectiveness in the use of organisational resources to improve customer satisfaction and loyalty that brings about repeat business (Kaynak, 2003). The principle of consumer focus pushes the organisation to invest in research and design with the aim to understand the customer needs as well as their expectations. Additionally, customer focus ensures that the organisational objectives are linked to their demands and expectations, communication with the consumers and those within the organisation (Agus, 2004). Organisation objectives under the customer needs clause in the ISO 9001: 2000 states that identification of consumer demands and expectations once determined sees the conversation of the product requirements with emphasis and energy being put to meet the consumer needs (Fotopoulos et al, 2010).

2. Management Leadership

Management leadership principle is one of the primary drivers of TQM. It has a significant effect on the effectiveness of TQM on organisational performance (Soltani, 2005). Management

leadership is defined as the guidance and supervision that comes from the management level of an organisation. The management level gives the required resources to train employees with the aim to meet the ever-changing consumer demands and consequently develop a conducive environment in which the employees can as well take part in the production and processes of change (Kaynak, 2003; Flynn et al., 1995). Flynn et al., (1995) further points out that management leadership is important to influence the decision while making a selection of qualified suppliers and when certifying them for quality products. According to Deming, (1986) management is responsible for product design mentoring and putting into consideration the market demands as well as consumer needs.

Evidence from empirical research points out that top management is of huge significance as it guides organisational activities towards being better (Schneider and George, 2011). According to Young et al., (2001) top level management guides and directs organisations to put TQM into place. An argument by Young et al (2002) is that being an institutional aspect, leadership has a huge impact on TQM and implementation in the long run. Management leadership is necessary to ensure that any managerial and innovative ideas are put in place with the aim to boost the organisational performance. The commitment by the top management according to Dwyer (2002) is strongly associated with quality management. Efficiency based on his findings is primary as it gives an organisation its competitive advantage only in places where there is commitment by staff. This implies that leaders play a rudimentary role in the increased performance as they proactively assume constructive attitude that constantly shapes the landscape of competition and steers an organisation to the desired course (Young et al., 2001).

Management leadership from the perspective of TQM possess transformational attributes. These attributes include inspirational motivation, ultimate influence, logical stimulation and personalized consideration. According to Schneider and George (2011) top management inspires transformational leadership which influences other employees to pursue goals and increase confidence as well as job performance among the employees. Transformational leadership in an organisational context significantly relates to the firm getting commitment by the team and subsequently an empowered work environment leading to competitive advantage by the organisation because all the employees are working towards the same goal. One of the significant aspects from leadership management as Ahire and Dreyfus, (2000) puts it is the ability to facilitate change. This involves providing a sense of direction and taking responsibility in

embracing as well as supporting change and becoming the agents of change within an organisation. Total quality management is achieved through effective leadership when the top management fosters a positive team environment for productivity and better organisational performance (Schneider and George, 2011).

Conclusively, top management in TQM leads through unity of purpose by putting in place appropriate policies on quality, establishing measurable objectives and demonstrating full commitment to the development process, sustaining and continuous improvement of quality management systems. Drawing from the literature, organisational leadership has the capacity as well as authority to create and keep an organisation's internal environment. Top management through the development of clear organisational vision challenges the whole team by setting goals that need to be met at a given time. They also give prerequisite resources such as training and staff development to encourage, inspire and reward their contributions towards the organisational goals. The management therefore ensures that all activities required to undertake TQM comprehensively are put in action without due delays.

3. Total Employee Involvement

TQM advocates for total employee involvement in the activities and decision-making process. This is an empowerment process that requires the participation of employees in the activities and decision-making process that are commonly reserved for the top management. According to Hill and Huq (2004) all employees must participate in the processes designed to assist the company maintain a quality level that will be satisfactory to the customers. In order to ensure that the employees are engaged in the business activities, the management should foster empowerment and eliminate any form of fear from the organisation. Also, empowerment can aid the company accomplish total employee commitment such that they are fully involved in the actions and activities of the organisation. Provision of high-performing systems, a suitable working environment and self-managed teams ensures will promote total employee commitment.

Management of employees contributes largely to the success of every project in an organisation (Kaynak, 2003). Top leaders through TQM take personal responsibility during the implementation, promotion and monitoring of every little activity in the organisation. This way, the employees are properly trained and are capable of actively taking part in the company's

operations and subsequently achieving the objectives. Employees through TQM work together to create a firm value environment and give everyone a primal role. This principle gives the employees the ability to measure and make use of data effectively and efficiently (Ahire and Dreyfus, 2000). According to a research by Ho et al. (2001), elements of human resources including employee relations, employee training positively relates to quality improvement that comes from the use of quality data and subsequently reports. For TQM to be a success, the collaboration as well as coordination between the workforce of an organisation is paramount. Success comes from deep understanding by the employees of the principles and philosophies of TQM.

TQM in an organisation makes the employees highly conscious of the data as well as reporting controls prepared by working staff which makes it easy to uncover the reality and therefore mitigate any possible flaws in operations. By so doing, research points out that the management of human resources provides a positive effect on the production of quality data as well as reporting (Ahire and Dreyfus, 2000; Ho et al., 1999). Employee involvement brings about a number of benefits including motivation, commitment by the employees to the company mission, innovation from their part and accountability among them all of which pushes the organisation to better performance. Additionally, employee involvement opens a discussion channel where employees can openly raise their concerns, share their experiences and knowledge and actively seek opportunities to improve their competence. All these enhance organisational performance.

Employee involvement implies sharing of knowledge, encouraging employees through incentives and recognizing their efforts by letting them contribute to issues raised (Lawler et al., 1992). It further involves making use of their experience as well as operating with honesty. As a principle of TQM, involving employees creates awareness among them and informs them of the significance of meeting the demands by the market. By making use of this TQM principle, persons in an organisation can identify their performance constraints, can evaluate the same and set their standards purposely for improvement. By so doing, they actively and consistently look for opportunities that will improve their competence and are able to freely share their knowledge and experience of the same. Conclusively, employee involvement acts as a foundation to employee motivation and as an approach to enhance their creativity as well as innovation by

providing an environment where people can own their mistakes and problems and take full charge of their responsibilities. This pushes the company performance a notch higher.

4. Process-centred

A fundamental principle of TQM is its focus on business processes. According to Barkemeyer, Holt, Preuss and Tsang (2014) business process consists of all the steps from the acquisition of raw materials to the release of the finished product to the consumers. The procedure undertaken in converting the raw materials to the final products forms the business process. The processing stages are well-defined, and their performance measures are continually determined to ascertain the effectiveness of every stage.

5. Integrated System

Companies mostly consist of different functionalities that are organized in vertically organized departments. These functionalities are what lead to the attainment of the organisational goals; however, the departments are also interconnected with horizontal processes that are the major focus on TQM management approach. According to Lozano (2015) the micro-processes in an organisation sum-up to make aggregated business processes. The effectiveness of the integration of the processes determines the attainment of quality products. TQM management approach advocates for the attainment of a maximum quality from the production process, thus recommends a highly integrated business process. Apart from just a highly integrated system, every employee within the organisation is required to undertake and understand the vision, principles, objectives, policies and critical processes of the organisation, to be able to work effectively within the highly integrated system.

6. Strategic and Systematic Approach

Strategic and systematic is also a critical component of TQM. The process of strategic planning, and management must be included in the management of the organisation's business activities. Also, there must be proper inclusion of a strategic approach in the management of the business activities, including working towards accomplishing the company's goals, and objectives. The strategic management approach entails the formulation of a strategic plan in accordance with the company vision and mission, followed with highlighting of the business goals and objectives that the company desires to attain.

7. Continual Improvement

Another fundamental of TQM is continual improvement. The processes within an organisation can only operate effectively and efficiently when they are subjected to a continual improvement process. According to Zhu and Sarkis (2004) the continual improvement process allows for an enhancement of innovations and creativity amongst the A major thrust of TQM is continual process improvement. Continual improvement drives an organisation to be both analytical and creative in finding ways to become more competitive and more effective at meeting stakeholder expectations.

Continuous improvement as a principle of TQM includes the involvement of staff in every organisational level and entities in activities that seek to improve the distinctive capabilities of an organisation (Rampersad, 2001). Considering the ever-changing expectations and preferences from the consumers, raising the quality of a product is fundamental to the success of an organisation. According to Rampersad (2001) continuous improvement therefore does not only seek to meet the demands but be able to meet them as they change with time. One of the fundamental aspects that this principle considers is that, when consumers are selecting and assessing the quality of a product is that they do not only do so in comparison with the previous quality, but with the present quality produced by other competing organisations (Fotopoulos et al., 2010). For this reason, QM is primarily concerned with the strategic levels and productivity in this principle. Continuous improvements therefore aim at improving the company's results as well as the capabilities to produce better results in the coming future.

One of the approaches used to help organisations to fulfil this principle; the plan-to-do-study-act (Ahmed and Ravichandran, 2002). This is a four-phase life cycle that guides organisations on the appropriate activities that will see them accomplish sustainable operations over time. It is a never-ending process. The first activity is plan, which implies that top leaders in an organisation must be in a position to evaluate every little process while developing plans based on these problems. This way, they can document every little procedure, data collected, and problems identified with a purpose to develop an improvement plan with specific measures that evaluates performance on the problems and better options to execute these plans. Do being the second phase in the life cycle documents all these changes made and the collected data for purposes of evaluation. Study, the third phase puts together the documented information that is to be used in the development of a plan by looking at the possible approaches in every situation. Act is the

last phase of the cycle which involves taking actions based on the results from the three phases already put in place. By putting in place all these phases, organisations can continuously improve their performance and be able to consistently meet the consumer needs by developing products based on their demands while overcoming the challenges (Flynn et al., 1995).

8. Fact-based decision making

In order to know how well an organisation is performing, data on performance measures are necessary. TQM requires that an organisation continually collect and analyse data in order to improve decision making accuracy, achieve consensus, and allow prediction based on history.

9. Communications

During times of organisational change, as well as part of day-to-day operation, effective communication plays a large part in maintaining morale and in motivating employees at all levels. Communications involve strategies, methods, and timeliness of the different approaches that the organisation seeks to undertake, an effective communication process is needed in ensuring that the important TQM principles are adequately communicated to the employees such that they are made aware of what is expected of them.

The identified principle of TQM is essential in ensuring total quality with zero defects is accomplished from the manufacturing process. The principles are so critical in TQM that they are sometimes labelled as values and principles that an organisation must operate under to attain maximum quality out of its many processes.

2.10.5. Total quality management fundamental issues

The TQM framework should be built upon a set of core values and concepts. These values and concepts provide foundation for integrating the key performance requirements within the quality framework. The fundamental core values that form the building block of TQM management include quality culture and effective leadership, proper employee participation, continuous improvement of the company's operational system (Juran and Gryna 1980) theory holds that quality circles utilize organized approaches to problem solving and operate on the principle that employee participation in decision-making and problem solving improves the quality of work.

Thapa (2011) stated that Total Quality Management (TQM) is the latest in a parade of models, recipes, programs, frameworks, and slogans for guiding academic reform. It provides a tool to help ensure this quality. The management in TQM means everyone is the manager of their own responsibilities because everyone in the institution, whatever their status, position or role is. Information and technologies have brought sea changes in education and has therefore changed the interpretation of the term quality. TQM advocates that everything and everybody in the organisation is involved in the academic institutions for continuous improvement.

2.11. Critical Success Factors and Inhibitors of TQM

Critical success factors refer to the drivers that promote the attainment of total quality in an organisation. On the other hand, inhibitors are factors that prevent a corporation from achieving the desired quality level in its operations that will ensure it adequately meets the needs of the customers. Chistos and Evangelos (2010) in their study obtained that major TQM drivers are the quality management practices adopted by the leadership, the extent of employee involvement in the organisation's processes, the ability of the company to focus on the customers, and the proper management of the organisation's processes and data. Also, the scholar reported that adoption of quality tools and sophisticated techniques in the production process also supports the attainment of total quality. In support of the above assertion Barkemeyer, Holt, Preuss and Tsang (2014) indicated that adhering with the identified practices ensures that the company achieves maximum quality in its operations that will translate into satisfaction of the customers, thus the attainment of Total Quality.

1. Customer focus

Customer focus is considered as a fundamental success factor in quality management. According to LeBoeuf (2000) focusing on the customers means that every employee and not just those operating in the front office, puts the customer first in their activities. The idea is to ensure that all activities and end products are made in line with the needs and requirements of the customers. The planning for the release of a new product, the acquisition of the raw materials, the manufacturing process, the marketing approach and the distribution strategy implemented by the company should focus on the needs of the customers. To attain a customer-focus approach in management, every employee should uphold the customer-focus approach in all their undertakings. LeBoeuf (2000) also emphasizes that maintaining a good relationship with the

customers and adopting an effective customer relationship management approach also promotes a customer-focus approach in management.

In another study Benavides-Velasco, Quintana-García and Marchante-Lara (2014) obtained that customer focus is the overriding critical success factor in TQM. According to the scholar, quality refers to the ability of an organisation to adequately fulfil the needs of the customers. In this regard, the company must identify the needs presented to be able to offer maximum quality services and goods. This can only be attained when a customer-focus approach is implemented in all the actions and activities of the organisation. As much as it is not easy to determine the needs of the customers, it is vital that companies gather information on consumer needs and feedback on the quality of the existing products, to identify the possible changes or improvements that the customers may need (Ferris, 2010).

2. Top management commitment

As much as the customer focus is considered a fundamental success factor of TQM, it can only be attained when all the employees focus on achieving maximum quality in all their actions. According to Siva et al (2016) TQM advocates for the engagement of all the employees in the organisation processes focused on achieving maximum quality. The attainment of the same is only possible when the company in question has a highly committed leadership. All the managers and supervisors must demonstrate their seriousness in the attainment of quality. Also, the leaders should ensure that they communicate the principles of TQM to the employees and its benefits so that they are encouraged to take part in its implementation.

Cortanda and Woods (2004) while exploring the role of leadership in promoting the implementation of TQM pointed out that a quality organisational policy is also vital in ensuring the TQM principles are implemented. The scholars stated that leaders are obliged to develop quality policies that communicate the process of TQM implementation. Also, constant monitoring of the performance achieved is important in ensuring that deviations from the set norms are spotted and corrected. As Maxwell (2009) posits effective leadership begins with the creation of the organisation's objectives and formulation of suitable strategies needed to ensure that the set objectives are accomplished. As such, having a highly committed and effective leadership promises the attainment of the Total quality in organisations.

3. Involvement and empowerment of employees

Employee empowerment refers to the approach undertaken by the management to give more discretion to the employees. According to Brymer (1991), the process undertaken to decentralize the decision-making process in an organisation such that autonomy is availed to the subordinates enhances their engagement in the organisation. Thomas and Velthouse (1990) also indicated that empowerment motivates the employees through instilling a sense of value and encouraging them to make vital decisions within their place of work. It is also evident according to Ugboro and Obeng (2000) that empowering employees does not only give them a sense of ownership of the company's activities and resources but also enhances their engagement in the company.

Empowerment and involvement of the employee is thus important in promoting the attainment of total quality in the organisation. Pearson et al (1995) asserted that the involvement of the employees enables the company benefits from the quality services that are availed by the staff. In fact, the benefits are more pronounced when the employees are involved in forms of teams that give them an opportunity to freely interact and associate with others, thus promoting knowledge sharing. Also, empowerment improves the performance of the employees such that they adequately and effectively undertake various tasks within the company. Proper involvement and empowerment of employees is thus important for any company that desires to accomplish total quality in its operations.

Even though employee empowerment is believed to contribute effectively towards the attainment of total quality, it must be undertaken appropriately for the perceived benefit to be realized. According to Hill (1991), it is advisable that companies communicate the reasons for and the goals of the empowerment process to avoid ambiguity in their actions. Also, the empowerment programs should be done to eliminate any form of domination within the workplace. The unnecessary control powers exhibited by some employees should also be abolished such that a level ground is created for all the employees (Hill and Huq, 2004). The sharing of responsibilities between the management and the employees enabled by the empowerment process is essential in flattening the organisational chart, an endeavour that is fully supported by the TQM management system.

4. Effective communication

Communication is a key requirement in any management process, TQM is not an exception. With proper communication, the quality issues can be easily outlined and the appropriate approaches for corrective measures conveyed. Also, communication can support the creation of awareness on the TQM principles and the suitable approaches for their implementation. There is a strong positive correlation between effective communication and attainment of quality in organisations (Burroughs, 2008). TQM requires effective communication that flows vertically and laterally within an organisation. The buyers and sellers must communicate effectively, for the needs of the customers to be understood such that maximum quality is promoted. The attainment of such an effective communication process assures the improvement of quality in the organisation.

5. Training

Training of employees is a prerequisite in TQM. The principle of TQM can only be understood and properly implemented when there is continuous training of the employees on the same. According to Kappelman and Prybutok (1995), training gives the employees an opportunity to understand the TQM goals and to acquire knowledge and skills needed to ensure the goals are achieved. Also, the training process ensures that the employees are always empowered. Continuous training of the employees is thus a sure way of ensuring that they work towards the attainment of zero defects that promote TQM.

6. Rewards and recognition

A system of rewards and recognition improves the motivation levels of the employees. Taking a positive approach in ensuring that the company's goals and objectives are accomplished is essential and likely to yield positive results. According to Charantimath (2006) looking for good deeds of the employees and recognizing their efforts through the provision of rewards is important in motivating them to focus on accomplishing the organisation's goals. Instead of focusing on the wrong doings of individuals and criticizing them, it is important to adopt a reward system that acknowledges and offers rewards to the high level of performance reported by individuals.

7. Measurement standards

Qualitative measurement of the performance of an organisation is important in ascertaining the extent of achievement of the set goals. Measurement is significant in enabling an organisation set objectives and priorities as well as evaluate the effectiveness of the approaches undertaken to execute them. Standards and measures of all the processes and procedures undertaken by the organisation should be set (Burroughs, 2008). Also, the standards should be set in a way that they reflect the customer requirements and needs. The role of the standards is to ensure that the employees are always doing the right thing and that there is a benchmark that guides the actions of the employees such that no errors are reported.

2.12. The Role of TQM on Organisational Performance

The measurement of the performance levels in an organisation is important in determining the effectiveness of the organisation is attainment of its goal. According to Isaksson (2006) organisational performance refers to the actual results of an organisation in relation to its intended output. The process of determining the performance of an organisation requires the identification of the organisation's goals, evaluation of the extent of their attainment and reporting on the deficiencies observed. Performance types such as financial, operational and quality exist, however, TQM is more focused on measuring performance in terms of operational efficiency and employee and consumer satisfaction.

The relationship evident between TQM and the performance of an organisation is based on the role of quality in enhancing the performance of an organisation. Different studies have focused on analysing their form of relationship and obtained that the performance of most manufacturing companies is influenced by their TQM levels. According to Das, et al. (2006), there is a positive relationship between TQM and organisation's performance. The scholars in their research found out that the implementation of the TQM principles leads to an enhanced performance level. The implementation of principles such as focusing on the customers, continuously improving the processes of the organisation, adequate involvement of the employees in the execution of tasks and having a highly committed leadership who embrace the need to accomplish total quality within the company leads to the achievement of a higher performance level. The authors also argued that the provision of rewards and adoption of an effective recognition system did not only

enhance the willingness of the employees to work towards the attainment of total quality but also positively influenced the performance of the manufacturing firms.

In another study by Saleheldin (2008) similar findings were obtained, where the researchers revealed that the implementation of the TQM principles leads to a significant positive improvement in the performance of the organisation. The researchers further pointed out that TQM had positive effects on both the organisational and operational performance of the firm. As much as an organisation takes a customer-focused approach in the management of its business activities, the possibility of reporting a higher level of performance is high. Also Burroughs (2008) has argued that continuous improvement of all the processes from the acquisition of raw materials to the release of the final product into the market leads to the attainment of a higher product value and enhanced customer satisfaction that positively contributes towards the attainment of a higher performance.

From a different perspective Sadikoglu and Olcay (2014) discovered that the different principles of TQM have varying implications on the performance of an organisation. The most significant principle that has positive implications on the performance of the organisation are top management commitment and customer focus. Also, the researchers pointed out that the lack of employee involvement in the organisation's activities and the lack of appropriate firm infrastructure were barriers to the implementation of TQM leading to the lower level of performance. Abuzaid (2015) while looking at the effects of TQM on the firm performance taking the case of a hospital obtained that the highest focus of the hospital in TQM practices led to the higher level of performance that was reported. Also, the customer orientation processes, supplier management and the nature of support availed by the leadership of the hospital also contributed significantly towards the attainment of a positive performance. The implementation of TQM therefore assures the attainment of a higher level of financial performance.

Most managers have recognized that the concept of TQM is useful in assisting them generate quality products and minimize their operational costs. According to Atkinson et al (2014) focusing on the needs of the customers and working towards attainment of maximum quality ensures that only those products that will meet the needs of the customers and that will be highly acceptable to the targeted consumer is developed. In this regard, the company is avail high value product that will not only accrue maximum sales but will also attract more customers into making purchases. The evolution of TQM as a philosophy has provided a significant opportunity for the

management to identify the best principles that are likely to promise the attainment of a higher performance level (Sadikoglu and Olcay, 2014). The role of TQM practices and principles in improving production efficiency, eliminating wastes, reducing production costs and reducing leads time thus justifies the ability of the concept to enhance the performance of an organisation.

As much as TQM provides an opportunity for enhanced level of performance and competitiveness it does not promise the continuous attainment of improved profitability. According to Tena, et al. (2001) most companies have failed to register a sustained profitability even with the implementation of TQM practices. However, as Abuzaid (2015) reported a higher level of performance and sustained profitability is only evident when the company effectively implements the TQM practices and principles. The idea is to accomplish all the quality standards from the beginning of the production process to ensure the higher performance desired is achieved.

2.13. Benefits and Critique of TQM

TQM offers significant benefits to both the organisation and the consumer. According to Li (2013) TQM can be adopted to ensure that the needs of the customers are met and to guarantee the provision of quality services to the same consumers. TQM approach also provides an opportunity for the customers to seek compensation if they feel that the services offered are not worth the value received. Such cases as discovered by Sadikoglu and Olcay (2014) are more evident in the banking sector where customers receive some payments when they stay longer in the queue or receive poor service. TQM thus ensures that consumers are highly satisfied.

TQM can also be implemented to ensure the customers receive just in time delivery of services of products. According to Das, et al. (2006) the engagement of the suppliers and the employees in the production process assures the timely production of the goods needed by the customers, thus a timely delivery is inevitable. Also, TQM suggests the use of the very best services providers, thus all the company's activities are likely to be of higher quality. The adoption of TQM in management is not only beneficial to the organisation but also supports the accomplishment of the needs of many consumers.

Despite the identified perceived benefits of TQM, the concept is not without some form of criticism. According to Burroughs (2008) TQM is not new and is just another approach of management. As such, the possibility of the concept in revolutionizing the manufacturing process

is minimal. Taking a customer approach in management, upon which the consumers determine the quality of the product, the price and the functions to be undertaken within the organisation posits the company as a subordinate to its clientele base (Maletič, 2013). Also, TQM is seen as a management approach under which the employees are given much power to act towards accomplishing the needs of the consumer. While some scholars may argue that the approach is effective and associated with increased organisational performance, others such as Tena et al (2001) have disputed the claim stating that TQM is just, and entrepreneurial spirit undertaken by organisations to empower its employees. It has nothing to do with improving the performance of the organisation, since in an environment where the customer dictates the occurrence within the company; more mistakes are prone to occur.

Other scholars have criticized the concept of TQM as an approach undertaken to just test the efficiency and effectiveness of the production process. Also, scholars argue that the assumption that the management approach promises the attainment of maximum quality is false. To them, the quality standards and manufacturing processes cannot be dictated by the happenings without the organisation. The views and ideas presented by the consumers

2.14. The Link between TQM and Sustainability

Most quality focused firms embrace the concept of TQM in their management. The pursuit of the ISO 9000 certification and the adherence with the principles of TQM ensures that the company embraces a customer-centric approach in management. TQM is based on the philosophy that the operations and activities of an organisation should be managed in a way that the resulting product or services offered to the customers exceeds their expectations (Abuzaid, 2015). Adherence to the set organisational and international standards of operation ensures that the desired maximum quality is attained to meet the needs and the requirements of the customers.

Elimination of any form of defect during the production process is the ultimate goal of a TQM management approach. The emphasis on the attainment of maximum quality with zero defects means that the companies that employ the concept register lower amounts of defects in their manufacturing process (Feigenbaum, 1983). Minimization of defects is considered a major requirement in companies, especially those operating in the manufacturing sector. The need by these companies to minimize the number of defects from their operation has spurred the

implementation of the TQM concept as currently evident in most companies (Matias and Coehlo, 2002).

The development of TQM over the decades has seen the integration of ISO standardised management systems such as ISO 9004, ISO 9001, ISO 14001, ISO 26000, ISO 18001, ISO 3100 and SA 8000. The ISO 9004 and ISO 9001 are aimed at quality management to improve quality performance and sustain a culture of continuous improvement. Guidelines on environmental issues are dealt with under the ISO 14001 while ISO 31000 and ISO 18001 deals with risk management. Social responsibility or corporate social responsibility (CSR) and social accountability are addressed under ISO 26000 and SA 81000, respectively. These ISO standards are viewed as international codes and standards that incorporate the concept of sustainability and thus have been widely accepted and are now common practice within organisations.

The ISO 26000 attempts to incorporate social responsibility into the operations of an organisation. Although it is only one part of the fundamentals of sustainability practices, it aims to support organisations in the implementation of sustainability practices (ISO, 2010). Previous studies (Garvare and Johansson, 2010; Isaksson, 2006; Zink, 2007) have argued that the ISO 26000 links quality management with sustainability as it aligns with the triple bottom line concept of 'true' sustainability. The ISO 26000 guidance standard provides organisations with engagement strategies on human rights, fair operating practices, community development, organisational governance, consumer issues, labour practices and environment. A comparison (Table 2.1) of the ISO standards ISO 26000, ISO 9001 and ISO 14001 as highlighted by Castka and Balzarova (2008) reveals that unlike the ISO 9001 and ISO 14001 where the key requirements for a management system are defined, the ISO 26000 is a guideline and not a management system. Thus, because the ISO 26000 is not a management system, it does not require a third-party certification like ISO 9001 and ISO 14001. The guidelines for monitoring and improving social responsibility performance have been stated in the ISO 26000. However, it is generalised, and it lacks a structured procedure as observed in quality and environmental management systems (ISO 9001 and ISO 14001). A process approach which embeds the plan-do-check-act (PDCA) cycle is applied to the ISO 9001 and ISO 14001 standards.

Table 2. 1 ISO standards comparison (adapted from Castka and Balzarova (2008))

	ISO 26000	ISO 9001	ISO 14001
General description	International standards on Social Responsibility (SR)	Quality Management System standard	Environmental Management System standard
Certification	No	Yes	Yes
Key elements	The SR context in which all organisations operate SR principles relevant to organisations Guidance on core SR subjects/issues Guidance for organisations of implementing SR	Quality management System Management responsibility Resource management Product realisation Measurement, analysis and improvement	Environmental policy Planning Implementation and operation Checking and Corrective Action Management review
Scope	Promotes common understanding in the field of social responsibility; provides guidance that is applicable to all types of organisations; takes account of societal, environmental and legal diversity, as well as differences in economic development conditions, except where these are in conflict with broadly accepted international norms of socially responsible behaviour	Specifies requirements for a quality management system where an organisation needs to demonstrate its ability to consistently provide product that meets customer and applicable regulatory requirements, and aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements.	Specifies requirements for a quality management system where an organisation needs to demonstrate its ability to consistently provide product that meets customer and applicable regulatory requirements, and aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements.
Principles	Accountability, Transparency, Ethical behaviour, Respect for stakeholder interests, Respect for the rule of law, Respect for international norms of behaviour	Customer focus, Leadership, Involvement of people, Process approach, System approach to management, Continual improvement, Factual approach to decision making, Mutually beneficial supplier relationship	Shares common management systems principles with ISO 9001

Having discussed the differences, it is important to state the similarities these standards share. While the main focus of the ISO 9001 is quality improvement and customer satisfaction (Castka and Balzarova, 2006; Corbett and Luca, 2002) and ISO 14001 addresses the environment, community and regulators (Zeng et al., 2005; Poksinska et al., 2003; Karapetrovic and Willborn, 1998), ISO 26000 deals with a more diverse stakeholders including stakeholders from the two

standards. ISO 26000 provides a general guidance applicable to all types of organisations. As CSR is seen as a precursor to sustainability practices, ISO 26000 drives ISO 9001 in the direction of CSR excellence in the sense that it shifts the traditional customer focus of ISO 9001 to a wider stakeholder base. It provides guidance (Clause 7) that supports organisations to outline objectives and develop strategies that will help evaluate performance for continuous improvement. This has substantiated the argument on the existence of congruence between TQM and ISO 26000 (Rocha et al., 2007; McAdam and Leonard, 2003).

2.15. Sustainability Practices in the Context of TQM

At the business level, sustainability is achieved when the business entity meets the needs of its direct and indirect stakeholders, such as customers and the society respectively, without hindering future generations of stakeholders from meeting their needs (Dyllick and Hockets, 2002). For total quality management to be achieved, the business must follow three sustainability elements of integrating economic aspects of a business with the environmental and social aspects in accordance with the Brundtland report. These three elements are referred to as the “triple-bottom line” elements. Dyllick and Hockets (2002) state that the concept of total quality management and the organisational sustainability are complementary aspects that are guided by the following three principles.

(i) Efficiency in Operation Processes

One of the fundamental principles of TQM is to increase customer efficiency by getting rid of all processes that do not add value to the customer or the product to be purchased by the customer. Waste reduction principle focuses on getting rid of processes that reduce organisational wastage. King and Lenox (2001) describe wastage in an organisation as any practice, process or material whose use leads to creation of unusable by-products. Consequently, the TQM’s policy of zero wastage encourages prudent and efficient use of resources in a manner that prevents both wastage and leads to customer satisfaction.

(ii) Process-Centred Focus

Process-centred focus emphasizes on quality practices in all steps of the processes. This principle encourages the attainment of the desired quality from the beginning to the end of every process.

According to King and Lenox (2001) a mistake committed at the beginning of the process should not be corrected in the later stages, since it will have negative impacts on the whole process. rather, it should be corrected at the point of origin and measures taken to avoid its repetition elsewhere. Similarly, Sawhney et al. (2007) points out that environmental sustainability should be implemented at the point of origin rather than finding solutions to counter problems at the end of the process.

(iii) Involvement and Participation of Employees

Martinez-Jurado and Moyano-Fuentes (2014) argue that TQM requires the organisation to involve the human resources with the system to create a friendly relationship. The people need to be trained on how to use tools and equipment as well as employ techniques aimed at improving their output. Teamwork, workers' versatility and group evaluation help in familiarizing the employees with the total quality management system. Business entities and other organisations should adopt TQM as part of their organisational culture to improve the principles and practices of the organisation.

Evidence shows that organisations that adopt TQM systems create a conducive environment for the adoption of environmental policies that promote green manufacturing, hence achieving desirable environmental performance. Vinodh, et al. (2011) points out that TQM principles and practices have been evidenced to promote attainment of environmental goals that lead to organisational sustainability. Vinodh further discusses the relationship between the level of total quality management and organisational performance. Although many authors (Vinodh, et al., 2011; King and Lenox, 2001) have linked high levels of TQM to organisational performance and sustainability, a few other authors found a negative relationship existed (Rothenberg et al., 2001).

