# INTEGRATION MANAGEMENT AND IMPLEMENTATION OF LOW-COST HOUSING CONSTRUCTION PROJECTS IN NAIROBI CITY COUNTY, KENYA
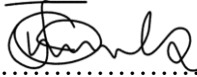
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**A Research Project Report Submitted in Partial Fulfillment for the Requirement of the Award of Master's Degree in Project Planning and Management of the University of Nairobi**

**2023**

# DECLARATION

This research project Report is my original work and has not been submitted for the award of a degree in this University or in any other University.

Sign……………………………………………Date…11/7/2023………………

**Jacob Oduor Ogada**

**L50/37422/2020**


This research project report has been submitted for examination with my approval as the University Supervisor


Sign……………………………………………………. Date………………….11/7/2023……………

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## DEDICATION

The cornerstone of my education was laid by my late mother, Everlyne Akinyi Apuoyo, to whom I dedicate this study report. I've been able to appreciate the value of reading and lifelong learning ever since. Mum, you were defeated by death and did not witness my success.

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Above all, I am grateful to God for His guidance, strength, and blessings throughout my study. It is through His grace that I have been able to overcome challenges, pursue knowledge, and reach this milestone. I am humbled and thankful for His unwavering presence in my life.

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I would also like to acknowledge the enormous efforts put forth by my classmates. Their well-deserved comments and recommendations have played a significant role in improving the text and refining the ideas presented in this study. The collaborative spirit and collective pursuit of knowledge within our cohort have fostered a rich learning environment, and I am grateful for the contributions of each and every one of my classmates.

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# ABBREVIATIONS AND ACRONYMS

ADB          African Development Bank

HCPs:        Housing Construction Projects

IPPD         Integrated Product and Process Development

IT           Information Technology

LCHCPs:      Low-cost Housing Construction Projects

SISP         Strategic Information Systems Planning

SMEs         Small and Medium Size Enterprises

# ABSTRACT

Implementation of low-cost housing is geared to meet the desired development goals as enshrined in the vison 2030 economic development blue print in Kenya. Despite the low-cost housing projects being implemented by the government and other real estate development companies in Kenya, progressive supply of affordable low-cost housing remains a mirage dream in Nairobi City County with mushrooming of slums and other informal settlements proliferating in the Kenya's capital city. The purpose of this study is to establish the influence of integration management on implementation of low-cost housing construction projects in Nairobi City County, Kenya. The objectives are; to determine influence of project charter and implementation of low-cost housing construction projects in Nairobi City County, Kenya; to establish influence of project management plan on implementation of low-cost housing construction projects in Nairobi City County, Kenya; to assess influence of knowledge integration and implementation of low-cost housing construction projects in Nairobi City County, Kenya and to investigate influence of integration change management and implementation of low-cost housing construction projects in Nairobi City County, Kenya. The study is based on the system and the theory of change in project management. Descriptive survey research design was used targeting a population of 283 contractors and project managers. A sample of 166 contractors and project managers were selected to participant in the study. The researcher used stratified sampling technique to determine the number of contractors and project managers and simple random sampling to select participants from each sub group. Structured questionnaires and interviews were used to collect quantitative and qualitative data respectively. The pilot study was conducted targeting 17 contractors and project managers in Nairobi County. Internal consistency of the questionnaire was determined using Cronbach's alpha and valued at 0.700. Also construct, content and face validity was tested for the study tool. The filed data was analyzed by use of descriptive and inferential statistics. Tables were adopted to present the findings. The study established that implementation of low-cost housing construction projects is not demonstrating good progress as respectively demonstrated by composite mean and S.D of 2.65 and 1.322. A significant strong positive correlation was established between project charter on implementation of low-cost housing construction projects (r=0.711; P<0.000). composite mean and S.D 3.64; 1.284. A significant strong positive correlation was established between project management plan and implementation of low-cost housing construction projects (r=0.697; P<0.000). composite mean and S.D 3.40; 1.336. significant strong positive correlation was established between knowledge integration and implementation of low-cost housing construction projects (r=0.613; P<0.000). composite mean and S.D 3.25; 1.353. And a moderately strong positive correlation was established between integration change management and implementation of low-cost housing construction projects (r=0.528; P<0.000). composite mean and S.D 3.31; 1.299. The study concluded that integration management influences implementation of low-cost housing projects and subsequently recommendation integration management to be applied in all housing construction projects.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background to the Study

Implementation of low-cost housing is geared to meet the desired development goals as enshrined in the vison 2030 economic development blue print in Kenya (Ajulu,2019). Housing being one of the fundamental and basic human needs must be affordable, clean, hospitable and safe so that it serves the purpose of protecting and providing comfort to the inhabitants, (UN-Habitat 2012). Housing is considered low-cost and affordable if the cost of mortgage or rent is generally below 30% of the total family monthly income as opined by the Department of Housing and Urban Development of the United States.

In the USA during the mid-19th century, there was a serious problem of low-cost housing leading to industrial production of houses in the undeveloped sites by the government as a policy response. The projects were implemented on the principle that the poor were to get housing at a low-cost and in order to achieve this, there was a trade-off between attractiveness and structural strength of the houses constructed, (Wainer, Ndengeyingoma, and Murray, 2016). The low-cost housings were constructed in less desirable locations and this lowered the demand and subsequently the housing costs. The low-cost housing projects were thus located in satellite Greenfields with low land potential leading to other social problems. They are majorly associated with poor designs which are not well executed leading to unattractiveness. Further the low-cost housings in USA like *Pruit Igoe* project of 1954 was associated with cheap building materials that meets the structural threshold quality but with limited aesthetic quality. Although low-cost housing projects have been conceived to solve the housing challenges in US, the contentious issues revolve around satisfying the architects' design on one hand and meeting the economists minimum cost and quality thresholds, (Bertaud 2015)

Asia where the population in excess of 0.5 billion dwell in major urban centres, affordable housing must be provided by the government since majority of the people in southern and central Asia where majority of the population are poor in the developing economies. Indonesia for instance, initiated one million housing project in 2015 to solve the housing projects while the shortage of

housing stands at 11.4 Million (Bernstein et al 2016). In Malaysia the government has initiated R1MA housing project between 2015 and 2016 aimed at solving the housing challenge in the major cities (Metcal, 2018). The project was to provide a housing unit at a cost of between $23,000 and 94,000. Although significantly successful, there was still a huge deficit and that called for policy shift in order to attract private developers through PPPs. Singapore has a fairly successful low-cost housing sector with Housing & Development Board created in 1960 having succeeded in providing low-cost housing to millions of her population. It is estimated that more than 80% of the Singaporean population currently reside in their housing development board provided housing units (Hemble,2019). In Vietnam the government has given a stimulus package amounting to $1.32 billion for housing development to promote low-cost housing sector. While in Cambodia, the government through her 2014 National Housing Policy, a total of 1.1M housing units are targeted for development by 2030, (Asian Development Bank, 2020).

In Africa a number of low-cost housing concepts have been adopted to meet the rising demands of rapid urbanization and high demand for housing in the continent. For instance, in South Africa MMA Architects have innovated a concept where two-story houses can be constructed with earth bags inside steel and wooden frame-columns. Compressed earth blocks have also been used to create to create low-cost housing in the country. Fired earth bricks have also been used in Rwanda for low-cost housing construction projects with the bricks being more sustainably fired by recycled coffee husks. In Angola, through PPPs there have been 200,000 low-cost housing units constructed by CITIC Construction Limited just in four years in Ethiopia in an ambitious social housing program was launched in 2015 to provide low-cost housing to her urban dwellers with the program running for more than a decade. However, the programme has barely met the demand as the Ethiopian population has been exponentially growing leading to increased demand for housing, (Alamy, 2017). With similar projects in Angola where $3.5billion was pumped in into social housing programme to provide affordable housing to the urban low earners, bearing very little fruits as the demand outweighs the supply, African countries need to find a lasting solution to solve her housing problems especially in the urban areas where slum mushrooming has been common with some of the world's largest slums being found in Africa. The government of Niger has been funding low-cost housing projects in Sari Koubou since 2015 to provide affordable housing to her citizen, however the project cannot match the growing demand for affordable housing in the country and therefore remains just a little drop in the ocean, (World Bank Report, 2018). Elsewhere

in countries across Africa government intervention to deliver low-cost housing in Gambia, Libya Morocco, Uganda, Nigeria but the major challenge remains supply that is way low than demand, (AFB report, 2017).

About 70% of the Kenya urban dwellers do not have access to affordable housing and are therefore forced to occupy informal settlements. The average cost of apartments in Nairobi is about Ksh. 11.5 M and this is way too high for the common man in the developing world. Kenya's urbanisation growth is quicker than her capita GDP, this has created challenges like housing crime, unemployment associated with rapid urbanization in the cities. Kenya's estimated housing deficit is about 2million units in the urban areas. The situation is also reflected in many African countries such as Cairo, Kampala, Dar es Salaam, Kigali, Abuja, Tripoli among others, (World Bank Publications, 2009) with Nigeria being in demand of about 17Millions units to bridge their deficits. Kenya has employed expanded polystyrene panels (EPS) as a technology for constructing low-cost housing where relatively cheaper building materials other than conventional stones are used for walling yet are strong enough to withstand severed forces from tremors and other explosive attacks.

The housing challenges in Nairobi cannot be underscored. Some of the largest slums in Africa are found in Nairobi with Kibra slums being the largest while others like Korogocho Mukuru Kwa Njenga; Kwa Reuben, Mathare, are also growing every day, (Wanjiru and Matsubara, 2017). Implementation of low-cost housing construction projects therefore becomes a real time intervention that can alleviate the suffering and deficiency in providing affordable housing units to low income earners residing in the city. The low-cost housing programme was initiated in 2004 through a partnership between the government and UN-Habitat under a project christened as Kenya Slum Upgrading Programme (KENSUP). The aim was to provide affordable low-cost housing to the slum dwellers in the Major Cities of Kenya.

