INFLUENCE OF QUALITY MANAGEMENT PRACTICES ON SUCCESSFUL COMPLETION OF TELECOMMUNICATION TOWER CONSTRUCTION PROJECTS IN TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF PROJECT MANAGEMENT (MPM)

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2025

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the Open University of Tanzania, a dissertation entitled; **"Influence of Quality Management Practices on Successful Completion of Telecommunication Tower Construction Projects in Tanzania"** in partial fulfillment of the requirement for thedegree of Master Degree in Project Management (MPM)

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DECLARATION

I, **Albert Akaro,** declare that the work presented in this dissertation is original. It has never been presented to any other University or Institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master in Project Management of the Open University of Tanzania.

……..……...

Signature

……...

Date

DEDICATION

I dedicate this study to my parents, for your constant prayers, love, and support.

ACKNOWLEDGEMENTS

I take this opportunity to thank almighty God for his mercy upon successful completion of this study. I thank my family for the boundless love and unwavering support during the research process. I owe a debt of gratitude to my dear parents who supported my academic endeavor from the beginning.

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ABSTRACT

This study assessed influence of quality management practices on successful completion of telecommunication tower construction projects in Tanzania. The study had four specific objectives which were to examine the influence of quality planning practices on the successful completion of telecommunication tower construction projects in Tanzania; to determine the influence of quality assurance practices on the successful completion of telecommunication tower construction projects in Tanzania; to determine the influence of quality control practices on the successful completion of telecommunication tower construction projects in Tanzania and to examine the influence of quality improvement practices on the successful completion of telecommunication tower construction projects in Tanzania. The study was conducted at BEST ONE Limited and attended by 50 respondents from whom data were collected using questionnaire and interview methods. Data were analysed using descriptive statistics, the multiple regression and content analysis methods. Study findings revealed that quality planning, quality assurance, quality control and quality improvement had positive and significant influence on successful completion of telecommunication tower construction projects. The study concludes that quality management practices had influence on successful completion of telecommunication tower construction projects. The study recommends that BEST ONE and related companies to put more efforts on improving quality in the telecommunication tower construction project to enhance outstanding efficiency.

KEYWORDS:

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LIST OF ABBREVIATION AND ACRONYMS

AA	Agency Acceptance
SPSS	Statistical Package and Service Solution
CQC	Contractor Quality Control
DR	Dispute Resolution
IA	Independent Assurance
LA	Laboratory Accreditation
PQ	Personnel Qualification
SPC	Successful Project Completion
QA	Quality Assurance
QC	Quality Control
QMP	Quality Management Practices
QP	Quality Planning
QI	Quality Improvement

CHAPTER ONE

INTRODUCTION

1.1 Chapter Overview

This chapter introduces the study by providing background information, problem statement, research objectives and questions, relevance of the study as well as study arrangement.

1.2 Background to the Study

Quality management is one of the essential areas in managing construction projects across sectors including telecom (Kwasira, Wambugu & Wanyoike, 2019). It is with no doubt that the telecom industry is among the most competitive and significant industries across the world since are links to almost every aspect of life especially on enhancing smooth operation of other industries and countries in general (Balashova & Gromova, 2017). With such liability, telecommunication companies have been doing an extensive job of ensuring that quality is always maintained to ensure that construction projects executed are completed (Duru & Alhasweh, 2013; Keshyap, 2023).

Considered the necessity of telecom industry, companies within have been building telecommunication and remain liable of telecom towers as service means of enhancing communication among individual companies and as nations at large (Kimaru, 2019). With such liability, telecommunication companies have been doing an extensive job of ensuring that quality is always maintained to ensure that construction projects executed are successfully completed (Duru and Alhasweh, 2013; Keshyap, 2023).

Globally, quality management has made tremendous change in some infrastructure since several various tools being adopted to enhance the successful completion of associated construction projects (Ratan, 2015). Among of the notable reasons to verify the change brought by quality management in telecom tower construction is its enhancement in assisting projects to be completed within budget and set time which appears to be dependent to a number of factors (Keup, 2021). However, completing projects within time and budget in the telecom tower construction projects requires stakeholders to effectively address the implementation of quality management measures with associated factors to enhance timely as well as within budget (Ibidunni, 2017).

The often constructed telecom towers are divided into five types namely self-standing towers, guyed/mast towers, cell/wheels towers, reinforced concrete towers as well as mobile telecom towers (Ratan, 2016). Ideally, for whichever tower construction project to experience quality management, there are four common factors namely quality planning, quality assurance, quality control and quality improvement which must transpire therein to constitute the related practices (Esmaeili, Pellicer and Molenaar, 2016). Descriptively, quality planning provides activities to be undertaken in a structural sequence that needs to be completed for the purpose of improving as well as sustaining the quality of a particular project (Naybour, 2022).

In addition, Alawag et al.., (2022) indicated that quality planning is one of the determined factor for enhancing successful completion of the construction project in which required resources, steps to be followed as well as specifications are

prioritized and considered accordingly. Secondly, quality assurance seeks to put in place relative checks responsible for ensuring that quality is enhanced from scratch in the project (Goswami, 2015). Another entity is quality control which stands for analyzing and inspecting the output of the project for the purpose of determining whether the particular output conforms to pre-given standards (Rumane, 2015). Lastly, there is a quality improvement element thatentails implementing deliberate quality tasks/actions for the purpose of increasing standards of quality (Orji, Obodoh and Emenike, 2019).

Nevertheless, despite of the given entities, the world still encounters challenges with regard to completing construction projects which reflect delays & projects to be completed out of set budget and time (Kazare, 2019). Gumo, Makokha & Namusonge (2018) clarified that lack of proper implementation of quality management practices has been affecting several construction projects not being successfully completed with regards to time for project completion and completing the same projects within the set budget. In a study about factors affecting monitoring and evaluation in telecom industry with a focus on project implementation at Safaricom Limited by Watiti (2018) revealed that most of the telecom infrastructure construction projects were not efficiently since they were not delivered on time and within set budget.

Uncertainty relies on the fact that most of the documented literature has concentrated on industry whether across the industry or within developing nations like Africa and Tanzania in specific where timely completion of the telecom tower construction and within set budget remains a problem (Mwanaumo *et al.*, 2020). This is contrary to

what Dvir's Four Dimensions of Project Success model which indicates that projects that are completed within time and budget are termed as efficient and therefore it must be made evident that carried period has transpired within such success factors (Shenhar *et a*l., 2001). In that regard, there is a great need for ascertaining whether or not the existing influence of quality planning, quality assurance, quality control, and quality improvement practices on successful (time and within budget) completion of telecom tower construction projects in Tanzania.

1.3 Statement of the Problem

Telecommunication tower construction projects in Tanzania faces challenges with regards to completing projects on time as well as within budget (Alawag *et al..*, 2023). Companies within telecom industry have made tremendous efforts such as establishment of quality management policies and monitoring but there still notable challenges with regards to successful completion of telecom tower construction projects (Gaibi, 2021). In addition, despite the role of quality management in telecom tower construction projects, it is uncertain on how related practices namely quality planning, quality assurance, quality control as well as quality improvement influence successful completion of telecom tower construction projects in Tanzania (Mwanaumo *et al..*, 2020).

BEST ONE Limited is among the companies in telecom industry found in Tanzania with several telecom tower construction projects executed and established quality policy in place but there is no evidence on the extent to which quality management practices influence successful completion of related projects. While addressing this knowledge gap, it was essential for this study to assess the influence of quality

management practices with their impact on successful completion of related projects specifically within time scheduled and budget. The expected study findings were for informing the contribution of each quality management practice towards successful completion of telecom tower construction projects and thus paving a way for companies to use the obtained findings as a model of implementation of such quality management practices for successful completion of tower construction projects.

1.4 Research Objectives

1.4.1 General Research Objective

This study generally sought to assess the influence of quality management practices on the successful completion of telecom tower construction projects in Tanzania.