2.16. Organisational Performance

Organisational performance is a subject that has been extensively researched over the years in various literatures (e.g. Zhang et al., 2012; Ho, 2011; Baird et al., 2011; Lin and Kuo, 2011; Prajogo and Sohal, 2006; Fuentes-Fuentes et al., 2004; Curkovic et al., 2000; Samson and Terziovski, 1999; Choi and Eboch, 1998; Yamin et al., 1997; Chenhall, 1996). In spite of this, the definition of organisational performance has remained ambiguous. However, it is important to note that attempts have been at defining organisational performance and the studies have been generally

categorised into performance measurement frameworks and systems and performance measures. Performance measurement has featured in most studies on organisational performance. And this has led to its dominance in the discussion around organisational performance. Taken from the perspective of marketing, Kotler (1984) argued that organisational performance is measured by the effectiveness of an organisation's ability to satisfy the needs of its customers in comparison with its competitors. Neely (1994) defined organisational performance measurement as the process where a set of metrics are used to assess the efficiency and effectiveness of an organisation's operations. This definition is adopted from an operational perspective.

Over the years, financial measures/indicators have been used by organisations to measure performance. However, these indicators have come under criticism as limited and lack the long-term view of the organisation's impact. A more comprehensive approach that includes financial and nonfinancial performance measures such as environmental impact, social responsibility and operational measures have been recommended (Gomes et al., 2011; Brown, 2000; Neely and Adams, 2000). The interpretation of this recommendation is that complete assessment of organisational performance requires the combination of multiple indicators. This development has seen the introduction of new organisational performance measures such as quality performance and inventory management performance (Baird et al. 2011), productivity, employee performance, operational performance and customer satisfaction, Fuentes-Fuentes et al. (2004), Samson and Terziovski (1999). Although this has broadened the concept of measurement of organisational performance, measurement of overall organisational performance still remains inconsistent and ambiguous.

2.16.1. Impact of TQM on organisational performance

The impact of TQM on organisational performance has received significant attention over the years. This has led to extensive review of TQM practices and their relationship with organisational performance. Researchers Wu et al. 2011; Baird et al. 2011; Sila 2007, Zu 2009; Lakhal et al., 2006; Kaynak, 2003; Prajogo and Sohal, 2003;; Samson and Terziovski, 1999; Choi and Eboch, 1998) across the board have identified various TQM elements or practices such as top management commitment, customer focus, process management, people management, supplier quality management, innovation and product/service design as the main drivers of

continuous improvement. The continuous improvement helps organisations achieve efficiency, increase profit and productivity and thus improve the overall organisational performance.

The synergy between TQM and organisational performance has featured extensively in TQM literature. In addition, a significant number of empirical studies have supported the positive relationship between TQM and organisational performance. The studies have suggested various ways TQM improves organisational performance. According to Zu (2009) and Sila and Ebrahimpour (2005), TQM practices such top management commitment has played a significant role in enhancing the performance of an organisation. They argued that top management are responsible for setting the vision, policies and organisational culture which are the foundation for performance in an organisation. Previous studies like Curkovic et al. (2000) hold the same view that suggest evidence of top management contribution to competitive advantage. Top management provides direction and lays the foundation in terms of policies, strategies that will lead to the implementation of vital programs in an organisation. This is consistent with empirical studies (Thiagarajan et. al., 2001; Arawati, 2000; Yusof and Aspingwall, 1999; Grandzol and Gershon, 1998; Black and Porter, 1996; Ahire and Golhar, 1996; Powell, 1995; Anderson, et. al., 1994; Porter and Parker, 1993 and Saraph, et. al., 1989) that have identified top management as a critical success factor of TQM implementation.

Customers or stakeholders are the most important element of an organisation. The success of an organisation is determined by how well the organisation is able to satisfy its stakeholders (Maletic, 2013). Understanding the different sets of customers (internal and external) will help organisations achieve their goals. Internal customer focus aims to boost employee morale to increase productivity while external customer focus is aimed at increasing customer satisfaction, sales growth and market share (Terziovski and Samson, 1999). Empirical evidence has revealed that this practice has a positive influence on organisational performance (Yang, 2006; Hoang et. al., 2006; Ahmed et. al., 2005; Lewis et. al., 2005; Lagrosen and Lagrosen, 2005; Prajogo and McDermott, 2005; Prajogo, 2005; Seth and Tripathi, 2005; Tari, 2005; Sila and Ebrahimpour, 2005). Another TQM practice that has been extensively documented to influence organisational performance is continuous improvement. In the quest for perfection, organisations continuously improve their processes and products/services to achieve a competitive advantage which will lead to improved organisational performance (Demirbag et al., 2006).

2.16.2. Impact of corporate social responsibility on organisational performance

The concept of CSR was born out of the concern of the impact of business activities and the idea that organisations have a role to play in society beyond satisfying the needs of their stakeholders. Depending on the perspective, there are a number of definitions of CSR. One of such definitions is the European Commission's (EC) definition of CSR which states that CSR is a concept where the environmental and social aspects are integrated into an organisation's business operation on a voluntary basis (EC, 2001). This definition implies that organisations are under no obligation to consider the social and environmental impact of their business activities. Therefore, organisations will only integrate social and environmental concerns if it aligns with their business strategy. Dahlsrud (2008) and Campbell (2007) share the view that CSR is a result of social pressure.

An extensive literature review reveals that the impact of CSR on organisational performance has been debated in various theoretical and empirical studies over the years. Some studies have concluded that CSR has a positive influence on organisational performance while other studies suggest that there is a negative or no correlation between CSR and organisational performance.

Table 2. 2 Summary of the influence of CSR on organisational performance

	Positive Correlation	Negative/No Correlation
1	A study by Orlitzky, et al. (2003) reveals that CSR has a significant positive influence on organisational performance.	The relationship between CSR and financial performance is insignificant (Margolis and Walsh, 2003).
2	Mittal, et al. (2008) and Cegarra Navarro and MartínezMartínez (2009) reported that CSR improves organisational reputation and has a positive effect on employee motivation and retention.	Mittal, et al. (2008) revealed in a case study that there is insufficient evidence to suggest that organisations with CSR have a competitive advantage.
3	Qu (2009) and Callan and Thomas (2011) corroborated the findings in previous studies that suggested that CSR has a positive relationship with organisational performance.	Although the study of Cegarra Navarro and MartínezMartínez (2009) found no correlation between CSR and financial performance, they suggest that CSR has a positive effect on organisational culture, business ethics and organisational reputation.

4	A quantitative empirical research by Lin, et al. (2009) reveals that there is evidence of a positive relation between CSR and financial performance. The study suggests that CSR increases profitability and market share.	A quantitative empirical research by Aras, et al. (2010) reveals that there is no relationship between CSR and financial performance or increase in profit of an organisation.
5	A study of Chinese companies' adoption of CSR activities has been reported to improve financial performance (Chang, et al., 2011).	Crisóstomo et al. (2011) reveals that CSR has a negative influence on the value of an organisation. They added that there is no relationship between CSR and financial performance.
6	Weber (2008) suggests that CSR helps organisations to save cost, increase profit and market share, improves organisational reputation. The study also found a positive correlation between CSR and recruitment of employees due to the improved image of the organisation. Another benefit of CSR reported by Weber (2008) is that it has a positive effect on employee motivation and retention.	Blomgren (2011) supported the assertion that CSR does not increase profit beyond the industry average. This implies that CSR does not result in competitive advantage in terms of profit.
7	There is evidence to suggest that there is a positive relationship between CSR and organisational performance (financial and nonfinancial performance) (Michelon, et al., 2012).	

It is significant to point out that there is no consensus on how to measure activities or link CSR to dimensions of organisational performance. An extensive review of literature on the concept of CSR reveals that researchers have used a wide range of approaches to evaluate the impact of CSR on the operations of an organisation.

2.17. Synergy Between TQM and Sustainability Practices

In the last few decades, TQM has evolved beyond the traditional focus of satisfying the needs and expectations of the customer as the end user of the product or service to include requirements of various stakeholders (Maletic, 2013). These stakeholders include investors, customers, employees, societies, environmental groups, governments. As a result of this widening of the scope of TQM, there is an increasing demand for organisations to integrate environmental and social concerns into their business strategy. Furthermore, this demand, competition and the need for resource conservation have led to the adoption of environmentally

friendly products, integration of environmental factors into the strategic and operational decisions of an organisation (Hart, 1997 and Sarkis, 2003).

The effect of integrating environmental factors into business strategy has been reported a number of studies to have a positive impact on both the economic and environmental performance of an organisation (Jacobs, et al., 2010; Iraldo, et al., 2009; Nawrocka and Parker, 2009; Eiadat, et al., 2008; Perotto, et al., 2008; Barla, 2007; Link and Naveh, 2006; Figge, 2005; González-Benito and González-Benito, 2005; Poksinska et al., 2003; Wagner et al., 2002; Sarkis and Cordeiro, 2001). This assertion is corroborated by the findings of Rao and Holt (2006). Their study concluded that environmental initiatives such as greening can result in improved economic performance in terms of cost saving as a result of waste reduction, increase in profit, and increase in market share. The improved organisational performance leads to increased competitive advantage. Additionally, the process ensures the elimination of waste, recycling and re-use of products which lead to a reduction in the use of energy, water and raw materials.

A number of parallels can be drawn between TQM and environmental management and by extension sustainability practices (Kleindorfer, et al., 2005). TQM focuses on eliminating inefficient processes to reduce cost, prevention of defects and efficient and effective use of resources (Corbett and Klassen, 2006; Dahlgaard, et al., 1998). This is consistent with the view taken on sustainability practices. The fundamental principles of sustainability are based on the efficient use of resources to satisfy current needs while at the same time ensuring the needs of the future are not diminished (Maletic, 2013). Therefore, in the context of sustainability practices, processes are refined to reduce waste, efficient energy usage and efficient consumption of raw materials. These initiatives have been reported to improve organisational performance and thus ensuring organisational sustainability (Banerjee, 2001).

The evolution of TQM together with increasing pressure on organisations to adopt the triple bottom line has seen a transition from a more traditional customer base (end user of product/services) to a wider stakeholder base where environmental and social concerns are considered in business operations. Webber (2008) posited that CSR a sub-area of sustainability aligns with the pursuit of the triple bottom line concept. Asif et al. (2013) argued that the organisations need to continuously identify the demands of their stakeholders in order to integrate them into their business activities. They further argued that the success of the

integration depends on strategic planning, efficient process design, continuous improvement strategy and efficient resource management.

Another synergy identified in this literature is in the area of product/service design. TQM through continuous improvement seeks to continuously improve products/services to exceed the expectations of the customer. This provides the foundation for innovation which is viewed as an integral part of sustainability practices (Maxwell and van der Vorst, 2003). Sustainability practices require that products/services be developed in a more sustainable way while reducing cost and without compromising the customers' requirements. This is consistent with the concept of continuous improvement in TQM. De Visser et al. (2010) argued that the integration of TQM and sustainability practices leads to the development of new product/service is multidimensional and it aims to improve existing processes and products/services while at the same time can lead to the creation of new product/service.

2.18. Conceptual Framework for the Study

Conceptual framework refers to a model illustrating the relationship between variables in a study. Jabareen (2009) defined conceptual framework as a systematic order of information and ideas that informs a study and the resulting relationship between the constructs of the study. The current study focuses on establishing three main constructs, sustainability, total quality management and organisational performance. As such, the conceptual framework will focus on illustrating the relationship between sustainability, total quality management and organisational performance variables.

Total Quality Management

From the critical review of literature, it is evident that the concept of TQM emerged as early as the 1920s, however, more emphasis on enhancing the quality of the technical processes of the organisation. Total quality management during that time was driven by the Japanese organisations, an approach that was later adopted by other companies across the world. Recent development has seen the manufacturing firms also consider other aspects such as customer satisfaction and employee empowerment as measures of quality (Arumugam, Ooi and Fong, 2008). As currently observed, total quality management practices have been classified as soft and hard quality. The soft aspect of quality focuses on employee engagement, training and development of staff, teamwork, compensation and commitment of the management amongst

others (Delbridge, Turnbull and Wilkinson, 1992). On the other hand, hard aspects of TQM focus on the effectiveness of the production techniques and processes. Also, the management of suppliers and production time is classified under the hard form of TQM.

Most studies have emphasized the role of the hard aspects of TQM in meeting the needs of the customers through availing quality products. Also, these scholars emphasize on the hard aspects of the TQM since it is directly linked with the proper utilization of different processes to ensure that the desired needs of the customers are met. Minimal emphasis has been put on the soft form of quality that aims at improving the effectiveness of the employees in the provision of services such that the desired higher quality products are attained. However, recent studies by Idris (2011) and Wong et al (2014) have highlighted the importance of the soft aspects of quality, and its relevance in ensuring that quality products that meet the needs of the customers are availed. According to the scholars, any discussion on TQM should thus focus on both the soft and the hard aspects of Total quality management.

The current study therefore included the soft and hard aspects of TQM in the development of the conceptual framework. The approach taken is in line with the framework used by Benavides-Velasco, et al., (2014) who adopted the EFQM framework in their study on total quality management. The model emphasized on the inclusion of both hard and soft dimensions of quality in any discussion on total quality management. The most discussed topics under the soft and hard aspects of quality include the management, employees, resources, processes, products, resources, strategy and partnership.

The management and leaders to an organisation are considered a vital component in the attainment of total quality management. The capacity of the leaders to offer quality supervision and proper control of resources determine the level of quality that can be accomplished. As such, the management is considered a vital component in TQM.

Employees are also vital enablers of TQM. Their contribution and delivery of quality services influences the attainment of effective production processes that assures the achievement of maximum quality (Oakland, 2011). Empowerment, training and motivation of the employees is thus mandatory for them to offer quality service to promote TQM.

The strategic plan adopted by the organisation and the availability of resources also influences the attainment of TQM. Also, the nature of partnerships evident between the organisation and

other stakeholders informs the level of performance that can be achieved (Harrington and Keating, 2006). The series of activities executed by the organisation and the probable value created by such activities also determines the level of quality that can be accomplished. The inclusion of the above quality variables in the conceptual framework is thus justified since they are significant enablers of total quality management.

Sustainability

Climate change has redefined the role business organisations play in economic, social and environmental development. The impact of the activities of business organisations around the world are being questioned today more than ever and their reputation and business ethics closely monitored. This has forced a growing number of businesses around the world to get more involved in the discussions around sustainability practices. However, it is important to note that some of these discussions as highlighted by Dyllick and Hockerts (2002) are taking place under headings such as Business Ethics, Environmental Management Corporate Social Responsibility (CSR).

The definition of sustainability practices in the context of business and how to integrate such practices into business strategies have been a major challenge for business. This has dominated the discussion on sustainability practices for over a decade. Therefore, it has been argued that to understand sustainability practices, business organisations must view sustainability as a means of meeting the needs of stakeholders (both direct and indirect) without compromising its ability to meet the needs of future stakeholders (Dyllick and Hockerts, 2002). This definition implies that organisational sustainability is vital for the successful implementation of sustainability practices. Another important standpoint from this definition is that it extends the traditional stakeholders of an organisation to include internal (employees, managers, investors) and external (customers, regulators, suppliers, society) stakeholders.

Sustainability focuses on the effective and efficient use of resources such that they meet the needs of the current consumers without compromising the needs of future generations. Organisations have a role to play in promoting sustainability practices. Their activities should have minimal negative implications on the environment; they should efficiently use the existing resources as well as adopt sustainable practices that focus on minimization of wastes. From the review of literature, it is evident that there are different sustainability practices that can be

adopted by an organisation. These practices focus on recycling of waste, use of renewable sources of energy, conservation of resources, amongst others to accomplish sustainability.

While sustainability practices are associated with better environmental performance, the effects of the strategies on economic performance have been strongly disputed by scholars who argue that the primary role of a business entity is to enhance shareholder value (Wagner and Llerena, 2008). This contentment has been disputed by Freeman (1994) who has asserted that an organisation is not only responsible for achieving maximum shareholder value but should also focus on managing proper relationships with other stakeholders including employees, suppliers and other customers. According to Adnan et. al., (2014) profitability is not the only factor that determines improved performance, the social performance of an organisation also has significant influence on its overall growth and profitability. Adoption of sustainable practices is therefore important in enhancing the overall performance of an organisation.

From the critical review of literature, the construct of sustainability can be defined in two main approaches. First, the relationship between sustainability describes the relationship between the company, stakeholders and the society, and secondly, the construct describes the company voluntary involvement in activities that promotes environmental conservation (Carroll and Buchholtz, 2014). As such, when looking at the construct of sustainability, social, economic and environmental issues pertaining to sustainable development must be taken into consideration.

Organisational Performance

The measurement of the performance of an organisation is complex. According to Sila (2007), the performance of an organisation can be measured through different accounting and financial angles. Homburg and Pilesner (2000); Kaplan and Norton (2001); Helfat, et al. (2007) support this view of using financial indicators as a measure of organisational performance. However, these indicators have been criticised to be limited. Several studies (Gomes et al., 2011; Brown, 2000; Neely and Adams, 2000) have suggested a more comprehensive approach that includes multiple indicators, financial and nonfinancial performance measures such as environmental impact, social responsibility and operational measures. This development has seen the introduction of new organisational performance measures such as quality performance and inventory management performance (Baird et al. 2011), productivity, employee performance, operational performance and customer satisfaction, Fuentes-Fuentes et al. (2004), Samson and Terziovski

(1999). The inclusion of multiple indicators has broadened the concept of organisational performance measurement.

2.19. Relationships Between the Variables and Hypothesis Development

The adoption of sustainable practices in an organisation is influenced by different factors. While the benefits of sustainable development are known, most organisations are yet to implement the strategy in their management process. Previous scholars have posited that the presence of an enabler or inhibitor of sustainability will determine the level of adoption of sustainability practices in an organisation (Lehrer and Vasudev, 2010; Darby, 2010). For instance, enablers of sustainability such as information technology, top management, organisational culture that supports the sustainability practices and adequate resources will positively influence the implementation of sustainability practices in the organisation. On the contrary, inhibitors of sustainability such as cost and short-term goals will limit the capacity of an organisation from fully implementing the sustainability practices.

Based on the findings of the scholars and as expounded in the literature section, it is hypothesized that there is a positive relationship between sustainability enablers and implementation of sustainability practices.

Hypothesis 1: There is a positive relationship between TQM principles as enablers and implementation of sustainability practices

Previous researchers have indicated that TQM and the adoption of sustainable practices have positive implications on the performance of the organisation. In the context of TQM, the researcher obtained that TQM practices influence the innovation and operational performance of the organisation (Sadikoglu and Zehir, 2010). Also, the previous studies have indicated that employee performance and customer satisfaction are associated with the implementation of TQM practices (Das, et al., 2008). Agus and Sagir (2001); Bondy, et al. (2012) and Yunie, et al. (2013) also obtained an association between the implementation of TQM practices and the financial performance of the organisation.

It is thus hypothesized that there is a positive relationship between both TQM and sustainability practices, and organisational performance.

Hypothesis 2: There is a significant relationship between both TQM and Sustainability practices and organisational performance

H2a: There is a significant relationship between TQM and organisational performance

H2b: There is a significant relationship between Sustainability practices and organisational performance

A significant relationship has also been established between the implementation of sustainable practices and TQM. According to Sun et al (2010) different elements of sustainability practices of an organisation are influenced by the implementation of the quality performance measures. For instance, the TQM principles focus on offering maximum quality to the customers and also ensuring that there is minimal wastage along the production line. Organisations that adopt a TQM approach in the management of their production activities will only focus on making goods that are likely to be acceptable by the customers (Sadikoglu and Zehir, 2010). Also, these organisations will aim at minimizing wastes and conserving the available resources to achieve maximum quality (Das et al., 2008). Sustainability is concerned with minimization of wastes along the production line as well as effective and efficient use of resources to assure their conservation. As such, the adoption of a TQM approach will thus require the implementation of sustainable practices such that the desired needs of the customer are attained. Companies that focus on TQM are therefore likely to adopt most if not all the sustainability practices. It is thus hypothesized that organisations with strong TQM implementation practices are better at implementing sustainability practices.

Hypothesis 3: Organisations with strong TQM implementation practices are better at implementing sustainability practices.

The profitability of the firm as well as other measures of performance such as customer and employee satisfaction are influenced by the engagement of a firm in the implementation of sustainable practices (Mishra and Suar, 2010; Sun et al., (2010). Similar to the implementation of a TQM approach in the management of the organisation's practices is likely to assure the attainment of a higher level of performance. TQM focuses on meeting the customer needs as well as efficient use of resources factors that are likely to enhance the performance and profitability of the organisation (Das et al., 2008). The co-implementation of TQM practices and Sustainability is thus likely to lead to an even higher level of performance. It is therefore

hypothesized that the co-implementation of TQM and sustainability has a direct positive effect on organisational performance

Hypothesis 4: The co-implementation of TQM and sustainability has a direct positive effect on organisational performance

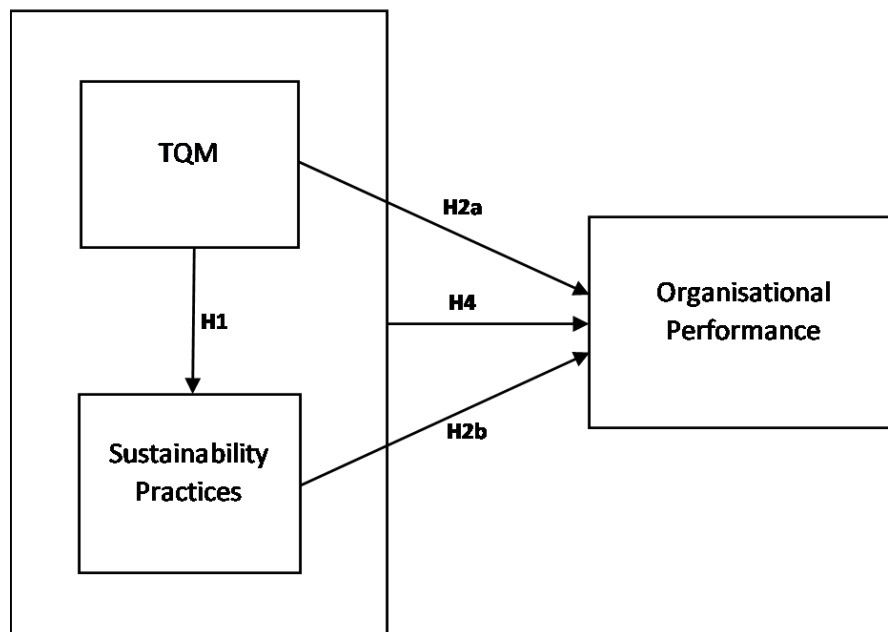


Figure 2. 1 The following conceptual framework is developed to illustrate the relationship between the study variables

2.20. Summary

Sustainability refers to the social, economic and environmental form of development that allows the present generation to accomplish their needs without compromising the ability of the future generation to access the desired natural resources. The concept of sustainability is based on three pillars, social, environmental and economic development

The historical emergence of the sustainability concept can be traced back to the year 1798, when the first publication on sustainability by Thomas Malthus emerged. More publications became evident in the subsequent years such as those of Garret Hardins. To further develop the concept

of sustainability and create more awareness, conferences by the governments and the UN were held to address the sustainability challenges. The assertion that sustainability requires a global approach in its management fuelled the emergence of most of the conferences held in different parts of the world

From the Stockholm conference held in 1972 to the United Nations Conference held in 1988, the conferences focused on the formation of partnerships amongst the member states that will contribute towards the attainment of sustainable development. The formation of the world conservation strategy and the Brundtland report, led to a clear outline and identification of the long-term development goals that when accomplished will support the attainment of sustainable development. The strategy also played a role in communicating the goals to the different nations of the world.

More conventions were formed post the Brundtland report to create more awareness on the concept of sustainability and the need to address its challenges. The UN conference held in 1992 named the Rio Earth Summit focused on communicating the issues of environment and sustainability, and also identifying the strategies that can be implemented to ensure that the strategic goals are accomplished. The conference culminated with the release of the Commission report on sustainable development and the Rio Declaration Agenda 21, documents that detailed the strategic approaches suitable for the attainment of sustainable development

Later, the Kyoto Conference held in 1997, tackled the issues of climate change and the need to reduce the emission of greenhouse gases to minimal levels. The world summit on sustainable development held in 2002, also had the same agenda, however, it also focused on building strong relationships amongst the member states to accomplish some level of trust needed in ensuring they implement the Millennium Development Goals

The most recent Paris conference led to the development of the “Paris Agreement” document where nations were expected to develop a plan with specific goals and targets on sustainability. As of February 2018, 195 states had signed the agreement and were in the process of developing the plans. Despite the many conferences and targets on sustainability set earlier, the challenges and problems of social, economic and environmental developments have remained pervasive. Whether the recent agreement signed by the different states will yield any positive results, is a matter of wait and see.

The Triple Bottom Line of sustainability has also explained the concept of sustainability in an expanded manner to include the economic and social aspects. The Triple Bottom line therefore determines the sustainability performance of an organisation based on the social, economic and environmental dimensions.

Strategies such as green building, use of renewable energy sources, efficient transportation, waste reduction and recycling, and offsetting carbon emissions can be adopted to accomplish sustainable development. However, sustainability barriers such as lack of clear definition, short-term goals, economic and financial cost have hindered the implementation of sustainability practices.

It is however, observed that the implementation of sustainability enablers such as enhanced information communication system, highly committed leadership, adequate resources and the implementation of a TQM approach in management will assist the organisation achieve the sustainability targets

Total quality management refers to a customer-focus approach adopted in management to achieve maximum quality and enhanced customer satisfaction. The approach is effective in promoting sustainability since it focuses on achieving efficiency of the production process, through identification of the customers' needs and only producing goods that will be acceptable to the consumers. In this sense there is efficient utilization of resources and maximum reduction of wastes.

TQM also enhances the economic value of an organisation following its effectiveness in the reduction of the production cost. The continuous improvement of the production systems as required by the TQM concept ensures maximum efficiency is reported in cost reduction

TQM also requires that the needs of the customers are satisfactorily met. As such, it can be deduced that the TQM concept supports the attainment of sustainability by accomplishing its three main components, economic, environment and social value. The adoption of TQM as a management strategy alongside other enablers of sustainability is likely to enhance the sustainability performance of the company as well as its level of contribution towards the attainment of sustainable development. The last section of the chapter presented the conceptual framework for the research and a discussion on how the framework was developed. A justification for the different variables included in the framework is also presented.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

This section presents the research methodologies and methods adopted in the current study. It identifies the main philosophical assumptions that guided the choice of research approach adopted. Based on these assumptions the justification for adopting quantitative research methods was made. This is followed by a discussion of the different research philosophies, research approach, designs and a comparison between the different types of research. And finally, the section concludes with a presentation of the conceptual model.

3.2. Research Philosophy

Management research seeks to provide objective knowledge especially when studying complex phenomena such as TQM and sustainability. Therefore, it is important to understand the different research philosophies that underpin how the researcher views the world (ontology) and the relationship between the researcher and the reality (epistemology) and the method adopted by the researcher (Easterby, Thorpe and Lowe, 1991). Interplay between the ontological and epistemological assumptions that will guide the research process. According to Bryman (2012), a research philosophy refers to the set of beliefs concerning the nature of the reality being investigated and this is often studied in the context of ontology and epistemology.

3.2.1. Ontology: objectivism versus subjectivism

Ontology in research is defined as “the science or study of being”. Ontological philosophy deals with the nature of reality. According to Hughes and Sharrock (2016) ontological philosophy refers to a system of belief reflecting the interpretation of what constitutes a fact. In essence, ontology is associated with a belief or an assumption that social entities need to be perceived as either objective or subjective. As such, objectivism (or positivism) and subjectivism are specified as the major aspects of ontological philosophy.

Objectivism aspect of philosophy “portrays the position that social entities exist in reality that is external to social actors concerned with their existence”. Alternatively, objectivism “is an aspect of ontology that asserts that a social phenomenon and the meaning pertaining to it is independent of social actors”. On the other hand, Subjectivism (also known as constructionism or interpretivism) holds that social phenomena are developed from the perceptions and

consequent actions of the social actors concerned with their existence. Formally, constructionism can be defined as “ontological position which asserts that social phenomena and their meanings are continually being accomplished by social actors”. Identification of ontology at the beginning of any study is important since it influences the choice of the research design that can be implemented in that study.

Importance of Ontological philosophy

The first importance of ontological analysis prior to starting-up a study is that it clarifies the structure of knowledge. According to Moon and Blackman (2014) ontology forms the heart of any given system designed in the representation of knowledge. The conceptualization of the knowledge underlying a study is needed to identify the right vocabulary for the representation of such knowledge. If we do not have the conceptualizations that underline knowledge, then we do not have a vocabulary for representing that knowledge. Thus, the initial step in knowledge representation is conducting effective ontological analyses of some field of knowledge. Karakayali (2015) asserts that weak ontological analyses lead to the formation of incoherent knowledge bases. Consider a domain consisting of different people, some students, some professors, while others are employees. Initially, a simple ontology would be used for the different classes of employees, students, professors, males and females. The ontology is likely to be represented as ‘types of’ humans. The simple ontology approach however caused problems since it was noted that students could at some time be employees and could also stop being students. As such a proper approach was needed to clarify the ontology of the data domain to support proper reasoning about the data.

Apart from clarification of knowledge ontologies enable knowledge sharing. According to Hughes and Sharrock (2016) ontology provide a means for sharing knowledge. As indicated above, ontological analysis supports the conceptualization of knowledge that underlies a given study. Also, ontological analysis enables the researcher to come up with different vocabularies within the knowledge area conceptualized (Walliman, 2015). The creation of such a knowledge base is not only important in guiding the research but also provides an avenue for knowledge sharing. The researcher can communicate the findings obtained such that the resulting ontology can be shared with others who require a similar knowledge representation thus avoiding the possibility of replicating the knowledge analysis.

These resulting ontologies form the foundation for the representation of knowledge that is specific to a given domain. Contrary to the initial approach to knowledge-representation such as KL-One, the current approach that embraces much specificity is considered to be rich in content (Karakayali, 2015). For instance, the approach to ontological analysis has a large number of terms that symbolize a complex content theory. As such, a specific knowledge base describing different situations can be attained. Ontological analysis is therefore important in supporting the conceptualization of knowledge and in ensuring that the resulting knowledge can be shared and reused.

3.2.2. Epistemology

Epistemology refers to the study scope and nature of knowledge to justify the belief assigned to the knowledge. Epistemology analyses the nature of knowledge in reference to its relations with the notions of truth, belief and justification of the same (Chinn and Rinehart, 2016). The philosophical approach also deals with the approaches undertaken in knowledge production and the uncertainty about various knowledge claims. Epistemology is mainly concerned with issues of knowledge creation and dissemination for inquiry purposes (Hanson et al., 2017). The major questions that a researcher would ask in regard to epistemology analysis include, what is knowledge? How do people acquire knowledge? To what extent does the level of knowledge influence the actions of an individual? And so on.

Most debates on epistemology and nature of knowledge is centred on the philosophical approach to research, analysis of the nature of knowledge, issues or scepticism associated with knowledge acquisition, sharing and dissemination, and the process for justification of knowledge. According to Chinn and Rinehart (2016) epistemology refers to how people think in order to discover the truth of a matter or the fault in it. Epistemology philosophy is needed in order to obtain comprehensive information from the situations and occurrences of the world. Walliman (2015) has asserted that in the absence of epistemology, humans are unable to think and are thus unlikely to discover any form of knowledge. It is therefore impossible for the researchers to ascertain that their beliefs are correct and realistic and not just mere information and images flashing the minds of an individual. With an inaccurate epistemology, the researcher is unable to distinguish between an error and a correct occurrence leading to poor conceptualization of knowledge.

As Hanson et al (2017) posit, the extent through which the epistemology is correct, influences the understanding of reality. Also, the degree through which one uses knowledge correctly is dependent on how well epistemology analysis is conducted. Correct epistemology analysis leads to enhanced ability to understand the occurrences in the environment, on the contrary flaws in epistemology analysis makes it difficult for one to accomplish any role.