It is therefore against this backdrop that the study seeks to establish the influence of integration management on implementation of low-cost housing construction projects in Nairobi City County, Kenya. Consequently, this will reinforce the project management practices that are currently being applied in the low-cost housing construction projects in Nairobi Kenya for better project implementation process outcome and deliverables that meet the fundamental purpose for which

the housing projects are undertaken: meeting the demands of low-cost housing as well as the cost, schedule, scope and quality project dimensions.

## 1.2 Statement of the Problem

Despite the low-cost housing projects being implemented by the government and other real estate development companies in Kenya, progressive supply of affordable low-cost housing remain a mirage dream in Nairobi City County with mushrooming of slums and other informal settlements proliferating in the Kenya's capital city. It is estimated that Nairobi City requires about 2Million low-cost housing to accommodate the low income earners and this number is exponentially growing due to the effects of rapid urbanization and conurbation. The houses constructed under the programme have not been affordable and are not low-cost as the average unit cost is between Kshs. 3 Million and 8 Million which is way above the average per capita income of the city slum dwellers whose average per capita income stands at a paltry Kshs. 100,000, (World Bank Report 2019). Without enhanced success of the low-cost housing project being implemented, the housing challenge in Nairobi City county remains a social time bomb waiting to explode to more serious socio-economic and health issues associated with poor housing, and unplanned informal settlements.

Kenya has reported its fair share of total project failure due to collapsing construction projects. According to study conducted by the National Construction Oversight on collapsed buildings, Kenya has registered more than 50 building collapse since 2010 with more than 10 building collapse in various areas of the nation in 2021 alone. Most of these cases have occurred in Nairobi City County, Kenya, particularly the recent cases. Most failed projects have been blamed on human errors. Away from building collapsing there have been cases of stalled housing construction projects due to legal tussles, inflation in the economy leading to cost overruns and low occupancy rates due to unaffordability of the housing units. Therefore, this study seeks to analyse how integration management influences implementation of low-cost housing construction projects in Nairobi City County, Kenya

## 1.3 Purpose of the study

The purpose of this study is to establish influence of integration management on implementation of low-cost housing construction projects in Nairobi City County, Kenya

### 1.4 Research Objectives

This study was guided by the following four objectives;

i.   To determine influence of project charter on implementation of low-cost housing construction projects in Nairobi City County, Kenya

ii.  To establish influence of project management plan on implementation of low-cost housing construction projects in Nairobi City County, Kenya

iii. To assess influence of knowledge integration on implementation of low-cost housing construction projects in Nairobi City County, Kenya

iv.  To investigate influence of integration change management on implementation of low-cost housing construction projects in Nairobi City County, Kenya

### 1.5 Research Questions

This study sought to answer the following four questions;

i.   How does project charter influence implementation of low-cost housing construction projects in Nairobi City County, Kenya?

ii.  How does project management plan influence implementation of low-cost housing construction projects in Nairobi City County, Kenya?

iii. How does knowledge integration influence implementation of low-cost housing construction projects in Nairobi City County, Kenya?

iv.  How does integration change management influence implementation of low-cost housing construction projects in Nairobi City County, Kenya?

### 1.6 Research Hypotheses

This study sought to test the enlisted four hypotheses from $H_01$ to $H_04$ at 95% confidence level;

i.   **$H_01$:** There is no significant relationship between project charter and implementation of low-cost housing construction projects in Nairobi City County, Kenya

ii.  **$H_02$:** There is no significant relationship between project management plan and implementation of low-cost housing construction projects in Nairobi City County, Kenya

iii. **$H_03$:** There is no significant relationship between knowledge integration and implementation of low-cost housing construction projects in Nairobi City County, Kenya

iv.     **H<sub>0</sub>4:** There is no significant relationship between integration change management and implementation of low-cost housing construction projects in Nairobi City County, Kenya

## 1.7 Significance of the study

The study's goal is to investigate the project charter, project management plan, knowledge integration, and integration project management and their influence on implementation of low cost housing construction projects. Project management best practices require project managers to include project charter, project management plan, knowledge integration, and integration change management, however, many organizations lack the necessary strategies to incorporate them. Several projects thus bypass this crucial component and simply continue to the planning phase without a clear goal, likely to result in failed projects. It is therefore anticipated that housing development companies will find this study useful for formulation of policies on stakeholder involvement, risk management strategies, scope management, resource scheduling in order to enhance implementation of low-cost housing construction projects sector and growth in the industry.

The findings of this will inform the policy formulation on the needs of project knowledge integration in ensuring success in the low cost housing project implementation. The findings will aid in reinforcing or developing the policy framework to promote successful business implementation. The project managers and contractors will use the study insight to improve integration management and the overall project success rate. Also, the project owners will get insight into the importance of project charter; project management plan, knowledge integration, and integration change management in the project initiation. The findings of the study may be utilised by policy makers in enhancing the approval of development.

Finally, the results of the study, is anticipated to contribute towards project management body of knowledge by either contributing to the findings or validating the works of other scholars. The findings are hoped to be beneficial to scholars who would want to review literature on integration management and implantation of LCHCPs as the results will provide empirical literature to meet their academic needs.

**1.8 Basic Assumptions of the Study**

This research was conducted based on the assumption that all participants would provide truthful and accurate information, which formed the basis for independent deductions made in the study. Additionally, it was assumed that there was sufficient time to collect the necessary data and that the chosen participants would willingly participate. The study also operated under the assumption that there is a connection between integration management and the implementation of low-cost housing construction projects in Nairobi City County, Kenya.

Therefore, it is crucial to eliminate assumptions and biases in qualitative research. With this in mind, the researcher implemented measures to ensure accurate data collection and analysis.

**1.9 Limitations of the Study**

The present study may face several limitations during data collection. The target audience consists of project managers and contractors and may have a tight work schedule. The researcher expects difficulty in securing time with the targeted participants for the purpose of answering the survey questions. To compensate for this limitation, meetings were arranged between researcher and participants on a day and time that was convenient for the participants. This allowed participants to choose their own suitable time to fill the questionnaire, potentially enhancing the response rates. Some of the instrument's components that were resisted by some of the selected participants. This is due to the fact that the questions on implementation and practices were very sensitive and, if communicated carelessly, would undermine the firm's economical privileges. As a result, the investigator provided a personal commitment letter assuring that the data collected was to be treated with the maximum privacy and was not to be shared with third parties. To assure participants that their information would be used strictly for academic purposes, authorizations from University of Nairobi and the National Commission for Science, Technology and Innovation (NACOSTI) were attached.

The study was also limited by design where descriptive survey was employed which allows for in depth description of the current status of affairs but not the past status. This limitation was however overcome by collecting qualitative data to supplement the quantitative data. The limitation due to data collection instruments instigated errors was surmounted by subjecting the instruments to pilot

test before the actual study to enhance their validity and reliability and to minimize errors due to faulty data collection instruments.

## 1.10 Delimitations of the study

This study specifically focused on project managers who have been involved in development projects within Nairobi City County, Kenya. Furthermore, the study exclusively concentrated on low-cost housing construction projects (LCHCPs) in Nairobi City County, Kenya.

Additionally, delimitation also included the use of structured interview. The investigator asked close-ended questions about project charter techniques for project start-up. These questions targeted different integrations aspects needs and use in project development in Nairobi City, County, Kenya. The interviews lasted approximately 35 to 40 minutes.

## 1.11 Definition of significant terms used in the study

**Project Charter:** In this study, this is defined by; stakeholder identification, project, objectives, project scope outline, project budget estimates and the overall project schedule

**Project Management Plan:** In this study, this is defined by; Timelines, milestones, deliverables, implementation metrics and risk management plan

**Knowledge Integration:** In this study, this is defined by; knowledge transfer, knowledge management, knowledge sharing, knowledge transfer and knowledge re-use

**Change Management Integration:** In this study, this is defined by; scope baseline, change request, change control tools, cost benefit analysis and change logs

**Implementation of Low-cost Housing:** Number of houses constructed, Number of units occupied, rental cost, Payment plans and affordability

## 1.12 Organization of the study

This document is structured into five chapters. The initial chapter offers an overview of the study, including its background, problem statement, objectives, research questions, significance, and limitations that may impact the study. The second chapter examines and analyzes previous

scholarly work on integrated management and the implementation of development construction projects. It also presents a review of relevant theories that support the subject of the study. Chapter three outlines the methodology employed in conducting the study. This includes details on the research design, target population, determination of the appropriate sample size, sampling technique, research instrument, pilot study, considerations of validity and reliability, data gathering methods, data analysis methods, ethical considerations, and operational definitions of variables. Chapter four integrates data analysis, presentation, interpretation, and discussions. It comprehensively examines and discusses the findings derived from the analysis of data. Finally, in Chapter five, a summary of the findings, conclusions, and recommendations derived from the study are presented at the end of the document.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1. Introduction

This chapter examines the concept of integration management within project management and its impact on the implementation of low-cost housing projects. Additionally, the study reviews relevant scholarly literature pertaining to various aspects, including the project charter and its influence on the implementation of low-cost housing construction projects, the influence of project management plans in the implementation of such projects, the integration of knowledge in the context of low-cost housing construction projects, and the influence of integrating change management practices during the implementation of these projects. Furthermore, the chapter explores and evaluates conceptual frameworks and theoretical frameworks to determine their applicability and relevance to the study.

## 2.2. Implementation of Low-cost Housing Construction Projects

As the population grows in major cities of the world due to the effects of urbanization, the demand for suitable and affordable housing also grows in equal measure. Affordable housing is characterized by affordability, sustainability and access to basic social amenities (Awuzie, 2021). According to a study by Ondola, Odundo and Rambo (2013) on the strategies for implementation of low-cost housing for the poor urban dwellers in Kisumu where the study reviewed low-cost housing project by the world bank in Migosi, Kisumu by adopting quantitative survey design. And total of 384 was selected from a possible 218766 people for observation. The study results indicated that there has never been a core focus in purveyance of affordable and low-cost housing by the government to her citizenry, instead her major focus has been on broader socio-economic and environmental goals. This has led to poor utilization of the available resources, ineffective housing implementation policies and inadequate housing finance funding. Conversely the study dwelled on housing construction project policies and the design adopted did not reveal the current implementation status of low-cost housing implementation.