1.4.2 Specific Research Objectives

i. To examine the influence of quality planning practices on the successful completion of telecommunication tower construction projects in Tanzania
ii. To find out the influence of quality assurance practices on the successful completion of telecommunication tower construction projects in Tanzania
iii. To identify the influence of quality control practices on the successful completion of telecommunication tower construction projects in Tanzania
iv. To measure the influence of quality improvement practices on the successful completion of telecommunication tower construction projects in Tanzania

1.5 Relevance of Research

This study assesses the influence of quality management practices namely quality planning, quality assurance, quality control as well as quality improvement on the

successful completion of telecommunication tower construction projects. The study findings contribute to the body of knowledge regarding quality management practices and thus establishing venture for other scholars to investigate on the related issues. The findings of this study set out various quality planning practices which inform about the focus of the company with regards to quality management and thus the findings to be obtained provide a clue on what telecommunication companies plan to do in response to quality management in tower construction activities. Furthermore, the study findings revealed the quality assurance mechanism in place at BEST ONE company as a reflection of the relative checks responsible for ensuring that quality is enhanced from scratch to the completion of the telecom tower construction projects.

In addition, the study findings revealed the practiced quality control mechanism in place to assist in creating awareness of how quality can be controlled. Last but not least, the study findings presented strategies in place in telecommunication companies for improving quality as a means of consistently implementing tower construction projects successfully. This will assist to companies to be informed on how they can always improve the state of quality practices in implementing the same projects.

1.6 Scope of the Study

This study was set out to showcase how quality management practices influences successful completion of telecommunication tower construction projects. This study only covered quality planning, quality assurance, quality control and quality improvement practices and the obtained findings reflected BEST ONE Limited and

could not be necessarily generalized. Additionally, the scope of the study was attributable to the limited time provided and thus issues covered in the narrated themes were sufficient enough as deduced from the Juran's Theory of Quality Management theory.

1.7 Organization of the Study

This report is organized into five chapters. The chapter one presents the background of the study with a problem statement, research objectives, and study's significance. Chapter two reviews relevant literature regarding the study topic as well as developing a conceptual model used to represent study variables with their relationships. Chapter three presents various methods and techniques including research design, research area, population, sample size, study data, data collecting tools, validity and reliability, research ethics as well as data analysis plan. Chapter four analysed, presented and discussed the study findings on basis of the specific objectives of the study. Chapter five summarized, concluded and provided recommendations based on the obtained study findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Chapter Overview

This chapter provides a conceptual definition of study variables as well as theoretical and empirical literature to provide a theoretical base for study data and support of the study findings.

2.2 Conceptual Definitions

2.2.1 Quality

Quality refers to a measure of how well a product, an object or service meet or exceeds given expectations (Huang, Chen & Lin, 2021). Furthermore, Awoku (2012) defines quality as a degree to which a given set of certain characteristics are inherited in the course of fulfilling requirements. This study adopts the definition of quality as provided by Awoku (2012) that quality refers to a degree to which a given set of certain characteristics are inherited in the course of fulfilling requirements. This definition has been adopted since this study needs to interrogate practices of quality management which will be defined by their characteristics for the purpose of meeting requirements which are successful completion of telecom tower construction projects.

2.2.2 Quality Management Practices

Quality management practices refers to systematic and coordinated processes and strategies implemented by organizations to ensure and enhance quality (Antony, Krishnan & Kumar, 2020). On further note, Shammot (2019) defines quality management practices as management activities to ensure that a given set of certain

characteristics for implementing certain tasks meet the required standards. This study adopts the definition of quality management practices as provided by Shammot (2019) that which refers to management activities to ensure that a given set of certain characteristics for implementing certain tasks meet the required standards. The adoption of this definition to the study is attributed to its comprehensiveness in addressing the standards in addressing the underlying practices.

2.2.3 Telecommunication

Telecommunication refers to exchange of information and transmission by electromagnetic, electrical, or optical means to facilitate communication between systems, organizations as well as individual beings (Winther and Humphrey, 2021). On the other note, Natai (2021) defines telecommunication as the employment of technology advances to enhance distant communication using several supportive equipment including towers. This study adopts the definition of telecommunication as provided by Natai (2021) as the employment of technology advances to enhance distant communication using several supportive equipment including towers. The adoption of this definition to this study is attributed to its inclusion of distant communication via supportive equipment like telecom tower and thus being more appropriate for this study.

2.3 Theories Underpinning the Study

This study will use two theories namely Juran's Theory of Quality Management as well as modified Dvir's Four Dimensions of Project Success. The inclusion of these theories is attributable to their focus and relevant variables that this study can deduct from to obtain a conceptual model.

2.3.1 Juran's Theory of Quality Management

Juran's Theory of Quality Management was developed by Juran in 1979. Juran's Theory of Quality Management is the one that will be the main theory governing the study. The theory is applicable in this study since it presents that for the results of a business to be improved, the quality of its processes including quality planning, quality assurance, quality control as well as quality improvement needs to be improved since customers are always in need of quality service (Koskela, Tezel and Patel, 2019).

Juran's Theory of Quality Management focuses on customer needs and expectations based on quality of delivered service through planning, improvement, assurance as well as control (Mosadeghrad, 2022). The theory to some extent may not provide comprehensive guidance on adapting quality management practices as far as globalization and emerging technologies are concerned (Havadtoi and Moldovan, 2019). With such stance, this study adopts the strength of the theory with conceptualized ideas obtained from the review of the literature to make it effective in addressing influence of quality management practices on the successful completion of telecom tower construction projects in Tanzania.

2.3.2 Dvir's Four Dimensions of Project Success

Dvir's Four Dimensions of Project Success model was developed by Shenhar, Levy and Divir in 1997. The essence of adopting the model is attributed to its ability to address project success factors and thus being efficient for this study. By default, the model indicates that measuring the success of a project is time-based after completion and being within budget and thus called efficiency. Dvir's Four

Dimensions of Project Success is applicable in this study since it indicates that measuring the success of a project is time-based after completion and being within budget and thus called efficiency which addresses the dependent variable of the study (Mwanaumo *et al*., 2020). The model has conceptualized and combined relevant dimensions (that is time and within budget) for project success and provided a representative variable (project efficiency) for the joint dimensions which appear to be more meaningful (Asiedu and Mkansi, 2022).

The model presents team satisfaction as another measure for project success while generally known that satisfaction might be subjective to the respective team irrespective of deficiencies notable in the same project (Gazal, Musibau, and Rukayat, 2023). In recognizing such weakness, his study employed project efficiency to showcase how it contribute towards project completion success which therefore contributes to the body of knowledge.

2.4 Empirical Analysis of Relevant Studies

Various studies were reviewed to build a theoretical base for this study.

2.4.1 Worldwide Studies

Memon (2014) studied contractor perspective on time overrun factors in Malaysian construction projects. The study findings revealed frequent changes in design, changes in project scope, financial constraints as well as delayed decision-making. The difference between Memon's study and this study relies on the location of their undertaking being in two different continents being Asia and Africa respectively. Menshikova, Khazanov and Styazhkin (2016) researched about the implementation

of the quality management system in the telecommunication companies. The study found that the implementation of the quality management system is advantageous to the telecommunication industry and not to companies themselves, but such system should consider all operations therein. The difference between Meshikova, Khazanov and Styazhkin study with this one is based on the themes covered being implementation of quality management system while this study focuses on quality management practices.

2.4.2 Studies in African Countries

Kwasira, Wambugu and Wanyoike (2019) carried out a study about the influence of quality management practices on the successful completion of building construction projects in Nakuru Town, Kenya. A structured questionnaire was the main data collection instrument. The study findings showed that all four quality management variables namely quality planning, quality assurance, quality control as well as quality improvement were positive and statistically significant related to the successful completion of construction projects in Kenya. The differences in these two studies relies on data collection instruments whereby study by Kwasira, Wambugu and Wanyoike employed one data collection instrument namely structured questionnaire while this study employed two data collection instruments namely semi structured questionnaire as well as interview guide.