Key elements of Epistemology

While every individual has the same senses designed for knowledge acquisition, the method adopted by various persons in achieving that knowledge varies. According to Chinn and Rinehart, (2016) the process of producing, understanding and disseminating information varies. Some people will subjectively seek for information, while others will objectively produce knowledge. The different approaches to knowledge acquisition form the aspects of epistemology. As Walliman (2015) points out, epistemology is concerned with two main aspects of knowledge acquisition, positivism and interpretivism.

Positivism

Positivism is the view that the only authentic knowledge is scientific knowledge, and that such knowledge can only come from positive affirmation of theories through strict scientific method (techniques for investigating phenomena based on gathering observable, empirical and measurable evidence, subject to specific principles of reasoning). The doctrine was developed in the mid-19th Century by the French sociologist and philosopher Auguste Comte (1798 - 1857).

As a philosophical ideology and movement, positivism first assumed its distinctive features in the work of Comte, who also named and systematized the science of sociology. It then developed through several stages known by various names, such as empiriocriticism, logical positivism, and logical empiricism, finally merging, in the mid-20th century, into the already existing tradition known as analytic philosophy.

The basic affirmations of positivism are that all knowledge regarding matters of fact is based on the “positive” data of experience and that beyond the realm of fact is that of pure logic and pure mathematics. Those two disciplines were already recognized by the 18th-century Scottish empiricist and sceptic David Hume as concerned merely with the “relations of ideas,” and, in a later phase of positivism, they were classified as purely formal sciences (Bunge, 2017). On the

negative and critical side, the positivists became noted for their repudiation of metaphysics—i.e., of speculation regarding the nature of reality that radically goes beyond any possible evidence that could either support or refute such “transcendent” knowledge claims. In its basic ideological posture, positivism is worldly, secular, anti-theological, and anti-metaphysical (Alaka et al., 2016). Strict adherence to the testimony of observation and experience is the all-important imperative of positivism. That imperative was reflected also in the contributions by positivists to ethics and moral philosophy, which were generally utilitarian to the extent that something like “the greatest happiness for the greatest number of people” was their ethical maxim (Hughes and Sharrock, 2016). It is notable, in this connection, that Comte was the founder of a short-lived religion, in which the object of worship was not the deity of the monotheistic faiths but humanity.

There are distinct anticipations of positivism in ancient philosophy. Although the relationship of Protagoras—a 5th-century-BCE Sophist—for example, to later positivist thought was only a distant one, there was a much more pronounced similarity in the classical sceptic Sextus Empiricus, who lived at the turn of the 3rd century CE, and in Pierre Bayle, his 17th-century reviver (Alaka et al., 2016). Moreover, the medieval nominalist William of Ockham had clear affinities with modern positivism. An 18th-century forerunner who had much in common with the positivistic anti-metaphysics of the following century was the German thinker Georg Lichtenberg.

The proximate roots of positivism, however, clearly lie in the French Enlightenment, which stressed the clear light of reason, and in 18th-century British empiricism, particularly that of Hume and of Bishop George Berkeley, which stressed the role of sense experience (Chinn and Rinehart, 2016). Comte was influenced specifically by the Enlightenment Encyclopaedists (such as Denis Diderot, Jean d’Alembert, and others) and, especially in his social thinking, was decisively influenced by the founder of French socialism, Claude-Henri, Comte de Saint-Simon, whose disciple he had been in his early years and from whom the very designation positivism stems.

There are five main principles behind Positivism:

The logic of inquiry is the same across all sciences (both social and natural).

The goal of inquiry is to explain and predict, and thereby to discover necessary and sufficient conditions for any phenomenon. Research should be empirically observable with human senses and should use inductive logic to develop statements that can be tested.

Science is not the same as common sense, and researchers must be careful not to let common sense bias their research.

Science should be judged by logic and should be as value-free as possible. The ultimate goal of science is to produce knowledge, regardless of politics, morals and values.

Positivism is closely connected to Naturalism, Reductionism and Verificationism, and it is very similar in its outlook to Scientism (Chinn and Rinehart, 2016). Later, in the early 20th Century, it gave rise to the stricter and more radical doctrine of Logical Positivism. Positivism is opposed to the Constructivist belief that scientific knowledge is constructed by scientists, and therefore not discovered from the world through strict scientific method.

Types of Positivism

Logical Positivism (or Logical Empiricism) is a school of philosophy that developed out of Positivism, and attempted to combine Empiricism (the idea that observational evidence is indispensable for knowledge of the world) with a version of Rationalism (the idea that our knowledge includes a component that is not derived from observation).

Sociological Positivism is the view, developed from Auguste Comte's philosophical Positivism that the social sciences (as all other sciences) should observe strict empirical methods (Hanson et al., 2017). Today, although many sociologists would agree that a scientific method is an important part of sociology, orthodox positivism is rare.

Legal Positivism is a school of thought in Philosophy of Law which holds that laws are rules made (whether deliberately or unintentionally) by human beings, and that there is no inherent or necessary connection between the validity conditions of law and Ethics or morality (Walliman, 2015). It stands in opposition to the concept of natural law (that there is an essential connection between law and justice or morality).

Polish Positivism was a political movement in the late 19th Century, drawing its name and much of its ideology from Comte's philosophy (as well as from the works of British scholars and scientists) (Alaka, et al., 2016). It advocated the exercise of reason before emotion, and argued that Polish independence from Russia, Germany and Austro-Hungary must be regained gradually from the ground up.

3.3. Research Approach

Deductive versus inductive

Deductive reasoning works from the more general to the more specific. Sometimes this is informally called a "top-down" approach. A researcher might begin with thinking up a theory about a given topic of interest. Then he/she narrows that down into more specific hypotheses that can be tested. The researcher can then narrow down even further to collect observations to address the hypotheses (Chinn and Rinehart, 2016). This ultimately leads the researcher to be able to test the hypotheses with specific data -- a confirmation (or not) of the original theories.

Inductive reasoning works the other way, moving from specific observations to broader generalizations and theories. Informally, this approach is sometimes called a "bottom up" approach. In inductive reasoning, the researcher begins with specific observations and measures, begins to detect patterns and regularities, formulate some tentative hypotheses that we can explore, and finally end up developing some general conclusions or theories.

These two methods of reasoning have a very different "feel" to them when conducting a study. Inductive reasoning, by its very nature, is more open-ended and exploratory, especially at the beginning of the study. On the contrary, deductive reasoning is narrower in nature and is concerned with testing or confirming hypotheses (Chinn and Rinehart, 2016). Even though a particular study may look like it's purely deductive (e.g., an experiment designed to test the hypothesized effects of some treatment on some outcome), most social research involves both inductive and deductive reasoning processes at some time in the project (Walliman, 2015). In fact, even in the most constrained experiment, the researchers may observe patterns in the data that lead them to develop new theories.

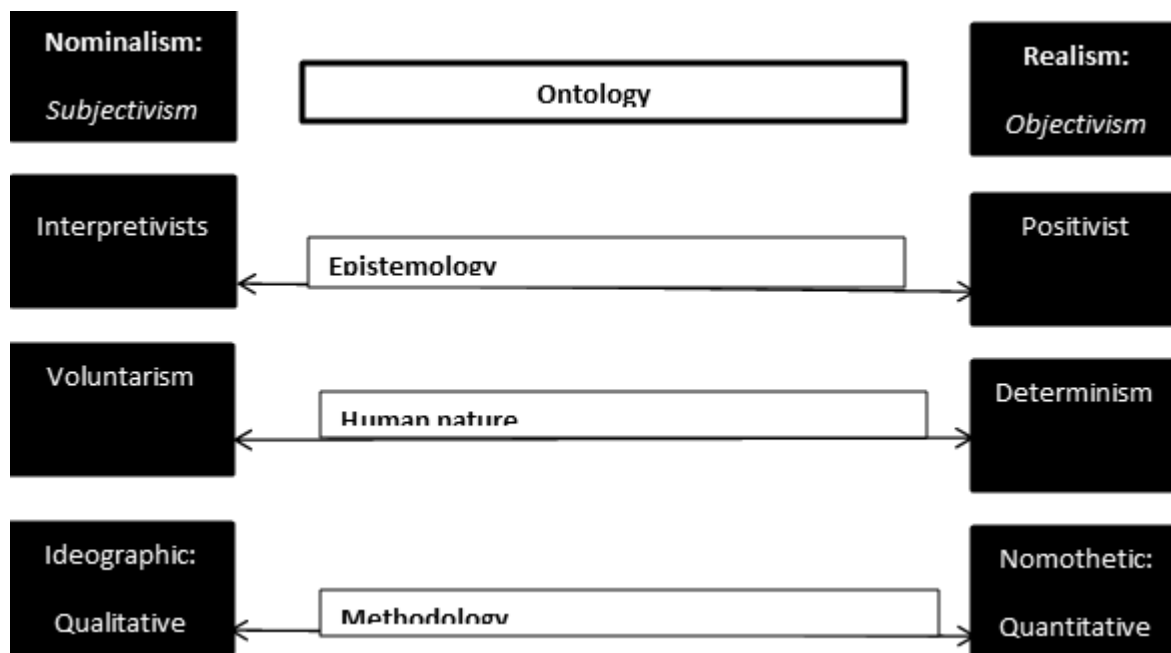
3.4. Research Design

In social science, a research design outlines the specific methods and procedures by which information regarding the study will be collected and analysed (Brewerton and Millward, 2001). According to Jabareen (2009) research design refers to the conceptualization of a given research problem followed with the development of suitable research questions and identification of the most appropriate research strategy to enable the attainment of quality findings to respond to the questions developed. In essence, the research design chosen in any study is largely determined by the nature of research questions or the research hypotheses.

There are mainly three types of research designs; (a) case-study; (b) experimental design and © correlation design.

According to Sayer (2000), the research strategy is determined by the generalizability of a certain phenomenon in a population or how specific a case may be within a given population. These are termed extensive research designs (e.g. experiment, survey) and intensive research designs (e.g. ethnography, case study). The extensive research design is often a deductive research approach that deals with a large volume of data collection suitable for statistical analysis. While intensive research designs are concerned with specific problems in a unique situation. Having defined the philosophical assumptions of this study, it is appropriate that the research method adopted is parallel with the positivist paradigm embraced earlier. Therefore, it is with this view that the quantitative research method has been adopted as the most appropriate methodology for this study. The choice of quantitative methodology indicates that theory testing is the primary focus of this study.

Research design has a significant role in fostering a rigorous study. It does not only form the basis for the selection of the various research methodologies but also ensures that the right approaches are adopted for the right questions. Bondy, et al. (2012) has asserted that the initial step in selecting the most suitable research design for a given study is to look at the research questions that are to be answered. Any changes made to the research questions will automatically lead to a change in the research design. Proper identification of a research design in line with the study's research questions is important since it communicates the vital features of the study that always differ for quantitative, qualitative and mixed study designs.



Source Morgan and Smirich (1980, p.492)

Figure 3. 1 A classification of ontology and epistemology in research

Morgan and Smirich (1980) presented a diagram (Figure 3.1.) that will guide researchers in making the right decision when adopting a research methodology. Figure 3.1 illustrates that the choice of methodology depends on the researcher's worldview.

3.4.1. Quantitative research method

Quantitative research design focuses on the maximization of replicability, objectivity and generalizability of the findings acquired from a given study. According to Chinn and Rinehart (2016) a quantitative approach is mostly concerned with the prediction of the probable outcome of an event following the analysis of a similar situation. The quantitative approach is developed and adopted based on the expectation that the researcher carrying out the study will set-aside his perceptions, views and ideas to ensure the attainment of objectivity when conducting the study (Jabareen, 2009). Also, the design is adopted based on the assumptions that there will be no form of biases during the research process.

The main features of a quantitative research design are the adoption of data collection instruments such as tests or surveys to acquire the needed data, the formulation of hypothesis based on existing theories and the use of a probability approach to statistically test the

hypothesis developed (Jabareen, 2009). These hypotheses are developed in line with the research questions, as such, responding and testing the hypotheses also leads to answering the research questions. As such, testing of hypotheses forms the main way of acquiring the needed information and data in quantitative research.

Quantitative research method normally adopts a deductive approach in acquisition of findings. As indicated above, the deductive approach refers to the data acquisition process where the researcher moves from specific information to the attainment of general inferences on the subject matter (Hughes and Sharrock, 2016). For instance, the researcher is likely to develop specific hypotheses based on the research questions and existing theories followed with the testing of the formulated hypothesis to come up with general inferences on the issues under discussion.

Benefits of the Quantitative Research Method

Using survey methods across a large group of individuals enables generalization. For example, if policy makers wanted to instantiate a policy about mentor training, they would likely require some evidence that this training actually works (Chinn and Rinehart, 2016). Interviewing a few individuals, or conducting a focus group with forty matches, might be reflective of specific cases in which the mentoring training worked; however, it would not provide strong evidence that such training is beneficial overall. Stronger support for successful training would be evident if using quantitative methods.

Quantitative research enables gathering information from a relatively large number of participants. Also, the method allows the researcher to conduct the study in a number of groups, allowing for comparison of the findings (Jabareen, 2009). The approach supports generalizing data to a broader population thus provides numerical or rating information and enhances information for instantiating policy or guidelines. Quantitative research methods also support statistical techniques that allow determining relations between study variables.

Limitations

Quantitative study design is not suitable in cases where a researcher needs to recognize new and untouched phenomena. The design also has a limitation of failing to support data interpretation without a control group.

3.4.2. Qualitative research method

Qualitative research methods focus on subjectivity and an understanding of the views, ideas, feelings and thoughts of the participants in a given research. According to Hiatt (1986) qualitative research explores reality, meaning or purpose in a given setting. The design allows for the exploration of a given research topic in which the needed study findings are collected subjectively. The most commonly known qualitative data collection methods include case studies, interviews, ethnographic works and qualitative surveys amongst others. The qualitative research design differs from the quantitative approach in its focus on subjectivity and the involvement of the researcher in the study (Niglas, 2004). In a qualitative design, the researcher and the participants interact in a naturalistic setting where there are few boundaries resulting in a more open study. The findings collected from a similar research topic under the qualitative research design are likely to vary. This is due to the fact that different researchers are likely to be involved in the varying studies, and since these researchers are given a leeway to interact with the study participants without any boundaries, they are likely to influence the outcome of the study.

Replicability and generalizability of findings obtained from a qualitative study design is unlikely. The general goal of any qualitative study is to provide an understanding of certain occurrences or happenings in a specific study setting. The issues existing in the setting and the possible influence of the researcher during the research process makes the findings unique to the given setting. Also, the engagement of the researcher in direct interaction with the study participants can instigate some form of bias thus the information gathered in the study cannot be replicated in another setting. Generalizability of the qualitative research findings are therefore less likely to occur in any kind of study.

Qualitative research design is mainly inductive in nature. This means that the researcher moves from a more specific finding to the formation of a general theory. In essence, the researcher can use the specific data collected from the study participants to construct some theory, formulate a hypothesis or conceptualize the details provided to come up with a general explanation of issues. The qualitative research design is based on the assumption that the researchers are unable to set aside their feelings and thoughts during the study and as such must influence the outcome of the research. Objectivity in qualitative study is not a major consideration; rather the researcher focuses on ensuring that qualitative comprehensive data are attained.

Benefits of Qualitative Research Method

Using open-ended questions and interviews allows researchers and practitioners to understand how individuals are doing, what their experiences are, and recognize important antecedents and outcomes of interest that might not surface when surveyed with predetermined questions. Although qualitative research can be thought of as anecdotal, when pooled across a number of participants it provides a conceptual understanding and evidence that certain phenomena are occurring with particular groups or individuals.

Qualitative research design allows for identification of new and untouched phenomena. Also, the design can provide a deeper understanding of mechanisms and gives one-on-one and anecdotal information. Qualitative research approach also provides verbal information that may sometimes be converted to numerical form. The approach is also beneficial in revealing information that would not be identified through pre-determined survey questions

Limitations

The data collected through qualitative research approach cannot be generalized to the general population. The approach also has limitations owing to the challenges it has in applying for the statistical methods. Qualitative research also makes it difficult for the researcher to determine or assess the relations between characteristics.

In summary, the qualitative and quantitative approaches to research allow a different perspective of situations or phenomena. These two main approaches to research are highly informative, when used appropriately. Each approach has its benefits and detriments and being aware of the methods used to gather information can help practitioners and policymakers understand the extent to which research findings can be applied.

Table 3. 1 Differences between qualitative and quantitative research

Basis for Comparison	Qualitative	Quantitative
Meaning	Qualitative research is a method of inquiry that develops understanding of human and social sciences, to find the way people think and feel	Quantitative research is a research method that is used to generate numerical data and hard facts, by employing statistical, logical and mathematical technique

Nature	Holistic	Particularistic
Approach	Subjective	Objective
Research type	Exploratory	Conclusive
Reasoning	Inductive	Deductive
Sampling	Purposive	Random
Data	Verbal	Measurable
Inquiry	Process-oriented	Result-oriented
Hypothesis	Generated	Tested
Elements of analysis	Words, pictures and objects	Numerical data
Objective	To explore and discover ideas used in the ongoing processes.	To examine cause and effect relationship between variables
Methods	Non-structured techniques like In-depth interviews, group discussions etc.	Structured techniques such as surveys, questionnaires and observation
Result	Develops initial understanding	Recommends final course of action

Differences in the Data

In terms of the actual data, here are some of the key differences

Qualitative data is not countable. It is usually non numerical in the form of text, photos, videos, and so on. Quantitative data can be counted as it is usually numerical.

Qualitative data is usually unstructured, which means it's not ordered or grouped logically. A researcher can turn qualitative data into structured quantitative data through analysis methods like coding.

Most of the time qualitative data will be collected from a smaller sample size than quantitative data, because generally one is not looking for statistical significance with qualitative research.

Qualitative data is quite rich, and can give directional insights about people's thoughts, feelings, emotions, and so on. Quantitative data can help to give one more confidence about a trend and allow one to derive numerical facts.

3.4.3. Mixed research approach

The debate on the most suitable study design for the different set of research questions has instigated the creation of mixed study design. Many researchers face difficulties in deciding on the most suitable design between qualitative and quantitative study designs that should be adopted to ensure accurate and more reliable findings for the developed set of research questions are attained (Chinn and Rinehart, 2016). The emergence of mixed research design has enabled researchers to incorporate both aspects of qualitative and quantitative research methods in the study.

Researchers have been conducting mixed methods research for decades, yet it has recently become more prominent as a form of inquiry. Researchers who adopt mixed methods studies are faced with many challenges such as definitions of mixed methods, mixed methods research designs, integration of qualitative and quantitative data, sampling techniques, and using mixed methods research to promote social justice, to name just a few (Bondy, et al., 2012). It is important to note that mixed methods research is a field of its own with unique techniques and methods. Quantitative and qualitative research fields are mature, and researchers have agreed upon designs, sampling techniques, and so on. Nevertheless, there is not much agreement in the mixed methods field on many of these topics, and there are multiple ideas available regarding the different steps of the research process (e.g., there are many types of mixed methods research designs available to researchers) (Chinn and Rinehart, 2016). Indeed, there is a consensus that this field is changing and growing. This situation presents researchers with various challenges.

One such challenge is that conducting mixed methods research can be difficult because a researcher needs to know both qualitative and quantitative techniques. One remedy for this is to work in teams (Bondy, et al., 2012). When conducting mixed methods research, it is imperative for researchers to learn how to integrate qualitative and quantitative strands so that the results from mixed methods research studies provide a deep understanding of the phenomena under investigation.

It is argued that by mixing both quantitative and qualitative research and data, the researcher gains in breadth and depth of understanding and corroboration, while offsetting the weaknesses inherent to using each approach by itself. One of the most advantageous characteristics of conducting mixed methods research is the possibility of triangulation, i.e., the use of several means (methods, data sources, and researchers) to examine the same phenomenon (Bondy, et al., 2012). Triangulation allows one to identify aspects of a phenomenon more accurately by approaching it from different vantage points using different methods and techniques. Successful triangulation requires careful analysis of the type of information provided by each method, including its strengths and weaknesses.

Mixed methods research is particularly suited when one wants to validate or corroborate the results obtained from other methods. Also, a mixed research approach can be adopted when a researcher needs to use one method to inform another method (Tashakori and Teddie, 2008). For instance, when little is known about a topic, and it is necessary to first learn about what variables to study through qualitative research, and then study those variables with a large sample of individuals using quantitative research.

Bondy, et al. (2012) have also pointed out that a mixed research method can be implemented when one wants to continuously look at a research question from different angles and clarify unexpected findings and potential contradictions. The method is also suitable when one wants to elaborate, clarify, or build on findings from other methods (Creswell, 2010). For instance, if a causal relationship has been established through experimental research, but one wants to understand and explain the causal processes involved in qualitative research.

The reason for combining qualitative and quantitative research methods have instigated heated debates. On each side of the argument are proponents of one particular type of research method, well-armed with reasons and examples why it is better than the other research method (Kutner, et al., 2008). Such arguments caused the creation of some middle ground, combining the two types of research methods, the result, and mixed methods research (Creswell, 2010). The rationale for the creation of common ground was concretized and coded. The coding mirrored each side's legitimate views and by so doing the weakness of each side was revealed. A scheme was created to tabulate the justifications for the need to join the two methods of research.

First, triangulation: which promulgated that there was a need for some convergence or corroboration since by doing so the emphasis would be shifted from the differences and moved towards the amalgamation of the research methodologies. Secondly, complementarity: which seeks the elaboration, or the results acquired from one method with the results of another method. Thirdly, development: which highlights the need to use the results acquired from one method to either inform or develop the different method. Fourthly, initiation: it seeks the unearthing of irony and incongruity, the remoulding of questions from results gotten from one method with the replica of the other method of research. Fifthly, expansion: This seeks to increase the span and variety of inquiry by adopting different ways for different inquiry components. (Niglas, 2004).

Alaka, et al. (2016) have also asserted that the insufficient argument either quantitative or qualitative may be insufficient by itself presenting the need for a Mixed Method research. Creswell et al (2011) assert that multiple angles arguments that are quantitative and qualitative approaches provide different “pictures.” The more-evidence-the-better argument, thus a combined quantitative and qualitative provides more evidence for any study making it more appropriate where such comprehensive evidence is desired.

A mixed research method is also adopted when one wants to develop a theory about a phenomenon of interest and then test it. Usually, qualitative research is more suitable to build theory, while quantitative research provides a better way of testing theories justifying the need to use both methods when one wants to develop and test a given theory (Alaka, et al., 2016). Also, a mixed research approach is more suitable when one wants to generalize findings from qualitative research. Despite the suitability of the mixed research methods to different study designs, there are some challenges that are likely to be experienced by researchers who adopt the method (Kutner, et al., 2008). The mixed research method is not only costly but also time consuming. Also, the researcher is also required to be highly knowledgeable to be able to combine both qualitative and quantitative aspects of research in conducting the study. This explains why the design is seldom used by most researchers.

Strengths of Mixed Research Method

Mixed method research is the third and more preferred method of research due to its array of advantages that appeal to many researchers. To begin with, the combined strength of both

quantitative and qualitative research can be found when using this method of research. Further, terms, pictures, and narratives can be used to add connotation to numbers (Bondy, et al., 2012). Also, while using a mixed method of research, researchers have the advantage of using numbers to add precision to words, pictures, and narratives. Another advantage of applying the mixed method in research is that researchers can generate and test a grounded theory.

Applying the mixed method of research allows the researcher to tackle a broader and a complete range of research questions because the researcher is not confined to the tenets of a particular method of research (Kutner et al., 2008). Also, researchers can use the strength of one method of research to counter or overcome the weaknesses in another method. In other words, it incorporates the concept of complementarity.

In the advent of a researcher conjuring up a conclusion under this method of research, they are in a better position to provide stronger evidence in the conclusion bit through convergence and collaboration of findings. Furthermore, the method of research allows the researcher to add insights and methods that might be omitted when only a single method is adopted (Bondy, et al., 2012). Similarly, the method allows the researcher to simplify to increase the simplicity of the results. Finally, since the mixed methods of research are all about the incorporation of both qualitative and quantitative methods of research, the researcher can produce complete knowledge necessary to inform theory and practice.

Weaknesses of Mixed Research Method

Unfortunately, this method of research also has a few shortcomings despite its overwhelming support from researchers. Firstly, owing to its duplicity content, the application of the mixed methodology in one study can prove difficult to handle by any one single researcher (Creswell, 2010). This is the case especially when the researcher has to apply two or more approaches concurrently.

Furthermore, a researcher choosing to rely on this method of research has to learn about multiple methods and approaches and understand how to mix them appropriately. Similarly, a lot of researchers are of the view that anyone researcher should work within either the qualitative or the quantitative method (Karakayali, 2015). Moreover, the mixed method of research is more expensive and time-consuming than any other method of research due to its duplicity content. Finally, since it is a mixture of two relatively different methods of research, a

lot of researchers and methodologists have yet to fully work out problems of interpreting conflicting results, quantitative data and the paradigm mixing.

3.5. Justification for the use of Quantitative Research Method

The kind of research philosophy and methodology adopted by a researcher is dependent on the nature of the research questions to be answered and the availability of resources. According to Creswell et al (2011), the adoption of an objectivism approach leads to the implementation of realism and positivism research philosophies as well as the adoption of a quantitative research design. On the other hand, the adoption of a subjectivism approach will prompt the researcher to adopt the interpretivist and constructionism research philosophies as well as a qualitative research design (Saunders et al., 2003). The current research adopted a quantitative research method, and this implies that the study findings were determined objectively. Also, the researchers adopted a positivism philosophy by holding the assumption that any occurrence can be studied objectively without any interference from the researcher within the research period (Saunders et al., 2003). The use of surveys as a method of data collection further justified the adoption of a quantitative research approach.

According to Forza (2002) the need to enhance the accuracy and reliability of social science research instigated the adoption of a positivist philosophical approach in undertaking such kind of studies. A positivist philosophical approach and a quantitative research method provides more accurate results and thus are widely used in cases where the study findings will form the basis of making critical decisions or policies (Zikmund et al., 2010). Also, the objectivism approach in social studies assures the possibility of result generalization to other settings making the approach more relevant in situations where data generalizability cannot be avoided.

The philosophical approach and the research design suitable for a given study is determined based on the nature of the research. As currently observed, the study focuses on sustainability, total quality management and organisational performance. Sustainability and sustainable practices can be determined objectively (Collins and Hussey, 2003). Also, the extent of involvement in such sustainable practices can be quantified, thus justifying the suitability of the quantitative research design (Antwi and Hamza, 2015). The total quality management practices, the extent of an organisation's involvement in the same and the performance level accomplished

by the organisation can also be determined objectively, further justifying the suitability of adopting a quantitative research approach in the current study.

3.6. Scale Development and Validity

After an extensive literature review on the main topics and related topics, a list of items was developed for the survey instrument. The research survey instrument development approach the complementary research methods are presented in figure 3.2.

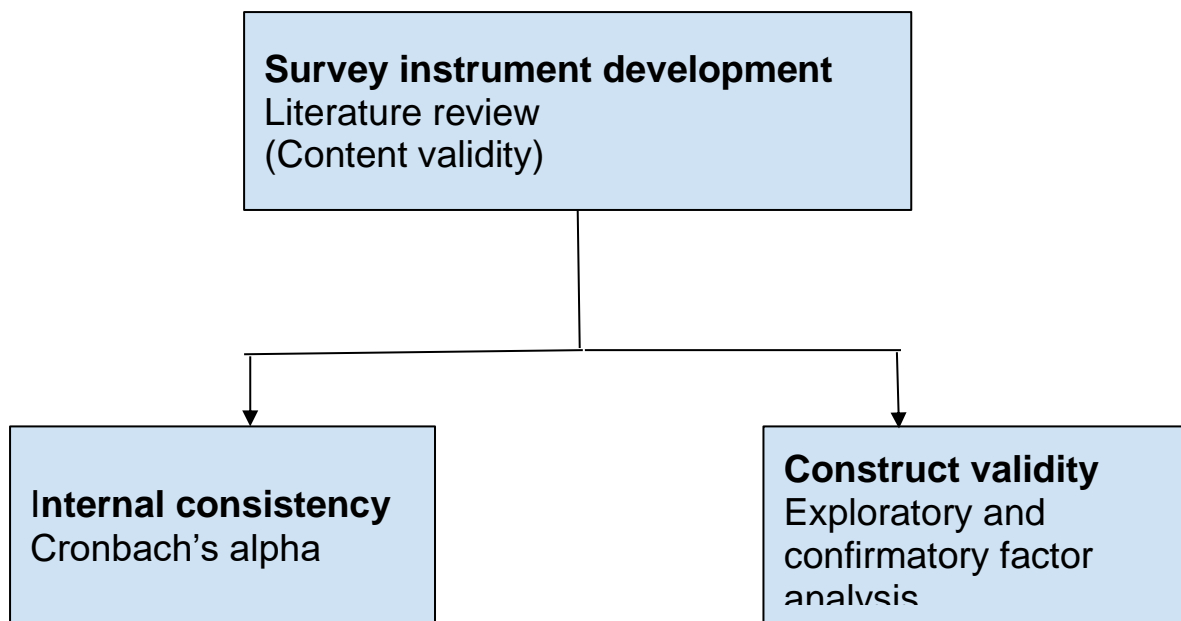


Figure 3. 2 Survey instrument development

It is vital to assess the validity of the survey instruments. The three main validity tests conducted in this research are content, convergent and discriminant validity. Nunnally and Bernstein (1994) and Bryman and Bell (2013) described content validity as the extent to which a measure represents the full domain of a given construct. This definition implies how well a test measures the behaviour it is designed to address. A number of experts, researchers and colleagues were asked to qualitatively assess the survey instrument in order to evaluate the content validity. The purpose for content validity is to ensure that the questions or statements were simple, clear and easy to understand.

Convergent validity

Convergent validity refers to the extent to which the new measurement scale is related to other variables and other measures of the same construct (Hair, et al., 1998). Convergent validity implies that constructs cannot be related to other variables that are not the same. There should only be correlation between related variables. The confirmatory factor analysis (CFA) is the most commonly used method for assessing convergent validity. This can be carried out using AMOS software. According to O’Leary-Kelly and Vokurka (1998), the AMOS is capable of testing and modifying measurement models based on more than one fit indices. The acceptable range of score for CFA models is usually a GFI and AGFI range of 0.8 to 0.9. This is usually considered a reasonable fit. While a good fit is a score of 0.9 and above. An RMSEA value of less than 0.05 is considered a good fit while a value as high as 0.08 is considered a reasonable error of approximation in the population (Hair, et al., 1998).

Discriminant validity

Discriminant validity also known as divergent validity refers to the degree to which measures of two conceptually similar constructs are found to be unrelated (Pallant, 2013). This means that it determines the level of correlation between the different constructs in a model. It compares the Square Root of AVE of a particular construct with the correlation between that variable with other variables.

3.7 Research Methods

3.7.1. Confirmatory factor analysis (CFA)

Confirmatory factor analysis is one of the structural equation modeling techniques that is used in a quantitative data analysis. Given that it is a multivariate statistical procedure, it is used to test how well a measure variable is consistent with a number of constructs (Hair et al., 2010). To analyse CFA, this study started with model specification, followed by model modification through refinement and retesting. And finally, the estimate of the parameters is established. A number of measures of goodness of test are used to evaluate how well the data fits the conceptual model. Some of these tests include the ratio of χ^2 to degrees of freedom (χ^2/df), the likelihood ratio chi-square (χ^2), the GOF index (GFI), the adjusted GOF (AGFI), Tucker-Lewis index (TLI) and the root mean square error of approximation (RMSEA).

Absolute fit measures

The chi-square statistic (χ^2) is considered the most significant measure of the overall fitness test. According to Hair et al. (2010), for a model to be considered a good fit, it must have low values that are greater than 0.05. Low values, which result in significance levels greater than 0.05, support the model as representative of the data, hence imply a good fit (Hair et al., 2010).

Another overall measure of fitness is called the goodness-of-fit index (GFI). The value range is from 0 to 1 where 0 is considered a poor fit and 1 a perfect fit (Hair et al., 2010).