To assess policy constraints towards the purveyance of low-cost housing in Kisumu Otieno (2014) undertook a study using survey design and document analysis on housing policies and related information was gathered. The study reviewed the housing demands viz a vis supply with factors in play being affordability and population growth. According to the findings, the demands for housing outweighs the supply and majority of the population in Kisumu suffer from low income and therefore cannot afford decent housing resulting in slums and informal settlements proliferation in Kisumu. However, the study majorly focused on policies factors and not implementation factors of low-cost development projects which this study analysed.

To evaluate factors that influence PPPs model in the purveyance of low-cost housing in Myanmar; Nyein and Hadikusumo (2017) conducted a study by applying descriptive design where; in-depth interviews on 51 KIIs were undertaken focused on those implementing low-cost housing projects. Based on the findings; funding challenges, land acquisition and lack of incentives form the government to private and potential developers were reported as major challenges affecting the low-cost housing implementation. On contrary, the study focused on PPP as a modelled for funding low-cost housing construction projects but failed to evaluate other possible funding models that has been applied to implement low-cost units' construction projects in the developing economies.

## 2.3. Project Charter and Implementation of Low-cost Housing Construction Projects

Project charter integrates all the components of the projects. According to Starns (2019) before starting a project, construction managers must have a project charter. The study gathered information from project managers who were PMI-certified as PMPs and had finally achieved projects using face-to-face, semi-structured interviews. Axial coding was used for data analysis, which involved gathering, organising, and categorising members' common experiences into recognised themes and classifications. When starting a project, the researcher identified the following ten themes concerning best techniques for creating a project charter: verifying training standards, establishing pre-charter prerequisites, governance practises, solidification project goals, successfully sharing information on project goals, recognising organisational strategies, informed, and recognising interested parties, confirming funding commitments, and instituting project approval Project Management, Project Manager, Project accomplishment, Project Charters, Strategic Planning, Institutional Decision Making are some of the key terms.

Mark and Lurie (2018) investigated the use of customised project charters in the scientific software development of computational products. According to them, difficulties encountered during the creation of the software is the disparity in expectations and perceptions among stakeholders regarding the targets, scope, and aspirations for the package. Project charter can be described as an official document that specifies the scope, goals and paid for by an organization to formally authorise project operations and to guarantee stakeholders conscious engagement and offer solutions to disparities in stakeholder perceptions

Kumaraswamy, Mahesh, Mahalingam, Loganathan and Kalidindi (2017) investigated establishing a project charter and housing developments KPIs as a guide to enhance the sector advancements. Their research was designed as a case study, where studies from housing sector transformation action plan in India were reviewed for to develop a representative project charter as an essential set of important implementation metrics, and as a foundation instrument for enabling the exceptional charter's preconceptions in trying to secure clients, organization and project goals throughout project lifecycle, in addition to inspiring building projects advancements in general. According to their findings, the charter was developed as integral part of the management, such as recognising "preferences" under four classifications: overall, supply chain aspirations, by distribution networks, and by end users. The charter is divided into six sections, thus broadly enhancing purchasing, design, advancement and overall implementations.

As per Furterer (2016), the project charter is created by implementation team that collaborates with the corporate to comprehend the project proposal scope. The project charter contains an explanation of the corporate proposition, recognition of stakeholders and clients project aims and priorities, and measurements for determining project outcomes. The charter also identifies possible risks that may possibly help stop the project from being accomplished effectively, as well as the presumptions that are believed to be factual. An original assessment of the program's capitals and expenses, as well as the soft and hard wares of completing the development, are also reviewed. The advantages are main source of funding that influences the financial disclosures; however, the soft values are cost exclusion and positive externalities to the corporate from completing the project.

## 2.4. Project management plan and Implementation of Low-cost Housing Construction Projects

Project planning should be an essential component of the construction building projects sector in order to obtain more effective accomplishment of a development and have an effect on deliverables. Arief and Latief (2021) conducted research on improving the project management plan in a residential development project. The research attempted to parse the risks in residential housing planning phase by classifying 10 knowledge zones and 24 strategic planning in the 2017 PMBOK using a qualitative risk analysis technique to gain a better comprehension and mitigate the significant risk aspect. Based on the research findings, a preventative measures action plan for each high risk predictor has been developed and will be incorporated into the planning framework. This risk analysis was carried out as part of a strategic approach to enhance the effectiveness of the residential construction schedule.

Du Plessis and Oosthuizen (2018) did extensive research to assess project management for construction plans and building contractual arrangements in South Africa. The research revealed that the standard planning circumstances used in South Africa had frameworks that were comparable to the primary construction project management skills acknowledged by the PMI. The publication also examines the broad agreements and themes of the four general circumstances of contracts supported by the South Africa's Construction Industries Development Board (CIDB). The Construction contract must take into account all phases of the project. The Construction Contract should also be viewed as the Project Implementation Plan (PIP), upon that the construction existing controls are premised. The significance, main objective, interdependences, and obligations of the two systems (contracts and governance) could be properly appreciated with a greater comprehension of their transformation.

When creating a construction plan, it is usual to prioritise either cost control or scheduling (Sears, Sears, Clough, Rounds and Segner, 2015). A few developments are primarily divided into expense categories, each with their own set of costs. Construction planning is cost or expenditure centred in these scenarios. Within the expense classifications, a distinction is drawn between expenses involved immediately in the execution of a project and expenses incurred with indirectly in the project's successful completion. Borrowing costs for capital investment, for instance, and overhead components are frequently treated as indirect costs. Work schedules responsibilities over time are

essential for several other developments and is emphasised during the strategic planning. In this case, the planner ensures that proper prioritisation is sustained between many practises and that similar concepts of available resources persists. Conventional project management processes illustrate task precedence (likely to result in critical path scheduling processes) or resource efficiency over time (leading to job shop scheduling process). Eventually, most construction problems necessitate the concern of costs and schedules over time. Strategic plan, tracking, and maintaining records should take both parameters into account (Hazr, 2015). The incorporation of budget and timeline relevant data is a main consideration in these instances.

**2.5. Knowledge Integration and Implementation of Low-cost Housing Construction Projects**

Berteaux and Javernick-Will (2015) emphasised organisational integration of knowledge, procedures, and strategic plan, stating that organisational integration enhances project outcomes across documentation functionalities and new technologies throughout the organisation, allowing the organisation to compete effectively. It is also stated that knowledge and procedure integration enhances project and organisation effectiveness. Because project conception and project implementation planning are critical, integration seems to be a major element in project implementation. As suggested in prior researches, integration is inextricably connected to the core aspects and areas of project management. As a result, one could draw the conclusion that integration has a clear and direct influence on the project's success.

Jia, Ma, Wu, Wu, and Jiang (2021) investigated the task conflict effect on productivity of construction. To put the conceptual approach to the test, 248 Chinese construction projects were used. Process conflict fosters knowledge integration but degrades success of a project, according to the findings. The evidence based confirmation of the serial moderating mechanism of integration of knowledge and contract management on the link among project task conflict. These results shed light on how work engagement affects success of a project and have important implications for practise.

Knowledge sharing behaviour, particularly in cooperative groups like interdisciplinary groups in IPPD developments, continues to pose challenges to management (Rauniar, Rawski, Morgan and Mishra, 2019; Li, Lee, Jin, and Chong, 2022). Knowledge, as opposed to information, is secured in the thoughts of team members individually attained though the many years of personal

interactions and may be difficult to document, accurately measure, and distribute. Knowledge is referred to as tacit knowledge by Olaisen and Revang (2018). The concept can be effectively communicated and documented through various means such as papers, guidebooks, and reviews (Addis, 2016). Despite the distinctions between tacit and explicit knowledge and the challenges associated with sharing knowledge to facilitate its integration, it is crucial for management to actively prioritize knowledge integration within an IPPD, similar to their focus on work methodologies and tools across parallel tasks or responsibilities.

The collective knowledge of a team reflects their collaborative efforts across different functions (Ghobadi, 2015; Navimipour and Charband, 2016). Henttonen, Kianto, and Ritala (2016) define knowledge integration as the process by which individuals exchange and incorporate specialized knowledge to generate new insights. Personal information is shared to bigger team via the knowledge integration framework (Bolisani, and Bratianu, 2018). The product team is better capable of dealing with product and project unpredictability and implications when information is exchanged and made accessible to others (Chaudhuri and oer, 2016). The collaborative comprehension of the team's and the project's goal must be attained for resolving issues and making decisions all over the interrelated activities of an IPPD project (DeChurch and Mesmer-Magnus, 2010).

## 2.6. Integration Change Management and Implementation of Low-cost Housing Construction Projects

Throughout the project, from designing and engineering to execution, adjustments are inevitable. According to Ward and Chapman (2008), the connections between the different project aspects are the most considerable sources of change. It is critical to give insightful information correlation between the project's different factors in order to design appropriate legislative changes. An alteration in the project-design or engineering will influence significantly the progress of the project during the execution and construction phases. The project is similar to a dynamic system that is more than just a collection of network elements (Cha and Kim 2018). It is difficult to account for the complex interaction between the project's elements when such a system is demonstrated in segments. To deal with prospect changes during the building project stages, the engagement between the program's aspects must be considered carefully. The importance of system dynamics tools in sophisticated strategic planning is widely recognised in the literature (Ansari, 2019). The

use of SD opens up new avenues for methodically analysing the guidelines were developed and the dynamic interactions among project elements (Demirel et al. 2017).