Mwanaumo *et al*. (2020) carried out an investigation of factors causing schedule overruns in telecommunication projects in Zambia. The study findings among others pinpointed poor planning as the main cause of telecommunication project schedule overrun which therefore also affected construction phases particular projects were

set for. The difference between these studies is based on the study context in which Mwanaumo's study focused on factors for schedule overrun in telecommunication projects in general while this study focuses on quality management practices on successful completion of telecom tower construction projects.

Asiedu and Mkansi (2022) did a comprehensive assessment of time overruns in Ghanaian telecom cell site construction. The study findings showed that the construction industry mostly encounter overrun in time for construction of telecom tower which is mostly from three weeks to two months which results in loss of revenue. The difference observed, Asiedu & Mkansi (2022) study did an assessment of time overrun while this study tries to establish the influence brought by quality management practices on successful completion of telecom tower construction projects.

2.4.3 Studies in Tanzania

Johnson (2018) carried out a study about the viability of shared mobile network infrastructure in Tanzania. The study findings established that delays in completing most of the telecommunication projects are the result of poor time management by contractors and thus affecting service delivery among members of the joint usage of infrastructure. The difference between these studies is on their context whereby the previous one centered on shared mobile network infrastructure while the current study centers itself on quality management practices. Jongo *et al*. (2019) studied about factors affecting performance and time schedule for multi-unit residential building construction in Dar es Salaam Tanzania. The study sought to explore factors affecting performance and time schedules in construction projects. Structured

questionnaires and interviews were used to collect data. The study findings showed that late payment influence cost and time overrun. The difference between these studies is established through industry address in which previous study addresses the construction industry while the current study addresses the telecom industry.

2.5 Conceptual Framework

A conceptual model for this study presents both independent variables as well as dependent variables to ascertain the existing relationship/influence. The Independent part of the study which is represented by quality management practices is measured using quality planning, quality assurance, quality control as well as quality improvement. On the other side, the dependent variable being successful project completion is measured by the efficiency of projects that are being completed within a set time and budget as showcased in Figure 2.1

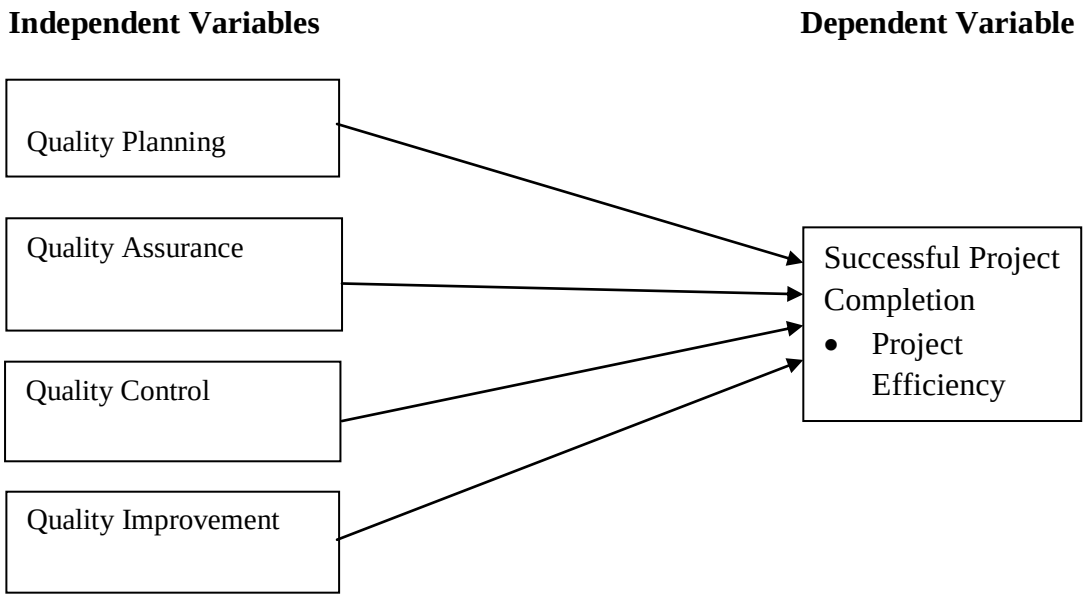

Figure 2.1: Conceptual Framework

Source: Theory of Quality Management (1979) and Dvir's Four Dimensions of Project Success (1997)

2.6 Research Gap

To date, despite its importance of quality management practices on successful project completion, the number of studies relating to telecom tower construction remains scarce (Hammed *et al.,* 2023). Most of the construction studies have focused on civil construction buildings and not telecom tower construction projects. Thus, the body of knowledge lacks related literature concerning the influence of quality management practices on the successful completion of telecom tower construction projects which is the gap that this study intends to fill.

2.7 Statement of Hypotheses

This study tested the following hypotheses.

H_1 *Quality planning influences successful completion of telecom tower construction projects*

H_2 *Quality assurance influences successful completion of telecom tower construction projects.*

H_3 *Quality control influences successful completion of telecom tower construction projects.*

H_4 *Quality improvement influences successful completion of telecom tower construction projects.*

2.8 Summary

The review of literature in this chapter showed that there is an essence of investigating the influence of quality management practices on the successful completion of telecom tower construction projects. The drawn essence is attributed to the knowledge needs of the study topic but also a breakthrough of coverage of

quality management practices in the telecom construction projects. In general, the review of literature in this chapter provides an insightful approach to how methodologies for this study will be to enhance the success of the study as presented in the following chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Chapter Overview

Various methods and techniques were adopted and used in this study are explained underneath.

3.2 Research Philosophy

This study adopted pragmatism research philosophy. According to Maarouf (2019) which indicates that adoption of pragmatism research philosophy is ideal for the scientific undertaking since it allows incorporation of both qualitative as well as quantitative methodologies to effectively address research objectives. Based on the given scenario, this study found it important to be included for effective addressing of the given objectives.

3.3 Research Approach

This study adopted a mixed research approach. Dawadi, Shrestha and Giri (2021) indicated that mixed methods research approach provides in depth understanding of the phenomenon through incorporation of both qualitative as well as quantitative research methods thereof. With such stance, the approach was found useful for the study and thus adopted to serve the purpose.

3.4 Research Design

This study used a case study research design. The use of a case study research design was fueled by the fact that this study intends to use one Company that deals with the construction of telecommunication towers to examine how quality management

practices enhance the successful completion of related projects.

3.5 Study Area

This study was carried out at BEST ONE Limited. The choice of using BEST ONE Limited as the study area is because the company had experience of over ten years (since 2011) and it had carried out a number (over 100) successful telecom tower construction projects in Tanzania and being awarded certificates as the best company in recent four years (2019-2022). Despite of all indicated specific qualities of BEST ONE limited, no study has been done to the company to assess the influence of quality management practices on successful completion of telecommunication tower construction projects which attributes the undertaking of the study at the company.

3.6 Population of the Study

The population of this study comprised 50 staff at BEST ONE Limited including Engineers, consultants, and Technicians as well as top management. The number of the staff is presented in the Best One Limited company profile (2023) which indicates the expertise of each staff in the company.

3.7 Sampling Technique

This study adopted the probability sampling technique by using Census method to incorporate all staff (contractors, engineers, consultants as well as management) at BEST ONE Limited to participate.

3.8 Sample Size

Sample size for this study was 50 respondents. Sample size to be used in this study reflects the Census sampling technique. A complete enumeration of all the items in

the ‘population’ is known as a census inquiry (CR Kothari, 2004). In this study, the Census sampling technique is employed in which all population is included as sample since it is too small to sample.

3.9 Methods of Data Collection

Questionnaires and interviews were used to collect primary data from respondents. A questionnaire was used to collect data from BEST ONE operational staff whereas interviews were conducted to Managers at BEST ONE Limited.

3.10 Data Collection Tools

This study used questionnaire and interview guide to collect data as described below.