There are other measures of overall fitness tests used. One of such measures is the root mean square error of approximation (RMSEA). The value range for RMSEA is from 0.05 to 0.10. The interpretation of these values is that any value less than 0.05 is considered a good fit, while 0.08 indicates reasonable fit. However, any value within the range of 0.08 to 0.10 represents a mediocre fit and values above 0.10 indicate poor fit.

Comparative Fit Measures

In structural equation models, fitness is evaluated using normed and non-normed fit indexes. The normed fit index (NFI) is one of the most frequently used fit indices with a range of 0 to 1. Hair et al. (2010) stated that a value of 0 indicates a not fit while a value of 1 indicates a perfect fit. Comparative fit indices (CFI) is an advanced normed fit index (NFI). A CFI value greater than 0.9 is usually considered a well fit model.

For a Tucker-Lewis index (TLI) value greater than 0.9 is usually considered a well fit model (Hair et al. 1998).

Parsimonious Fit Measures

The adjusted goodness-of-fit index (AGFI) is the most frequently used measure of parsimonious. An adjustment of GFI by the ratio of degrees of freedom for the proposed model to the degrees of freedom for the null model results in AGFI. An AGFI value above 0.9 is considered a good fit (Hair et al. 1998).

3.7.2. Regression analysis

To assess the impact of co-implementation on organisational, regression analysis was employed. The aim of regression analysis is to predict an outcome variable from a single or multiple predictor variable by fitting a linear equation to observed data (Maletic, 2013). F statistics and R^2 are used to test the overall fit of the model (Field, 2005). F statistics is defined as the overall significance of the regression model while R^2 is defined as the fraction of variance explained by the model (Maletic, 2013). The strength of the relationship between an independent variable and a dependent variable is represented by the Beta value as generated in SPSS output.

3.7.3. Mediation analysis

This study proposed to test the mediation effects of the principle of TQM on the relationship between sustainability practices and organisational performance. To achieve this objective, SPSS procedure (SPSS macro) was used to estimate the indirect effects in multiple mediation models as seen in figure 3.3 (Preacher and Hayes, 2004).

The mediation models shown in figure 3.3 shows the multiple mediation paths and effects (direct, indirect and total) of different independent variables on dependent variables. The coefficients required for the mediation test are unstandardized coefficients (Preacher and Hayes, 2008). Figure 3.3 shows a relationship between X and the proposed mediator M where the effect of the relationship is denoted by path a. While the path b denotes the effect of M on Y. To determine the indirect effect of X on Y, the product of a and b (i.e., ab) must be taken. And the total effect of X on Y as seen in figure 5A is determined by taking the sum of direct and indirect effect, i.e., $c=c' + ab$.

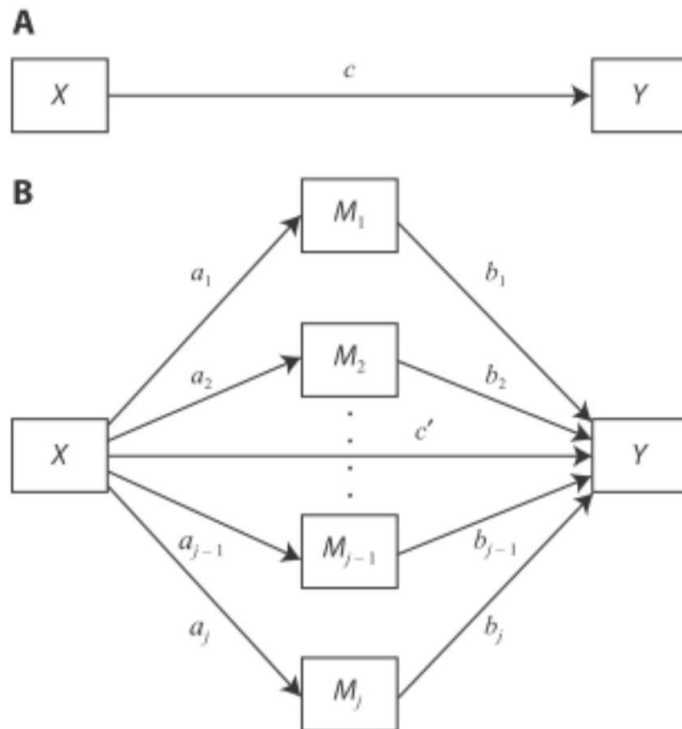


Figure 3. 3 Illustration of a multiple mediation design. (A) X affects Y . (B) X is hypothesised to exert an indirect effect on Y through M_1, M_2, \dots, M_j (Preacher and Hayes, 2008).

3.8. Data Collection and Sample Frame

Data can be collected in two ways, via primary source and secondary source (Kumar, 2005). Primary sources of data collection can either be quantitative or qualitative. The quantitative data collection method is based on a series of mathematical calculations. The collection and analysis of quantitative data includes survey questionnaires with closed-ended questions, mean, mode, median, correlation and regression. Survey is the main method of data collection in a quantitative study. The method allows for the collection of quantitative data either through the use of questionnaires as a data collection tool, or the use of an interview guide (Forza, 2002). Qualitative data collection methods, on the other hand, are usually non-quantifiable. It involves words, colours, emotions and sounds. The data collection method here involves survey questionnaires with closed-ended questions, case studies, observation, focus group etc.

The current study will make use of questionnaires as a data collection tool. As such, survey by questionnaire data collection method will be adopted.

The selection of questionnaires as a data collection tool is based on the many advantages it has over interviews. Apart from enabling the researchers to reach a wider audience, the use of

questionnaires is beneficial since it is less costly and less time consuming. The researcher is able to obtain information from a large group of study participants within a limited time that could have not been achieved through the use of interviews (Collins and Hussey, 2003). Questionnaires are also suitable as data collection tools in the current case, since all the study variables can be quantified and objectively determined.

Sample frame refers to the source of material from which a sample is drawn (Saunders et al., 2003). The sample frame for this study was drawn from a wide range of companies across different sectors in the UK. This study used the CSR Hub database and the Green Directory database and sought detailed information about organisations engaged in sustainability implementation. Drawing the sample frame these sources offer the research diversity of industry. Since it is not feasible to include all manufacturing organisations in the study, a selection was done to identify those companies that could be comfortably covered during the data collection methods. Simple random sampling technique was adopted in the selection process. According to Saunders et al (2003) simple random sampling technique is adopted when the study respondents within the sample frame have equal chance of being involved in the study. The technique allows for random selection of the respondents such as issues of bias are largely minimized. This enhances the possibility of attaining accurate findings.

3.9. Design of the Questionnaire

Questionnaire contains a list of questions that are formulated to enable the researcher to provide responses that will give insights on a given topic being investigated. The nature of the questions used in the questionnaire is determined based on the type of study being conducted. In a qualitative study, open ended questions are used to enable the researcher to provide qualitative findings, while in a quantitative study, the research makes use of structured questions and a likert scale to allow for quantification of the responses being provided (Couper, 2005). The -

The current study made use of structured or closed-ended questions that required a “yes” or “no” answer. The closed-ended questions were used because the study was a quantitative research and required the collection of quantitative data.

From the critical review of literature, it is clear that there is no theoretical basis for co-implementation of sustainability and total quality management practices. As such, proper design of the questions to be included in the questionnaire must be assured. According to Dillman (2007)

total design method approach can be adopted in the design of the questions to be included in the questionnaire. The questionnaire questions should be formulated to respond to three main variables, including behaviour, attitude and opinion of the study participants (Bryman and Bell, 2004). The total design method entails 18 steps needed to be undertaken by a researcher to come up with a quality standard. These steps contain information on what should be avoided or observed to ensure most appropriate questions are included in the questionnaire. According to the model, the following issues should be considered when designing the questionnaire.

Uphold maximum simplicity when formulating the questions. The researcher must ensure that the questions included in the questionnaire are easy to understand. The language used should be simple and understandable to the target respondents (Dillman, 2007). Also, the questions should be direct and specific to the research objective being sought by the researcher. Simple and unambiguous questions will give the study respondents an easy time of communicating the desired responses.

The questions included in the questionnaire should be straightforward such that the targeted respondents are able to know what is required of them. Ambiguous questions cannot lead the researcher to the attainment of the desired study findings (Sekaran and Bougie, 2009). As such, the researcher used straightforward questions in designing the questionnaire to enable the respondents to comprehend the kind of answers needed to adequately respond to the questions.

The current study required the collection of quantitative data as such, open-ended questions were avoided. Also, the use of open-ended questions makes the questionnaire complex and prolongs the time needed for data collection. Closed-ended questions that require minimal time to respond to were used since they are likely to be more preferred by study respondents (Zikmund et al., 2010). These questions are also easy to standardize making it possible for the attainment of alternative responses that do not only facilitate coding but also allow for easy interpretation of the data collected.

Short and precise questions were also used in designing the questionnaire to ensure the respondents are motivated to answer the questions. Short questions are suitable and highly preferred than long questions since they do not bore the study respondents. According to Couper (2017), the questions included in the questionnaire should not be more than 20 words if more responses are to be attained. This rule of thumb was adopted in the formulation of the questions such that short and precise simple questions were included in the questionnaire.

The relevance of the questions included in the questionnaire was also assured. The researcher focused on formulating questions whose responses had a higher chance of answering the research questions of the study (Zikmund et al., 2010). The main idea was to link the questionnaire questions with the research questions such that maximum relevance is achieved.

The flow of questions in the questionnaire is another issue that was taken into consideration. It is recommended that the questions in the questionnaire adopt a sequence where the questions flow from relatively simple and easy questions to more complex questions (Sekaran and Bougie, 2009). This sequence of question flow facilitates easy flow of responses from the research respondents. Also, the flow ensures that more response is attained before the study participants get tired of providing the information needed. The progression from simple to more complex questions is essential in ensuring that the study participants move from answering general to specific questions (Sekaran and Bougie, 2009). The use of this approach in question ordering in the current research was important in building confidence amongst the respondents such that they showed a maximum cooperation when filling the questionnaires.

The use of Likert scale in the questionnaire was to allow for quantification of data. The Likert scale adopted in the current study ranged from 1-5, where 1 represented an extreme low satisfaction and 5 indicated an extreme high satisfaction, the value 3 represented neutral or modest value between the two extremes (Rattray and Jones, 2007). An assumption was made that every response had important weight either in ascending or descending order. Also, the different values indicated varying extent of involvement in sustainability and implementation of total quality management practices ((Sekaran and Bougie, 2009). The Likert scale was thus suitable in the determination of the extent of co-implementation of total quality management practices and sustainability practices as reported by the companies included in the study, as well as the resulting implications of the implementation on the performance of the organisations.

The survey instrument (questionnaire) attached in Appendix 1 is divided into eleven sections consisting of 26 main questions. The sections are:

Q1-6. Company background

Q7-13. TQM adoption

TQM Implementation

A. Top management commitment

B. Customer focus

C. People management

D. Supplier quality management

E. Continuous improvement

Organisational Performance

F. Organisational performance

Sustainability

G. Sustainability Adoption

H. Sustainability strategies

I. Sustainability practices

The first part of the questionnaire, Q1-6, seeks the demographic characteristics of the company. The background information includes information on the name and position held in the responding company, the length of time the firm has been operating in the UK, estimated of the number of employees and core business area. Thus, in this section both textual and numeric data are generated.

The second part of the questionnaire, Q7-13, obtains information concerning TQM adoption. That is the number of years of TQM adoption, percentage of employees involved, departments as well as the average number of hours employees spend on TQM training. This section is also concerned with other quality certification organisations may possess. Sections A to E elicited information concerning the main areas of TQM implementation. Section A seeks to obtain information about the involvement of the top management in the decision-making process of the organisation which is one of the critical success factors (CSF) of TQM implementation. The 5 questions in section B is focused on the significance of the value the organisation places on the customer. This is the fundamental criterion of successful TQM implementation. Section C is concerned with employee involvement in the operations of the organisation while section D seeks to understand the relationship between the organisation and its suppliers. Continuous

improvement, also a key critical success factor (CSF) makes up the questions in section E. The impact of the 2 practices (TQM and sustainability) on organisational performance were solicited by the questions in section F. Respondents were asked how TQM or sustainability has impacted their organisation for those that have only implemented one of the 2 practices. While the same have been also been asked of those that have co-implemented the 2 practices.

This segment of the questionnaire seeks to answer questions on how well sustainability is integrated in the operations of an organisation. Section G deals with sustainability adoption while section H is focused on sustainability strategies that responding organisations implemented or that is currently being implemented. It covers questions on types of sustainability strategies (process-driven sustainability strategies), top management, organisational policy and investments towards sustainability. Section I deals with sustainability practices. That is whether the sustainability strategies adopted leads to positive impacts on organisational performance, society and the environment.

3.10. Pilot Testing

The testing of questionnaire instruments to be used for data collection in the process of the survey is termed pilot study. Pilot study often reveals and highlights potential problems associated with the questionnaire wording and clarity as well as the survey administrative processes (Oppenheim, 1992; Forza, 2002).

Forza (2002) suggests that to pilot-test the survey instrument prior to commencing the full field study, the questionnaire should be submitted to three types of people: colleagues, industry experts and target respondents. Colleagues test whether the questionnaire accomplishes the study objectives, while industry experts prevent inclusion of some obvious questions that might reveal avoidable ignorance of the researcher in some specific area. Finally target respondents provide feedback on things that can affect response as well as intent to respond. Additionally, Forza (2002) proposed a two-phase strategy to carry out the pilot-test. In the first phase the researcher fills in the questionnaire with a group of potential respondents who fill the questionnaire as if they are part of the planned survey. The researcher should be present to observe the respondents filling the questionnaire and record their feedback. Subsequently the researcher determines from the respondents whether:

- the instructions accompanying the questionnaire were clear

- the questions were clear
- there were problems in understanding the questions or in providing answers to the questions posed; and
- the planned administration procedure would be effective

The second phase of the pilot-test involves administering the questionnaire to a sample to test contact-administration protocol. This phase is aimed at gathering data to perform exploratory analysis to assess the measurement quality of the questionnaire as well as sampling adequacy.

To pilot test the questionnaire for this study, it was administered to seven colleagues (PhD students within the University of Central Lancashire) and two people outside the university. They were asked to complete the questions as if they were potential respondents, and to provide feedback on clarity, flow and time taken to answer the questions. The respondents' comments and observation on the questionnaire were also documented. An average of 10 minutes has emerged as the average time required to complete the questionnaire. Appropriate changes from the comments expressed on the questionnaire in terms of clarity of instructions were incorporated into the final questionnaire.

Overall, the result of pilot-test indicates that the survey instrument was perceived:

- Clear, legible and the items comprehensively measures the issues
- The questionnaire took an average of 10 minutes to complete
- The instructions on how to complete the questionnaire were clear and precise

3.11. Questionnaire Administration and Response Rate

There are different approaches that can be adopted in the distribution of questionnaires. According to Creswell et al (2011) questionnaires can be distributed over the internet, through telephone conversation or personal interview. Also, the questionnaires can also be administered via mail (postal distribution). The approach to be adopted by a researcher is dependent on the availability of resources such as money and time (Walliman and Appleton, 2009). The benefits and drawbacks associated with each method of questionnaire administration also form the basis for the selection of the method to adopt. Administration of questionnaires over the telephone or through personal interviews is time consuming and might be costly on the researcher. These

methods can also only work for study respondents that are readily available and willing to spend much time conversing with the researcher (Dillman, 2007).

On the other hand, administration of the questionnaires through mail posting is associated with low response rate since the researcher cannot easily ascertain whether the questionnaires have been delivered or not. Although not as fast as the internet, administering questionnaires by mail post is an efficient way of collecting large amounts of data in a short time. Also, the speed of distribution of the questionnaire is lowered since posting takes time before the document reaches the respondents. Distribution of the questionnaire over the internet, (through email) is not only affordable but also saves on time that the researcher would have incurred to travel from one location to another (Homburg and Pilesner, 2000). This method gives an opportunity for the respondents to have ample time in responding to the questions presented. However, emails may end up in the respondent's junk or spam mail and may never be read.

The cheap and efficient nature of distributing questionnaires via mail post justifies its selection as a questionnaire distribution method for the current study (Sekaran and Bougie, 2009). Since the study did not focus on collecting sensitive information, the researcher was more comfortable adopting mails post as an avenue for the distribution of the questionnaires. Another advantage of postal questionnaire distribution is that it compels an obligation to pass on the questionnaire along with other mails to the intended respondent (CEOs). Enclosed in the envelopes addressed to the respondents, were the questionnaires, covering letter and a prepaid self-addressed return envelope. The covering letter introduced the researcher, the study and its purpose and offered assurance of confidentiality.

A total of eight hundred and eighty (880) questionnaires were mailed to addresses of respondents taken from the CSRHub database and other databases that host business directory of corporations. Out of the 880 organisations sampled, 206 (23.4%) questionnaires were returned of which 137 were deemed valid and usable. It should be noted that 47 of the 206 questionnaires returned were undelivered either due to change of address or wrong address while another 22 were rejected base on the fact that they were either partially completed, returned uncompleted, returned with missing pages, returned with multiple answers or returned with comments like 'it doesn't relate to us or refer to our website for information'. While partially completed questionnaires still provided some data, researchers often exclude such

questionnaires to avoid negative impact on statistical analysis as well as improve reliability of the result (Zikmund, 2012; Singh, 2007; Hair, et al., 2010).

As observed in Table 3.2, a 15.6% response rate was achieved. Although this is lower than the 30% response rate anticipated, the response rate is still considered adequate (Bryman and Bell, 2015; Fisher, 2010). From the general spread of responses among the core business area as shown in Table 3.2, this response rate (15.6%) can be considered a fair representation and that there is limited bias in the demographic composition of the responses.

Table 3. 2 Analysis of response rate across core business area

Core business area	Sample	Rate %	Response	Rate %
Financial services	40	4.5	3	2.2
Transport services	145	16.4	7	5.1
Civil engineering	153	17.2	10	7.3
Telecommunications	53	6.0	5	3.6
Hospitality	41	4.5	2	1.5
Automobile	66	7.5	4	2.9
Construction	122	13.7	10	7.3
Education	45	5.1	0	0
Retail	125	14.2	15	10.9
Other	100	11.3	81	59.1
Total	880	100	137	15.6

The response rate across business sectors provided the groundwork to carry out statistical analyses which forms the basis for the hypotheses testing and validation performed to answer the research questions.

3.12. Demographic Characteristics of Respondents

Descriptive statistics were used to establish the distribution of the demographic and socio-economic characteristics of the response to the survey. In Table 3.3, some basic demographic characteristics of the survey respondents are depicted, and these include the size of organisations measured by number of employees, designation of respondents, legal classification of company and core business area of the respondents to the survey. The results in Table 3.3 reveal that the survey is a fair representative in terms of size, core business area and the designation of respondents.

Table 3. 3 Respondents profile

Criteria	Frequency	Per cent
Size of organisation by number of employees		
Less than 50	10	7.3
51 – 100	17	12.4
101 – 200	14	10.2
201 – 500	13	9.5
501 and above	83	60.6
Total	137	100
Core business area		
Financial services	3	2.2
Transport services	7	5.1
Civil engineering	10	7.3
Telecommunications	5	3-6
Hospitality	2	1.5

Automobile	4	2.9
Construction	10	7.3
Education	0	0
Retail	15	10.9
Other	81	59.1
Total	137	100
Respondents' position held in company		
CEO	16	11.7
Director	39	28.5
General Manager	3	2.2
Manager	78	56.9
Procurement Manager	1	0.7
Total	137	100
Legal classification of company		
Sole Proprietorship	0	0
Public Limited Liability (PLC)	57	41.6
Private Limited Liability (Ltd)	76	55.5
Partnership	2	1.5
NGO	2	1.5
Total	137	100

The size of the company was indicated by the number of employees in the company as shown in Table 3.3. According to Ghobadian and Gallear (1995), Companies with 50 or fewer employees are characterised as small-scale businesses while a range of 51 to 200 employees will be considered medium scale. Large-scale companies fall with the range of 201 employees and above. The modal category was the 501 and above employees from the results above. It can be observed from the table that out of the sample respondents about 29.9% had less than 50 to 200 employees while 70.1% constitute organisations with 201 to 500 and above employees. This result shows that the majority of the responding companies were large-scale companies with a range of respondents across small and medium size enterprises (SMEs).

With respect to the core business area of the respondents, as shown in Table 3.3, 59.1% of the respondents constitute other organisations which were not specified in the survey. The majority of these organisations fell within the manufacturing and service sector. Organisations involved with retail, construction, civil engineering, transport and financial services constituted 10.9%, 7.3%, 7.3%, 5.1% and 2.2% respectively.

Considering the position held by the respondents, the majority (56.9%) were managers, while 28.5% were directors. The third-rated category was CEOs, and these were 11.7% in frequency. General managers and procurement managers were the least rated. Effectively, owing to the high prevalence of managers and the executive, the researcher can argue that the respondents to the study were well informed to be able to objectively and reliably respond to the research questions.

With respect to the legal classification, the modal category was *private limited liability*, and had a respective proportion of 55.5%, while private limited liability companies constituted 41.6% among the respondents. This amounts to a cumulative of 97.1%. Those that were partnerships and NGO comprised only 1.5% each.

Table 3. 4 Size of organisation

Size of organisation by number of employees	Frequency	Per cent
Less than 50	10	7.3
51 – 100	17	12.4

101 – 200	14	10.2
201 – 500	13	9.5
501 and above	83	60.6
Total	137	100

Table 3.4. shows that most of the responding organisations 70.1% were categorised as large organisations with more than 200 employees while 29.9% represented the small and medium organisations with 1 – 200 employees. A closer look at the time spent on TQM implementation (Table 3.5) reveals that there is a high rate of TQM implementation especially within the large organisations.

Table 3. 5 Years spent implementing TQM

Years spent on TQM implementation	Frequen cy	Per cent	Size organisation	of	Frequen cy	Per cent
Less than a year	4	3.0	Less than 50		2	1.6
1 – 5 years	14	11.5	51 – 100		8	6.5
6 – 10 years	21	17.2	101 – 200		17	13.8
11 – 15 years	29	23.6	201 – 500		31	25.2
16 years and above	55	44.7	501 and above		65	52.9

About 68.3% of the responding organisations have spent over 11 years implementing TQM while 14.5% have spent less than 5 years. 66.7% of the responding organisations (Table 3.6) indicated that TQM is implemented in all departments while 33.3% were implemented across different departments in the organisation.

Table 3. 6 Departments TQM is implemented

Departments	Frequency	Percent
Procurement	12	9.8
Quality Assurance	14	11.4
Sales and Marketing	1	0.8
Accounting	2	1.6
Administration	1	0.8
Customer Service	11	8.9
All departments	82	66.7
Total	123	100

Based on the result in Table 3.7., 69.1% of the responding organisations involved over 66.7% of their employees in the implementation of TQM. Large organisations (70.1%) accounts for 69.1% of the organisations that ensure the participation of over 76% of their employees are involved in the practice of TQM. The medium size organisations have been shown to adopt selective implementation with 15.5% across some specific departments.

Table 3. 7 Departments TQM is implemented in relation to size of organisation

	Size of Organisation				
Departments	Less than 50	51 - 100	101 - 200	201 - 500	Above 500
Procurement	0	3	3	4	0
Quality Assurance	2	2	5	3	0
Sales and Marketing	0	2	3	1	0
Accounting	0	0	1	0	0
Administration	0	0	1	0	0
Customer Service	1	1	4	2	0
All departments	0	0	2	28	57

Table 3.8 indicates that 85.4% of the responding organisations use energy saving equipment, 56% buys energy from renewable sources. This implies that this practice is aimed at saving cost and maximising profit.

Table 3. 8 Sustainability Strategies Adopted in Relation to Size of Organisation

	Size				
Sustainability Practices	Less than 50	51 - 100	101 - 200	201 - 500	Above 500
1. The company uses energy saving equipment.	10	17	14	13	77
2. The company buys non-toxic products for its operations.	3	8	12	12	83
3. The company buys energy from renewable sources.	1	3	6	6	56
4. The company has invested in carbon emission reduction projects.	0	0	1	7	26
5. The company encourages employees to use public transport, bicycle or walk to work	1	1	9	13	78
6. The company recycles or reuses waste products.	10	17	14	13	83
7. The company is committed to social issue such as human rights, child labour, non-discrimination, etc.	1	0	5		81
8. The company conducts social audits.	0	0	0	9	72
9. The company is committed to good business conduct and compliance.	10	17	14	13	83
10. Sustainability practice has improved brand reputation.	1	4	9	13	79
11. Sustainability practice has reduced cost due to efficient use of resources.	1	1	11	12	69

3.13. Summary

The current chapter presented a discussion on the methodological approaches adopted in the current study. The chapter provided the ontological, epistemological positions of the study as well as availed a justification for the selection of the philosophical approaches. This chapter also presented a discussion on the research design of the study, justifying the reasons for the adoption of a quantitative research design. The sampling frame and sampling strategy adopted in the current study is also discussed. The data collection method chosen for the collection of quantitative data is also justified. The researcher provided a rationale for the adoption of the survey method of data collection as well as gave a discussion on the process adopted in the design of the questionnaires and their administration. The demographic data was also presented in this chapter.

CHAPTER 4: SURVEY BY QUESTIONNAIRE

4.1. Introduction

This chapter reports the planning and administration of a survey by questionnaire and the resulting findings. The survey generally gathered data with a view to exploring and testing the relationships specified in the conceptual framework and research hypotheses presented in chapter 3. To test the hypotheses proposed in the previous chapter, a structural equation modeling (SEM) was employed. SEM is a powerful technique widely used to analyse structural relationships between measured variables (exogenous and endogenous) and latent constructs. This technique combines confirmatory factor analysis models, regression models and complex path models. One of the main goals of the regression analyses was to investigate the mediating roles of TQM on the relationship between sustainability and organisational performance.

There are two main themes in this study; the first is based on the view that TQM compliant organisations are better equipped at implementing sustainability practices. The second theme of the research was to assess the impact of co-implementation of TQM and sustainability on organisational performance. This prompted the design of the survey to gain an understanding of the two themes. The survey was carried out to determine the extent to which TQM and sustainability are co-implemented and their cumulative impact on organisational performance. Survey method was deemed to be an appropriate research methodology as a means of investigating practitioners' opinions on emerging concepts and practices of sustainability (Malhotra and Grover, 1998; Curkovic, et al., 2000). The survey is extensive, as the co-implementation of TQM and sustainability as a practice is only recently being subjected to empirical study. The survey data was designed to provide the basis for answering research questions and testing the research hypotheses. In order to reduce error and enhance validity of results, formal procedures of survey design, administration and data analyses were applied (Nachmias and Nachmias, 1992; Creswell, 1994).

4.2. Measurements and Validation of Constructs

The responses to the survey were input into *Statistical Package for the Social Science* SPSS® version 21 for windows in order to carry out statistical analysis of the data collected from the study. The SPSS software tool enables the computation of frequency, means, standard deviation

of the data collected from the study. It also enables detailed statistical analysis such as performing comparative analysis of the data between the various classification of the research theme to test for association or differences among the responding organisations to the study.

4.2.1. Normality test

Prior to performing inferential statistical analysis there is a need to assess the characteristics of the distribution of the data to determine whether the variables are normally distributed. Indeed, the assumption of normality is a prerequisite for carrying out multivariate analysis. There are different graphical methods of exploring the assumption of normal distribution in a dataset, which are: histogram, Stem-and-leaf plot, Boxplot, normal distribution plot, normal Q-Q plot and Detrended normal plot. Furthermore, a number of statistics are also available to test for normality, including:

- Kolmogorov –Smirnov (K-S) statistics with a Lilliefors significance level and the Shapiro-Wilk statistic.
- Skewness and
- Kurtosis

Within this study the tests of normality considered were the normal Q-Q plots, Shapiro-Wilk and the K-S (Lilliefors) tests.

There are several procedures available in the SPSS software tool to obtain these graphs and statistics. Two of these procedures are the ANALYZE and EXPLORE menu, but the EXPLORE procedure is the most convenient, especially when graphs and statistics are required simultaneously. Accordingly using the EXPLORE analysis procedure test for normality of each dimension of the construct was carried out. Figure 4.1 shows a histogram for the number of employees in a company and record of the company's impact on the environment. While Figure 4.2 shows Q-Q plots for the residuals. Additionally, Table 4.2 shows the results of the Kolmogorov –Smirnov's test statistics with Lilliefors significance level and Shapiro-Wilk test statistics for standardised and unstandardized residuals and organisational performance.

Histogram is a statistical chart that is used to assess the distribution of a dataset. Hence, Figure 4.1 shows the histogram of number of employees in a company and record of company's impact on the environment. It can be seen from the histogram reported in Figures 4.1 that the two

variables have distributions that will be considered to be skewed to the right. Thus, indicating that the scores are not normally distributed. Nevertheless, assessment of the other characteristics is necessary to be able to conclude on the nature of the distribution. Furthermore, Figures 4.2 show the normal Q-Q plot.

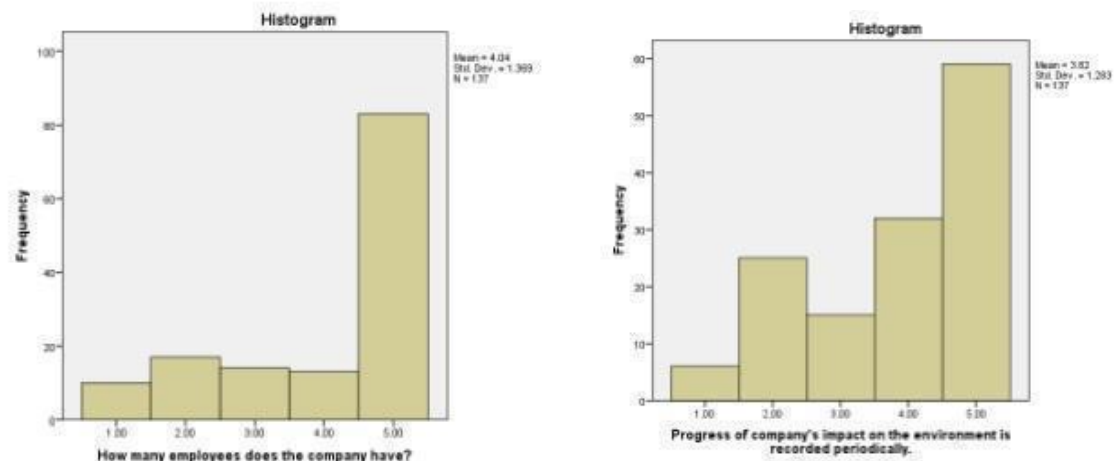


Figure 4. 1 Histogram plotting of dependent variables

The aim of a normal Q-Q plot is to aid in indicating the nature of distribution of data, that is, whether it is normally distributed or not. It is often difficult to detect normality from a histogram especially if the data set is not large thus this necessitated the use of a normal Q-Q plot. The plot of the dataset is compared with an expected normally distributed one. If the two are similar, then the dataset is consistent with expected sampling from a normal distribution. Accordingly, the normal Q-Q plots shown in Figures 4.2 indicate that the dataset is not normally distributed.