Samin, Halou, and Ahmmad (2019) investigated the effects of change management in the building and construction industry project risk and cost administration. Data was acquired quantitatively through questionnaire in Klang Valley, Malaysia. The data was collected using simple random sampling method, with 105 orders to evaluate the proposed and 90 given back. The correlation analysis reveals a strong link in cost, risk, and organisational change. The research reveals that design changes, client and contracting firm adjustments happened most frequently in construction project change management. Selecting suppliers on the premise of an incomplete design, that then changes all through construction, was discovered to be the primary cause of the adjustments. The engineers maintain quoted rates, site memorandum, variation orders, and monthly payment certificates thru a paper-based activity.

As Opined by Zhaoo and Ahmed (2009), change management is a critical management practise in projects that resolves difficulties as projects undergo changes or minimises the likely changes which may result and obstruct construction process. It aims to forecast potential changes, identify existing changes, plan for precautionary measures, and coordinate adjustments throughout the entire operation among all interested parties. Aside from order to address the effects of the changes, successful change managers ought to ensure the construction cost, time, and effectiveness.

According to a research published by Motawa Anumba, Lee and Peña-Mora, (2007), inconsistent management of the organizational change can result in a variety of disruptive effects. Furthermore, if changes are not resolved through change management formal process they may turn into a significant source of contractual disputes, ultimately resulting in project failure. The process of change management is composed of four fundamental principles: identification of modifications changes, evaluate changes, suggest improvements, and learn from past perceptions.

## 2.7. Theoretical Framework

The research is based on systems theory and the change theory (TOC) in construction projects.

**2.7.1 System theory**

The theory was formulated in the 1940s by Bertalanffy. The theory states that systems relate to one another within a larger more sophisticated system. It further propagates that smaller systems interact together to run more complex systems with larger parts and complex structure and higher degree of combining power. The theory application requires an examination of all integrating parts of the smaller systems and effectively merging them to produce the desired products and results. This also include combining the resource for production to get the desired outputs. This theory is relevant in guiding this study because integration management is like a system with different components working as small independent systems but combining to achieve the overall goal of the projects. There are systems for project stakeholders, suppliers, beneficiaries, proponents, implementation teams each separately focusing on their independent roles but collectively contributing to the overall project implementation goal. A system that is cohesive produces better results while a system disjointed cannot perform leading to system breakdown and subsequently stalled project.

System theory is highly relevant to the implementation of construction projects as it provides a comprehensive framework for understanding and managing complex systems. Construction projects are inherently complex, involving multiple interdependent components, stakeholders, and processes. System theory offers valuable insights into how these elements interact and influence project outcomes. System theory offers a valuable perspective and set of principles for understanding and managing the complex nature of construction projects. By considering the project as a system and applying system thinking, project managers can improve project outcomes, enhance stakeholder collaboration, and navigate the challenges associated with large-scale construction endeavour

**2.7.1 Theory of Change**

The idea of TOC originated in the 1990s in the context of enhancing assessment theory and practises in community programs in the USA. It is challenging to determine whenever the term "theory of change" was coined, although it can be observed in the substantial body of theoretical and applied progression in the assessment field, particularly in the work of Peter Rossi, Huey Chen,

Carol Weiss and Michael Quinn Patton, Weiss defined the TOC as a "theory of how and why it works" in its early conceptions in 1995. The TOC refers to a theory-based strategy for planning, incorporating, and assessing change at the personal, organisational, or community levels (Ruesga, 2010). The theory of change presumes that an action is intentional. A theory of change expresses consciously how an intervention aims to accomplish results via actions taking the context into consideration. Theory-based techniques can be applied to a variety of subject areas, comprising education, community engagement, and public health. This method dates back to the 1960s, when Kirkpatrick used it to investigate the consequences of schooling on students. The methodology has popularly been applied over the last couple of years spanning into 2 decades, in part due to the need for a framework that can contribute for the sophistication of multi-stranded and interconnected activities to promote progressive reform (McGee and Edwards, 2016).

The theory of change is a framework commonly used in the field of program evaluation and development to guide the planning, implementation, and evaluation of interventions or projects. While it is not specifically designed for construction projects, the theory of change can be adapted and applied to various contexts, including the implementation of construction projects. The theory of change provides a structured approach to planning and implementing construction projects by clarifying goals, identifying activities, mapping inputs and outcomes, assessing assumptions and risks, and supporting monitoring and evaluation. It helps project teams ensure that their efforts are aligned with the desired changes and increases the likelihood of successful project implementation.

## 2.8. Conceptual framework

This framework is an investigator's creation on a challenge that provides guideline to research (Kothari 2012). It is a proposed model for categorising the concepts used in an investigation and how they interrelate. Agulas (2005) examine the essence of the framework as a pointer to the reader to quickly comprehend and conceptualize the variables and concepts being investigated

**Independent Variable**

```
┌──────────────────────────────────────┐
│          Project charter             │
│   • Stakeholder Identification       │
│   • Project Deliverables             │
│   • Project scope outline            │
│   • Project budget estimates         │
│   • Overall Project schedule         │
└──────────────────────────────────────┘

┌──────────────────────────────────────┐
│       Project management plan        │
│   • Timelines                        │
│   • Milestones                       │
│   • Work plans                       │
│   • Implementation Metrics           │
│   • Risk Management Plan             │
└──────────────────────────────────────┘

┌──────────────────────────────────────┐
│        Knowledge integration         │
│   • Knowledge capture                │
│   • Knowledge management             │
│   • Knowledge sharing                │
│   • Knowledge transfer               │
│   • Knowledge re-use                 │
└──────────────────────────────────────┘

┌──────────────────────────────────────┐
│ Project change integration           │
│   • Scope baseline                   │
│   • Change request                   │
│   • Change control tools             │
│   • Cost benefit analysis            │
│   • Change logs                      │
└──────────────────────────────────────┘
```

**Dependent Variable**

```
┌──────────────────────────────────────┐
│   Implementation of low-cost         │
│   housing construction projects      │
│                                      │
│   • Number houses constructed        │
│   • Number of units occupied         │
│   • Rental Cost                      │
│   • Payment plans                    │
│   • Affordability                    │
└──────────────────────────────────────┘
```

**Figure 1: Conceptual framework on the relationship between integration management and Implementation of low-cost housing construction projects**

## 2.9. Summary of Literature

A project charter formalises the project and gives the go-ahead to commit organisational resources to it. Misunderstandings about the term "prerequisites" are especially prevalent among construction professionals. As a result, attaining this project achievement criterion ought to be clearly outlined in the project charter during the inception phase, so project managers can better investigate and comprehend the various techniques required for completing a project effectively (Joslin and Müller, 2016; Coleman, 2014; Kerzner, 2017). Preparing a document that might be up to twenty-five pages long is time and effort intensive. A document of this type may be required, but it cannot be the original charter for the effort. There is very little investigations on the initiation lifecycle of project charter techniques. These strategies are necessary and required for construction managers to have project charters.

When creating a construction plan, it is frequent to prioritise either cost control or scheduling. The use of subcontracting on a project is usually accomplished during construction planning. Some projects are experience of various into expenses, each with their own set of costs. Construction project is primarily concerned with cost or expenditure. Strategic planning has a long history, including the occurrence of multiple and conflicting theories to describe the strategic planning and its connection to attaining organization goals.

According to Frey and Sunwolf (2005), constructing a shared knowledge or comprehension is critical to organization growth. Knowledge integration, according to Henttonen, Kianto, and Ritala (2016), is the acts of people who disseminate and incorporate specialised information to produce new knowledge. Several more authors have described the significance of institutional knowledge and competencies. In the latest research, we describe shared knowledge as the significant degree to which business development representatives have a common understanding of the corporation's engineering and design procedures, marketing, industrial production, and other key competencies (Nguyen, Ngo, Bucic and Phong, 2018).

According to Ward and Chapman (2008), the conversations between the different construction elements are the most substantial sources of change. A modification in the design or engineering stage is going to impacts on the success of the projects during the execution and construction process. It is critical to encourage and motivate teammates in order to ensure that favourable adjustments are supported and encouraged while detrimental adjustments are disheartened and

ignored. According to Burnes (2004), transformation is a constant in organisational life, both operationally and strategically. Change management and organisational strategy cannot be differentiated. It is a project management practise that addresses issues that arise when changes take place in a project. It aims to forecast potential changes, identify existing changes, plan for precautionary measures, and synchronise adjustments throughout the operation across all interested parties.

## 2.10. Knowledge Gap

Previous research has primarily focused on overall project success using other components of a project. There is little literature on building projects construction management and implementation. In addition, few developments have concentrated on the effectiveness of construction housing development. This investigation aimed to close the gap by assessing the impact of integration management on low-cost HCPs implementation in Nairobi City County

**Table 1: Knowledge Gap**

| Variable | Authors & Year | Title of the Study | Methodology | Findings | Knowledge Gap | Focus of the Current Study |
|---|---|---|---|---|---|---|
| Project Charter | Mark and Lurie (2018) | Customised project charters in software development | Descriptive research design | The project charter development may offer a solution to the disparity in perceptions. | The study did not link project charter to implementation of low-cost HCPs | Project charter and implementation of low-cost HCPs |
| | Kumaraswamy, Mahesh, Mahalingam, Loganathan and Kalidindi (2017) | establishing a client charter and housing developments KPIs to guide and enhance the sector advancements | Case study | The charter was developed in integral part of the management, such as recognising "preferences | The study however, did not elucidate on influence of project charter housing construction project implementation | Project charter and implementation of low-cost HCPs |
| Project Management Plan | Du Plessis and Oosthuizen (2018) | project management for construction plans and building contractual arrangements in South Africa | Survey research design | upon that the construction existing controls are premised | The results do not show how project management plan influence implementation of low-cost HCPs was not presented | Integration management and implementation of low-cost HCPs |
| Knowledge integration | Jia, Ma, Wu, Wu, and Jiang (2021) | effect of task conflict on construction productivity | Survey design | Engagement affects success of a project and have important implications for practise | The study failed to link knowledge integration and implementation of low-cost housing implementation projects | Knowledge integration and implementation of low-cost HCPs |
| | by Olaisen and Revang (2018)) | Collaborative comprehension of the team's and the project's goal | Descriptive survey | A team's shared knowledge demonstrates the teams cross - functional collaboration | The study failed to unpack how knowledge integration influences implementation of low-cost HCPs | Knowledge integration and implementation of low-cost HCPs |

| Integration Change Management | Zhao et al., (2009), | effects of the changes, successful change managers | Survey | inconsistent management of the organizational change can result in a variety of disruptive effects | The study fell short of directly linking integration change management and implementation of low-cost HCPs | Integration change management and implementation of low-cost HCPs |
|---|---|---|---|---|---|---|
| | Samin, Halou, and Ahmmad (2019)) | Effects of change management in the building and construction industry project risk and cost administration | Descriptive Survey | Selecting suppliers on the premise unfinished design that leads to construction changes, was discovered to be the primary cause of the adjustments | The authors did not report on positive influence of integration change management on implementation of low-cost HCPs | Integration change management and implementation of low-cost HCPs |

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1. Introduction

In this section, the methodology employed in conducting the study is outlined. It provides an overview of the research design, target population, determination of the sample size required to represent the population, sampling technique, research instrument, pilot study, considerations of validity and reliability, techniques for data collection, methods for data analysis, ethical considerations, and the operationalization of variables.