3.10.1 Questionnaire

A structured questionnaire comprising closed questions and interview was used to collect data from 40 BEST ONE Limited staff namely contractors (10), engineers (25), as well as consultants (5). Closed ended questionnaires were used in this study since they provide the researcher with possibilities to examine relationships between constructs in the study, especially the cause-and-effect relationships (Saunders et al., 2017). Furthermore, the use of questionnaire in to collect data from the named staff was attributed to the need for collecting data in short time as the preferred respondents had tight work schedule.

3.10.2 Interview Guide

Interview guide was used to collect data from staff from management team. The essence of using interview to solicit responses from members of the management team was due to the need of acquiring in depth information regarding the study topic.

The inclusion of members of the management team was attributed to the need for obtaining information from information reach personnel regarding quality management practices as they were the actors in monitoring the implementation of quality management practices at BEST ONE limited.

3.11 Variables and Measurement Procedures

This study had the following variables, and they were measured as follows.

Table 3.1: Measurement of Variables

Variable	Indicator variables	Scale measurement	Method
Quality planning	Scope, quantification, scheduling, forecasting	5-Likert scale	Descriptive statistics & multiple regression
Quality assurance	Work program, defined policies, evaluation, staff competency, monitoring	5-Likert scale	Descriptive statistics & multiple regression
Quality control	Quality register, standards, inspection plan, action, and reactions	5-Likert scale	Descriptive statistics & multiple regression
Quality improvement	Quality updates, training, audits & frameworks	5-Likert scale	Descriptive statistics & multiple regression
Successful project completion	Project efficiency	5-Likert scale	Descriptive statistics & multiple regression

3.11 Data Processing and Analysis

Data for this study were analyzed qualitatively and quantitatively. Qualitatively, content analysis was used to narrate study themes and make meaningful discussions regarding the study findings whereas quantitatively, data were analyzed using

descriptive statistics and the multiple regression analysis method with the aid of a Statistical Product Service Solution (SPSS). Data were thereafter presented in charts, tables, and graphs. The multiple linear regression model used reads as follows.

$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon,$

where,

Y = successful project completion

X1 = quality planning

X2 = quality assurance

X3 = quality control

X4 = quality improvement

β1, β2, β3, β4 = coefficients

ε = error

3.12 Validity and Reliability

The quality of research outcome in any academic or scientific investigation is presumed to be dependent on how the research instruments are designed and implemented. According to Easwaran and Singh (2020), validity and reliability are research quality criteria mostly applied in quantitative research.

3.12.1 Validity

Validity entails ensuring that the study measures what is supposed to be measured. Validity in this study was enhanced by using criterion related validity in which study variables were extracted from theories underpinning this study namely Theory of Quality Management and Dvir's Four Dimensions of Project Success.

3.12.2 Reliability

According to Rehman, Kyrillidou and Hameed (2014) highly acceptable Cronbach's alpha coefficient that provides consistency across the measuring instruments as well as yielding of trustworthy data in the course of repeating the same test should range between 0.7-1. In that regard, this study conducted reliability test of data using the same Cronbach's alpha coefficients. The basis for the reliability of data which ranged between 0.7-1 values as supported by Koonce and Kelly (2014) that Cronbanch Alpha coefficient scales rating 0.7 to 1 represent high internal consistency of the measuring instrument. The study tested the independent variables which were quality planning, quality assurance, quality control and quality improvement as well as dependent variable namely successful project completion to ascertain how reliable the study data were. Table 3.2 provides results for reliability test.

Table 3.2: Reliability Test of Variables

Variable	Cronbanch Alpha Score	Number of Items
Quality Planning	0.901	4
Quality Assurance	0.864	5
Quality Control	0.881	5
Quality Improvement	0.886	4

Source: Field Data (2024)

The reliability test results presented in Table 3.2 revealed that obtained Cronbanch Alpha values for each independent variable tested were higher than 0.7 and not above 1, thus high internal consistency was found across the measuring instrument. The study findings signify that, measuring instrument employed in this study could in any time possibly bring similar results whenever the test is repeated.

3.13 Ethical Considerations

To enhance ethics in this study, researcher solicited research permit from the Open University of Tanzania and Best One Limited. In additional, no personal information of respondents was exposed.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Chapter Overview

This study examined the influence of quality management practices on successful completion of telecommunication tower construction projects in Tanzania. The specific objectives of the study were to examine the influence of quality planning practices on the successful completion of telecommunication tower construction projects in Tanzania, to examine the influence of quality assurance practices on the successful completion of telecommunication tower construction projects in Tanzania, to examine the influence of quality control practices on the successful completion of telecommunication tower construction projects in Tanzania and to examine the influence of quality improvement practices on the successful completion of telecommunication tower construction projects in Tanzania.

Conceptually, the study was guided by the Juran's Theory of Quality Management. The study is comprised of four independent variables namely quality planning, quality assurance, quality control and quality improvement which were derived to influence successful project completion. Sample size for this study was 50 respondents. Findings and discussion being preceded by statistical tests and demographic information then followed by chronological order of the specific objectives and research hypotheses.

4.2 Response Rate

According to Ali *et al.* (2021) response rate comprises of computations undertaken by the researcher to attain successful rate of completed research data collection tools

for analysis purposes. This study initially targeted sample of 50 respondents to participate in the study. Successfully, the study had attained responses from all 50 respondents as prior targeted. In that regards the study had response rate comparably to 100%. The description of attained response rate in this study is presented in Table 4.1 underneath.

Table 4.1: Response Rate

Targeted Sample	Participated Sample	Response Rate
50	50	100%

Source: Field Data (2024)

Study findings regarding response rate as displayed in Table 4.1 reveal that this study successfully managed to collect data from the whole targeted population as represented by 100% responses.

4.3 Demographic Profile of Respondents

Four demographic entities of respondents were interrogated in this study. The essence of interrogating respective entities was attributed to the rationale of assessment of the defined characteristics of the study respondents to reveal whether the study had engaged qualified respondents for the topic studied or not. Findings of the gender category disclose that, the majority 39 (78%) of the respondents were male staff while the minority 11 (22%) of the respondents were female staff of the BEST ONE Limited. The study findings signify that male BEST ONE Limited staff were thrice the number of female staff which indicates a gender gap among BEST ONE Limited staff. On the job titles of the respondents, the study findings showed that majority 20 (40%) of the respondents were site engineers, 16 (32%) respondents were sub-contractors, 8 (16%) respondents were foremen and 6 (12%) respondents

were project managers.

For the education level, the study findings showed that majority 25 (50%) of the respondents were masters holders, 18 (36%) respondents were holders of bachelor degree, 5 (10%) respondents were diploma holders, 2 (4%) respondent had postgraduate diploma, while none of the respondents had neither certificate nor PhD levels of education. Regarding work experience, the study findings revealed that majority 35 (70%) respondents has worked at BEST ONE Limited for a period of 1-5 years, 11 (22%) respondents has worked for 6-10 years, 2 (4%) respondents has worked for less than a year and 2 (4%) respondents has worked for more than 10 years. The analysed study findings are further presented in Table 4.2 underneath.

Table 4.2: Demographic Profile of Respondents

Category	Descriptions	Frequency	Percent
Gender	Male	39	78
	Female	11	22
	Total	**50**	**100**
Job Title	Project Manager	6	12
	Foreman	8	16
	Site Engineer	20	40
	Sub-Contractor	16	32
	Total	**50**	**100**
Education Level	PhD	-	-
	Masters	25	50
	Bachelor Degree	18	36
	Postgraduate Diploma	2	4
	Diploma	5	10
	Certificate	-	-
	Total	**50**	**100**
Work Experience	Less than a year	2	4
	1-5 years	35	70
	6-10 years	11	22
	More than 10 years	2	4
	Total	**50**	**100**

Source: Field Data (2024)

Overall, the study findings portrayed in Table 4.2 discloses that this study involved qualified respondents to assess the influence of quality management practices on successful completion of telecommunication tower construction projects in Tanzania. Gender responses revealed that at BEST ONE Limited gender gap exist in which male gender dominated among respondents. Regarding education levels of respondents, the study findings disclosed that BEST ONE Limited huge number of staff with master's level of education. The study findings signify the availability of competent staff with satisfactory levels of education to execute related tasks at the company including quality management practices on successful completion of undertaken telecommunication tower construction projects in Tanzania.