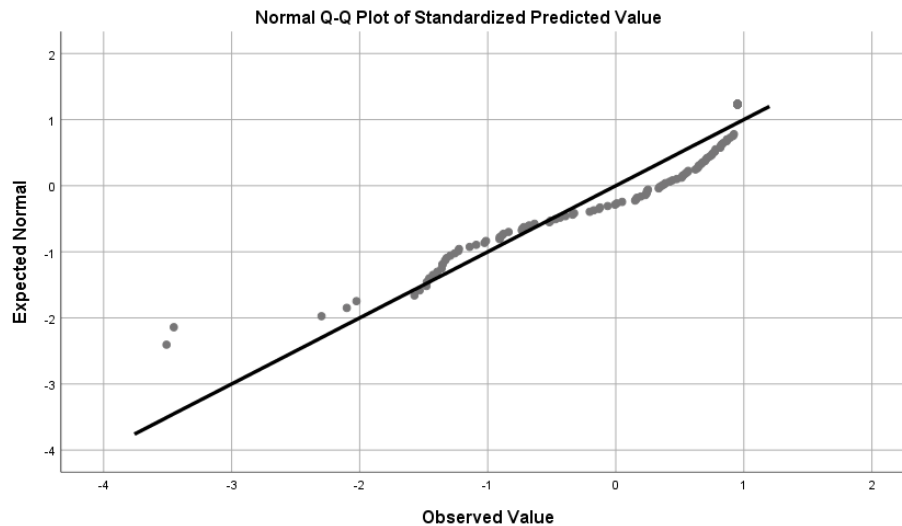


Figure 4. 2 Normal Q-Q plot for the residuals

The aim of a normal Q-Q plot is to aid in graphically visualising the nature of distribution of data, that is, whether it is normally distributed or not. It is often difficult to detect normality from a histogram especially if the data set is not large thus this necessitated the use of normal Q-Q plot (Dauda, 2008). The plot of the dataset is compared with two probability distributions, which in this case would be the normal distribution and the distribution of the residuals. If the trend fits closely to the normal plot, then that would validate the normality of the data and vice-versa. Accordingly, from the normal Q-Q plots in Figure 4.2 above, there is a clear departure from the normal Q-Q plot of the residuals from the normal trend, and this validates the above computed non-normality of the distribution of the residuals. To this effect, this called for the need to use non-parametric tests for the rest of the analytical approaches.

Additionally, the Shapiro Wilk statistics was computed since the data was less than 200 (Hair et al., 2010). Coakes et al. (2006), state that if the significance of the K-S statistics is less than 0.05 ($p < 0.05$) then we can retain the null hypothesis for non-normality. Hence, the null hypothesis that there is a significant difference between the distribution of the data from which the statistics in Table 4.1 were computed and normal distribution cannot be rejected. Accordingly, the tests of normality presented in Table 4.1 and Figures 4.1– 4.2 demonstrates that the data set satisfies the requirement for non-normal distribution from the study. Thus, it can be concluded that the sample is drawn from a population that is not normally distributed.

Table 4. 1 Test for normality – Shapiro-Wilk

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residuals	.179	123	.000	.838	123	.000
Standardized Residuals	.179	123	.000	.838	123	.000
Organisational Performance	.245	123	.000	.811	123	.000

a. Lilliefors Significance Correction

Although two results of assessment of normality are presented here, this is not to suggest that only two variables were assessed. The two reported results are just for parsimony as all the variables were assessed for all the dimensions and they all met the requirements of normality which needed to be satisfied before further analysis such as correlation and regression analysis could be carried out. However, Table 4.18-4.20 shows the skewness and kurtosis, which is another statistical tool that assesses normality, for all the variables studied. The skewness and kurtosis reported in Table 4.18-4.20 demonstrate that the data set is normally distributed since they do not depart significantly from between zero and one. Moreover, the dataset contains a mix of positive and negative values within the range of values for the two variables. An exceptional value for kurtosis of 2.688 was reported for Flexibility (ability to deliver any quantity); nevertheless, kurtosis values of 3 represent normal distribution (Tabachnick and Fidell, 2007).

4.2.2. Non-Response Bias Analysis

A variety of ways exists to deal with the potential problem of non-response bias. One method as reported in Lambert and Harrington (1990) involves summarising the original questionnaire and sending to the non-respondents to complete. On receiving the result of their response, one-way analysis of variance (ANOVA) is carried out to test for variance between respondents to the full questionnaire and respondents to the abridged questionnaire. This approach was not adopted in this study, due to the fact that there was no guarantee that this group would respond to the research, given that they refused to participate in the first study. Other approaches include the

comparison of population attributes vis-à-vis the sample attributes, the comparison of a sub-sample of non-responders to the responders, the analysis of early responders to late responders (wave analysis), as well as the regression analysis of the days that were taken to respond to the instrument (linear extrapolation) (Kypri et al., 2004; Zhao et al., 2009; Lewis, Hardy and Snaith, 2013; Welch and Barlau, 2013; Wallace and Sheetz, 2014). The wave analysis which is the most widely used (Furlan, 2009; Bernroider, 2013; Ibrahim, 2014; Roni, 2015), involves testing for the possibility of non-response bias in the data, which constitutes a test for statistically significant differences in the responses of early and late waves of returned surveys. The administration of the research instrument was executed in phases (waves). The first wave consisted of respondents that responded in time without a reminder. The second wave consisted of respondents that took part in the study after only one reminder was sent. The last wave consisted of the respondents that took part in the study after two reminders had been sent. The comparative distribution of these respondents by their respective wave is presented in Table 4.2 below.

Table 4. 2 Distribution of respondents by wave

	Wave	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	62	45.3	45.3	45.3
	2	49	35.7	35.7	81.0
	3	26	19.0	19.0	100.0
	Total	137	100.0	100.0	

To test for non-response bias, according to Lewis, Hardy and Snaith (2013), Bernroider (2013) and Ibrahim (2014), it is imperative that an independent sample test be conducted between the early responders and late responders. The late responders would be the proxy for the non-responders. While the tests for independence differ, the ultimate choice is based on the fulfilment or non-fulfilment of the assumption of normality, which is one of the key benchmarks for the choice of either parametric or non-parametric tests (Field, 2016). In this research, the assumption of normality was violated as shown in the section on normality tests. To this effect,

as prescribed by Bernroider (2013) and Ibrahim (2014), the Mann-Whitney test would be optimal. Effectively, the respective hypothesis that this research tested was whether there was a significant difference between the early responders and the late responders, the latter who would be the proxy for the non-responders (Welch and Barlau, 2013).

H_0 : There is no difference between the early responders and the late responders

H_1 : There is a significant difference between the early responders and the late responders

The first approach was to compare the constructs between Wave 1 and Wave 3, then Wave 2 and Wave 3. The second approach was to group both Waves 2 and 3 as late responders and compared with Wave 1. This was tested at 95% level of significance and the respective results are presented below in Table 4.3.

Table 4. 3 Non-response bias test

Waves 1 and 3	TMC	CF	PM	SQM	CI	OP	SS	SP
Mann-Whitney U	655.500	778.500	800.500	780.000	797.000	746.500	669.500	717.500
Wilcoxon W	2308.500	2731.500	2753.500	2733.000	1148.000	2699.500	2622.500	2670.500
Z	-.463	-.286	-.052	-.309	-.103	-.565	-1.266	-.827
Asymp. Sig. (2-tailed)	.644	.775	.958	.757	.918	.572	.205	.408

Waves 2 and 3

Mann-Whitney U	476.000	607.500	632.000	628.500	571.000	564.000	578.000	598.000
Wilcoxon W	1379.000	958.500	983.000	979.500	922.000	1789.000	1803.000	1823.000
Z	-.577	-.388	-.057	-.129	-.983	-.840	-.670	-.447
Asymp. Sig. (2-tailed)	.564	.698	.954	.897	.325	.401	.503	.655

Waves 1 and (Waves 2 and 3)

Mann-Whitney U	1869.500	2181.500	2306.500	2228.000	2191.000	2324.000	2078.000	2096.500
Wilcoxon W	3522.500	4134.500	4259.500	4181.000	4144.000	4277.000	4031.000	4049.500
Z	-.089	-.718	-.083	-.555	-.752	-.004	-1.085	-1.009
Asymp. Sig. (2-tailed)	.929	.472	.934	.579	.452	.996	.278	.313

a. Grouping Variable: Wave

Table 4.3 shows, with respect to the significance of the differences between Waves 1 and 3, it can be confirmed that neither of the constructs was identified with a p-value less than 0.05 ($p < 0.05$). Therefore, this confirms that there was no statistically significant difference between the results of the study between the early responders and the late responders, and thus the null hypothesis is retained. The same applied to the comparison between Waves 2 and 3. Most

importantly, comparing the Waves 1 against the combined Waves 2 and 3, which stood as the late responders, and thus the proxy for non-responders, again, there was no statistically significant difference. It can, therefore, be concluded that for each of the research constructs, the absence of any significant difference across the waves confirms that there was no significant non-response bias (Bernroider, 2013; Roni, 2015).

Creswell (1984) contends that absence of non-response bias indicates that the findings from the survey can be generalised to other settings. A research that satisfies the nonresponse bias requirement by being representative of all the surveyed organisations can be generalised to different research set-ups from the one originally studied. This implies that when the same research instrument is administered to a different sample from the same population it should give identical results (Wisner, 2003).

4.2.3. Reliability Analysis

4.2.3.1. Reliability analysis

The research constructs were measured based on a 5-point Likert scale, with 1 representing Strongly Disagree and 5 representing Strongly Agree. According to Field (2016); Tracey et al. (2005); Curkovic et al. (2000) it is highly imperative to make sure that Likert-based research constructs are internally consistent and reliable. This section, to this effect, seeks to test the reliability of the research constructs and to achieve this end, the researcher used Cronbach's Alpha statistic (Hair *et al.*, 2010; Pallant, 2010; IBM, 2017). Field (2016) and IBM (2017) proposed the minimum threshold of the Cronbach's alpha statistic at 0.7 if reliability is to be met. In other words, all alpha statistics ought to be greater than 0.7 where 0.8 is good and 0.9 is excellent. Taking this into consideration, for all the constructs with alpha statistics less than 0.7, the omission of items with low correlation was considered. According to IBM (2017), this is best done by considering items with corrected item-total correlation statistics less than 0.4.

The summary of the overall alpha statistics for all the constructs measured are presented below. The reliability test result for the research instrument is reported in Table 4.4, which shows Cronbach's alpha for each of the sub-constructs of the survey. In addition, for each of the sub items the scale reliabilities were also computed again. Using results of earlier empirical studies, Swafford et al. (2006) report that while Cronbach's alpha at 0.70 or higher is typically used to

establish reliability of a construct, through there are situations in which values of 0.6 are acceptable (Forza, 2002), especially for broadly defined constructs like sustainability.

Along with the reliability test, the corrected item-total correlation (CITC) analyses were conducted for each construct. According to Hair et al., (2010), corrected item-total correlation score of value greater than 0.4 is acceptable.

4.2.3.2. Reliability analysis - top management commitment (TMC)

With respect to the reliability analysis of TCM, the results are summarised in Table 4.4 along with the item-total statistics.

Table 4. 4 Reliability analysis - top management commitment (TMC)

Cronbach's Alpha	N of Items
.993	4

	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Deleted
Top executives are actively involved in establishing and communicating the company's vision, goals, plans and values for quality program	14.49	1.392	.994	.988
Management insists on accuracy and reliability of information and communication within the organisation	14.49	1.392	.994	.988
Top management prioritizes quality ahead of meeting production schedules	14.49	1.392	.994	.988
Top management is evaluated on quality performance	14.51	1.392	.950	1.000

From the results shown in Table 4.4, with a very high Cronbach's alpha statistic of $0.993 > 0.7$, the construct was internally consistent. This can be validated by the fact that neither of the item-total correlation statistics were below the minimum threshold of 0.4. The top management commitment construct was thus deemed to be reliable.

4.2.3.3. Reliability analysis - customer focus (CF)

The second construct was customer focus and the reliability statistics for the customer focus construct are presented below.

Table 4. 5 Reliability analysis - customer focus (CF)

Cronbach's Alpha	N of Items				
.926	4				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	
Production/service design, development and delivery are based on meeting the needs of customers	13.91	2.536	.783	.923	
A wide variety of mechanisms (eg phone, email and social media) for customers to contact the company are readily available	14.01	2.338	.796	.914	
Customer focused strategies and approaches are continuously reviewed for further improvement	14.07	1.980	.903	.877	
Customer surveys, reviews and focus groups are used for seeking and learning customer needs and expectations	14.08	1.913	.875	.891	

Again, the Cronbach's alpha was very high, being $0.926 > 0.7$ and thus the construct was internally consistent. Further, neither of the item-total correlation statistics was below the 0.4, and this confirmed the reliability of customer focus as a construct.

4.2.3.4 Reliability analysis - people management (PM)

The third research construct considered was customer focus. The corresponding reliability statistics for this construct are presented below.

Table 4. 6 Reliability analysis - people management (PM)

Cronbach's Alpha	N of Items
.659	5

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The selection and recruitment process is effective (in terms of objectivity and 'right man for the right job')	17.42	5.202	.297	.662
The company concentrates on on-going development of personnel by establishing extensive training programs that covers all aspects of TQM	17.85	3.670	.584	.526
The company periodically implements quality activities such as Quality Circles, Quality Improvement Teams or suggestion systems	18.01	3.537	.624	.503
Employee satisfaction is formally and regularly measured	18.49	2.561	.470	.652
Occupational health and safety practices are excellent	17.45	5.132	.304	.659

From the results above, the overall Cronbach's alpha was $0.659 < 0.7$, which was not a favourable statistic. Further checking revealed problems with two of the items whose item-total correlation was less than 0.4. These include: *the selection and recruitment process are effective* and *occupational health and safety practices are excellent* whose correlations were 0.297 and 0.304 respectively and were considered for omission. The result of the revised Cronbach alpha after omission is shown below in Table 4.7.

Table 4. 7 Reliability analysis - revised people management (PM)

Cronbach's Alpha	N of Items
.709	3

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The company concentrates on on-going development of personnel by establishing extensive training programs that covers all aspects of TQM	8.12	2.883	.536	.637
The company periodically implements quality activities such as Quality Circles, Quality Improvement Teams or suggestion systems	8.27	2.699	.612	.559
Employee satisfaction is formally and regularly measured	8.75	1.600	.553	.688

As seen from the results above, the revised construct yielded a favourable alpha statistic of 0.709.

4.2.3.4 Reliability analysis - supplier quality management (SQM)

With respect to supplier quality management, the respective Cronbach's alpha statistic and the item-total statistics are presented in the table below.

Table 4. 8 Reliability analysis - supplier quality management (SQM)

Cronbach's Alpha	N of Items
.582	3

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The company prioritizes quality over price and schedule when selecting a supplier	9.04	1.462	.459	.498

Regular feedback is provided on the performance of supplier's product	9.15	1.184	.602	.280
The company always participates in supplier activities related to quality	9.58	.627	.358	.820

From the above analysis, Cronbach's Alpha statistic was very low, being $0.582 < 0.7$. This confirmed the poor construction of the construct. Considering the item-total statistics, the problem was with *the company always participates in supplier activities related to quality*, whose correlation was $0.358 < 0.4$. From the table above, deleting the item would increase the Cronbach alpha statistic from 0.582 to 0.820. However, it is important to consider that Cronbach alpha values are affected by the number of items (variables) in the construct (Koufteros, 1999). "Cronbach alpha values are, however, quite sensitive to the number of items in the scale." (Pallant, 2011, p. 97). Yong and Pearce (2013) have also supported the use of 2 items in a construct to determine reliability. They argued that "A construct with 2 variables is only considered reliable when the variables are highly correlated with each other ($r > .70$)." Yong and Pearce, (2013, p. 80). To this effect, the inclusion of 2 items in this construct is justified, see Table 4.9.

Table 4. 9 Reliability analysis - supplier quality management (SQM)

Cronbach's Alpha	N of Items			
.820	2			

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The company prioritizes quality over price and schedule when selecting a supplier	4.74	.225	.711	.

Regular feedback is provided on the performance of supplier's product	4.85	.145	.711	.
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4.2.3.5 Reliability analysis - continuous improvement (CI)

The fifth research construct was continuous improvement, and this consisted of three items, *competitive benchmarking, the company encourages continual study and improvement of all its processes, products and services and products and processes are frequently measured for data collection*. With a view to evaluating its reliability, Cronbach's Alpha statistic was computed and the results from Table 4.10 below, generally show that the construct was very reliable, with an alpha statistic of 0.952. Neither of the items had a corrected item-total correlation less than 0.4, and thus confirming the integrity of the construct.

Table 4. 10 Reliability analysis - continuous improvement (CI)

Cronbach's Alpha	N of Items
.952	3

	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Deleted
Competitive benchmarking	9.49	.796	.855	.963
The company encourages continual study and improvement of all its processes, products and services	9.55	.691	.936	.901
Products and processes are frequently measured for data collection	9.56	.689	.913	.920

4.2.3.6 Reliability analysis - organisational performance (OP)

The sixth construct was organisational performance and consisted of 17 items. The corresponding reliability analysis for the construct is shown below.

Table 4. 11 Reliability Analysis - Organisational performance (OP)

Cronbach's Alpha	N of Items
.968	17

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Employee involvement has increased	73.84	44.842	.842	.966
Employee satisfaction has improved	74.14	43.988	.665	.970
Employee turnover has decreased	73.80	45.914	.761	.967
Information sharing has increased	73.79	45.639	.848	.966
Defects/errors in products/services have decreased	73.77	45.960	.820	.966
Cost of quality has decreased	73.77	45.886	.833	.966
Productivity has improved	73.85	45.420	.819	.966
Wastes have reduced	73.75	46.085	.818	.966
Customer complaints have reduced	73.77	45.916	.828	.966
Sales have increased	74.07	44.753	.803	.966
Profit has increased	74.08	44.824	.794	.966
Company's overall market share has increased	74.12	44.565	.795	.966
The company's reputation has improved	73.89	44.878	.828	.966

The company's ability to meet unexpected high levels customer demands has improved	73.99	44.926	.808	.966
The range of services provided has increased	74.15	44.920	.770	.967
Product/service innovation has increased	74.14	44.694	.801	.966
Competitive position of the company has been strengthened	73.98	44.742	.792	.966

Based on the result above, the overall reliability statistic was 0.968, and the alpha statistic being much higher than the minimum expected 0.7, we can conclude that the construct was by and large reliable and internally consistent. Considering the item-total correlation, all the items were above the minimum threshold of 0.4, and it follows, therefore, that the organisational performance construct was very reliable.

4.2.3.7 Reliability analysis - sustainability strategies (SS)

The table below presents the reliability statistics and item-total statistics for the sustainability strategies construct.

Table 4. 12 Reliability analysis - sustainability strategies (SS)

Cronbach's Alpha	N of Items
.882	9

	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Deleted
Our company had put together structures to ensure resources are used in a manner that will not limit the sustainability of future generations	33.85	35.684	.695	.867
Senior management is committed to implementing policies that ensure	33.88	35.369	.715	.866

resources are used in a manner that will not limit the sustainability of future generations				
Strategies to ensure resources efficiency and sustainability have been included in our company's business plan	34.10	33.401	.811	.856
Progress of company's impact on the environment is recorded periodically	34.71	31.635	.635	.871
Progress on economic viability of company's operations is reported periodically	33.86	38.223	.686	.876
Our company conducts staff training periodically to ensure prudent use of resources	34.21	34.227	.805	.859
Company has designed a motivation plan to promote the culture of good ethics in resource use	34.42	32.319	.790	.855
Company has invested in information technology systems to help ensure sustainable operations	33.93	37.539	.635	.874
Company has an Environmental Protection Agency (EPA) Certificate	35.29	27.855	.580	.905

With respect to sustainability strategies, the alpha statistic that was computed was 0.882, and being greater than 0.7, we can confirm that the research construct was internally consistent and reliable. None of the items had a least item-total correlation of less than 0.4, and thus confirming the internal consistency of the construct.

4.2.3.8 Reliability analysis - sustainability practices (SP)

The last research construct was sustainability practices with 11 items and the respective reliability statistics are presented in the table below.

Table 4. 13 Reliability analysis - sustainability practices (SP)

Cronbach's Alpha	N of Items
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.816	11
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	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The company uses energy saving equipment	45.55	22.793	.449	.812
The company buys less toxic products for its operations	45.55	22.793	.449	.812
The company buys energy from renewable sources	45.66	20.828	.602	.795
The company has invested in carbon emission reduction projects	45.89	18.716	.692	.780
The company encourages employees to use public transport, bicycle or walk to work	46.30	17.064	.627	.788
The company recycles or reuses waste products	45.57	22.379	.562	.807
The company is committed to social issue such as human rights, child labour, non-discrimination, etc.	45.54	23.030	.396	.815
The company conducts social audits	46.89	16.657	.409	.853
The company is committed to good business conduct and compliance	45.64	22.496	.400	.812
Sustainability practice has improved brand reputation	46.02	18.125	.800	.768
Sustainability practice has reduced cost due to efficient use of resources	46.04	18.130	.790	.769

The results above, with a very high Cronbach's alpha statistic of $0.816 > 0.7$, we can confirm that the construct was reliable. With respect to the corrected item-total correlation, the least correlation was 0.396, which approximated the minimum threshold 0.4.

In summary, the results of the reliability test of the sub-constructs are presented in Table 4.13. Using results of earlier empirical studies, Swafford et al. (2006) report that while Cronbach's alpha at 0.70 or higher is typically used to establish the reliability of a construct.

Table 4. 14 Summary of Cronbach's Alpha reliability test for all sub-constructs

Focus of test	Cronbach's Alpha	Number of items
Top management commitment	0.993	4
Customer focus	0.926	4
People management	0.709	3
Supplier quality management	0.820	2
Continuous improvement	0.952	3
Organisational performance	0.968	17
Sustainability strategies	0.882	9
Sustainability practices	0.816	11

4.3 Multicollinearity Test

Another key assumption that forms one of the principal criteria for the selection of the ideal analytical approaches, particularly, the viability of regression approaches is multicollinearity. Multicollinearity is a statistical phenomenon in which predictor variables in a logistic regression model are highly correlated (Midi et al., 2010). Ideally, given any two or more independent variables, none of them should be moderately or highly correlated to the other, or at least predict the other independent variable, which may lead to skewed results (Field, 2016). According to Midi et al. (2010), multicollinearity can cause unstable estimates and inaccurate variances which affects confidence intervals and ability to test hypotheses. Given the conceptual overlap between several mediators, it is imperative to carefully consider all correlations between variables because the presence of collinearity inflates the variances of the parameter estimates, leading to incorrect conclusions drawn. To test whether there is multicollinearity or not, two common measures are employed: the variance inflation factor (VIF) as well as the condition index. According to O'Brien (2007), VIF thresholds higher than 5.0 are suggestive of the presence of high multicollinearity. The results are presented in Table 4.14. Di= Dimension, EV=EigenValue, Clx=Condition Index, Const=Constant

Table 4. 15 Multicollinearity test

Di	EV	Cix	Variance Proportions							
			(Const)	TMC	CF	PM	SQM	CI	SS	SP
1	7.952	1.000	.00	.00	.00	.00	.00	.00	.00	.00
2	.021	4.182	.01	.01	.00	.52	.01	.00	.03	.00
3	.011	5.725	.00	.01	.00	.40	.00	.00	.26	.03
4	.007	7.504	.23	.00	.13	.04	.01	.02	.03	.05
5	.004	10.172	.01	.21	.24	.02	.10	.16	.00	.00
6	.002	13.548	.10	.68	.62	.02	.01	.00	.14	.04
7	.001	15.833	.62	.03	.00	.00	.04	.03	.51	.81
8	.001	18.847	.03	.06	.02	.00	.84	.78	.03	.07
VIF				2.180	3.320	1.589	4.212	4.197	3.731	3.14

a. Dependent Variable: Organisational Performance

In the case presented above, none of the VIF statistics were close to the maximum threshold of 5.0, and to this effect, the assumption of multicollinearity was satisfied. On the other hand, with respect to the condition index, Field (2016) suggests a threshold of 30 as being the maximum expected. Also, from the result above, none of the computed condition indices were greater than 30, and thus, again validating the assumption of multicollinearity (Cooper and Schindler, 2014). In summary, the above assumption tested confirmed that there was no multicollinearity between the independent variables. In other words, the research constructs were fit for use in regression tests.

4.5 Descriptive Statistics

The next approach before further analysis, was to evaluate the descriptive statistics of the research constructs. This will be examined in this section, using appropriate statistical techniques. These independent variables that were reviewed in this study include: top management commitment, customer focus, people management, supplier quality management, continuous improvement, sustainability strategies, sustainability practices, with the only dependent variable being organisational performance. These were measured on a 5-point Likert scale, with 1 representing Strongly Disagree and 5 representing Strongly Agree. Effectively, the cut-off point, that is, the median was 3.0, with mean ratings less than 3.0 implying a generally negative rating while those greater than 3.0 were positively rated.

4.5.1 Total Quality Management

Total Quality Management was measured by the sub-constructs *top management commitment*, *customer focus*, *people management*, *supplier quality management* as well as *continuous improvement*. Based on the need to determine the magnitude of the ratings by the respondents for each and every item, as well as each and every research construct, the mean ratings were used. As explained earlier, higher scores meant that there was consensus among the respondents who rated positively, while lower scores meant otherwise. With the median scale being 3.0, it meant that any score above 3.0 meant that the responses by the respondents were generally positive as they tended to agree. Thus, using 3.0 as the benchmark would effectively help us determine whether the respondents were positively responding or negatively responding. The respective summary statistics are presented in Table 4.16.

Table 4. 16 Descriptive statistics - total quality management

	N	Mean	Std. Deviation	Skewness	Kurtosis
Top executives are actively involved in establishing and communicating the company's vision, goals, plans and values for quality program	1 2 3	4.84	.392	- 2.25 8	4.33 4
Management insists on accuracy and reliability of information and communication within the organisation	1 2 3	4.84	.392	- 2.25 8	4.33 4

Top management prioritizes quality ahead of meeting production schedules	1 2 3	4.84	.392	- 2.25 8	4.33 4
Top management is evaluated on quality performance	1 2 2	4.82	.407	- 2.05 1	3.29 2
Production/service design, development and delivery are based on meeting the needs of customers	1 2 3	4.78	.432	- 1.64 8	1.48 8
A wide variety of mechanisms (eg phone, email and social media) for customers to contact the company are readily available	1 2 3	4.68	.499	- 1.13 1	.079
Customer focused strategies and approaches are continuously reviewed for further improvement	1 2 3	4.62	.583	- 1.72 4	4.21 0
Customer surveys, reviews and focus groups are used for seeking and learning customer needs and expectations	1 2 3	4.61	.621	- 1.93 4	4.90 8
The company concentrates on on-going development of personnel by establishing extensive training programs that covers all aspects of TQM	1 2 3	4.45	.717	- 1.40 9	2.17 4
The company periodically implements quality activities such as Quality Circles, Quality Improvement Teams or suggestion systems	1 2 3	4.30	.731	- .992	1.09 8
Employee satisfaction is formally and regularly measured	1 2 3	3.82	1.19 6	- .584	- 1.11 8
The company prioritizes quality over price and schedule when selecting a supplier	1 2 3	4.85	.381	- 2.34 2	4.72 8

Regular feedback is provided on the performance of supplier's product	1 2 3	4.74	.474	- 1.50 3	1.22 4
Competitive benchmarking	1 2 3	4.81	.412	- 1.91 6	2.60 3
The company encourages continual study and improvement of all its processes, products and services	1 2 3	4.75	.450	- 1.42 2	.682
Products and processes are frequently measured for data collection	1 2 3	4.74	.458	- 1.32 1	.359
Valid N (listwise)	1 2 2				

From the results in the above table, it is evident that all the ratings were positive, being greater than 3.0. The kurtosis was very high and positive, suggesting that the distribution was leptokurtic. In this regard, it can be argued that there was a very high consensus among the respondents and this can further be validated by the very low standard deviations, most of which were less than 1.0. Nevertheless, comparing across the sub-constructs, it is evident that the highest rating was *top management commitment* whose aggregate mean rating was 4.833. This was followed by *supplier quality management*, with a mean rating of 4.79, the third rated being *continuous improvement*, with a mean rating of 4.766. *Customer focus* had a mean rating of 4.67, while the least rated were *people management*, and had a respective rating of 4.16.

Overall, the aggregate statistic for TQM was 4.6476. The fact that this computed rating was close to 5.0, the maximum rating, it can be argued that TQM was being implemented extensively among the companies studied. The respective consensus among the respondents is evident from

the very low standard deviation of 0.37, while the kurtosis of 1.940 was high enough to argue that generally there was a unanimous consensus among respondents with respect to the perceived ratings of TQM.

4.5.2 Descriptive Statistics – Organisational Performance

Organisational performance was measured as a single construct with 17 items and was confirmed as being internally consistent earlier. The respective mean ratings of the items are presented in Table 4.17 below.

Table 4. 17 Descriptive statistics - organisational performance

	N	Mean	Std. Deviation	Skewness	Kurtosis
Employee involvement has increased	137	4.72	.514	-1.936	4.939
Employee satisfaction has improved	137	4.42	.724	-1.059	.582
Employee turnover has decreased	137	4.76	.462	-1.670	1.840
Information sharing has increased	137	4.77	.442	-1.530	1.054
Defects/errors in products/services have decreased	137	4.79	.428	-1.710	1.733
Cost of quality has decreased	137	4.79	.428	-1.710	1.733
Productivity has improved	137	4.70	.475	-1.093	-.276
Wastes have reduced	137	4.80	.417	-1.844	2.288

Customer complaints have reduced	1 3 7	4.79	.428	- 1.71 0	1.73 3
Sales have increased	1 3 7	4.49	.544	- .373	- 1.03 2
Profit has increased	1 3 7	4.47	.543	- .316	- 1.06 6
Company's overall market share has increased	1 3 7	4.43	.566	- .340	- .823
The company's reputation has improved	1 3 7	4.66	.518	- 1.17 8	.336
The ability to meet unexpected customer demands has improved	1 3 7	4.57	.526	- .590	- .989
The range of services provided has increased	1 3 7	4.41	.550	- .169	- .954
Product/service innovation has increased	1 3 7	4.42	.551	- .196	- .955
Competitive position of the company has been strengthened	1 3 7	4.58	.552	- 1.10 7	1.79 4
Organisational Performance	1 3 7	4.62 09	.419 65	- .992	.494
Valid N (listwise)	1 3 7				

From the analysis, all the items were rated above the median 3.0 and it can be confirmed that all measures affirmed the high ratings of organisational performance. While the majority of the items were leptokurtic, with positive kurtosis statistics, hardly a few were platykurtic, with a negative kurtosis. In this regard, the researcher confirms a very high consensus as well among the respondents, especially considering that the aggregate rating of the construct was very high,

4.6209, with the standard deviation being low, 0.4609, and kurtosis as well, being overall positive and thus leptokurtic.

4.5.3 Descriptive Statistics – Sustainability

The last research construct that the researcher investigated as the independent variable was sustainability. This was measured by two key sub-constructs, *Sustainability Strategies* and *Sustainability Practices*. The summary statistics are presented in Table 4.18.