## 3.2. Research Design

This study employed a descriptive survey design, which is characterized by its structured and precise nature in capturing the present state of phenomena as they are (Rinjit, 2020). Descriptive survey design aims to describe existing phenomena by examining people's perceptions, attitudes, behaviours, or values, utilizing both qualitative and quantitative methods. Additionally, this design is particularly suitable for this study as it enables data collection from a large population. Elsewhere, Cr, (2020) asserts that descriptive design collect data in testing hypotheses and answer on the current state of the subjects under study, which is applicable in this research. The implication in line with Pandey and Pandey (2021) is that this specific design studies an enormous population to reveal the integration management practices and its implication on implementation of LCHCPs. The researcher used descriptive research design to describe integration management and its implication in implementation of low-cost HCPs. Descriptive research design is a valuable approach in various fields, including social sciences, market research, and even in some aspects of construction projects. The research design is relevant in construction projects for exploring phenomena, establishing baseline data, identifying patterns and trends, supporting feasibility studies, informing decision-making, and evaluating project outcomes. It offers a systematic and comprehensive approach to gathering information, describing current conditions, and generating insights that can contribute to successful project implementation and improvement.

## 3.3. Target Population

The target population for this study comprise of 283 contractors and project managers involved in construction of housing projects in Nairobi City County between the year 2020 and 2022. The group of people, things, events, that share measurable features relevant to the study

constitutes target population (Acharyya and Bhattacharya, 2019). According to Lawes, et al. (2021), a population is a collection of occurrences that an investigator is interested and wishes to extrapolate.

**Table 2: Target Population**

| Categories | Population |
|---|:---:|
| Contractors | 110 |
| Project managers | 173 |
| **Total** | **283** |

**Source: Nairobi City County, Kenya Government, 2022**

### 3.4. Sample Size and Sampling Technique
Sample size denotes a select representative few from the overall population while the process of selecting such a sample is the sampling technique, (Ogulas, 2005)

### 3.4.1. Sample Size
This is process of selecting a subset of a population to serve as a representation of that population (Andrade, 2020). The most important condition for any sample is that it be inclusive representative of the population from that it was taken. A sample is representation if the findings of the analyses performed using the investigator sampling units are comparable to those found if the investigator analysed the complete population. Slovin's formula was applicable to establish a representative sample size. Slovin's formula is a statistical method used to determine the appropriate sample size for a given population when conducting research or surveys, and it is commonly used in situations where the population size is large and a representative sample is desired. The formula is as follows:

$$n = \frac{N}{1 + N(e)^2}$$

$n =$ Sample Size

N= Target population

$e =$ alpha $\pm$ 5%

$1 =$ Constant

$$n = \frac{283}{1 + 283(0.05)^2} = 166$$

Hence, the sample size was 166 participants appropriated as put in Table 2 using a stratified sampling technique

### 3.4.2. Sampling Technique

The researcher utilized probability-sampling technique to select study participants, aiming to provide equal opportunities for every individual in the population to be chosen (Quatember, 2019). Probability sampling techniques guarantee that each member of the population has a known probability of being included in the sample. This approach enables researchers to estimate population parameters and make broader inferences about the entire population. By employing these techniques, the validity and representativeness of the sample are enhanced, thereby increasing the reliability of the research findings. The investigator must ensure that everyone in the company has a different chance of being selected using this method using randomization approach. The participants for this research were chosen by stratified sampling approach. The sample size was calculated as follows using Cochran's stratified sampling approach (1977).

**Table 3: Sample determination**

| Categories | Strata Population(Ni) | $n_{i=} \frac{ithstratumpopulation}{targetpopulation(N)}$x n | % of the desired sample size |
|---|---|---|---|
| Contractors (contractor with NCA1 to NCA5) | 110 | 65 | 59.1% |
| Project managers | 173 | 101 | 59.1% |
| Total | 283 | 166 | 59.1% |

### 3.5. Data Collection Instruments

To gather data from the selected participants, interview schedules and questionnaires were utilized. Questionnaires were chosen as a method of data collection due to their ability to efficiently gather information from a large population within a relatively short timeframe. Further, they can be administered directly or through representatives where people are able to read and write (Sahaya, 2017). Questionnaires were used to gather quantitative since they were close-ended questions. Specifically, questionnaires to be administered to the respondents in this study contained only closed questions. This presented them with the advantage of being more objective and detailed. The study questionnaire had six sections; first section targeted respondent's general information, second section gathered data on project charter; third section gathered data on project management plan, fourth section on knowledge integration, fifth on integration change management and sixth on implementation of LCHCPs. All these sections were closed ended questions with Likert scale weights. The qualitative findings were used to supplement data obtained through a quantitative approach. Questionnaires were used to target the contractors and project managers in the County. KII were administered with interview guides to get qualitative data

### 3.5.1 Pilot Study

A small-scale preliminary study was carried out prior to the primary research to assess the design, technique, data collection tools, and processes that would be used in the bigger study. It entailed gathering and analyzing data from a small sample, frequently representative of the target population, in order to pinpoint potential problems, hone research procedures, and make required modifications. For the pilot study, a 10% sample size (Mugenda & Mugenda, 2008), or 16 homogenous feature surveys, is appropriate. In Kiambu County, the trial was done with 16 contractors and project managers in mind. 10% of the desired sample size is represented by this group. These respondents were chosen on purpose. Prior to the official survey, a pilot survey was started to assess the study methods and tools. This was done to guarantee the legitimacy and dependability of the tools. Performing a pre-test utilizing the questionnaires or interview guide is an excellent approach to avoid issues before beginning the actual data collection, according to Lowe (2019). For the pilot test, it is suggested that a sample of individuals who are related to those who will make up the research sample be chosen.

The pilot survey helps identify questionnaire issues that could cause participants to provide improper responses or provide responses that don't make sense. It also helps increase the internal consistency of the investigation tool. A pilot study's development may benefit from a prototype survey. Additionally, it can anticipate potential weaknesses in the initial study, the likelihood of not following research protocols, and the appropriateness of chosen methodology. It also demonstrates what is effective and ineffective, such as unclear suggestions and enquiries (Malmqvist, et al., 2019). Researchers can also discover how the tool can assist them in developing coding strategies for open-ended queries through testing (Orodho, 2009).

### 3.5.2 Validity of the Instruments

Validity relates to the accuracy, dependability, and meaningfulness of the conclusions derived from the findings of a study (Kothari and Gerg, 2014). Validity is established when the data effectively measure what they are intended to measure. In this study, expert reviews were conducted to ensure construct, content, and face validity. The tools developed were shared with university supervisors to obtain constructive feedback and assess their face validity. Subsequently, adjustments were made to the tools based on their suggestions.

The extent of precision in obtaining the required data is defined as validity; construct validity of the questionnaire was assessed by the investigator. This test establishes a connection

between the measurement and the theoretical underpinnings. Construct validity is confirmed when there is a connection between the assessments and the relevant domains they are associated with. It evaluates the degree to which the operational definition of a variable aligns with its theoretical definition. It examines whether the measurements or indicators employed in a study accurately represent the underlying theoretical construct being investigated.

The CVR is in the +1 to-1 range. The positive figure shows that the question was deemed important by at least half of the professionals. Evaluating the average CVR across all queries in the questionnaire subjects to specialists in the topic of the research established the content, face and construct validities

### 3.5.3. Reliability of the Instruments

The capability of a measurement device to deliver the same response in the same surroundings, again and again, is referred to as reliability (De Vaus, 2002; Kipkebut, 2010). It means that if people respond to a questionnaire in the very same way on numerous occasions, the instruments is considered dependable.

Running frequencies and editing inaccuracies were applied to enforce reliability of the tools. The piloting was utilized to determine how long the questionnaires takes to present to the sample inside a two-week period, the investigator presented surveys to almost the same group twice. To determine the extent to which similar responses are elicited, the researcher utilized correlation to determine the efficiency.

The degree to which the tools provide persistent results are referred to as reliability (Kothari, 2004). The Cronbach's coefficient was applied to enforce reliability and is a widely used reliability test. It is a number that runs from 0 to 1. A value larger than 0.70 specifies that the study instrument is consistent (Gliem and Gliem, 2003). This was applied in this study though SPSS.

### 3.6. Data collection Procedure

Questionnaire distributing was achieved through dropping and then collecting later as opined by Kim and Smith (2015) as a convenient method when dealing with respondents under busy schedules as it was in this case. Investigator sought NACOSTI approval after being cleared by a panel of University examiners and making required corrections from the defense

## 3.7. Data Analysis Techniques

Data was organized and sanitized at the conclusion of data gathering. Data cleaning entailed identifying of inaccurate and unreliable responses that were then updated in enhancing the replies' quality. SPSS was used to summarise and code the responses.