The study findings were in line with the findings established by Chisulo et al. (2024) in a study about factors affecting the successful implementation of telecommunication tower projects in Zambia which revealed that AIRTEL and IHS Zambia Limited as telecommunication tower construction companies had huge number of staff with master's level of education as enclosed to postgraduate degrees.

Concerning job titles of the respondents, the study findings revealed that most of the participated respondents were site engineers who were followed by the sub-contractors. The study findings were attributed to the needs of the BEST ONE company Limited.

4.4 Statistical Tests

Various statistical tests were conducted to ascertain the validity of the study as shown in the following subsections.

4.4.1 Data Normality Test

This study tested the normality of study data using Kolmogorov-Smirnov test in which provision of significance value which is greater than 0.05 was determined as confident level that signifies that study data was normally distributed. In that regard, study data regarding quality management practices (QMP) including quality planning, quality assurance, quality control and quality improvement as well as successful project completion (SPC) as defined by project efficiency were well tested to determine whether they had normal distribution.

Table 4.3: Normality Test for QMP and SPC (n=50)

		Kolmogorov-Smirnov[a]	
Variables	**Statistics**	**df**	**Sig.**
QMP	.222	4	.211
SPC	.251	1	.174

Source: Field Data (2024)

The study findings presented in Table 4.3 indicate that the study data were normally distributed across variables with the significance value (P=.211) for quality management practice and (P=.174) for successful project completion which were greater than 0.05. The study findings agreed with those obtained by Mishra et al. (2019) who revealed that, for data to have normal distribution, the P value must be greater than significance level being 0.05 and thus indicating greater possibility of quality management practice to influence successful completion of telecommunication tower construction projects. Therefore, the involved study data were normally distributed.

4.4.2 Descriptive Statistics

Descriptive statistics of the study variables that forms quality management practice

and successful project completion was undertaken. Quality management practice variables namely quality planning, quality assurance, quality control and quality improvement against success project completion variable namely project efficiency were examined. The essence of undertaking this test was to establish data closeness as based on their variability for further analytical insights. The descriptive statistics results were presented in Table 4.4.

Table 4.4: Descriptive Statistics of Study Variables

Variables	N	Min	Max	Mean	Std. Deviation
Quality planning	50	1.00	2.50	2.03	0.45
Quality assurance	50	1.09	2.85	1.75	0.42
Quality control	50	1.20	4.40	2.12	0.89
Quality improvement	50	1.00	2.75	1.77	0.56
Successful project completion	50	1.00	4.50	1.80	0.85

Source: Field Data (2022)

Findings in Table 4.4 reveals that the highest mean score was 2.12 representing reliability being less than 3.5 as required and thus though not completely addressed, quality management practice was related to successful project completion. Findings for quality planning (2.03), quality assurance (1.75), quality control (2.12), quality improvement (1.77) as well as successful project completion (1.80) as a whole also showed that mean score were less than 3.5 implying that data were at marginal level with no huge difference observed. The study findings further suggest that, the study data were close to each other and thus could be an effect brought by quality management practice on successful project completion.

The study findings show that, all variables had medium mean scores which is between 1.75 – 2.12. The study findings also imply that there was an average

relationship between the study variables (quality planning, quality assurance, quality control, and quality improvement) with successful project completion. The study findings were in line with Bouhmama (2020) who revealed that an average mean score of less than 3.5 could possibly predict influence between study independent and dependent variables. Ideally, the study findings on mean and standard deviations across five (5) study variables computed had a minimal difference and therefore the study data were close to each other and useful for establishing the influence of quality management practices on successful completion of telecommunication tower projects in Tanzania.

4.4.3 Correlation Analysis of Variables

This section cantered on the existed relationship between budget cut incidences and the extent of budget cut implementation. Therefore, a Pearson correlation test was undertaken to ascertain the existed relationship between quality management practices and successful project completion. The study findings showed that all tested variables namely quality planning (QP), quality assurance (QA), quality control (QC), quality improvement (QI) and successful project completion (SPC) had less than 0.5 Pearson correlation coefficient as presented in Table 4.5.

Table 4.5: Correlation between QMP and SPC (n=37)

Variables	QP	QA	QC	QI	SPC
Quality planning (QP)	1				
Quality assurance (QA)	.004	1			
Quality control (QC)	.045	.000	1		
Quality improvement (QI)	.011	041	.005	1	
Successful project completion (SPC)	.018	.011	019	.000	1

Source: Field Data (2024**).**

The study findings in Table 4.5 revealed that all quality management practices namely quality planning, quality assurance, quality control and quality improvement were related to successful project completion. Findings signify the direct effect brought by the quality management practices towards successful completion of telecommunication tower construction projects in Tanzania.

4.4.4 R Square and Adjusted R Square

The study findings showed that the adjusted R square value .856 was significant and thus the study data well fitted the model proposed in this study. A standard residue analysis found no outliers across the data with Standard residual. Standard error independence being difference between mean values was confirmed by Durbin Watson test (d=1.096) which stood for autocorrelation. The obtained results were presented in Table 4.4.

Table 4.6: R Square and Adjusted R Square

		Model Summary			
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimates**	**Durbin Watson**
1	.597[a]	.856	.799	.71278	1.096

a. Predictors: (Constant), Quality Planning, Quality Assurance, Quality Control, Quality Improvement

The Findings in Table 4.6 indicate that the determinants ($R^{2)}$ was 0.856 which signified that quality planning, quality assurance, quality control and quality improvement had possibility of influencing successful completion of telecommunication tower construction projects by 85 percent. Furthermore, the findings of the adjusted R^2 of the regression model was 0.799 signifying that quality

planning, quality assurance, quality control and quality improvement predicts 79% of the variations in successful completion of telecommunication tower construction projects. Therefore, the model's findings indicate that quality management practices had positive and significant influence on successful completion of telecommunication tower construction projects in Tanzania.

4.5 Main Findings of the Study

This study was guided by four specific objectives which were to examine the influence of quality planning practices on the successful completion of telecommunication tower construction projects in Tanzania, to examine the influence of quality assurance practices on the successful completion of telecommunication tower construction projects in Tanzania, to examine the influence of quality control practices on the successful completion of telecommunication tower construction projects in Tanzania and to examine the influence of quality improvement practices on the successful completion of telecommunication tower construction projects in Tanzania. Furthermore, the quantitative analysis of the findings regarding these objectives was subject to multiple regression method with equation that reads $Y = \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$,

Where

Y = successful project completion

X1 = quality planning

X2 = quality assurance

X3 = quality control

X4 = quality improvement

β1, β2, β3, β4 = coefficients

ε = error

In that regards, a multiple regression computation was conducted to assess the influence of quality management practices on successful completion of telecommunication tower construction projects in Tanzania. The study findings showed that quality planning was significant at 0.012, quality assurance at 0.005, quality control at 0.000 and quality improvement 0.048 The obtained findings were presented in Table 4.7.