Table 4. 18 Descriptive statistics - sustainability

	N	Mean	Std. Deviation	Skewness	Kurtosis
Our company had put together structures to ensure resources are used in a manner that will not limit the sustainability of future generations	1 3 7	4.68	.747	- 2.51 4	5.65 6
Senior management is committed to implementing policies that ensure resources are used in a manner that will not limit the sustainability of future generations	1 3 7	4.65	.763	- 2.33 3	4.75 3
Strategies to ensure resources efficiency and sustainability have been included in our company's business plan	1 3 7	4.43	.881	- 1.55 3	1.54 8
Progress of company's impact on the environment is recorded periodically	1 3 7	3.82	1.283	- .706	- .857
Progress on economic viability of company's operations is reported periodically	1 3 7	4.67	.471	- .739	- 1.47 6
Our company conducts staff training periodically to ensure prudent use of resources	1 3 7	4.32	.804	- 1.25 3	1.39 1

Company has designed a motivation plan to promote the culture of good ethics in resource use	1 3 7	4.11	1.012	- .870	- .404
Company has invested in information technology systems to help ensure sustainable operations	1 3 7	4.61	.586	- 1.64 5	3.91 4
Company has an Environmental Protection Agency (EPA) Certificate	1 3 7	3.24	1.833	- .253	- 1.80 0
Sustainability Strategies	1 3 7	4.28 14	.7238 6	- .946	.356
The company uses energy saving equipment	1 3 7	4.91	.284	- 2.95 0	6.80 2
The company buys less toxic products for its operations	1 3 7	4.91	.284	- 2.95 0	6.80 2
The company buys energy from renewable sources	1 3 7	4.80	.540	- 3.24 3	11.5 17
The company has invested in carbon emission reduction projects	1 3 7	4.58	.793	- 1.96 4	3.15 7
The company encourages employees to use public transport, bicycle or walk to work	1 3 7	4.17	1.115	- 1.01 6	- .468
The company recycles or reuses waste products	1 3 7	4.90	.304	- 2.65 6	5.12 8

The company is committed to social issue such as human rights, child labour, non-discrimination, etc	1 3 7	4.93	.261	- 3.32 0	9.15 3
The company conducts social audits	1 3 7	3.58	1.528	- .549	- 1.27 9
The company is committed to good business conduct and compliance	1 3 7	4.82	.382	- 1.72 8	1.00 0
Sustainability practice has improved brand reputation	1 3 7	4.45	.785	- 1.25 0	.700
Sustainability practice has reduced cost due to efficient use of resources	1 3 7	4.42	.793	- 1.18 2	.502
Sustainability Practices	1 3 7	4.58 79	.4461 9	- 1.03 1	.116
Sustainability	1 3 7	4.43 47	.5662 3	- .985	.309
Valid N (listwise)	1 3 7				

With respect to sustainability strategies, the overall mean rating was 4.2814, and this can be confirmed as having been the least rated sub-construct among other constructs studied. This mean rating was largely affected by two items with relatively low mean ratings whose respective mean ratings were 3.82 and 3.24, and these were: *Progress of company's impact on the environment is recorded periodically* as well as *Company has an Environmental Protection Agency (EPA) Certificate*. On the other hand, considering the sub-construct *sustainability practices*, the

overall men rating was relatively high and was 4.5879, with a standard deviation of 0.446. The kurtosis, on the other hand was 0.116, and thus indicative of rather positive consensus among the respondents. The least rated was with respect to the conduct of social audits whose mean rating was 3.5. On aggregate, the mean rating for the construct *sustainability* was 4.4347, and this can be identified as being a relatively positive rating. The mapping of the constructs is summarized below.

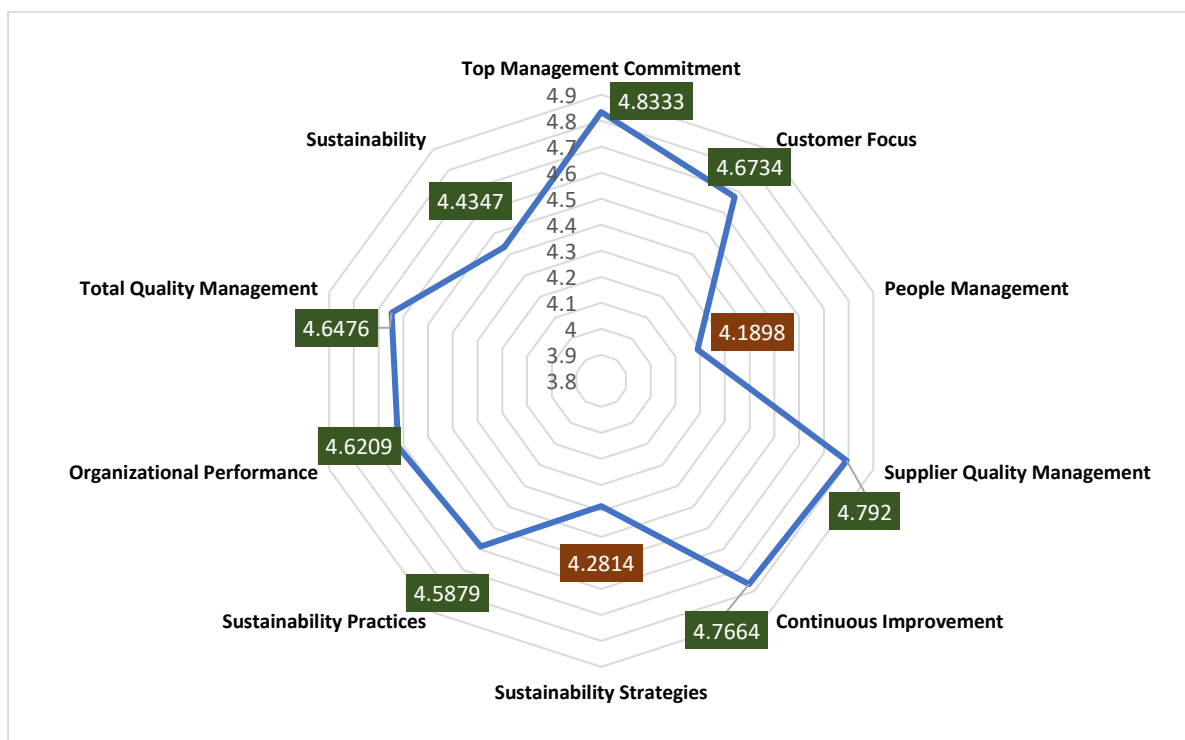


Figure 4. 3 Polar graph – aggregate ratings

From the foregoing, it is evident that the overall high rated sub-construct was *top management commitment*, with a mean of 4.83, followed by *continuous improvement* (mean = 4.7664), while *customer focus* was third, and all these were classified under TQM. It is thus not surprising that comparing TQM with sustainability, TQM had a very high rating (4.6476) as compared with Sustainability (4.4347).

4.6. Effect of TQM as Enabler on Co-implementation

Using AMOS software to validate the measurement instruments, an exploratory factor analysis was applied followed by a confirmatory factor analysis. This technique is called a combined exploratory- confirmatory technique. This technique allows the researcher to validate measurement instruments. The constructs of TQM were used for the measured variables of exploratory factor analysis. The mean, standard deviation, correlations and the corresponding factor loadings are presented in Table 4.19.

Table 4. 19 Mean, standard deviation, correlations and factor loadings

Item	F1	Mean	SD	5	4	3	2
TMC	0.896	4.833	1.0386	0.759**			
CF	0.881	4.670	0.9691	0.718**			
PM	0.876	4.160	1.0419	0.548**	0.608**		
SQM	0.827	4.766	1.2088	0.497**	0.624**	0.655**	
CI	0.764	4.790	1.6782	0.722**	0.747**	0.554**	0.522**

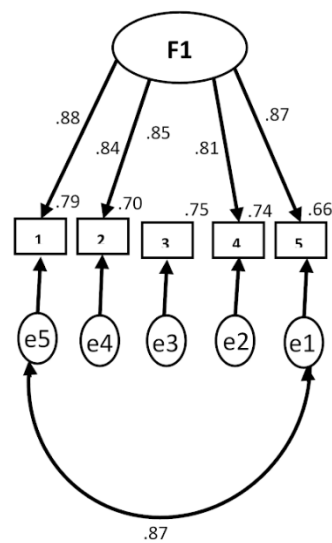
Notes: Sample size=137 p<0.01

Following results from the mean values, it appears that the respondent organisations to a large extent are implementing TQM principles. Top management commitment and continuous improvement is observed to have the highest mean value of 4.83 and 4.79 respectively. While people management showed the lowest mean value of 3.16. This supports the significant difference seen in terms of mean value between TMC and PM ($t = 7.549$, $p < 0.01$).

From the result in Table 21, it can be noted that there is relatively little difference in the correlation coefficients of the TQM constructs. The values can be seen ranging from 0.52 to 0.76. TMC and CI ($r = 0.759$, $p, 0.1$) was found to have the highest correlation amongst the constructs while SQM and Pm showed the lowest correlation with a correlation coefficient of $r = 0.497$, $p, 0.01$.

Using confirmatory factor analysis (CFA), convergent validity was conducted to assess the extent to which the items measured the scale. Figure 6 shows the measurement model for TQM

constructs. As stated in the preceding chapter 4, for a CFA model to be considered a good fit, a GFI and AGFI must fall within the range of 0.8 to 0.9 and above. While an RMSEA value of less than 0.05 is considered a good fit (Hair, et al., 1998). Therefore, all the value of the factor loading estimates presented here are considered significant. Therefore, it can be concluded that the model fit indices are an acceptable fit ($\chi^2 = 0.611$, $\chi^2/df = 0.611$, GFI = 0.999, AGFI = 0.987, NFI = 0.999, RMSEA = 0.000).



($\chi^2 = 0.611$, $\chi^2/df = 0.611$, GFI = 0.999, AGFI = 0.987, NFI = 0.999, RMSEA = 0.000)

1=TMC, 2=CF, 3=PM, 4=SQM, 5=CI

Figure 4. 4 TQM enablers model for co-implementation

4.6.1 Regression analysis

A regression analysis was carried out to examine the effect of TQM constructs on sustainability practices. The results presented in Table 20 show that there is a positive and significant relationship between TMC and sustainability practices ($\beta = 0.691$, $p < 0.01$) and CI and sustainability practices ($\beta = 0.623$, $p < 0.01$). This finding supports hypothesis H1 which states that there is a positive relationship between TQM principles and sustainability practices.

Table 4. 20 Results of regression analysis on TMC and sustainability practices

Standardised β coefficient	
Sustainability practices	
TMC	0.691**
R ²	0.577
Adjusted R ²	0.575
F	213.460
P-value	0.000

Notes: **p<0.01

Table 4. 21 Results of regression analysis on CI and sustainability practices

Standardised β coefficient	
Sustainability practices	
CI	0.623**
R ²	0.547
Adjusted R ²	0.567
F	421.245
P-value	0.000

Notes: **p<0.01

The acceptable cut-off value for variance inflation factor (VIF) is 10. Considering the cut-off value to the results above (Table 22 and Table 23) presents a maximum VIF value of 1 which is below the acceptable value for multicollinearity. However, the R square values for TMC ($R^2 = 0.577$) and CI ($R^2 = 0.547$) are high. This implies that a significant part of the variance in sustainability practices are explained by TCM and CI. Therefore, it can be suggested that there is a positive relationship between TQM principles and the implementation of sustainability practices.

4.7. Impact of Co-implementation on Organisational Performance

In order to assess the impact on organisational performance, different dimensions of organisational performance measure such as quality performance, financial performance, innovation performance, social performance and environmental performance were included in the questionnaire. A 5-point Likert-type scale was used to reflect the organisation's level of performance.

Additionally, to reduce the data to a smaller number of constructs that represent organisational performance, factor analysis was applied. Table 4.22 shows seven factors with <1 eigenvalue. Thus, this accounts for 67.998% of variance (K-M-O statistic 0.874; Bartlett statistic 220; significance 0.000).

Table 4. 22 Mean, standard deviation and factor loadings for organisational performance constructs

Standardised β coefficient	
Sustainability practices	
TMC	0.691**
R^2	0.487
Adjusted R^2	0.465
F	213.460

P-value	0.000
---------	-------

**p<0.01

4.7.1 Regression analysis

In order to carry out regression analysis an aggregate score was generated by calculating the mean scores of the constructs of organisational performance. In addition to this test, normality test of the aggregate score was applied to assess and the result shows that Skewness values are within the acceptable range of ± 1 and the Kurtosis value also less than 3 (<3). This is also supported by the Kolmogorov-Smirnov test of normality (K-S = 0.046, $p = 0.200$). The effect of TQM and sustainability practices on organisational performance is presented in Table 4.23.

Table 4. 23 Regression analysis: TQM, sustainability and organisational performance

Organisational performance	
Model 1	
TMC	0.741**
Sus	0.242**
R ²	0.553
Adjusted R ²	0.491
F	18.693
P-value	0.000

*p<0.05 **p<0.01

The result in Table 4.23. shows that both TQM ($\beta = 0.741$, $p < 0.01$) and sustainability practices ($\beta = 0.242$, $p < 0.01$) have significant relationship with organisation performance in Model 1. This result supports Hypotheses 2a and 2b.

Hypothesis 2a stated that there is a positive relationship between TQM and organisational performance.

Hypothesis 2b stated that there is a positive relationship between sustainability practices and organisational performance. The R square value for Model 1 is 55% and an F value of 43.455 ($p < 0.001$). The acceptable variance inflation factor (VIF) < 10 and having calculated the VIF to determine multicollinearity, the value was found to be 1.94.

The co-implementation effect of TQM and sustainability practices on organisational performance is examined in Model 2. To combine TQM and sustainability practices into a single index, the two constructs were summed up. According to Field (2005), summed models are usually superior to individual models. Following this view, the two constructs were summed up. Furthermore, to avoid multicollinearity between the constructs and their summed constructs, the items in TQM and sustainability practices were not included. The result of the effect of co-implementation as shown in Table 4.24 indicates that the coefficient ($\beta = 0.691$, $p < 0.01$) is positive and significant. The R square value of 78% is the variance in organisational performance accounted for by the co-implementation of TQM and sustainability practices.

Table 4. 24 Regression analysis: co-implementation and organisational performance

Organisational performance	
	Model 2
Co-implementation	0.691* *
R ²	0.783
Adjusted R ²	0.475

F	21.480
P-value	0.000

*p<0.05 **p<0.01

Table 4. 25 Impact of co-implementation of TQM and sustainability practices on organisational performance

Organisational Performance				
	Overall effect on OP	Economic	Social	Environmental
R	0.691	0.553	0.503	0.498
R2	0.46	0.396	0.346	0.374
df	123	123	123	123
Sig.	0.00	0.00	0.00	0.00
	Coef.	Coef.	Coef.	Coef.
Constant	0.96***	2.59***	2.28***	2.87***
TQM	0.51***	0.69***	0.31***	0.34***
SP	0.33***	0.29***	0.49***	0.61***

* significant at 10%; ** significant at 5%; *** significant at 1% (2-tailed test). TMC: Top Management Commitment, CF: Customer Focus, PM: People Management, SQM: Supplier Quality Management, CI: Continuous Improvement, OP: Organisational Performance

4.8 Mediation Analysis

Having explored the research constructs from various aspects, this section will seek to address the key objectives of the study. As observed earlier, the multicollinearity assumption for the research's independent variables was met, and being a prerequisite towards regression analyses, regression analysis was embraced as one of the principal tests that would help test the research

objectives. Mediation analysis was employed to examine whether there is an indirect effect of TQM on the relationship between sustainability practices and organisational performance. Considering the assumption that there is a positive relationship between sustainability practices and TQM, Baron and Kenny (1986) suggested that a test for mediators be carried out (Rockwood and Hayes, 2017; Kenny, 2016 and Bolin, 2014). In this study, the predictor variable is sustainability practices which is considered to have a positive relationship with TQM the criterion variable. Therefore, the assumption here is that TQM has a mediator effect on organisational performance. The mediation analysis is presented below.

Table 4. 26 Mediation of the effects of the sustainability practices on organisational performance

Coefficients				
Mediators	(a paths)	(b paths)	Total Effect (c path)	Direct Effect (c' path)
TQM	0.4385, p=0.000	0.4056, p=0.000	0.5523, p=0.000	0.2881, p=0.3896

The results in table 4.25, reveals that the direct effect of sustainability practices on organisational performance is statistically significant. Thus, this indicates that the relationship is strong after controlling mediators (where $c' = 0.2881$, $p = 0.3896$) are employed. The interpretation is that there appears to be mediation between sustainability practices and organisational performance. It appears that the relationship between sustainability practices and organisational performance is partially mediated by TQM. However, to determine which of the TQM principles acts as a mediator, multiple mediation is employed.

Table 4. 27 Bootstrap estimates of paths and estimated standard error for TQM

		Product Coefficients		of	Bootstrapping 95% CI	BCa
Mediators	Point estimate	SE	Z		Lower	Upper

0.2423	0.0433	4.3416	0.1357	0.3588
--------	--------	--------	--------	--------

TQM

BCa - Bias Corrected and Accelerated Confidence Intervals, 1000 bootstrap samples

Table 4.27 presents the multiple mediation analysis with sustainability practices as the independent variable and organisational performance as the dependent variable. The principles of TQM; top management commitment, continuous improvement, customer focus, employee involvement will serve the purpose of mediators.

Table 4. 28 Mediation of the effects of the TQM principles

Coefficients				
Mediators	(a paths)	(b paths)	Total Effect (c path)	Direct Effect (c' path)
TMC	0.5523, p=0.000	0.4052, p=0.000	0.6912, p=0.000	0.7418, p=0.000
CI	0.4952, p=0.000	0.3523, p=0.000		
CF	0.4623, p=0.000	0.0923, p=0.061		
EI	0.4298, p=0.000	0.1529, p=0.000		

(TMC=top management commitment, CI=Continuous improvement, CF=Customer focus, EI=Employee involvement)

With total effect ($c = 0.6912$, $p = 0.000$) and direct effect ($c' = 0.7418$, $p = 0.3896$) remaining statistically the same, the results indicate that the relationship is still significant. To determine the total indirect effect against four mediators, the difference between total and direct effect is calculated. This shows a total point estimate of 0.3522 and a bootstrap BCa 95% confidence interval of 0.3994 to 0.7629. Considering the difference between the total and direct effect of sustainability practices on organisational performance is greater than zero, it can be asserted

that top management commitment mediates the relationship. Therefore, top management commitment is a partial mediator. According to Baron and Kenny (1986) and supported by Kenny and Judd (2014), partial mediation occurs when all the three paths (a, b, and c') are statistically significant after controlling for M (mediator).

Table 4. 29 Bootstrap estimates of paths and estimated standard error

Mediators	Product of Coefficients			Bootstrapping BCa 95% CI	
	Point estimate	SE	Z	Lower	Upper
TMC	0.2423	0.0433	4.3416	0.1357	0.3588
CI	0.0367	0.0306	1.1413	-0.0278	0.1292
CF	0.0168	0.0273	0.3392	-0.0719	0.1102
CF	0.0564	0.0339	1.7671	-0.0166	0.1647
Total	0.3522	0.1351	7.5892	0.3994	0.7629

BCa - Bias Corrected and Accelerated Confidence Intervals, 1000 bootstrap samples

Preacher and Hayes (2008) state that multiple mediation models should always consider other specific indirect effects while examining the total indirect effect of X on Y. In this study table 4.28 shows paths $a_1b_1 = 0.2423$ (through top management commitment), $a_2b_2 = 0.0367$ (through continuous improvement), $a_3b_3 = 0.0168$ (through customer focus) and $a_4b_4 = 0.0564$ (through employee involvement), for the specific indirect effects. For bootstrap estimates, the point ab is the mean ab calculated over 1,000 samples. The standard deviation of the 1,000 ab estimates is equal to the estimated standard error. With a critical ratio (Z value) of $Z=4.3416$, top

management commitment has been estimated to have a true indirect effect between 0.1357 and 0.3588 with BCa bootstrap confidence interval of 95%. Regarding the other mediators, it can be seen from the results that their effect was statistically insignificant. There is sufficient evidence to conclude that top management commitment partially mediates the relationship between sustainability practices and organisational performance.

4.9. Multiplicative Effects of TQM and Sustainability on Organisational Performance.

The last research objective sought to establish the multiplicative effect of both TQM and sustainability on organisational performance. As recommended by Little, Slegers, and Card (2006), Little, et al. (2007), Hair, et al. (2010) and Hair, et al. (2014), for the study of multiplicative effects, Structural Equation modeling (SEM) is the ideal approach owing to the robustness and accuracy of the technique, especially its ability to measure the presence of measurement error, as compared to other approaches such as multiple regression. With a view to computing the SEM analysis, Hair, et al. (2014) strongly recommends that Confirmatory Factor Analysis (CFA) be computed to help with the determination of the fitness of the research items and constructs. CFA was used in this research to determine how well the research items measured a given construct as shown below.

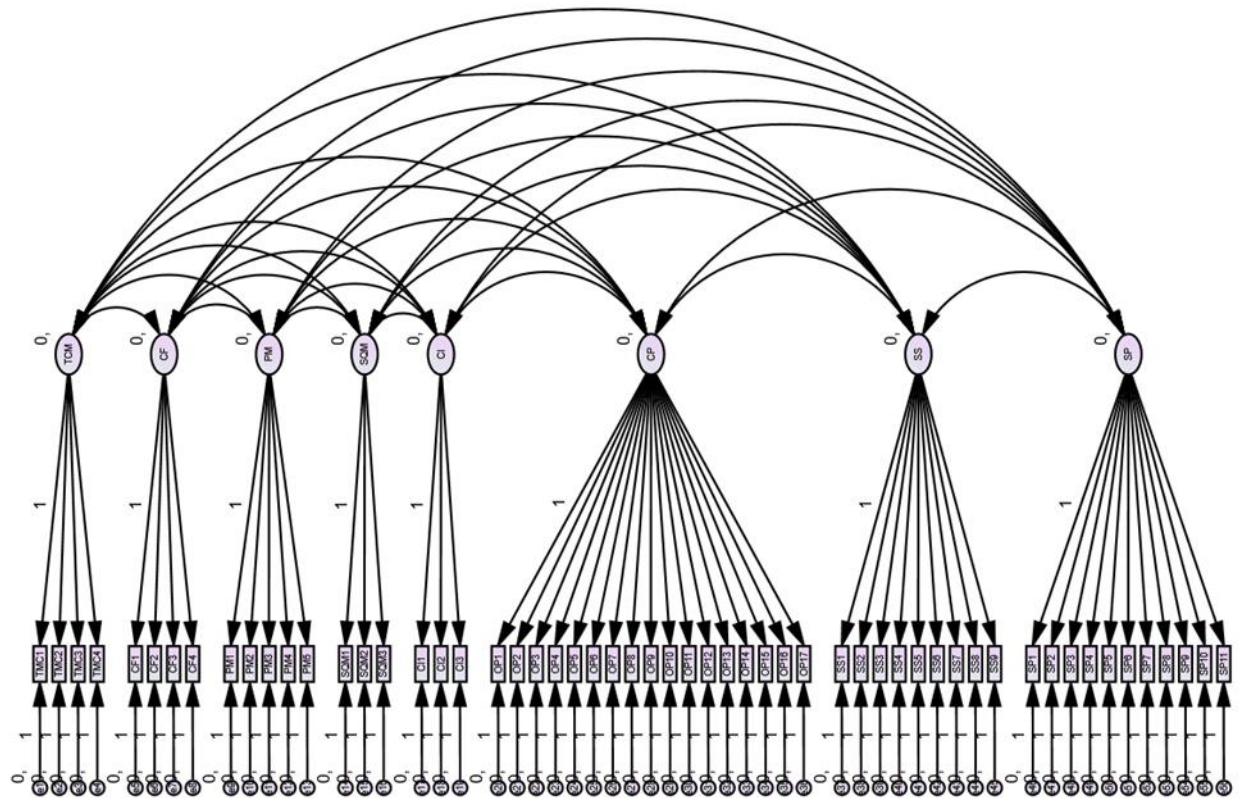


Figure 4. 5 CFA model

With respect to CFA, according to Hair, *et al.* (2010), convergent validity and divergent validity are the main aspects of CFA that are tested (Bryman and Bell, 2013). Convergent validity helped to establish construct validity when we use two or more different measurement procedures to collect data about a single construct (e.g., we had four questions that were measuring TMC). Divergent/Discriminant validity, on the other hand, helped to establish construct validity by demonstrating that the construct we are interested in (e.g., CFI) was different from other constructs that were present in the study (that is., PM, SQM, SS, SP). In this study, the assessment of both convergent and discriminant validity as being part of CFA was done within SPSS AMOS. Acceptable coefficients for convergent validity should never be less than, 0.5 while a value of 0.7 and above is considered best fit (Field, 2016). However, coefficients for divergent/discriminant validity should never exceed 0.85 (Field, 2016; Hair, et al., 2014). The results from the analysis met all the assumptions for construct validity as presented in Table 4.27 (Appendix 2).

The result from the analysis, with respect to convergent validity, of the research constructs and items studied, only two items had respective weights less than the minimum 0.50, and these were SS5 and SP7. In spite of the low composite reliability value for these variables, their inclusion did not affect the overall result. Therefore, it was retained in the model fit. However, the rest of the estimates were higher than the minimum threshold. With respect to discriminant validity, none of the covariates between the constructs was greater than 0.85 as shown in Table 4.28 (Appendix 2). Effectively, this approved discriminant validity, that is, the constructs measured were statistically different from each other.

Following the analysis above, the highest covariance was the covariance between CP and SS, which had an estimate of 0.132, which was significantly different from the expected threshold of 0.85. Subsequently, none of the factors/constructs was dropped and all the research constructs were confirmed. Effectively, the eventual Structural Equation Model was to be defined structurally based on these validated constructs.

4.9.1. Structural equation modeling (SEM)

This research has employed the use SEM to test the multiple hypothesised relationships in the model (Bollen, 1989). Given the nature of data, SEM is one of the most regularly used methods for analysing dependency relations in multivariate data through causal modelling (McClelland, 2015). According to McClelland (2015), SEM is particularly useful because it allows the application of simultaneous equations with numerous exogenous and endogenous variables (Bollen and Long, 1993). Estimation of how well a pattern of interrelationships between variables fits the data can also be analysed through SEM (McClelland, 2015). There are two main models in structural equation model: a measurement model and a path model. The measurement model represents a set of observable variables whose purpose is to act as multiple indicators of a smaller set of latent variables. The measurement model is largely based on confirmatory factor analysis. A well-designed measurement model will represent independent clusters of observable variables loading on only one individual latent variable. The path model illustrates the dependencies between the latent variables. The analysis is structured around the correlation matrix of the observable variables.

One of the critical assumptions of SEM is the precondition for the data to have a multivariate distribution (Byrne, 2010). As mentioned in previous analyses mentioned above, the data for the

variables were tested to ensure that assumptions were met in respect to the linearity, reliability, normality in distributions of dependent variables (Kolmogorov Smirnov test), and a lack of multicollinearity between predictors (Field, 2013). These assumptions were tested in the overall data set through the analysis and examination of histograms, standardised residual, correlations and skewness statistics.

The respective SEM model was to be built based on the three-way conceptual research model which modelled the relationship between TQM, sustainability practices and organisational performance as shown in Figure 4.6 below.

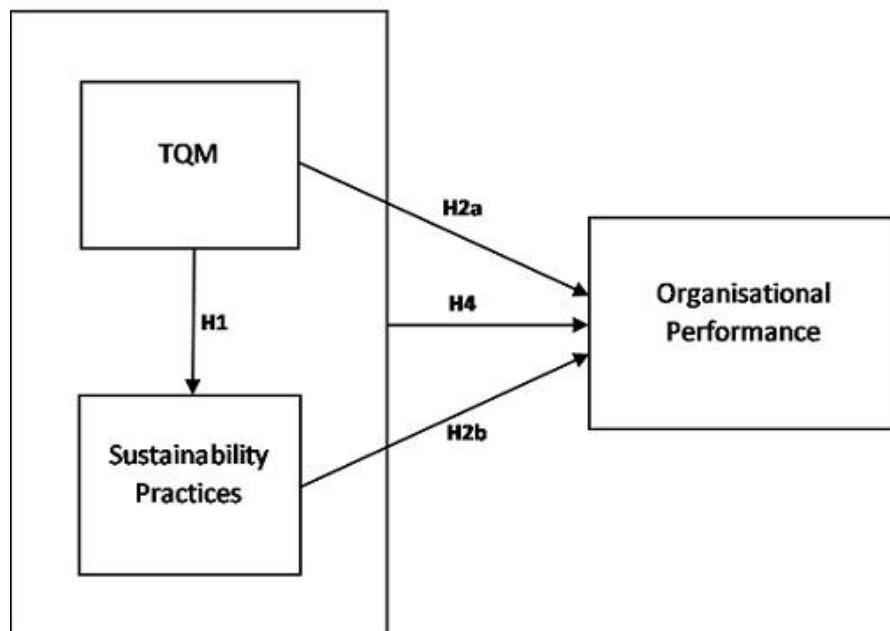


Figure 4. 6 Conceptual framework

The subsequent SEM model is presented in Figure 4.7 below.

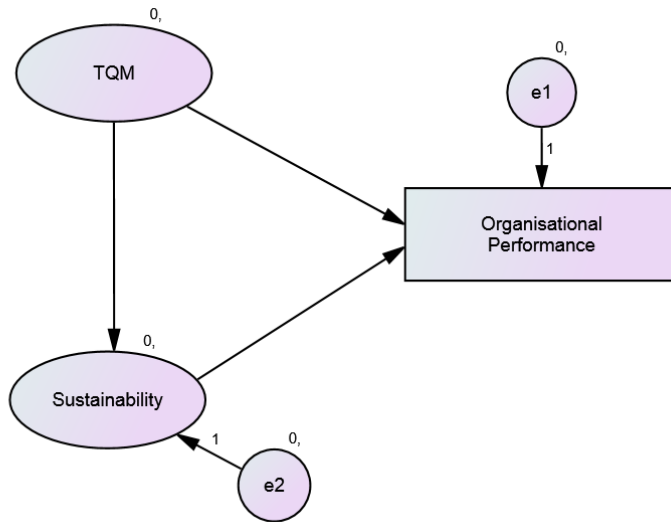


Figure 4. 7 SEM model

Nevertheless, TQM was measured by 5 other sub-constructs, that is, Top Management Commitment, Customer Focus, People Management, Supplier Quality Management and Continuous Improvement. On the other hand, Sustainability was measured by two sub-constructs, that is, Sustainability Strategies and Sustainability Practices. The indirect measurement of TQM and Sustainability from other sub-constructs entailed the use of latent variables for the broader constructs. Following the analysis of the eventual structural equation model in SPSS, the respective results are presented in Figure 4.8 below.

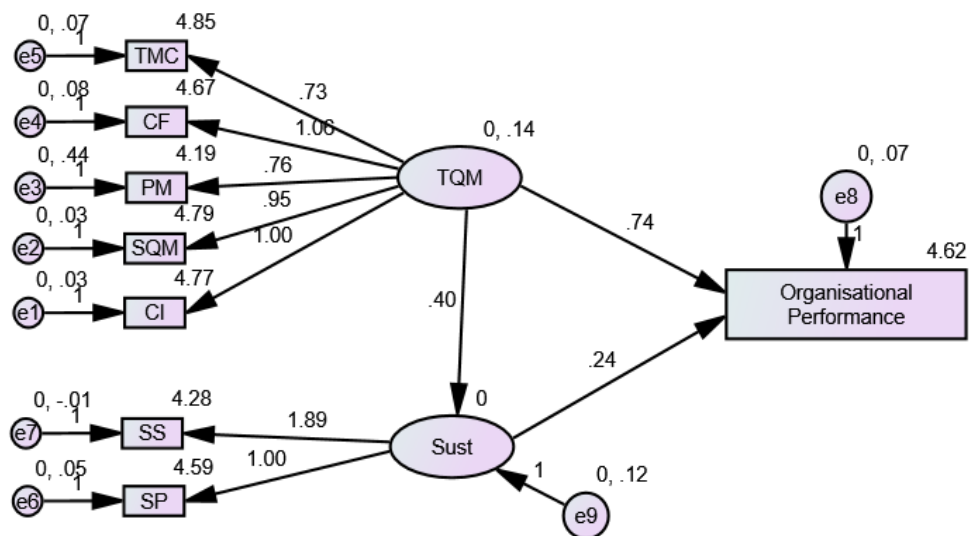


Figure 4. 8 SEM model – model 1 (TQM on sustainability)

The respective regression weights are presented in Table 4.29.