The information gathered from open-ended queries was codified to make computer processing easier. The final data was entered into SPSS Ver. 27 for analysis once validation was completed. SPSS is a versatile tool that allows users to manage data in a variety of formats. Before any modification of the dataset to be used in assessment, the original data was preserved. Thematic analysis of qualitative data was carried out in accordance with four purpose of the study. Quantitative data has been presented utilizing descriptive statistics such as mean, SD, whereas statistical measures has been summarized using percentages and frequency counts. The data was also analyzed by inferential statistics of regression alongside correlation analyses. The results have been presented in Tables. Narrative verbatim has been used to illustrate the qualitative statistical results.

## 3.8. Ethical considerations

Prior to beginning a data collection procedure, the investigator and the participant signed agreements that spelled out their respective responsibilities and obligations via informed permission (Kerlinger and Lee, 2000). As a result, all ethical considerations relevant to the design of this study were enforced. The participants as participants who needed to take care of their basic rights that required to be respected during the research process was the focus of the second level of ethics. Permission to perform this investigation was acquired from the Universities of Nairobi Research Ethics Board and the NACOSTI-permit as a vital aspect of adhering to the ethical criteria.

All relevant stakeholders were informed of the research's intent. It was also needed to describe the survey's purpose to all participants. Respondents were informed of any positive and negative features or effects of their involvement in the study by the investigator (Nachmias and Nachmias, 1996). After the purpose of the study is described to the participant, they were requested to sign written consent indicating their free-will to take part as participants. The investigator obtained participants' written consent preceding the study and did not compel them to provide any information.

## 3.9. Operationalization of variables

The operationalization of the variables is indicated here-in Table 3;

**Table 4: Operational Definition of Variables**

| Objective | Variables | Indicators | Data collection instrument | Scale of measurement | Research approach | Types of analysis | Tools of analysis |
|---|---|---|---|---|---|---|---|
| To determine project charter's influence on implementation of LCHCPs projects in Nairobi City County | Project charter | • Stakeholder Identification<br>• Project objectives<br>• Project scope outline<br>• Project budget estimates<br>• Overall Project schedule | Questionnaire<br><br>Interview guide, | Interval | Mixed method | parametric | Arithmetic mean, Percentages, SD, Correlation, Regression ANOVA |
| To establish project management plan's influence on implementation of LCHCPs projects in Nairobi City County | project management plans | • Timelines<br>• Milestones<br>• Deliverables<br>• implementation<br>•  Metrics<br>• Risk Management Plan | Questionnaire<br><br>Interview guide | Interval | Mixed method | parametric | Arithmetic mean, Percentages, SD, Correlation, Regression ANOVA |
| To assess knowledge integration's influence on implementation of LCHCPs projects in Nairobi City County | knowledge integration | • Capacity needs Knowledge capture<br>• Knowledge management<br>• Knowledge sharing<br>• Knowledge transfer<br>• Knowledge re-use | Questionnaire<br><br>Interview guide | Interval | Mixed method | parametric | Arithmetic mean, Percentages, SD, Correlation, Regression ANOVA |

| To investigate integration change management's influence on implementation of LCHCPs projects in Nairobi City County | Change management integration | • Scope baseline<br>• Change request<br>• Change control tools<br>• Cost benefit analysis<br>• Change logs | Questionnaire<br><br>Interview guide | Interval | Mixed method | parametric | Arithmetic mean, Percentages, SD, Correlation, Regression ANOVA |
|---|---|---|---|---|---|---|---|
| To determine implementation HCPs | Implementation low-cost HCPs | • Number houses constructed<br>• Number of units occupied<br>• Rental cost<br>• Payment plans<br>• Affordability | Questionnaire | Interval | Mixed method | parametric | Arithmetic mean, Percentages, SD |

# CHAPTER FOUR

# DATA ANALYSIS, PRESENTATION, INTERPRETATION, AND DISCUSSION OF FINDINGS

## 4.1 Introduction

Chapter four provides details regarding the demographics of the respondents and presents the study's findings derived from the anticipated analysis. It encompasses the presentation and interpretation of both descriptive and inferential analyses. The results are discussed according to thematic categories, considering the significance of each theme. Furthermore, the chapter offers a comprehensive and meaningful interpretation of the results obtained from the descriptive and inferential analyses concerning the themes of integration management and their impact on the implementation of LCHCPs.

## 4.2 Questionnaire Return Rate

As enlisted in the Table ~5, an aggregate of 166(100%)- questionnaire were self-administered to all the 166 respondents. 146(87.95%) were collected from them for analysis while non-return for various reason were recorded at 20(12.05%) of the aggregate administered. Fichman (2008) opines that since surveys are characterized by low response rate. If a 75% and above return response is achieved, then that is categorized as an excellent rate of response. And since this study achieved 87.96% response rate, subsequently it was an excellent rate of return.

**Table 5: Questionnaire Return Rate**

| Questionnaires | Frequency(f) | Percent (%) |
|---|---|---|
| Returned'(Collected) | 146 | 87.95 |
| Non-Response (Retained) | 20 | 12.05 |
| **Sum Total Questionnaire Administered** | **166** | **100.00** |

## 4.3 The Demographics of Study Respondents

The study acquired biodata of the enlisted respondents' demographics with reference to sex, age, academic level attained, and the duration spent working in the construction of housing industry. The outputs are enlisted in Table 6

**Table 6 Respondents Distribution by Demographics**

| Characteristics | Frequency | Percent |
|---|---|---|
| **Respondents' Gender** | | |
| Male | 87 | 59.59 |
| Female | 59 | 40.41 |
| **Total** | **146** | **100.00** |
| **Age of Respondents in Years** | **Frequency** | **Percent** |
| 25 and below | 11 | 7.53 |
| 26***35 | 56 | 38.36 |
| 36*** 45 | 45 | 30.82 |
| 46***55 | 21 | 14.38 |
| Above 55 | 13 | 8.91 |
| **Total** | **146** | **100.00** |
| **Respondents' Highest Academic Qualification** | **Frequency** | **Percent** |
| Certificate | 33 | 22.60 |
| Diploma | 47 | 32.19 |
| Bachelor's Degree | 39 | 26.71 |
| Masters | 23 | 15.76 |
| Ph.D. | 4 | 2.74 |
| **Total** | **146** | **100.00** |
| **Duration Worked in Construction Projects (Years)** | **Frequency** | **Percent** |
| Less than 2 | 14 | 9.59 |
| 2-5 | 48 | 32.88 |
| 6-9 | 53 | 36.30 |
| Above 10 | 31 | 21.23 |
| **Total** | **146** | **100.00** |

The constructed output Table 6 results; with the results distribution of respondents with regards to sex indicates male 87(59.59%) who were the majority and female were 59(40.41%). The results demonstrate the construction industry is dominated by males over their female counterparts

The respondents' distribution as demonstrated by age indicate that; 25 years and younger 11(7.53%), 26-35 years 56(38.36%), 36-45 years 45(30.82%), 46-55 years 21(14.38%), above 55 years 13(8.91%). The results demonstrate a well distributed sample across the possible age groups and a pointer towards a normal distribution demographic structure. The results suggest that between 26-35 years were the majority in the construction of housing industry.

The respondents' distribution as demonstrated by highest academic level indicate that; Certificate holders 33(22.60%), Diplomas 47(32.19%), Bachelor degree 39(26.71%), Master23(15.76%), and PhD 4(2.74%). The result is appointer towards high levels of literacy among the respondents and thus did not find any difficulties in dealing with the questionnaires.

On the duration of involvement in construction projects; not more than 2 years 14(9.59%) 2 years to 5 years 48(32.88%) 5-9 years 53(36.30%) and above 10 years 31(21.23%) The results demonstrate a significant number of respondents had between 5-9 years' experience in implementation of the construction projects.

**4.4 Descriptive Statistics on Implementation of low-cost housing construction projects**

This objective of this study was to assess the degree and level of implementation of low-cost housing construction projects. The descriptive statistics regarding the implementation of these projects are presented in Table: ~7.

**Table 7: Descriptive Statistics of Implementation of Low-cost Housing Construction Projects**

| Item | Statements on Implementation of low-cost housing construction projects | Strongly Agree (5) | Agree (4) | Neutral (3) | Disagree (2) | Strongly Disagree (1) | Mean | S.D |
|------|------|------|------|------|------|------|------|------|
| F1 | Numerous housing units have been achieved through construction of low-cost housing initiative | 24(16.64%) | 24(16.64%) | 14(9.59%) | 37(25.34%) | 47(32.19%) | 2.60 | 1.488 |
| F2 | The completed housing have all been occupied | 15(10.27%) | 25(17.12%) | 23(15.75%) | 67(45.89%) | 16(10.96%) | 2.70 | 1.182 |
| F3 | The house rental cost for low-cost housing are low | 17(11.64%) | 29(19.86%) | 17(11.64%) | 48(32.88%) | 35(23.97%) | 2.62 | 1.350 |
| F4 | The low-cost housing construction projects firms offer flexible house purchase plans | 27(18.49%) | 27(18.49%) | 12(8.22%) | 69(47.26%) | 13(8.90%) | 2.88 | 1.302 |
| F5 | The low-cost housing units constructed are generally affordable to majority of city dwellers | 19(13.01%) | 11(7.53%) | 22(15.07%) | 60(41.10%) | 34(23.29%) | 2.46 | 1.287 |
| **Composite (average) Mean and S.D** | | | | | | | **2.65** | **1.322** |

The descriptive statistical analysis results as outlined in Table 7 demonstrates that implementation low-cost HCPs can be described by a composites mean =2.65 and composite S. D=1.322 This is interpreted to mean implementation of low-cost housing projects is influenced positively by statements F2, and F4, because they have means greater than composite mean of the variable. Consequently, F1, F3 and F5, negatively influenced the variable because their means were less than composite mean for the variable. Thus the negative and positive effects of the statement contributed variedly to the implementation of low-cost HCPs.