Table 4.7: Regression Analysis Results

		Coefficients[a]			
	Unstandardized Coefficients		**Standardized Coefficients**		
Coefficients	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	.125	.540		2.110	.036
Quality planning	.424	.010	.366	3.175	.012
Quality assurance	.333	.023	.248	5.677	.005
Quality control	.252	.002	.172	4.265	.000
Quality improvement	.495	.028	.218	6.688	.048

a. Dependent Variable: SPC

Source: Field Data (2024**)**

The study findings in Table 4.7 revealed that that the beta coefficients for the five predictors namely quality planning, quality assurance, quality control and quality improvement were all positive. The obtained study findings imply that the study data were appropriate and fitted the regression model as they had correlations in predicting variations between quality management practices and successful completion of telecommunication tower construction projects in Tanzania. in service

quality dimensions towards relationship quality. The combination of the five service quality variables as expressed in the conceptual framework was further described as follows:

Quality management practices= .366 (quality planning) +.248 (quality assurance) +.172 (quality control) + .218 (quality improvement)

The description of the model indicated that quality management practices was capable for predicting variations in the successful completion of telecommunication tower construction projects in Tanzania. Ideally, the findings depicted in the model revealed that all variables (quality planning, quality assurance, quality control, quality improvement) had significant influence on successful completion of telecommunication tower construction projects in Tanzania.

4.6 Discussion of the Findings

4.6.1 Influence of Quality Planning on Successful Project Completion

This was the first objective of the study which sought to examine the influence of quality planning on successful completion of telecommunication tower construction projects in Tanzania. The study findings revealed that quality planning had positive and significant influence on successful completion of telecommunication tower construction projects ($\beta = 0.366$, $p<0.05$). The given study findings signify that with effective quality planning, telecommunication tower construction companies can enhance successful project completion with efficiency. The study findings were in line with Chisulo et al. (2024) in a study about factors affecting the successful

implementation of telecommunication tower projects in Zambia which revealed that quality planning had positive and significant influence on successful completion of telecommunication tower construction projects and thus with effective planning telecommunication tower construction projects escape from time overruns.

The study findings were attributed to the required real time plans with regards to financial, human and technological key construction project aspects for successful completion of respective projects as alluded by Asiedu and Mkansi (2022) in a comprehensive assessment of time overruns in Ghanaian telecom cell site construction. The study findings also reflect the linear relationship established in the conceptual framework and the Juran's theory of quality management which as a whole indicates a greater role played by quality planning in establishing a benchmark for successful completion of telecommunication tower construction projects. Furthermore, the study findings were also compliant to Dvir's Four Dimensions of Project Success model which advocated for efficiency as a model for successful completion of construction project in which respective projects must be completed within planned time and budget.

During an interview, respondents had shown a great deal of quality planning incidences that are undergone at the company to ensure successful completion of respective projects. In commenting about quality planning practices at BEST ONE company, an interviewed respondent said;

> *Since we have competent human capital, most of the time we concentrate on the time a project will engage upon completion as well financial resources available for enhancing project completion so that upon project requirement success can be obtained responsibly* (Manager 1, 2024).

The study findings signify a close insight on human resource, financial resource and time resource as basic components considered in quality planning of the execution of telecommunication tower construction projects and thus contributing to successful completion of respective projects. In addition, the study findings signify that BEST ONE company limited effectively implement quality planning practice and thus assist in the effective implementation of telecom tower construction projects thereof. Wholly, the study findings accepted the alternative hypothesis that stated

> "*Quality planning influences successful completion of telecom tower construction projects".*

4.6.2 Influence of Quality Assurance on Successful Project Completion

This second objective of the study sought to examine the influence of quality assurance on successful completion of telecommunication tower construction projects in Tanzania. The study findings revealed that quality assurance had positive and significant influence on successful completion of telecommunication tower construction projects ($\beta = 0.248$, $p<0.05$). The given study findings connote that any telecommunication tower construction project affected with substantive quality assurance mechanisms would probably be efficient and thus enhancing successful completion.

The study findings were similar to those drawn by Johnson (2018) in a study about the viability of shared mobile network infrastructure in Tanzania which revealed that quality assurance as one of the quality management practices assures quality in the telecom construction projects to enhance efficiency in the projects and thus being successful completed. The study findings indicate a constructive and remarkable role played by quality assurance in ensuring that telecommunication tower

construction projects being successfully implemented. The study findings could be attributed to the existence of quality assurance entities that any project undertaken must be verified with as alluded by Salvi (2020) that for quality assurance to be viable in the effect towards successful completion of telecommunication tower construction projects, there must be effective Contractor Quality Control (CQC), Agency Acceptance (AA), Dispute Resolution (DR), Independent Assurance (IA), Personnel Qualification (PQ) and Laboratory Accreditation (LA). It is thus worthy stating that, the execution of quality assurance is not a solely entity and thus teams for the construction of telecommunication tower projects must take account of these important quality assurance practices to enhance timely and within budget completion of respective project for efficiency purposes.

Ideally, respondents had shown important efforts placed in the company to ensure that quality is assured and that underlying quality assurance practices were well outlined. In an interview with managers, it was declared that;

> *In assuring quality implementation in our projects, we must engage project managers who are well conversant with quality management practices so that to ensure quality transpires in technical, procedural and compliances to avoid unnecessary cost that might evolve due to poor quality assurance mechanisms* (Manager 2, 2024).

The study findings present essential considerations placed by BEST ONE company to assure that any telecommunication tower construction project executed is within quality standards for efficiency purposes. As a whole, the study findings accepted the second alternative hypothesis posed in this study which stated that

> "*quality assurance influences successful completion of telecom tower construction project".*

4.6.3 Influence of Quality Control on Successful Project Completion

The third objective of this study assessed the influence of quality control on successful completion of telecommunication tower construction projects in Tanzania. Based on given study findings in Table 4.8, it was found out that quality control had positive and significant influence on successful completion of telecommunication tower construction projects ($\beta = 0.172$, $p<0.05$). The obtained study findings mean that whenever effective quality control measures exercised, telecommunication tower construction projects would in turn being completed successful with required efficiency.

Similar findings were established by Jongo *et al*. (2019) in a study about factors affecting performance and time schedule for multi-unit residential building construction in Dar es Salaam Tanzania. The study findings disclosed that quality control in every construction entity had positive and statistically significant influence on successful completion of construction projects. The study findings signify a distinguished role played by quality control in ensuring successful projects being completed without any deficiency in quality defined standards and thus being regarded as successful completed projects.

In a study about quality control in construction as subjected to strategies for project success by Kolosky (2024) it was revealed that quality control in construction projects including telecommunication tower construction projects entails the execution of quality test, quality inspections and quality evaluations to ensure that any potential issue related to quality in the underlying construction projects is timely revealed and sorted out for efficiency purposes.

The study further solicited additional responses on how BEST ONE company implement quality control practices to ensure that the underlying projects were successfully completed. In explaining about implementation of quality control, an interviewed respondent said;

> *For the purpose of implementing quality control in telecommunication tower construction projects we execute, the company does various quality practice measures including quality inspections, quality tests and quality evaluations which to a large extent controls quality and thus projects being completed on time and within budget* (Manager 3, 2024).

The study findings revealed that BEST ONE company had been taking relevant measures to control quality in telecom tower construction projects and thus efficiency enhanced. Collectively, the study findings accepted the alternative hypothesis posed in this study that stated

> "Quality *control influences successful completion of telecom tower construction projects".*

4.6.4 Influence of Quality Improvement on Successful Project Completion

Examining the influence of quality improvement on successful completion of telecommunication tower construction projects in Tanzania represented the fourth and last objective of the study. The study findings revealed that quality improvement had positive and significant influence on successful completion of telecommunication tower construction projects ($\beta = 0.218$, $p<0.05$). The given study findings indicate that any practice put in action as a means of improving quality in the telecommunication tower construction project would in turn enhance successful completion of respective project. The study findings were in support of the findings drawn by Kwasira, Wambugu and Wanyoike (2019) of Kenya in as study titled the influence of quality management practices on the successful completion of building

construction projects which also found that quality improvement had positive and statistically significant influence on successful completion of construction projects.

Based on the given study findings, it is evident that for a telecom construction project to improve quality therein, there must be important considerations to be made by the construction team. A conceptual framework for quality improvement proposed by construction managers in South Africa identified that quality improvement must be viable when there is a project manager who understands quality, perspectives of quality, implementation of quality management standards, factors (internal and external) affecting quality and the associated benefits of having skilled quality manager in the team (Zondo and Harinarain, 2023). The study findings connote that, a competent project manager would effective in enforcing quality management practices and thus whenever quality inspections and evaluations being carried would have turned positive results with higher scoring levels and assuring the underlying projects to be completed on time and as per set budget for efficiency purposes.