Table 4. 30 SEM regressions – model 1

			Estimate	S.E.	C.R.	P	Label
Sus	<---	TQM1	.395	.095	4.155	.000	
CI	<---	TQM1	1.000				
SQM	<---	TQM1	.949	.061	15.451	.000	
PM	<---	TQM1	.760	.161	4.734	.000	
CF	<---	TQM1	1.063	.083	12.862	.000	
TMC	<---	TQM1	.729	.075	9.673	.000	
SP	<---	Sus	1.000				
SS	<---	Sus	1.894	.196	9.687	.000	
OP	<---	TQM1	.741	.078	9.554	.000	
OP	<---	Sus	.243	.068	3.573	.000	

Following the analysis Table 4.29, all the relationships tested were significant. With respect to the influence of TQM on organisational performance, the regression weight for the relationship was 0.741 ($p < 0.01$), and this was greater than the direct and indirect influence of Sustainability on organisational performance. Overall, TQM had a significant influence on Sustainability, with the regression coefficient being 0.395 ($p = 0.000 < 0.01$). The squared multiple correlations, which quantified the multiplicative effect are presented in Table 4.30 below.

Table 4. 31 Squared multiple correlations – model 1

		Estimate
Sus		.151
OP		.608
SS		1.011
SP		.742

TMC			.512
CF			.677
PM			.157
SQM			.818
CI			.804

From the foregoing Table 4.30, the overall variance explained by both TQM and sustainability on organisational performance was 0.608. From this basis, it can be confirmed that the multiplicative effect of TQM and sustainability accounted for an explained variance of 60.8% while that explained by TQM on Sustainability was 15.1%. In other words, 60.8% of the change in organisational performance was explained by TQM and Sustainability collectively. In this regard, 24.1% of the variance in organisational performance was accounted for by other factors other than TQM and Sustainability.

The total effects for the first model are presented in the following table.

Table 4. 32 Total effects – model 1

Total Effects (Group number 1 - Default model)

	TQM1	Sus
Sus	.395	.000
OP	.837	.243
SS	.749	1.894
SP	.395	1.000
TMC	.729	.000
CF	1.063	.000
PM	.760	.000
SQM	.949	.000
CI	1.000	.000

From the above analysis, the total effect of TQM on organisational performance had a weighting of 0.837, while that for Sustainability had a weighting of 0.243. What this means is that TQM had

the greatest influence on organisational performance. This can be validated by the direct effects results in Table 4.32 below.

Table 4. 33 Direct effects – model 1

Direct Effects (Group number 1 - Default model)

	TQM1	Sus
Sus	.395	.000
OP	.741	.243
SS	.000	1.894
SP	.000	1.000
TMC	.729	.000
CF	1.063	.000
PM	.760	.000
SQM	.949	.000
CI	1.000	.000

With regard to the direct effects, again the greatest weight was identified with TQM, whose coefficient was higher than that for Sustainability, and these were 0.741 and 0.243 respectively. The indirect effects for the first model are summarised in Table 4.33.

Table 4. 34 Indirect effects – model 1

Indirect Effects (Group number 1 - Default model)

	TQM1	Sus
Sus	.000	.000
OP	.096	.000
SS	.749	.000
SP	.395	.000
TMC	.000	.000
CF	.000	.000
PM	.000	.000
SQM	.000	.000

CI	.000	.000
----	------	------

From the results, the indirect effect of Sustainability on the relationship between TQM and Organisational Performance had a respective weight of 0.096. Technically, these findings, again do confirm that sustainability did not have much influence on organisational performance as compared to the influence that TQM had.

4.9.2. Model fit tests

With a view to ascertaining the validity of the structural equation model, the researcher went forward to assessing the fit indices. For the absolute fit index, which does not use an alternative model for the fitness assessment, the CMIN/DF (Chi-square/df) was used, and for the relative fit indices, IFI (Incremental fit Index), and CFI (Comparative Fit Index) were used to compare to the baseline model. The resultant model fit results are presented below.

Table 4. 35 Model fit – model 1

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	26	87.682	18	.000	4.871
Saturated model	44	.000	0		
Independence model	8	788.652	36	.000	21.907

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.889	.778	.910	.815	.907
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.169	.134	.205	.000
Independence model	.392	.369	.416	.000

From the results, the CMIN/DF statistic was 4.871. While Field (2016) suggests an optimal statistic of 3.0, Moss (2015), Hair *et al.* (2010) and Hooper (2008) all confirm that the maximum threshold is 5.0. To this effect, the computed CMIN/DF was thus acceptable. With respect to the IFI value of 0.901 and CFI value of 0.907, both exceeded the minimum threshold of 0.90. According to IBM (2017), a value greater than 8 is sometimes permissible while >0.90 is the acceptable threshold and >0.95 is the most desirable. On the other hand, however, with respect to the RMSEA, the computed statistic was 0.196, and being greater than the maximum acceptable threshold of 0.10, it follows that the model fit was not so perfect.

4.9.3. Model 2: Mediation effect of TQM

The second model looked into the mediation effect of TQM on the relationship between sustainability and organisational performance. This is illustrated in figure 4.9 below.

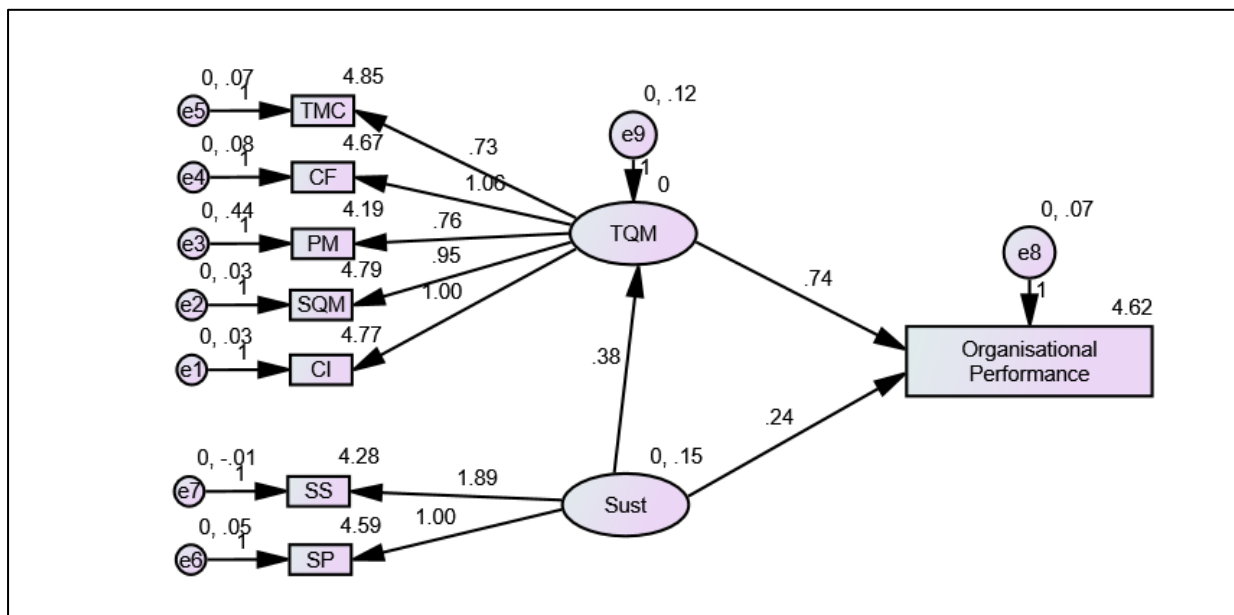


Figure 4. 9 SEM model – model 2 (sustainability on TQM)

The respective regression results are summarised in Table 4.35.

Table 4. 36 SEM regressions – model 2

			Estimate	S.E.	C.R.	P	Label
TQM1	<---	Sus	.381	.084	4.517	.000	
CI	<---	TQM1	1.000				
SQM	<---	TQM1	.949	.061	15.451	.000	
PM	<---	TQM1	.760	.161	4.734	.000	
CF	<---	TQM1	1.063	.083	12.862	.000	
TMC	<---	TQM1	.729	.075	9.673	.000	
SP	<---	Sus	1.000				
SS	<---	Sus	1.894	.196	9.687	.000	
OP	<---	TQM1	.741	.078	9.554	.000	
OP	<---	Sus	.243	.068	3.573	.000	

As with Model 1, all the relationships were significant. With respect to the influence of Sustainability on organisational performance, the regression coefficient was 0.243 ($p < 0.01$) and the regression coefficient was less than the direct influence of TQM on organisational performance whose regression weight was 0.741 ($p < 0.01$). Overall, Sustainability had a significant influence on TQM, the regression coefficient being 0.381 ($p < 0.01$). The squared multiple correlations are shown below.

Table 4. 37 Squared multiple correlations – model 2

	Estimate
TQM1	.151
OP	.608
SS	1.011
SP	.742
TMC	.512
CF	.677

PM	.157
SQM	.818
CI	.804

The variance explained by Sustainability on TQM was 15.1%, which was the same with Model 1. The overall variance explained by the multiplicative effect of TQM and sustainability on organisational performance was identified by a squared multiple correlation of 0.608, thus accounting 60.8% of the variance in organisational performance. As argued earlier on, these findings give prominence to both independent variables as being strong determinants of organisational performance. However, 39.2% of the variance in OP was unaccounted.

The total effects for the relationship between TQM and Sustainability on Organisational Performance was as well tested and the results are presented in Table 4.37.

Table 4. 38 Total effects – model 2

Total Effects (Group number 1 - Default model)

	Sus	TQM1
TQM1	.381	.000
OP	.525	.741
SS	1.894	.000
SP	1.000	.000
TMC	.278	.729
CF	.405	1.063
PM	.290	.760
SQM	.362	.949
CI	.381	1.000

From the results, again, it was confirmed that the effect of TQM was greater than that for sustainability, with respective weights of 0.741 and 0.525. Unlike in Model 1, the total effect attributed to sustainability was higher (0.525) as compared to 0.243.

Table 4.38 below summarises the corresponding direct effects.

Table 4. 39 Direct effects – model 2

Direct Effects (Group number 1 - Default model)

	Sus	TQM1
TQM1	.381	.000
OP	.243	.741
SS	1.894	.000
SP	1.000	.000
TMC	.000	.729
CF	.000	1.063
PM	.000	.760
SQM	.000	.949
CI	.000	1.000

From the analysis of the direct effects, the direct effect of TQM on Organisational performance was weighted 0.741, while that for Sustainability had a weighting of 0.243. Again, the relative influence of TQM over sustainability on their influence on organisational performance was validated. The corresponding indirect effects are summarised below.

Table 4. 40 Indirect effects – model 2

Indirect Effects (Group number 1 - Default model)

	Sus	TQM1
TQM1	.000	.000
OP	.282	.000
SS	.000	.000
SP	.000	.000
TMC	.278	.000
CF	.405	.000
PM	.290	.000
SQM	.362	.000
CI	.381	.000

Table 4.40 above confirms that the indirect effect of TQM on the relationship between Sustainability and Organisational Performance had a weight of 0.282. Effectively, unlike in Model 1, where the indirect influence of sustainability was underweighted (0.096), for model 2, the indirect effect was much higher (0.282). Overall, this outcome confirms the relative importance of TQM over sustainability.

With a view to ascertaining the validity of the structural equation model, the researcher went forward to assessing the fit indices. For the absolute fit index, which does not use an alternative model for the fitness assessment, the CMIN/DF was used, and for the relative fit indices, IFI, and CFI were used to compare to the baseline model, along with RMSEA. The resultant model fit results are presented below.

Table 4. 41 Model fit tests – model 2

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	26	87.682	18	.000	4.871
Saturated model	44	.000	0		
Independence model	8	788.652	36	.000	21.907

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.889	.778	.910	.815	.907
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.169	.134	.205	.000
Independence model	.392	.369	.416	.000

Again, from the results above, the CMIN/DF statistic was 4.871. While Field (2016) suggests an optimal statistic of 3.0, Moss (2015), Hair *et al.* (2010) and Hooper (2008) all confirm that the maximum threshold is 5.0. To this effect, the computed CMIN/DF was thus acceptable. With respect to the IFI and CFI statistics, both exceeded the minimum threshold of 0.90, according to IBM (2017), with respective ratings of 0.910 and 0.907. With respect to the RMSEA, the computed statistic was 0.196, and being greater than the maximum tolerable 0.10, it follows that the model fit was not so perfect.

4.9.4. Model 3: Combined effect of TQM and sustainability

The third research model evaluated the combined effect of TQM and sustainability on organisational performance. The respective model is shown in Model 3.

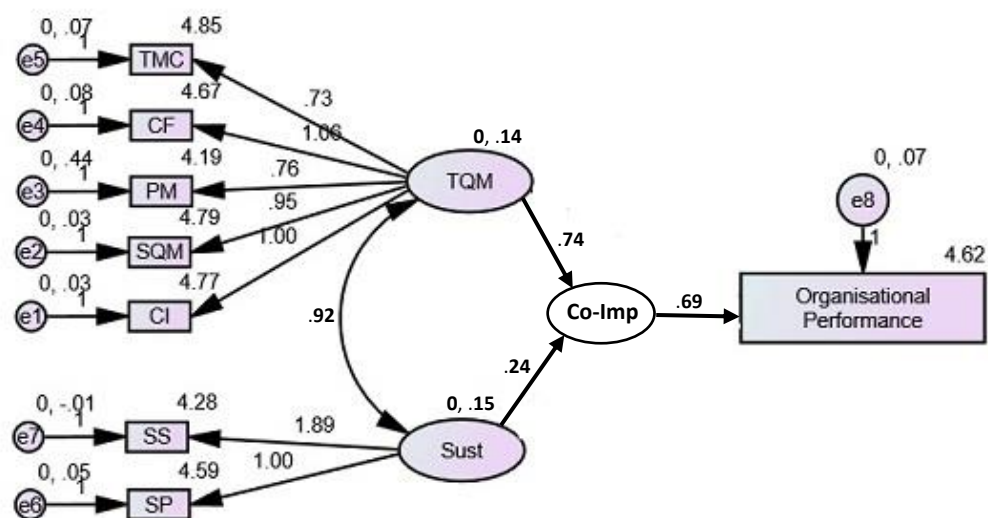


Figure 4. 10 SEM model – model 3

The regression results are summarised in Table 4.41.

Table 4. 42 SEM regressions – model 3

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
OP	<---	TQM + Sus	.689	.078	9.554	***	

Having confirmed that TQM has greater effect than sustainability practices, model 3 examined the combined effect of the two variables on organisational performance. When taken as a set, the combined effect of TQM and sustainability practices was found to be 0.698. This supports the hypothesis 4 which states that there is a positive relationship between co-implementation of TQM and sustainability practices and organisational performance. The value of direct effect is slightly lower than the direct effect of TQM (0.741) and considerably higher than sustainability practices (0.243). A plausible explanation for this is the strong correlation between TQM and the economic aspect of organisational performance. Therefore, the introduction of sustainability into the equation tends to lower the effect of TQM in an attempt to balance the effect within the three aspects of organisational performance (economic, social and environmental).

Fit indices were examined to assess the validity of the structural equation model. For the absolute fit index, which does not use an alternative model for the fitness assessment, the CMIN/DF was used, and for the relative fit indices, IFI, and CFI were used to compare to the baseline model, along with RMSEA. The resultant model fit results are presented below.

Table 4. 43 Model fit tests – model 3

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	26	83.744	16	.000	3.594
Saturated model	44	.000	0		
Independence model	8	674.219	32	.000	19.062

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.816	.864	.931	.815	.912
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.172	.156	.221	.000
Independence model	.389	.381	.441	.000

The results reveal that the CMIN/DF statistic was 3.594. According to Field (2016), the optimal statistic for a CMIN/DF value should be <3.0. However, Moss (2015), Hair *et al.* (2010) and Hooper (2008) all suggest that the maximum threshold is 5.0 is acceptable. Taking this into account, the computed CMIN/DF was thus acceptable. With respect to the IFI and CFI statistics, both exceeded the minimum threshold of 0.90, according to IBM (2017), with respective ratings of 0.931 and 0.912. With respect to the RMSEA, the computed statistic was 0.172, and being greater than the maximum tolerable 0.10, it follows that the model fit was not so perfect.

CHAPTER 5: DISCUSSION

5.1. Introduction

This study was aimed at investigating the effect of co-implementation of TQM and sustainability on organisational performance and whether either of the concepts has an enabling effect on the other. The empirical research employed has not only investigated whether there is a link between TQM and sustainability but has also investigated the role of each of the concepts and how they complement each other and their resulting effects on the organisational performance. In other words, the study debated the question of whether organisations that have implemented TQM are better at implementing sustainability practices. Respectively, the goal of this study was to contribute to the literature and empirically validate understanding of the relationship of the two distinct concepts of TQM and sustainability practices and their impact on organisational performance.

A conceptual model was developed based on the literature and corresponding hypotheses were examined to investigate the relationships between the main constructs. To achieve the objectives of this study, a quantitative approach was adopted to support the validation of the conceptual model, hypotheses, resulting links and explain the results obtained from the analysed data.

5.2. Discussion of the Findings

In an effort to gain competitive advantage, organisations are increasingly dependent on sustainability practices (Wagner, 2010). Therefore, it is pertinent to have a better understanding of the implementation process and the corresponding effect on organisational performance. Evidenced from the literature review, Fairfield et al., (2011); Hahn and Scheermesser (2006), recognise that there is a rapidly growing body of literature that consists of a broad range of sustainability practices implemented across organisations. While some of these sustainability practices are related to the improvement of environmental quality through waste reduction, others are the implementation of innovative product design which results in a more sustainable product.

Just like TQM with its diversity in application, the implementation of sustainability practices cuts across all the 3 aspects of sustainability (social, environmental and economic). Another similarity between TQM and sustainability is advocated by March (1991). He stated that the success of the

implementation sustainability depends on the long-term organisation's ability to take advantage of its current strengths while simultaneously seeking new opportunities (March, 1991). The congruence that exists between TQM and sustainability has been acknowledged and established in the literature review. However, this study will attempt to provide empirical data to examine how the two distinct concepts impact organisational performance.

5.3. Level of Co-implementation of TQM and Sustainability

To investigate the level of co-implementation of TQM and sustainability practices within organisations in the UK is one of the objectives of this research. As such, this was determined by analysing the results of the descriptive statistics with specific focus on the size of organisation, length of TQM implementation, departments TQM is implemented and employee involvement. The level of adoption of sustainability strategies, sustainability reporting and delegation of sustainability responsibility in relation to TQM and non-TQM organisations have also been assessed to determine the level of co-implementation. Thus, these criteria adopted will help determine the extent to which these two practices are implemented simultaneously.

Table 5. 1 Size of organisation

Size of organisation by number of employees	Frequency	Per cent
Less than 200	41	29.9
200 and above	96	70.1

Table 5.1 shows that most of the responding organisations 70.1% were categorised as large organisations with more than 200 employees while 29.9% represented the small and medium organisations with 1 – 200 employees. This corroborates previous studies that due to the initial cost involved in the implementation of TQM, large organisations are more likely to adopt the practice (Yusof and Aspinwal, 2000). A closer look at the time spent on TQM implementation (Table 5.2) reveals that there is a high rate of TQM implementation especially within the large organisations.

Table 5. 2 Years spent implementing TQM

Years spent on TQM implementation	Freq	Per cent	Size	Freq	Per cent
Less than 5 years	4	3.0	Less than 50	2	8.1
11 years and above	14	11.5	51 – 100	91	98.1

(Size=Size of organisation, Freq=Frequency)

Considering that TQM is a long-term process, large organisations possess the resources and investment to carry out a continuous practice over a long period of time. About 98.1% of the responding organisations have spent over 11 years implementing TQM while 8.1% have spent less than 5 years. According to Saylor (1992), a successful implementation of TQM is determined by the employee involvement at all levels of the organisation. In relation to this, I have assessed the percentage of employees involved in TQM implementation as well as the departments TQM is implemented. 66.7% of the responding organisations (Table 5.3) indicated that TQM is implemented in all departments while 33.3% were implemented across different departments in the organisation.

Table 5. 3 Departments TQM is implemented

Departments	Frequency	Percent
Across different departments	41	33.3
All departments	14	66.7
Total	123	100

However, the results indicate that organisations where TQM is not implemented in all departments are most likely to implement in departments such as procurement, quality assurance and customer service departments. Based on the result in Table 5.4, 69.1% of the responding organisations involved over 66.7% of their employees in the implementation of TQM. Large organisations (70.1%) accounts for 69.1% of the organisations that ensure the participation of over 76% of their employees are involved in the practice of TQM. The medium size

organisations have been shown to adopt selective implementation with 15.5% across some specific departments.

While most of the large organisations tend to be the most likely to adopt sustainability practices, the results have shown that some small organisations do actually adopt sustainability or some elements of sustainability. Sustainability adoption, like most concepts encounter challenges. For the purpose of this research, these challenges are considered inhibitors that limit the successful implementation of sustainability adoption. Some of these inhibitors include inappropriate infrastructures, lack of sustainability information, initial and running costs of adoption, lack of employees' awareness on the impact of sustainability (Abubakar, 2014; Wu et al., 2012; Yusuf et al., 2012; Nikolaou and Evangelinos, 2010; Nidumolu et al., 2009). Therefore, while acknowledging the fact that some organisations may not have the capacity to fully implement sustainability, this research has taken a different approach by asking the responding organisation whether they practice elements of sustainability. Some of the sustainability practices adopted for this research have been focused on how the organisations activities affect their environment and the world at large.

Data analysis from this study has revealed that 77% of the responding organisations use energy saving equipment, 56% buys energy from renewable sources. This implies that this practice is aimed at saving cost and maximising profit. Additionally, the immediate impact of these particular practices as opposed to the long-term options usually associated with sustainability adoption makes it quite popular with most organisations. This is supported by Abubakar (2014) assertion that organisations are implementing all the process and market driven strategies to help them minimise the cost of production while maximising their profits and at the same time improving their environmental performance. In an effort to reduce running cost, carbon footprint, amount of resources used in production processes as well as create environmentally friendly products, organisations have adopted numerous sustainability strategies. Some of these strategies adapted in this research include recycling or reuse of waste product, investment in carbon emission projects. The results show that 69% of the responding organisations recycle or reuse waste products while 45% invest in carbon emission. These sustainability strategies also have an immediate impact on the activities of the organisation (cost and profit) and its surrounding environment. There are several plausible interpretations for organisations' affinity towards these sustainability strategies. One of such explanations is the creation of financial value.

Economic aspect of sustainability seems to be prioritised in the implementation of sustainability. However, this research looks to bridge the gap that all the aspects of sustainability (economic, social and environment) can in fact work simultaneously to have a positive impact on organisational performance. Sustainability reporting indicates that organisations generally measure the progress of their sustainability performance against the universally acceptable methods of sustainability assessments or reporting (Abubakar, 2014; Delai and Takahashi, 2011; Aras and Crowder, 2009; Carter and Rogers, 2008). Only 45.3% of the responding organisations stated they publish a sustainability report while 61.3% acknowledge they had a senior management person responsible for sustainability. In addition, the data analysis revealed that 99.3% of the responding organisations adopt a health and safety policy while 93.4% have environmental policy. Although a majority of the responding organisations do not report on their sustainability adoption, the findings of this study reveals that elements of sustainability practices are widely adopted. This research did directly ask the responding organisations if they implement sustainability or not as seen in previous research due to the ambiguity surrounding sustainability and the lack of clear understanding by managers what sustainability adoption actually means. Therefore, factors that determine sustainability implementation were incorporated into the questionnaire.

Table 5. 4 Sustainability adoption

Does your company publish a sustainability report?	45.3%
Does your company have a health and safety policy?	99.3%
Does your company have an environmental policy?	93.4%

Table 5. 5 Correlation of TQM values and sustainability practices

Sustainability Practices/TQM Values	TMC	CF	PM	SQM	CI
1. The company uses energy saving equipment.	.343** (.060)				.248* (.055)
2. The company buys non-toxic products for its operations.		.257* (.030)		.256* (.022)	
4. The company has invested in carbon emission reduction projects.	.543** (.050)				-.245** (.010)
9. The company is committed to good business conduct and compliance.	.543** (.060)	-.213** (.036)	-.303** (.029)		-.344** (.030)

*. Correlation is significant at .05 levels (2-tailed). **. Correlation is significant at .01 levels (2-tailed). NSC: no significant correlation

From the results presented above, it can be deduced that the majority of the organisation implementing sustainability practices are large organisations that have implemented TQM for over a decade. These organisations have the capacity to make the required investment in terms of money, time and workforce necessary for the adoption of sustainability. The size of organisation and length of TQM implementation plays an important role in sustainability adoption. It is also important to note that not all large organisations have TQM implementation across all departments. However, the core principles of TQM are in operation in these organisations. It can be argued that there is a high level of co-implementation of TQM and sustainability across organisations in the UK. However, the co-implementation is limited to large organisations. In other words, organisations that have the resources to implement TQM are more likely to adopt sustainability. The low implementation of sustainability can be attributed to the severe lack of resources that plagues the SMEs.

5.4. Effect of Enabler on Co-implementation of TQM and Sustainability Practices

The results reveal that there is a positive relationship between enablers and sustainability practices. The empirical findings presented in the previous chapter reveal that the success of co-implementation of TQM and sustainability is supported by some core values of TQM. The most important enablers identified in this study top management commitment and continuous improvement. Maletic, (2013) and Fairfield et al., (2011), in a previous study had stated the

significance of having the support of top management in the implementation of sustainability practices. This is consistent with the findings of this study.

Top management plays a pivotal role in creating the enabling environment and taking the necessary decisions that will lead to the successful implementation or integration of new systems in the organisation (Aragón-Correa, et al., 2007). Sustainability adoption just like TQM is a capital-intensive process. The initial investment needed for the adoption of sustainability practices requires that top management is involved from the onset to provide leadership, vision and necessary strategies for the successful implementation. Similar to TQM implementation, top management must ensure the concept of sustainability practice is rooted in the organisational culture. Studies (Kim, et al., 2012; Issakson, 2006; Wagner, 2006) have proven with empirical evidence that sustainability creates financial value and improves organisational performance through reduction of cost and waste.

Therefore, it is vital that top management starts to view sustainability practices as a means of gaining competitive advantage, value creation and improving organisational reputation. To ensure sustainability is integrated into the business context, it is vital that top management create a vision that places sustainability as a core value of its business activities. The organisational culture is determined by how well the top management communicates its vision and this provides a guiding principle for all employees in the organisation.

Another enabler identified in this study is continuous improvement. This has been shown to have a significant relationship with TQM, sustainability practices and organisational performance. Cooper (1996) highlighted continuous improvement as a requisite requirement for sustaining a long-term competitive advantage. Continuous improvement leads to innovation of products or services and processes which in turn leads to economic sustainability. In this context, this study suggests the integration of continuous improvement into the organisational culture, structure and learning. This will ensure the participation of all employees in the organisation. Hogan et al., (2011) stated that continuous improvement creates an added value to the stakeholders when the organisation applies the collective knowledge, skills and resources of the organisation to create an environment to innovate new products, services and processes which leads to increased productivity and profitability.

Other TQM values like customer focus and people management have also shown positive correlation with elements of sustainability practices. In particular, people management appears to have a positive influence on social sustainability while customer focus is more closely related to economic and environmental sustainability. With the values of TQM confirmed to have a significant impact on sustainability practice, we can accept the assumption that TQM values enable the implementation of sustainability practice. Thus, this suggests that TQM is an enabler of sustainability practice.

5.5. Effect of Co-implementation on Organisational Performance

The benefits of adopting sustainability practices and its corresponding effects on organisational performance have been discussed in the literature review. Maletic (2013) and Issakson (2006), argued that sustainability practices have a positive impact on organisational performance. This assertion is consistent with the findings of this study. Organisations that simultaneously implement TQM and sustainability practices will continuously improve their products, services and processes and this will lead to the development of improved or new products, services and also innovative solutions to organisational challenges. The co-implementation of TQM and sustainability practices have been confirmed in this study to have a positive impact on organisational performance. Thus, this study underscores previous assertions that the co-implementation has a positive influence on organisational performance.

Table 5. 6 Impact of co-implementation of TQM and sustainability practices on organisational performance

Organisational Performance				
	Overall effect on OP	Economic	Social	Environmental
R	0.691	0.553	0.503	0.498
R ²	0.46	0.396	0.346	0.374
df	123	123	123	123
Sig.	0.00	0.00	0.00	0.00
	Coef.	Coef.	Coef.	Coef.

Constant	0.96***	2.59***	2.28***	2.87***
TQM	0.51***	0.69***	0.31***	0.34***
SP	0.33***	0.29***	0.49***	0.61***

* significant at 10%; ** significant at 5%; *** significant at 1% (2-tailed test). TMC: Top Management Commitment, CF: Customer Focus, PM: People Management, SQM: Supplier Quality Management, CI: Continuous Improvement, OP: Organisational Performance

The results of regression analysis as shown in the table 5.9 above indicates that TQM and sustainability practices simultaneously influence the relationship with organisational performance. This means that when the co-implementation level is high, there will be a corresponding positive impact on organisational performance. The findings of this study support the assumption that co-implementation of TQM and sustainability practices have positive influence on organisational performance. TQM particularly, has been shown to have higher positive impact on economic performance (quality performance, market performance and financial performance) compared to sustainability. A plausible explanation for this result is that the underpinning idea behind TQM is focused at satisfying and exceeding the expectation of the customer/stakeholder while increasing profit, productivity and efficiency, market share and reducing wastes in products and inefficient processes. This is consistent with the argument put forward by Prajogo and Sohal (2006) and Sila and Ebrahimpour (2005) that concluded that TQM has a positive and significant impact on the performance of an organisation particularly on the financial aspect. In contrast, the result suggests that sustainability has a greater positive impact on environmental performance and social performance compared to the influence exhibited by TQM.

It is expected that TQM will exhibit affinity towards quality performance, market performance and financial performance. This is due to the fact that the nature of the responsibilities of TQM is rooted in improving quality by eliminating waste, reducing costs and increasing productivity for the customer. Maletic (2013) argued that for an organisation to achieve performance benefits, it will need to produce value for one or more stakeholders. It is undisputed that customers are the most important stakeholders and are placed at the centre of all organisational decision making. However, it is also important to note that with TQM, organisations are confronted with multiple internal and external stakeholders who have different expectations. Nevertheless, Delmas (2001) confirms that the external stakeholders have a positive and

significant impact on the competitive advantage of an organisation. Therefore, it is understandable that the main focus of TQM is to satisfy the external stakeholders.

According to Gond et al. (2010), sustainability practices have positive and significant impact on employee morale, motivation, job satisfaction and significantly reduces job turnover. It is widely perceived that organisations that are socially responsible will attract and retain the best employees in the job market (Gond et al., 2010). And people want to be associated with good ethical business practices. The result in this research also confirms that there is a positive relationship between sustainability and social performance. This is consistent with the congruence explained earlier between TQM and sustainability, particularly with reference to CSR and employee involvement. The culture of continuous improvement which results in the reduction of waste, cost and increased efficiency requires the participation of all employees is facilitated by CSR. This study underscores previous assertions that CSR activities boosts employee engagement and create a more productive output (Zink et al., 2008). Zink et al. (2008) also argued that organisations can increase employee satisfaction and motivation by actively involving them in the process of continuous improvement.

The results suggest that for organisations to succeed in the simultaneous implementation of TQM and sustainability, there is a need to understand and identify the needs and expectations of the various stakeholders involved, incorporate the sustainability aspects into product and process at the early stage development and a supportive learning environment needs to be established. This is the same concept employed in TQM to ensure quality characteristics are entrenched in a product or process at conceptualisation stage. It is important to understand that the importance of processes as they are essential to satisfying the expectations of the external stakeholders.

5.6. Mediation Effect of TQM on the Relationship Between Sustainability Practices and Organisational Performance

To examine the mediation effect of TQM on the relationship between sustainability practices and organisational performance, multiple mediation analysis was employed. The indirect effects of mediators on sustainability practices and organisational performance is presented in Table 5.10. The findings reveal that TQM has a mediating effect on the relationship between sustainability practices and organisational performance. However, this is a partial mediation. The insight drawn from this analysis is that TQM acts as a partial mediator between the sustainability practices and

organisational performance. This suggests that the implementation of TQM leads to greater adoption of sustainability practices. It is important to note that non-TQM organisations have a positive relationship with sustainability. However, the integration of TQM creates an enabling environment that leads to increased level of sustainability practices and consequently an improved organisational performance.