Item F1 sought to establish if numerous housing units have been achieved through construction of low-cost housing initiative. The response distribution of the 146 respondents demonstrate that; 24(16.64%) strongly-agreed, 24(16.64%) agreed, 314(9.59%) neutral, 37(25.34%) disagreed and 47(32.19%) disagreed strongly with the item assertion. The aggregate score for the item statement was 2.60 and 1.488 S.D. The response frequency suggests that implementation of low-cost HCPs in Nairobi City County have not made substantial progress in constructing low-cost houses.

Item F2 sought to establish if the completed housings have all been occupied. The response distribution of the 146 respondents demonstrate that; strongly agreed, 15(10.27%) agreed, 25(17.12%) neutral, 23(15.75%) disagreed, 67(45.89%) and 16(10.96%) disagreed strongly. A mean of 2.70 and 1.182 S. D were recorded. The responses suggest the completed low-cost housing projects have low occupancy rates

Item F3 sought to establish if the house rental cost for low-cost housing are low. The response distribution of the 146 respondents demonstrate that; strongly-agreed 17(11.64%) agreed, 29(19.86%) neutral, 17(11.64%) disagreed 48(32.88%) and strongly-disagreed with F3 were35(23.97%). The mean aggregate for the statement was 2.62 and 1.350S.D. The poll frequency for the item suggest that the house rental cost for low-cost housing are is relatively not low and few people can afford them.

Item F4 sought to establish if the low-cost HCPs firms offer flexible house purchase plans. The response distribution of the 146 respondents demonstrate that; 27(18.49%) strongly-agreed, agreed were 27(18.49%) neutrals were,12(8.22%), 69(47.26%)disagreed and strongly-disagreed 13(8.90%) thereby scoring a mean of 2.88 and 1.302 S.D. The responses suggest that the low-cost HCPs firms do not offer flexible house purchase plans suitable for low income class of people.

Item F5 sought to establish if the low-cost housing units constructed are generally affordable to majority of city dwellers. Of the 146 respondents who responded to the questionnaire, 19(13.01%) strongly-agreed, 11(7.53%) agreed, neutral, 22(15.07%), 60(41.10%) disagreed with another 34(23.29%) strongly-disagreed thereby scoring a mean aggregate of 2.46 and 1.2.87 S.D. The results indicate that low-cost housing units constructed are generally not affordable to majority of city dwellers.

For the qualitative data the study collected on implementation of low-cost HCPs show that;

> "There is just the hype for low-cost housing construction projects. The building materials are very expensive with all manner of taxes, so there is no way you can develop a property

*and dispose it off at a loss in the name of low-cost housing. This can't happen and will not happen, unless the government does it but not provide developers".* KII1

## 4.5 Project Charter and Implementation of Low-cost Housing Construction Projects

The study's theme of first objective examined influence of project charter on implementation of low-cost HCPs. The resulting figures are enlisted in Table: -~9

**Table 8: Descriptive Statistics of Project Charter and Implementation of Low-Cost Housing Construction Projects**

| Item | Statement on Project charter | Strongly Agree (5) | Agree (4) | Neutral (3) | Disagree (2) | Strongly Disagree (1) | Mean | S.D |
|---|---|---|---|---|---|---|---|---|
| B1 | Stakeholder are clearly identified by the project charter | 38(26.03%) | 48(32.88%) | 10(6.85%) | 39(26.71%) | 11(7.53%) | 3.43 | 1.328 |
| B2 | Clarity in project deliverables in the charter | 40(27.40%) | 64(43.84%) | 20(5.56%) | 17(13.70%) | 5(3.42%) | 3.80 | 1.074 |
| B3 | Clarity of project scope in the charter | 50(34.25%) | 47(32.19%) | 17(11.64%) | 20(4.17%) | 12(8.22%) | 3.71 | 1.293 |
| B4 | Project budget estimates in the charter is well captured | 58(39.73%) | 42(28.77%) | 10(6.85%) | 25(17.12%) | 11(7.53%) | 3.76 | 1.335 |
| B5 | The overall project schedule is well elaborated in the charter | 47(32.19%) | 38(26.03%) | 22(15.07%) | 63(43.75%) | 12.33%) | 3.51 | 1.391 |
| **Composite Mean and Composite S.D** | | | | | | | **3.64** | **1.284** |

The descriptive statistical analysis results as outlined in Table 8 demonstrates that project charter can be described by a composites mean =3.64 and composite S.D=1.2.84. This is interpreted to mean project charter is influenced positively by statements B2, B3 and B4, because they have means greater than composite mean of the variable. Consequently, B1, and B5, negatively influenced the variable because their means were less than composite mean for the variable. Thus the negative and positive effects of the statement contributed variedly to the project charter

Item B1 sought to establish if stakeholders are clearly identified by the project charter. The response distribution of the 146 respondents demonstrates that; 38(26.03%) strongly-agreed, 48(32.88%) agreed, 10(6.85%) neutral, disagreed were 39(26.71%) and 11(7.53%) strongly-disagreed thereby scoring a mean of 3.43 and 1.328 S.D. The results show that to a relatively great extent stakeholders are clearly identified by the project charter.

Item B2 sought to establish if there is clarity in project deliverables in the charter. The response distribution of the 146 respondents demonstrates that; 40(27.40%) respondents agreed strongly, while agreed were 64(43.84%) neutral, 20(5.56%) 17(13.70%) disagreed and 5(3.42%) disagreed strongly. The aggregated mean the item scored 3.80 and 1.074 S.D. The positive responses frequency dictates that there is clarity in project deliverables in the charter.

Item B3 sought to establish if there was clarity of project scope in the charter. The response distribution of the 146 respondents demonstrate that; strongly-agreed were 50(34.25%) agreed, were 47(32.19%), 17(11.64%) were neutral, 20(4.17%) disagreed and 12(8.22%) disagreed strongly. Therefore, the x̄ recorded stood at 3.71 and 1.293 SD. The statement approval level is a pointer towards clarity of project scope in the charter

Item B4 sought to establish if project budget estimates in the charter is well captured. The response distribution of the 146 respondents demonstrate that; 58(39.73%) strongly-agreed, 42(28.77%) agreed, 10(6.85%) neutral, 25(17.12%) disagreed and 11(7.53%) strongly-disagreed. Therefore, the aggregated mean the item scored 3.76 and 1.335 S.D. The result is a pointer towards a fact that project budget estimates in the charter is well captured and can be used to guide the project
Item B5 sought to establish if the overall project schedule is well elaborated in the charter. The response distribution of the 146 respondents demonstrate that; 47(32.19%) strongly-agreed, 38(26.03%) agreed, 22(15.07%) neutral, 63(43.75%) disagreed and 12.33%) disagreed strongly. The means score for the item was 3.51 and 1.391 S.D. The outlined results suggest that the overall project schedule is well elaborated in the charter for the majority of the stakeholders

For the qualitative data the study collected on project charter and implementation of low-cost HCPs provide that;

> *"Project charter though provided but due to different interests is not followed to the latter to entirely guide the project implementation process. This is done to satisfy the varied stakeholder interests and this negatively affects the project implementation".* KII2

### 4.5.1 Analysis of Correlation Between Project charter Implementation of Low-cost Housing Construction Projects

The linear associations and predictability levels between project charter and implementation of low-cost HCPs was determined through correlation analysis as computed where the values of "r" which shows the strength and association direction of the linear relationships and the value of "P" which

shows the degree of significance the predictor and criterion variables have as laid out in output Table 9 indicates that;

**Table 9: Analysis of Correlation Between Project Charter and Implementation of Low-cost Housing Construction Projects**

| Variable | | Project charter | Implementation of low-cost housing construction projects |
|---|---|---|---|
| **Project charter** | Pearson's Correlation | 1 | 0.711** |
| | Sig. (two-tailed test) | | 0.000 |
| | n | 146. | 146 |
| **Implementation of low-cost housing construction projects** | Pearson's Correlation | 0.711** | 1 |
| | Sig. (two-tailed test) | 0.000. | |
| | n | 146 | 146 |
| **\*\*Correlation at 0.05 level of significance (two-tailed test)** | | | |

The tabulated results in Table 9 results illustrates that project charter and implementation of low-cost HCPs are linked by an association of a strong significant positive correlation (r=0.711; P<0.000). This association as it exists confirms that project charter is a critical document in the implementation low-cost housing projects. Presence and strictly followed project charter results in a better and progressively implementation of low-cost HCPs. The findings corroborate the results as presented by Furterer (2016) and Mark and Lurie (2018) who equally reported that project charter is a critical component of the project management as it also identifies possible risks that may possibly help stop the project from being accomplished effectively

### 4.5.2 Analysis of Model Summary Between Project Charter and Implementation of Low-cost Housing Construction Projects

Model summary regression output as computed to demonstrate the degree, effect, strength and relationship exhibited between project charter and low-cost housing projects construction implementation has been laid out in output Table 10;

**Table 10: Analysis of Model Summary Between Project Charter and Implementation of Low-cost Housing Construction Projects**

| Model | R | R-Square | Adjusted R- Square | Standard Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.711ᵃ | 0.506 | 0.502 | 1.043 |

a. Predictors: Project charter(Constant)
b. Criterion: Implementation of low-cost HCPs

The illustrated Table 10 model summary output results demonstrate that project charter and implementation of low-cost HCPs have an identifiable pattern of linear association relationship as a unit increase in implementation of low-cost HCPs can be predicted by 50.6%-point increase in project charter, while the other 49.4% is attributable to other factors other than project charter. And whereas drawing a project charter is an important process of integration management influencing the implementation of low-cost HCPs, the other factors and processes should also be given as important consideration because their influence cannot be underscored.