Towards enhancing quality improvement at BEST ONE company, an interviewed respondent informed that;

> *We are always striving to improve quality in the course of executing our projects on behalf of customers since the technology changes, competition increase and thus we must adapt to this changing era so that quality is not only maintained but improved accordingly to enhance more efficiency* (Manager 4, 2024).

The quoted study findings connote that there is huge commitment of quality practice implementation at BEST ONE company since the focus of the company is not only

on maintaining quality practices implemented but improving such quality to excel further in the telecommunication tower construction projects. As a whole, the study findings accepted the null hypothesis posed which stated that

> "*quality improvement influences successful completion of telecom tower construction projects".*

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS RECOMMENDATIONS

5.1 Chapter Overview

This chapter provides summary, conclusion and recommendations regarding the influence of quality management practices on successful completion of telecommunication tower construction projects in Tanzania. Summary, conclusion and recommendations base on the specific objectives and the tested hypotheses of the study.

5.2 Summary of the Main Findings

Summary of the major findings of the study is aligned to the study specific themes as shown underneath.

5.2.1 Influence of Quality Planning on Successful Project Completion

Study findings regarding influence of quality planning on successful completion of telecommunication tower construction projects revealed that quality planning had positive and significant influence on successful completion of telecommunication tower construction projects attributed to attributed to the required real time plans with regards to financial, human and technological key construction project aspects for successful completion of respective projects. Furthermore, the study findings signified a close insight on human resource, financial resource and time resource as basic components considered in quality planning of the execution of telecommunication tower construction projects and thus contributing to successful completion of respective projects.

5.2.2 Influence of Quality Assurance on Successful Project Completion

On the side of influence of quality assurance on successful completion of telecommunication tower construction projects revealed that quality assurance had positive and significant influence on successful completion of telecommunication tower construction projects. The study findings were attributed to the existence of quality assurance entities that any project undertaken must be verified with which include but not limited to quality control, agency acceptance, dispute resolution, independent assurance, personnel qualification and laboratory accreditation.

5.2.3 Influence of Quality Control on Successful Project Completion

Concerning the influence of quality control on successful completion of telecommunication tower construction projects revealed that quality control had positive and significant influence on successful completion of telecommunication tower construction projects. Furthermore, the study findings disclosed that execution of quality test, quality inspections and quality evaluations assisted in ensuring that any potential issue related to quality in the underlying construction projects is timely revealed and sorted out for efficiency purposes.

5.2.4 Influence of Quality Improvement on Successful Project Completion

Lastly but not least, regarding influence of quality improvement on successful completion of telecommunication tower construction projects revealed that quality improvement had positive and significant influence on successful completion of telecommunication tower construction projects. Furthermore, study findings revealed that a competent project manager would effective in enforcing quality management practices and thus whenever quality inspections and evaluations being carried would

have turned positive results with higher scoring levels and assuring the underlying projects to be completed on time and as per set budget for efficiency purposes.

5.3 Implication of the Findings

The implication of the findings of this study is that with effective implementation of quality management practices, companies, organizations and institutions will be able to attain successfully completion of construction projects.

5.4 Conclusion

This study had disclosed that BEST ONE company effectively implement quality planning, quality assurance, quality control and quality improvement practices for successful completion of telecommunication tower construction projects in Tanzania. Based on that, this study concluded that quality management practices had positive and significant influence on successful completion of telecommunication tower construction projects in Tanzania.

5.5 Recommendations

Based on the given study findings, it can be recommended that;

i. BEST ONE and related companies to put more efforts on improving quality in the telecommunication tower construction project to enhance outstanding efficiency.

ii. Project managers for the telecommunication tower construction projects should be regularly equipped on how they can be compliant in the implementation of quality management practices so that to enhance efficiency in respective projects.

iii. Customers with telecommunication tower construction projects should often consult companies with quality expertise to avoid unnecessary cost of project implementation.

5.6 Limitations of the Study

This study was limited by case study design adopted since at the end the study findings reflected BEST ONE company and could not be generalized to all other telecommunication tower construction companies in Tanzania.

5.7 Recommendation for Future Study

This study was conducted to assess the influence of quality management practices on successful completion of telecommunication tower construction projects in Tanzania. Another study can be conducted to examine the effectiveness of the implementation of quality management practices in the construction of telecommunication towers in Tanzania.

REFERENCES

Alawag, A. ., Alaloul, W. ., Musarat, M. ., Baarimah, A. ., Saad, S., Ammad, S. & Ammad, S. (2023). Critical Success Factors Influencing Total Quality Management In Industrialised Building System: A Case of Malaysian Construction Industry. *Ain Shams Engineering Journal*, *14*(2), 101877.

BOL. (2022). *BEST ONE Company Profile*. *21*(4), 10.

Buma, R. (2021). *Construction Quality Control: Essential Tips for Managing Quality*. Retrieved on 21st September, 2024 from https://www.projectmanager.com/blog/construction-quality-control

Danso, H., & Antwi, J. K. (2012). Evaluation of the Facto Factors Influencing Time e and Cost Overruns in Telecom Tower Construction in Ghana. *Civil and Environmental Research*, *2*(6), 15–25.

Duru, L. I. (2013). Improving Project Management Performance A Case Study of Mobile Telecom Site Rollout Project in MTN Syria. unpublished master thesis, Stockholm, Sweden.

Esmaeili, B., Pellicer, E., & Molenaar, K. R. (2016). Critical Success Factors For Construction Projects. In book: Project Management and Engineering Research, 2014 (pp.3-14).

Freeman, M. (2015). Measuring Project Success. Information Systems Project Management. *Project Management Journal,* 23, 8-17.

Gazal, O., Musibau, A., & Rukayat, O. (2023). Evaluation of Impact of Project Quality Management on Project Success. *International Journal of Interdisciplinary Research in Social Sciences*, *September*, 2790–5276.

Hotepo, A. S. ., Oyeobo, H. O. ., & Nwatulegwu, B. (2018). An evaluation of total

quality management practices on business performance of the Nigerian telecommunications sector : a case study of MTN Nigeria Limited History Management of Total Quality Overview of telecommunications sector Nigerian 3.

Johnson, B. (2018). Viability of Shared Mobile Network Infrastructure in. Jongo, J. S., Dennis, N. G. A. K., & Mary, S. N. (2019). Original Research Paper Factors Affecting Performance & Time Schedule For Multi-Unit Residential Building Construction Tesha Gullamabbas H . Mufaddal Sylvanus. 1.

Kazare, B. (2019). The determination of factors influencing construction project performance in public institutions: a case of Musoma & butiama district council. Master Paper submited at Institute of Accountancy Arusha, Tanzania.

Kashyap, S. (2023). What Causes Project Delay and 6 Best Solutions to Avoid Them. Project Delay. retrieved on 12th March, 2025 from https://www.proofhub.com /articles/project-delays.

Kimaru, J. M. (2019). Effects of project complexity on project success : the case of telecom firms in Nairobi. PhD dissertation, Strathmore University, Nairobi, Kenya.

Kowo, S. (2019). The Implementation of Total Quality Management (Tqm) in the Telecommunication Industry : Problems and Prospects the Implementation of Total Quality Management (Tqm) in the Telecommunication Industry : June 2019.

Kwasira, L. A., Wambugu, D. G., & Wanyoike, D. M. (2019). Influence of quality management practices on successful completion of building construction

projects in Nakuru Town, Kenya. *International Journal of Innovation and Scientific Research*, *27*(1), 22.

M. Gumo, D., Makokha, E. N. & Namusonge, P. G. (2018). Effects of Total Quality Management Practices on Performance of Construction Projects in Trans Nzoia County. *European Journal of Business and Management*, *10*(9), 166–175.