Table 5. 7 Mediation of the effects of the sustainability practices on organisational performance

Coefficients				
Mediators	(a paths)	(b paths)	Total Effect (c path)	Direct Effect (c' path)
TQM	0.4385, p=0.000	0.4056, p=0.000	0.5523, p=0.000	0.2881, p=0.3896

A further analysis was carried out on TQM values. The results reveal that top management commitment positively affects sustainability practices and organisational performance. To understand this effect, it is essential that top management commitment is viewed in the context of TQM and as an enabler. This suggests that the successful implementation of sustainability practices is dependent on the support of the top management. Without top management commitment, the implementation of sustainability practices will be inhibited. This supports previous assertions (Aragón-Correa, et al., 2007) that top management plays a pivotal role in creating the enabling environment and taking the necessary decisions that will lead to the successful implementation or integration of new systems in the organisation. There is a substantial influence TQM exerts on the strategies of an organisation due to its integration into organisational culture.

CHAPTER 6: CONCLUSION

6.1. Introduction

To present the conclusions drawn from the study, a recap of the aims, objectives and research methodology are highlighted in this chapter. Additionally, it is important to reiterate the research questions as a reminder and the basis for their validation as well as acceptance. The contribution of this study to theory (literature) and practice is also outlined in this chapter. Finally, the chapter concludes with limitations of the study and suggestions for future research opportunities.

6.2. An Overview of the Research

The main objective of this study is to identify the most significant driver (enablers) of co-implementation of TQM and sustainability and the mediating role of TQM on sustainability implementation. In addition, the study seeks to investigate the extent of co-implementation of TQM and sustainability practice. The increasing debate on climate change and the need for reduction in carbon footprint compelled organisations to implement sustainable practices. The idea is to ensure that the activities in the country have minimal implications on the environment and that they focus on the conservation of the available natural resources such that the needs of the future generation are not compromised. While most nations are still struggling to adopt sustainable practices, the concept of total quality management has emerged as a strategy that can foster the attainment of a higher performance in the manufacturing sector. Empirical evidence indicates that the implementation of total quality management has positive effects on the performance of an organisation; however, there is limited information on its association with sustainable development. The proposed study therefore seeks to establish the link between Total Quality Management and Sustainability and their resulting effects on the performance of an organisation. The aim of the study is to investigate the co-implementation of TQM and Sustainability and to determine whether either of the concepts has an enabling effect on the other.

A quantitative research method was adopted for data collection as well as data analyses. Survey by questionnaire was used to collect primary data from top management officials in organisations across the UK. Data analysis was carried out using the SPSS 22' software.

A conceptual framework consisting of three concepts were developed namely, total quality management, sustainability and organisational performance. The synopsis of the conceptual framework is that the co-implementation of total quality management and sustainability will provide the requisite environment for adoption of sustainability practices as well realization of improved organisational performance. In this regard, three research questions were proposed to test the validity of relationships specified in the conceptual framework.

A survey by questionnaire was employed to test the impact of co-implementation of TQM and sustainability. A total of 880 questionnaires were administered to organisations across the UK. The responding organisations were selected randomly from across a wide range of industries. One hundred and thirty-seven organisations provided useful data, the analysis and results of which were used as a basis for making inferences and reaching conclusions. Data collection from the responding organisations was focused on their level of TQM implementation, TQM values adopted, sustainability adoption, sustainability strategies and impact on organisational performance. Data analysis validated some aspects of the three research questions and therefore, certain central arguments adopted in the conceptual framework. The results from the data analyses corroborated previous studies that suggested that there is a significant relationship between the main research variables. Additionally, the data was tested to determine the role TQM and its core values play in the adoption of sustainability practices.

6.3. Research Questions

The purpose of this research was to determine the impact of co-implementation of TQM and sustainability practices on organisational performance and also identify the enablers of the co-implementation. Three questions were developed to ensure that the objectives of the research were met. Presented below are the research questions and the answers as provided by the data analysis.

6.3.1. Research question 1. What are the key enablers of sustainability practice?

Enablers are those elements that create a conducive environment for the successful implementation of sustainability. The most important enablers of sustainability implementation identified in this study are top management commitment, customer focus and continuous improvement.

Several authors have reported on the viewpoint many managers and indeed organisations hold regarding sustainability practices. Sustainability practices are seen as a capital-intensive project with limited benefits to the organisation. This is quite similar to the same fate encountered by TQM in its early years of introduction. Most organisations are focused on the short-term gains rather than long term benefits associated with sustainability adoption. Underpinning this view is the lack of adequate information on the integration of sustainability strategies into organisational operations. This study can conclude that TQM is an enabler of sustainability practices due to the positive influence that TQM principles have on sustainability practices. To achieve the benefits of co-implementation, sustainability practices must be embedded into the culture, structure and vision of the organisation.

Hence, this study has contributed to the clarity and eliminated the current ambiguity surrounding the implementation of sustainability both in the short and the long term. Highlighting the main focus of TQM in an organisation which is to increase profit and ultimately ensure organisational sustainability will help organisations understand that sustainability implementation will help increase their competitiveness, profitability and at the same time increase environmental and social performance. Additionally, a more profound implication of the results of this study is that it provides empirical evidence that rejects the view that TQM and sustainability are two contrasting concepts.

6.3.2. Research question 2. What is the level of co-implementation of TQM and sustainability practices in the UK?

To investigate the level of co-implementation of TQM and sustainability practices across business in the UK, a number of sustainability variables were taken into account. The variables considered for this study include size of the organisation, year of establishment, length of time the companies spent on TQM implementation, sustainability strategies adopted, sustainability practice assessment and sustainability reporting.

The data analysis as revealed by this study indicates that majority of the respondents have implemented sustainability practices or have taken significant steps towards the implementation process. The results show that a majority of the responding organisations that have implemented sustainability are TQM organisations with over 5 years of TQM practice. However, this is not to say that non-TQM organisations have not implemented sustainability practices at all, but it is

limited to large organisations. The size of organisation has been shown to play a significant role in the adoption of sustainability practices both in TQM and non-TQM organisations. This study can reveal that a majority of the responding organisations that implemented sustainability practices belong to the large organisations with over 250 workforce. A plausible explanation is the fact that small and medium size enterprises (SMEs) lack the financial, human, information and physical resources required for the implementation of sustainability practices. The initial investment required for TQM as well as sustainability adoption has been identified to be a major barrier for SMEs. Nevertheless, it is important to state that in spite of their lack of resources, SMEs engage in CSR which is considered a weak form of sustainability practice.

Although a number of the responding organisations do not file for sustainability reporting as revealed in the results, a measure of their environmental, social and economic performance on sustainability was used to assess their sustainability implementation. The results indicate that there is a wide spread of sustainability implementation across the UK. This leads us to the understanding that organisations are making a conscious effort to reduce their carbon footprints. However, this study did not investigate whether these decisions are driven by competition, image reputation or law enforcement. Nevertheless, it can be argued from the result of this study that there is a high level of co-implementation of TQM and sustainability practices in the UK. greenhouse emissions

6.3.3. Research question 3. Are TQM compliant organisations more successful in sustainability adoption compared to their non-TQM compliant counterparts?

This study has taken a closer analysis of the concept of co-implementation of TQM and sustainability and its impact in relation to organisational performance. The results show that TQM has a significant impact on dimensions of sustainability practices. This is consistent with previous studies that suggests that the adoption of sustainability practices will not only improve organisational performance but also help in reducing the effect on the environment and improve social impact. This study has revealed that TQM shows more significant impact towards the economic and social aspects of sustainability as compared to the environmental aspect. One plausible explanation for this effect is perhaps that the primary focus of TQM is not the reduction of pollution but rather the elimination of wastes in inefficient processes. Nevertheless, it is important to state the elimination of waste tends to reduce pollution if the pollution is as a result

of inefficient processes. However, a suggestion for future study is the integration of TQM with environmental management systems such as ISO 9001 and ISO 14001 to improve impact on the environment.

The benefits of TQM implementation have since been reported in many studies to have a positive impact on the performance of an organisation. Therefore, this is considered to be a critical driver that puts such organisations in a better competitive position. As one of the core principles/elements of TQM, top management commitment has been revealed in this study to contribute significantly to the adoption of sustainability practices and also play a mediating role in the co-implementation of TQM and sustainability practices. The conclusions drawn from this study are in line with prior studies that suggested that top management commitment plays a critical role in the successful implementation of sustainability practices. A comparison with non-TQM organisations shows that the level of sustainability adoption is low or weak at best.

In summary, this study can conclude that TQM organisations are in a better position to implement sustainability practices as compared with non-TQM organisations. In line with the findings of previous studies, TQM ensures organisational sustainability which in turns translates to economic sustainability. This provides the condition to counter the effect of sustainability adoption in the short term which has been viewed as a major barrier. A profound finding of this study is that it contributes to the understanding of the existence of synergy between TQM and sustainability practice and how both concepts can be co-implemented within an organisation to improve organisational performance.

6.3.4 Research question 4. What is the impact of co-implementation on organisational performance?

The literature review in this study highlights the absence of empirical studies that have addressed the question of how co-implementation of TQM and sustainability practices has influenced organisational performance. Accordingly, this study has presented through literature review an explanation of the synergy that exists between TQM and sustainability practices and also empirically examined their relationship and impact on organisational performance. The results from the regression analysis shows that co-implementation of TQM and sustainability practices are positively and significantly related with organisational performance. This contributes to clarity and understanding of the relationship between the three variables. Previous studies have

examined the impact of TQM on organisational performance and the impact of sustainability practices on organisational performance. Hence, taking into consideration the numerous ways organisations have attempted to integrate sustainability practices with limited success, this will give managers and decision-makers the confidence to integrate sustainability practices with greater clarity and better understanding of the implementation and how the synergies can improve overall organisational performance.

6.4. Contributions to Knowledge

The significance of sustainability has transformed it into a vital tool used by organisations in ensuring they remain competitive, particularly in this era of globalisation. This theme has dominated sustainability related literature over the past decade (Schaltegger and Wagner, 2006). A number of studies (e.g. Wagner, 2010; Issakson, 2006; Wagner and Schaltegger, 2004; Orlitzky et al., 2003) have been carried to establish the link between total quality management, organisational performance and sustainability. Although there have been significant contributions made over the last few years, there still exists a gap to increase understanding of the co-implementation of total quality management and sustainability. Maletic (2013); Issakson (2006); Wagner (2006), have presented the theoretical and empirical perspective to the benefits of sustainability on organisational performance. Nevertheless, this study seeks to add to existing literature by developing a conceptual framework for testing relationships within the context of total quality management and sustainability practices. The contribution of this study is outlined below.

First, this study has developed a conceptual as well as an empirical framework that will enable the analysis of relationships between total quality management and sustainability practices. Although a measurement scale for sustainability practice was not tested in this study, it lays the foundation for future studies on how organisations can measure the impact of the co-implementation on organisational performance. Having employed different approaches to implement sustainability practices with limited success, this study seeks to generally improve the understanding of the implementation of sustainability practices. As highlighted in the literature review in chapter 2, the congruence that exists between total quality management and sustainability can be exploited to improve the implementation of sustainability practice.

Second, several studies have presented evidence that quality related sustainability practices have significant impact on organisational performance. However, only a few of these studies have actually empirically examined the implication of the co-implementation of total quality management and sustainability on organisational performance. Hence, this study through the literature review highlights the existence of congruence between the two main variables (total quality management and sustainability) and also empirically confirms the roles these links play in the co-implementation process. The managerial implication of this is that the study provides clarity and improved understanding of the relationship between total quality management and sustainability practices in relation to organisational performance.

Third, the mediating role of top management commitment revealed in this study contributes to prior literature that examined the impact of TQM implementation on sustainability practices (Nguyen, Phan and Matsui, 2018). The conclusion drawn from this study suggests that top management commitment plays a bilateral role in the sense that it is vital for the successful implementation of both concepts. This finding will help define a more targeted research topic for future studies. Additionally, a wider implication for managers is that it can be viewed as the basis for translating the synergies between TQM and sustainability practices into practice.

Fourth, several studies have suggested that organisations can benefit and also improve their competitive advantage through the implementation of sustainability practices. However, there are limited studies that have empirically validated these assertions and identified the links in the relationship between TQM and sustainability practices. The correlation identified between constructs of TQM and sustainability practices in this study underlines the practical significance of understanding the links between TQM and sustainability practices and its practical implications for managers.

Finally, this study has demonstrated that TQM is an enabler of sustainability adoption. With its primary focus rooted in the improvement of the economic performance of an organisation, this implies that it is an important antecedent to sustainability adoption. And the simultaneous integration of TQM and sustainability does not only guarantee organisational sustainability but at the same time place the organisation in a better position to adopt sustainability practices. Empirically testing the co-implementation of TQM and sustainability practices will contribute to the debate on sustainability integration. The implications of this study are of practical significance

as it will help provide insights on how managers can develop a well-informed strategy on sustainability. Additionally, it presents opportunities for future research and advances the academic debate on sustainability integration.

6.5. Limitations and Future Research Suggestions

This research covers the link between total quality management and sustainability and the effect of simultaneous implementation on organisational performance. The level of co-implementation as well as enablers of TQM and sustainability were also explored. However, as it is common with most studies, this study is not exempt from certain limitations. The limitations identified along with suggestions presented in this study provides avenues for future research opportunities.

First, the methodology employed in this study suffers limitations due to the fact that survey by questionnaire is subjective. A cross-sectional data was collected by a self-administered questionnaire based on a five-point Likert scale. In spite of measures taken to address issues on individual and perceptual biases, the tendency for respondents to over or underestimate items of social desirability to the organisation exists. Therefore, future studies can engage multiple managers from each responding organisation to address bias and enhance data reliability.

Second, the capabilities of organisations in this study is generalised. Therefore, generalisation cannot be specific. This calls for industry specific study on the impact of co-implementation of TQM and sustainability practices. Additionally, future studies can employ case study on organisations that have deliberately and explicitly adopted the co-implementation of both concepts to capture industry specific know-how.

Third, organisational performance is determined from the perception of top management by measuring items such as profitability, productivity level and market share. Financial data such as return on investment, return on equity, financial statements, and sustainability investments may provide more reliable data on the performance of the organisation.

Fourth, the measurement of sustainability practices depends on a long-term performance report of an organisation. Thus, this creates a challenge with regards to obtaining concrete data on sustainability practices. As it has been shown in this study, a cross-sectional survey method was used to collect. However, this method has been debated to be insensitive to changes of time and limit interpretation of empirical findings. Therefore, there is a need for future studies to consider

other longitudinal data to confirm the findings and validate measurement scale to enhance generalisability.

Finally, future studies should consider the influence of organisational culture, stakeholder theory and institutional theory on co-implementation of TQM and sustainability practices. Previous research on sustainability has suggested that these theories play a significant role in the implementation of sustainability practices. Thus, this creates potential research opportunities for future studies.

6.6. Summary

The global campaign on sustainability has compelled organisations to collectively address a wide range of issues beyond their traditional goal of maximising profits. In an effort to address the effects of their activities on the environment, organisations have attempted to adopt sustainability practices. However, despite the growing number of studies on the implementation of sustainability practices, organisations are still struggling with the implementation. Total Quality Management (TQM) practices, on the other hand, have been researched extensively and empirically proven to have positive impacts on organisational performance (Kaynak, 2003; Yusof and Aspinwall, 2002). Given the seeming similarity between TQM and Sustainability adoption processes, the central question of this research is if organisations can leverage on their experience in TQM implementation to facilitate and enhance implementation of sustainability practices.

This research therefore seeks to present and analyse a conceptual framework that will provide a better understanding of the relationship between TQM and sustainability practices and their impacts on organisational performance when co-implemented. To address this, an extensive literature review was carried out which highlighted the key intersections between TQM and sustainability practices. Based on the assumption that organisations that implement TQM are better at adopting sustainability practices, a further delineation of the relevant theoretical insights and the existence of synergies between TQM and sustainability practices were highlighted.

One of the main conclusions drawn from the empirical evidence revealed that top management commitment serves as a mediator in the relationship between sustainability practices and organisational performance. This suggests that the greater the involvement of the leadership

team in an organisation the greater the sustainability adoption which will in turn lead to improved organisational performance. The commitment of the top management is critical to the success of sustainability implementation. This is due to the fact management is responsible for creating the vision and culture that embeds sustainability practices and strategies into the core values of the organisation.

Furthermore, the results also confirmed the existence of synergies between TQM principles and sustainability practices. TQM principles, especially continuous improvement and customer focus have been revealed to have positive and significant impact on organisational performance. Therefore, this supports the assertion that TQM acts as an enabler of sustainability practices which in turn implies that TQM organisation will have considerable advantage at implementing sustainability practices.

APPENDICES

Appendix 1

RESEARCH QUESTIONNAIRE

GENERAL INFORMATION

Please read the questions and fill-in / tick the appropriate space or box provided

1. Name of company? _____

2. Position held in the company? _____

3. Year company was incorporated? _____

4. Legal classification of company?

☐

Sole Proprietorship

☐

Public Limited Liability

☐

Partnership

☐

Private Limited Liability

☐

NGO

5. What is the company's core business area?

☐

Financial services

☐

Automobile

☐

Transport services

☐

Construction

☐

Civil engineering

☐

Education

☐

Telecommunications

☐

Retail

☐

Hospitality

☐

Other_____

6. How many employees does the company have?

☐ Less than 50

☐ 51 -100

☐ 101-200

☐ 201-500

☐ 501 and above

7. Does your company implement TQM?

☐ Yes

☐ No

If No please go to Question G

8. Does your company have ISO 9000 or similar Quality Assurance Certifications?

☐ Yes

☐ No

Other_____

9. How long has your company been implementing TQM?

☐ Less than a year

☐ 11-15years

☐ Less 5 years

☐ 16years and above

☐ 6-10years

10. In which departments of your company is TQM implemented?

☐ Procurement

☐ Administration

☐ Quality assurance

☐ Customer services

☐ Sales and marketing

☐ All departments

☐ Accounting

☐ Other_____

11. What percentage of employees are involved in TQM?

☐ Less than 10

☐ 51-75

☐ 11-25

☐ 76 and above

☐ 26-50

12. How many hours does an average employee spend in TQM training yearly?

☐ Less than 10hours/yr

☐ Up to 50hours/yr

☐ Up to 20hours/yr

☐ More than 50hours/yr

☐ Up to 30hours/yr

13. How often do you conduct surveys on your customers?

☐ Quarterly

☐ Not sure

☐ Twice yearly

☐ Never

☐ Annually

TQM IMPLEMENTATION

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

A. TOP MANAGEMENT COMMITMENT	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. Top executives are actively involved in establishing and communicating the company's vision, goals, plans and values for quality program.	1	2	3	4	5

2. Management insists on accuracy and reliability of information and communication within the organization.	1	2	3	4	5
3. Top management prioritizes quality ahead of meeting production schedules.	1	2	3	4	5
4. Top management is evaluated on quality performance.	1	2	3	4	5

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

B. CUSTOMER FOCUS	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. Production/service design, development and delivery are based on meeting the needs of customers.	1	2	3	4	5
2. A wide variety of mechanisms (e.g. phone, email and social media) for customers to contact the company are readily available.	1	2	3	4	5
3. Customer focused strategies and approaches are continuously reviewed for further improvement.	1	2	3	4	5
4. Customer surveys, reviews and focus groups are used for seeking and learning customer needs and expectations.	1	2	3	4	5

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

C. PEOPLE MANAGEMENT	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. The selection and recruitment process is effective (in terms of objectivity and 'right man for the right job').	1	2	3	4	5
2. The company concentrates on on-going development of personnel by establishing extensive training programs that covers all aspects of TQM.	1	2	3	4	5

3. The company periodically implements quality activities such as Quality Circles, Quality Improvement Teams or suggestion systems.	1	2	3	4	5
4. Employee satisfaction is formally and regularly measured.	1	2	3	4	5
5. Occupational health and safety practices are excellent.	1	2	3	4	5

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

D. SUPPLIER QUALITY MANAGEMENT	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. The company prioritizes quality over price and schedule when selecting a supplier.	1	2	3	4	5
2. Regular feedback is provided on the performance of supplier's product.	1	2	3	4	5
3. The company always participates in supplier activities related to quality.	1	2	3	4	5

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

E. CONTINUOUS IMPROVEMENT	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. Competitive benchmarking.	1	2	3	4	5
2. The company encourages continual study and improvement of all its processes, products and services.	1	2	3	4	5
3. Products and processes are frequently measured for data collection.	1	2	3	4	5

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

F. ORGANIZATIONAL PERFORMANCE	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. Employee involvement has increase.	1	2	3	4	5
2. Employee satisfaction has improved.	1	2	3	4	5
3. Employee turnover has decreased.	1	2	3	4	5

4. Information sharing has increased.	1	2	3	4	5
5. Defects/errors in products/services have decreased.	1	2	3	4	5
6. Cost of quality has decreased.	1	2	3	4	5
7. Productivity has improved.	1	2	3	4	5
8. Wastes have reduced.	1	2	3	4	5
9. Customer complaints have reduced.	1	2	3	4	5
10. Sales have increased.	1	2	3	4	5
11. Profit has increased.	1	2	3	4	5
12. Company's overall market share has increased.	1	2	3	4	5
13. The company's reputation has improved.	1	2	3	4	5
14. The company's ability to meet unexpected high levels customer demands has improved.	1	2	3	4	5
15. The range of services provided has increased.	1	2	3	4	5
16. Product/service innovation has increased.	1	2	3	4	5
17. Competitive position of the company has been strengthened.	1	2	3	4	5

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

G. SUSTAINABILITY

1. Does your company have any senior management person responsible for sustainability?

☐

Yes

☐

No

2. Does your company publish a sustainability report?

☐

Yes

☐

No

3. Does your company have a health and safety policy?

☐

Yes

☐

No

4. Does your company have an environmental policy?

☐ Yes

☐ No

5. Does your company have a supplier sustainability policy?

☐ Yes

☐ No

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

I. SUSTAINABILITY STRATEGIES	Strongl y disagree	Disagre e	Not sure	Agree	Strongl y agree
1. Our company had put together structures to ensure resources are used in a manner that will not limit the sustainability of future generations.	1	2	3	4	5
2. Senior management is committed to implementing policies that ensure resources are used in a manner that will not limit the sustainability of future generations.	1	2	3	4	5
3. Strategies to ensure resources efficiency and sustainability have been included in our company's business plan.	1	2	3	4	5
4. Progress of company's impact on the environment is recorded periodically.	1	2	3	4	5
5. Progress on economic viability of company's operations is reported periodically.	1	2	3	4	5
6. Our company conducts staff training periodically to ensure prudent use of resources.	1	2	3	4	5
7. Company has designed a motivation plan to promote the culture of good ethics in resource use.	1	2	3	4	5
8. Company has invested in information technology systems to help ensure sustainable operations.	1	2	3	4	5
9. Company has an Environmental Protection Agency (EPA) Certificate.	1	2	3	4	5

Please circle the number of the response that best represents your level of agreement with the corresponding statements.

H. SUSTAINABILITY PRACTICES	Strongl y disagree	Disagre e	Not sure	Agree	Strongl y agree
1. The company uses energy saving equipment.	1	2	3	4	5
2. The company buys less toxic products for its operations.	1	2	3	4	5

3. The company buys energy from renewable sources.	1	2	3	4	5
4. The company has invested in carbon emission reduction projects.	1	2	3	4	5
5. The company encourages employees to use public transport, bicycle or walk to work.	1	2	3	4	5
6. The company recycles or reuses waste products.	1	2	3	4	5
7. The company is committed to social issue such as human rights, child labour, non-discrimination, etc.	1	2	3	4	5
8. The company conducts social audits.	1	2	3	4	5
9. The company is committed to good business conduct and compliance.	1	2	3	4	5
10. Sustainability practice has improved brand reputation.	1	2	3	4	5
11. Sustainability practice has reduced cost due to efficient use of resources.	1	2	3	4	5

Thank you very much for your time.

Please return the Questionnaire by mail using the enclosed self-addressed envelope.

Appendix 2

Table 1. Mediation Effect of Sustainability

Model = 4

Y = OP

X = TQM

M = Sust

Sample size

137

Outcome: Sust

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4993	.2494	.2425	44.8441	1.0000	135.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.9266	.5255	1.7631	.0801	-.1128	1.9660
TQM	.7548	.1127	6.6966	.0000	.5319	.9777

Outcome: OP

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7699	.5927	.0728	97.5065	2.0000	134.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.5665	.2913	1.9449	.0539	-.0096	1.1426
Sust	.0903	.0472	1.9137	.0578	-.0030	.1835
TQM	.7862	.0713	11.0293	.0000	.6453	.9272

***** TOTAL EFFECT MODEL *****

Outcome: OP

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7626	.5816	.0742	187.6501		1.0000 135.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.6501	.2908	2.2356	.0270	.0750	1.2252
TQM	.8544	.0624	13.6985	.0000	.7310	.9777

***** TOTAL, DIRECT, AND INDIRECT EFFECTS *****

Total effect of X on Y

Effect	SE	t	p	LLCI	ULCI
.8544	.0624	13.6985	.0000	.7310	.9777

Direct effect of X on Y

Effect	SE	t	p	LLCI	ULCI
.7862	.0713	11.0293	.0000	.6453	.9272

Indirect effect of X on Y

Effect	Boot SE	BootLLCI	BootULCI
Sust	.0681	.0372	.0089 .1587

Ratio of indirect to total effect of X on Y

Effect	Boot SE	BootLLCI	BootULCI
Sust	.0797	.0449	.0096 .1886

Ratio of indirect to direct effect of X on Y

Effect	Boot SE	BootLLCI	BootULCI
Sust	.0866	.0557	.0097 .2324

R-squared mediation effect size (R-sq_med)

	Effect	Boot SE	BootLLCI	BootULCI
Sust	.2119	.0561	.1117	.3322

Appendix 3

Table 2. Mediation Effect of TQM

Model = 4

Y = OP

X = Sust

M = TQM

Sample size

137

Outcome: TQM

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4993	.2494	.1061	44.8441	1.0000	135.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	3.1826	.2205	14.4317	.0000	2.7465	3.6187
Sust	.3303	.0493	6.6966	.0000	.2328	.4279

Outcome: OP

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7699	.5927	.0728	97.5065	2.0000	134.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.5665	.2913	1.9449	.0539	-.0096	1.1426

TQM	.7862	.0713	11.0293	.0000	.6453	.9272
Sust	.0903	.0472	1.9137	.0578	-.0030	.1835

***** TOTAL EFFECT MODEL *****

Outcome: OP

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4722	.2230	.1379	38.7439	1.0000	135.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	3.0688	.2514	12.2089	.0000	2.5717	3.5659
Sust	.3500	.0562	6.2245	.0000	.2388	.4612

***** TOTAL, DIRECT, AND INDIRECT EFFECTS *****

Total effect of X on Y

Effect	SE	t	p	LLCI	ULCI
.3500	.0562	6.2245	.0000	.2388	.4612

Direct effect of X on Y

Effect	SE	t	p	LLCI	ULCI
.903	.0472	1.9137	.0578	-.0030	.1835

Indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TQM	.2597	.0540	.1651	.3800

Partially standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TQM	.6189	.1105	.4151	.8554

Completely standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TQM	.3505	.0574	.2392	.4689

Ratio of indirect to total effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TQM	.7421	.1139	.5321	.9772

Ratio of indirect to direct effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
TQM	2.8779	57.9377	1.0297	20.1247

R-squared mediation effect size (R-sq_med)

	Effect	Boot SE	BootLLCI	BootULCI
TQM	.2119	.0557	.1095	.3243

***** ANALYSIS NOTES AND WARNINGS *****

Appendix 4

Table 3. CFA - Convergent Validity

		Estimate	S.E.	C.R.	P
TMC1	TCM	1.000			
TMC2	TCM	.853	.016	53.135	***
TMC3	TCM	.853	.016	53.135	***
TMC4	TCM	.823	.053	15.614	***
CF1	CF	1.000			
CF2	CF	.830	.108	7.720	***
CF3	CF	.989	.125	7.931	***
CF4	CF	1.047	.133	7.854	***
PM1	PM	1.000			
PM2	PM	.845	.279	3.023	.003
PM3	PM	.706	.279	2.526	.012
PM4	PM	.788	.446	1.766	.077
PM5	PM	.607	.154	3.938	***
SQM1	SQM	1.000			
SQM2	SQM	.803	.137	5.849	***
SQM3	SQM	.729	.280	2.602	.009
CI1	CI	1.000			
CI2	CI	.858	.097	8.854	***
CI3	CI	.851	.101	8.442	***
OP1	CP	1.000			
OP2	CP	.874	.094	9.325	***
OP3	CP	.784	.051	15.376	***

OP4	CP	.832	.044	19.093	***
OP5	CP	.817	.042	19.322	***
OP6	CP	.834	.042	19.999	***
OP7	CP	.811	.052	15.481	***
OP8	CP	.800	.041	19.490	***
OP9	CP	.817	.042	19.317	***
OP10	CP	.751	.069	10.953	***
OP11	CP	- 1.48 3	.343	-4.325	***
OP12	CP	.768	.072	10.691	***
OP13	CP	.829	.060	13.716	***
OP14	CP	.784	.064	12.229	***
OP15	CP	.711	.071	10.072	***
OP16	CP	.740	.070	10.555	***
OP17	CP	.842	.067	12.660	***
SS1	SS	1.00 0			
SS2	SS	.692	.080	8.610	***
SS3	SS	.797	.093	8.536	***
SS4	SS	.777	.148	5.255	***
SS5	SS	.328	.054	6.115	***
SS6	SS	.691	.087	7.926	***
SS7	SS	.842	.111	7.578	***
SS8	SS	.417	.066	6.289	***
SS9	SS	1.06 7	.212	5.034	***
SP1	SP	1.00 0			
SP2	SP	.579	.089	6.494	***
SP3	SP	1.08 6	.172	6.317	***

SP4	SP	1.45 1	.255	5.693	***
SP5	SP	1.58 8	.360	4.415	***
SP6	SP	.655	.096	6.844	***
SP7	SP	.406	.084	4.860	***
SP8	SP	1.39 2	.492	2.832	.005

Appendix 5

Table 4. CFA – Discriminant Validity

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
TCM	<-->	CF	.086	.016	5.341	***	
TCM	<-->	PM	.053	.013	4.020	***	
TCM	<-->	SQM	.042	.013	3.170	.002	
TCM	<-->	CI	.038	.013	2.869	.004	
TCM	<-->	CP	.069	.022	3.080	.002	
TCM	<-->	SS	.027	.028	.979	.328	
SP	<-->	TCM	-.002	.011	-.152	.879	
CF	<-->	PM	.045	.014	3.318	***	
CF	<-->	SQM	.048	.014	3.337	***	
CF	<-->	CI	.089	.017	5.364	***	
CF	<-->	CP	.124	.026	4.751	***	
CF	<-->	SS	.077	.030	2.536	.011	
SP	<-->	CF	.012	.011	1.104	.270	
PM	<-->	SQM	.040	.012	3.213	.001	
PM	<-->	CI	.046	.013	3.580	***	
PM	<-->	CP	.073	.021	3.444	***	
PM	<-->	SS	.033	.026	1.299	.194	
SP	<-->	PM	.019	.010	1.854	.064	

SQM	<-->	CI	.096	.016	5.989	***	
SQM	<-->	CP	.080	.022	3.604	***	
SQM	<-->	SS	.012	.027	.453	.650	
SP	<-->	SQM	.014	.010	1.346	.178	
CI	<-->	CP	.057	.022	2.620	.009	
CI	<-->	SS	.034	.027	1.242	.214	
SP	<-->	CI	.007	.010	.670	.503	
CP	<-->	SS	.132	.048	2.777	.005	
SP	<-->	CP	.025	.018	1.441	.150	
SP	<-->	SS	.124	.028	4.465	***	

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