Menshikova, E., Khazanov, O., & Styazhkin, M. (2016). Implementation of the Quality Management System in telecommunications companies. *SHS Web of Conferences*, *28*,

Mwanaumo, E. M., Mambwe, M., Mwanza, B. G., & Sibalwa, E. (2020). An investigation of factors causing schedule overrun in telecommunication projects in Zambia. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, *59*, 1359–1370.

Natai, P. (2021). Factors Affecting Change Management in Telecommunication Companies in Tanzania: A Case of Selected Telecommunication Companies. unpublished master paper, the Open University of Tanzania, Dar es Salaam, Tanzania.

Nambour, P. (2022). Describing the Four Main Components of a Quality Management Process. Quality Through Project Life Cycle. Retrieved on 17th from https://www.parallelprojecttraining.com/blog/describe-the-four-main-components-of-a-quality-management-process/.

Orji, S., Obodoh, D. ., & Emenike, O. . (2019). Quality Management Practices in Construction, a key to quality management practices in construction, a Key to Successful Building Project Delivery. April 2022.

https://www.researchgate.net/publication/335244385_quality_management_practices_in_construction_a_key_to_successful_building_project_delivery/link/626c0993b277c02187d5fba2/download

Park, Y. S., Konge, L., & Artino, A. R. (2020). The Positivism Paradigm of Research. *Academic Medicine, 95,* 690–694.

Ratan, P. (2016). Quality Management Practices Used by Telecom Infrastructure Organizations. Unpublished master dissertation, Amity University, Noida, Uttar Pradesh, India.

Shammot, M. (2019). Quality management practices and their impact on performance. *International Journal of Quality & Reliability Management*, 23(6), 25-646.

Watiti, L. (2018). Factors Affecting Monitoring and Evaluation in Telecommunication Industry With Focus on Project Implementation At Safaricom Limited. *International Journal of Management and Commerce Innovations*, *6*(1), 1306–1322.

APPENDICES

APPENDIX I: QUESTIONNAIRE

Dear respondents, I am Albert Akaro a student at the OPEN University of Tanzania undertaking a research on the Influence of Quality Management Practices on Successful Completion of Telecommunication Tower Construction Projects in Tanzania. I kindly ask your maximum cooperation by participating in this survey so that to enhance success of this study. Be assured that information you provide are highly confidential and used for none other purpose than to attain academic awards of Masters in project management.

Thanks in advance.

Part A: Demographic Information

1. Gender
    a) Male ( )
    b) Female ( )
2. What is your role at BEST ONE Company
    a) Project Manager
    b) Office engineer
    c) Forman
    d) Site engineer
    e) Sub-contractor
    f) Any other, please specify…….
3. How long have you worked at BEST ONE Company?

    _____

4. Education Level

a) PhD ( )

b) Master's degree ( )

c) Bachelor degree ( )

d) Diploma ( )

e) Certificate ( )

PART B: Influence of Quality Planning on Successful Completion of Telecom Tower Construction Projects

5. Please indicate your level of agreement on regarding the influence Quality Planning on Successful Completion of Telecom Tower Construction Projects by ticking (√) the scale against each statement whereas; SA=Strongly agree, A=Agree, NS=Not sure, D=Disagree and SD=Strongly Disagree.

At BEST ONE Company, telecom tower construction projects are always….	**SA**	**A**	**NS**	**D**	**SD**
Well forecasted so that no additional cost employed					
Specified in terms of their scope					
Well organized and quantified					
Carried as per prior developed schedule					

PART C: Influence of Quality Assurance on Successful Completion of Telecom Tower Construction Projects

6. Please indicate your level of agreement on regarding the influence Quality Assurance on Successful Completion of Telecom Tower Construction Projects by ticking (√) the scale against each statement whereas; SA=Strongly agree, A=Agree, NS=Not sure, D=Disagree and SD=Strongly Disagree

At BEST ONE, quality assurance is done by…..	**SA**	**A**	**NS**	**D**	**SD**
Having program of work for tower construction project					
Management defining policies and objectives to enhance effective use of resources					
Undertaking evaluations at each stage of telecom tower construction					
Employing staff with competency in telecom tower sector					
Engaging consultant to monitor implementation of quality aspects in telecom tower construction project					

PART D: Influence of Quality Control on Successful Completion of Telecom Tower Construction Projects

7. Please indicate your level of agreement on regarding the influence Quality Control on Successful Completion of Telecom Tower Construction Projects by ticking (√) the scale against each statement whereas; SA=Strongly agree, A=Agree, NS=Not sure, D=Disagree and SD=Strongly Disagree.

At our Company, quality is controlled by….	**SA**	**A**	**NS**	**D**	**SD**
Having quality register in all telecom tower construction projects					
Adhering to standards pertaining telecom tower construction projects					
Having inspection plan with associated procedures					
Taking corrective action against any observed default					
Providing prompt response to quality problems evolving					

PART E: Influence of Quality Improvement on Successful Completion of Telecom Tower Construction Projects

8. Please indicate your level of agreement on regarding the influence Quality Improvement on Successful Completion of Telecom Tower Construction Projects by ticking (√) the scale against each statement whereas; SA=Strongly agree, A=Agree,

NS=Not sure, D=Disagree and SD=Strongly Disagree

To improve quality, BEST ONE Company…	**SA**	**A**	**NS**	**D**	**SD**
Often updates its quality check measures					
Provide frequent quality management training to staff					
Conducts regular quality audits					
Established a framework for tower construction processes					

PART F: Successful Completion of Telecom Tower Construction Projects

9. Please indicate your level of agreement on regarding Successful Completion of Telecom Tower Construction Projects by ticking (√) the scale against each statement whereas; SA=Strongly agree, A=Agree, NS=Not sure, D=Disagree and SD=Strongly Disagree

Efficiency of BEST ONE is obtained through.	**SA**	**A**	**NS**	**D**	**SD**
Tower projects being completed within planned time (schedule)					
Being achieved within set budget					

Appendix II: Interview Guide

1. What is your position?
2. How does BEST ONE limited ensure quality planning in telecom tower construction projects?
3. How does BEST ONE limited ensure effective quality planning in telecom tower construction projects?
4. How does BEST ONE limited implement quality assurance in telecom tower construction projects?
5. How does BEST ONE limited ensure quality control in telecom tower construction projects?
6. How does BEST ONE limited ensure quality improvement in telecom tower construction projects?
7. Rate the overall successful completion of telecom tower construction projects at BEST ONE Company.

Appendix III: The Scanned Research Data Clearance Letter from OUT

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT/PG202100757 **10th July, 2024**

Director,

Dear,

RE: Research Clearance For Albert Akaro: PG202100757

1.The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1stMarch 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1stJanuary 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

2. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Albert Akaro: PG202100757),** pursuing **MASTER OF PROJECT MANAGEMENT.** We here by grant this clearance to conduct research titled **"INFLUENCE OF QUALITY MANAGEMENT PRACTICES ON SUCCESSFUL COMPLETION OF TELECOMMUNICATION TOWER CONSTRUCTION PROJECTS IN TANZANIA"**

3. '. He will collect his data at your office from 15st July, 2024 to 30TH October, 2024.

4. In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof.Gwahula Raphael Kimamala

For: VICE CHANCELLOR

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TO: DIRECTORATE OF POSTGRADUATE STUDIES
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P.O. Box 23409 Fax: 255-22-2668759,
Dar Es Salaam, Tanzania
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REF: REQUISITION FORM FOR RESEARCH CLEARANCE.

Reference is made on the letter received on 10th July 2024, We **BEST ONE LIMITED** located ate Salasala Mbezi Beach Tanzania, we hereby grant permission to your student Albert Akaro PG202100757 to proceed with data collection in our organization from 15th July to 30th October 2024. Our resources will accord him with all necessary support and information

Yours faithfully,

Jackline Tairo

Human Resources Manager.

BEST ONE LIMITED
P.O BOX 35782
DAR-ES-SALAAM