### 4.5.3 Analysis of Regression ANOVA Between Project Charter and Implementation of Low Cost Housing Construction Projects

Regression ANOVA output as computed to demonstrate the degree, effect, strength and relationship exhibited between project charter and implementation of low-cost HCPs has been laid out in output Table 11;

**Table 11: Analysis of Regression ANOVA Between Project Charter and Implementation of Low-**
**Cost Housing Construction Projects**

| Model | | Sum of Squares | Df | Mean Squares | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 160.200 | 1 | 160.200 | 147.387 | 0.000ᵇ |
| | Residual | 156.519 | 144 | 1.087 | | |
| | Total | 316.719 | 145 | | | |

a. Predictors: (Constant), Project charter
b. Criterion Variable: Implementation of low-cost HCPs

The illustrated Table 11 regression ANOVA output results demonstrate that project charter has a statistically significant relationship in predicting implementation of low-cost HCPs because the value $P<0.000$ compared to the alpha significant level $\alpha=0.05$ is less and qualifies to be significant and $F=147.387$ which is positive suggesting a positive association. Therefore, project charter is

significant and positively influence the implementation of low-cost HCPs. Project charter as a process of integration management should thus be availed and followed all through project execution as a guide to enhanced implementation of low-cost HCPs

### 4.5.4 Analysis of Regression Coefficients Between Project Charter and Implementation of Low-cost Housing Construction Projects

Regression coefficients output as computed to demonstrate the degree, significance, strength and relationship exhibited between project charter and implementation of low-cost HCPs has been laid out in output Table 12;

**Table 12: Regression Coefficient Between Project Charter and Implementation of Low-cost Housing Construction Projects**

| Model 1 | Unstandardized coefficients | | standardized coefficients | T | Sig. |
|---|---|---|---|---|---|
| | B | Std. Err | Beta | | |
| 1(Constant) | 0.695 | 0.221 | | 3.138 | 0.002 |
| Project charter | 0.701 | 0.058 | 0.711 | 12.140 | 0.000 |

Criterion: Implementation of low-cost housing construction projects

The illustrated Table 12 regression coefficient output results demonstrate that project charter is statistically significant in predicting implementation of low-cost HCPs because the value P<0.000 compared to the alpha significant level $\alpha=0.05$ is less and subsequently significant. Project charter as illustrated going by the given evidence is a significant document that influences implementation of low-cost HCPs. This is so because of consistency in patterns, facts trends and linear associations levels between the predictor and the criterion variables as established between project charter and implementation of low-cost HCPs. Therefore, project charter should be present and consistently used as a guide in the processes of implementation of low-cost HCPs.

### 4.5.5 Hypothesis 1 Testing

**$H_01$:** There is no significant relationship between project charter and implementation of low-cost HCPs With $\alpha=0.05$being the priori significant level and P>0.05being subsequently the value where null hypothesis is accepted for when no significant relationship exists for project charter and implementation of low-cost HCPs Whereas when P< 0.05, subsequently null hypothesis in not accepted for no evidence is sufficient enough to back up the values and demonstrate a significant relationship is established between project charter and implementation of low-cost HCPs

Therefore, hypothesis test using t-test scores was undertaken to determine if a significant degree of identifiable associations exists between project charter and implementation of low-cost housing construction projects where analysis of ANOVA regression computed as guided by the null hypothesis formulated and tested being $H_01: \beta_1 = 0$. On the other hand, alternative hypothesis correspondingly being $H_01: \beta_1 \neq 0$. Thus, with the values for P<0.000 and which is less than priori set significant level of 0.05, we do not accept null hypothesis as stated and subsequently retain the corresponding alternative hypothesis.

## 4.6 Project Management Plan and Implementation of Low-cost Housing Construction Projects

The study's second objective aimed to assess the influence of project management plan on Implementation of low-cost housing construction projects. Table~13 enlists the resulting figures of descriptive statistics

**Table 13: Descriptive Statistics of Project Management Plan and Implementation of Low-Cost Housing Construction Projects**

| Item | Statements on Project management plan | Strongly Agree (5) | Agree (4) | Neutral (3) | Disagree (2) | Strongly Disagree (1) | Mean | S. D |
|------|---------------------------------------|--------------------|-----------|-------------|--------------|----------------------|------|------|
| C1 | Clear project timelines for all project phases | 42(28.77%) | 36(24.66%) | 11(7.53%) | 44(30.14%) | 13(8.90%) | 3.34 | 1.397 |
| C2 | Project milestones are well defined | 32(21.92%) | 51(34.93%) | 21(14.38%) | 36(24.66%) | 6(4.11%) | 3.46 | 1.198 |
| C3 | Clear sequence of events that incrementally built up until your project is complete | 41(28.08%) | 46(31.51%) | 7(4.79%) | 34(23.29%) | 18(12.33%) | 3.40 | 1.421 |
| C4 | Clear project implementation metrics for all project phases | 42(28.77%) | 42(28.77%) | 13(8.90%) | 34(23.29%) | 15(10.27%) | 3.42 | 1.384 |
| C5 | There is clear risk management plan | 37(25.34%) | 36(24.66%) | 26(17.81%) | 38(26.03%) | 9(6.16%) | 3.37 | 1.281 |
| | **Composite Mean and S.D** | | | | | | **3.40** | **1.336** |

The descriptive statistical analysis results as outlined in Table 13 demonstrates that project management plan can be described by a composites mean =3.40 and composite S.D=1.336. This is interpreted to mean project management plan is influenced positively by statements C2, and C4, because they have means greater than composite mean of the variable. Consequently, C1, and C5, negatively influenced the variable because their means were less than composite mean for the

variable. Thus the negative and positive effects of the statement contributed variedly to the project management plan

Item C1 sought to determine if there are clear project timelines for all project phases. The response distribution of the 146 respondents demonstrate that; 42(28.77%) strongly-agreed, 36(24.66%) agreed, 11(7.53%) neutral, 44(30.14%) disagreed, and 13(8.90%) strongly-disagreed, thereby scoring a mean of 3.34 and 1.397 S.D. The distribution mean suggests that there are clear project timelines for all project phases

Item C2 sought to determine if project milestones are well defined. The response distribution of the 146 respondents demonstrate that; 32(21.92%) strongly-agreed, 51(34.93%) agreed, 21(14.38%) neutral, 36(24.66%) disagreed and 6(4.11%) disagreed strongly. This item's mean stood at; 3.46 and 1.198 S.D. The results suggest that to some extent project milestones can be said to be well defined and can be seen in the activity work plans.

Item C3 sought to determine if clear sequence of events that incrementally built up until your project is complete. The response distribution of the 146 respondents demonstrate that; 41(28.08%) strongly-agreed, 46(31.51%) agreed, 7(4.79%) neutral, 34(23.29%) disagreed, whereas 18(12.33%) disagreed strongly. This item statement $\bar{x}$ therefore stood at 3.40 and 1.421 S.D. The outlined results suggest that to some good extent there is clear sequence of events that incrementally built up until your project is complete s

Item C4 sought to determine if clear project implementation metrics for all project phases. The response distribution of the 146 respondents demonstrate that; 42(28.77%) agreed strongly 42(28.77%) agreed, 13(8.90%) neutral, 34(23.29%) disagreed, whereas 15(10.27%) disagreed strongly. This item's mean therefore stood at 3.42 and 1.384, S.D. The level of the statement contends to some agreeable there is clear project implementation metrics for all project phases.

Item C5 sought to determine if there is clear risk management plan. The response distribution of the 146 respondents demonstrate that; 37(25.34%) strongly-agreed, 36(24.66%) agreed, 26(17.81%) were neutral, 38(26.03%) disagreed, and 9(6.16%) disagreed strongly. This item's mean therefore stood at 3.37 and 1.281 S.D. This suggest that to a moderately good extent there exists a clear risk management plan

For the qualitative data the study collected on project management plan and implementation of low-cost housing construction projects provide that;

*"In majorly all construction projects, there is a project management plan drafted to guide the implementation of the project, however what differs is the level at which the plan is applied to guide the process as in most cases the plan is disregarded and haphazard activity execution exists".* KII3

### 4.6.1 Analysis of Correlation Between Project Management Plan and Implementation of Low-cost Housing Construction Projects

The linear associations and predictability levels between project management plan and implementation of low-cost housing construction projects was determined through correlation analysis as computed where the values of "r" which shows the strength and association direction of the linear relationships and the value of "P" which shows the degree of significance the predictor and criterion variables have as laid out in output Table 14 indicates that;

**Table 14:** **Analysis of Correlation Between Project Management Plan and Implementation of Low-cost Housing Construction Projects**

| Variable | | Project management plan | Implementation of low-cost housing construction projects |
|---|---|---|---|
| **Project management plan** | Pearson' Correlation | 1 | 0.697** |
| | Sig. (two-tailed test) | | 0.000 |
| | n | 146 | 146 |
| **Implementation of low-cost housing construction projects** | Pearson' Correlation | 0.697** | 1 |
| | Sig. (two-tailed test | 0.000 | |
| | n | 146 | 146 |
| **\*\* Correlation at 0.05 level of significance (two-tailed test)** | | | |

The tabulated results in Table 14 results illustrates that project management plan and implementation of low-cost housing construction projects are linked by an association of a strong significant positive correlation (r=0.697; P<0.000). This association as it exists confirms that project management plan is a critical document in the implementation low-cost housing projects as it guides the project implementation process. It highlights and illustrates activity precedence for better project implementation outcome. The findings validate the results by Du Plessis and Oosthuizen (2018) and Arief and Latief (2021) who also reported that execution of a project with a clear project management plan prioritise either cost control or scheduling and expenses incurred which directly impacts project's successful completion.

### 4.6.2 Analysis of Model Summary between Project Management Plan and Implementation of Low-cost Housing Construction Projects

Model summary regression output as computed to demonstrate the degree, effect, strength and relationship exhibited between project management plan and implementation of low-cost housing construction projects has been laid out in output Table 15;

**Table 15: Analysis of Model Summary Between Project Management Plan and Implementation of Low-cost Housing Construction Projects**

| Model | R | R-Square | Adjusted R- Square | Standard Error of the Estimate |
|-------|------|----------|--------------------|--------------------------------|
| 1 | 0.697[a] | 0.485 | 0.482 | 1.064 |

Predictor: Project Management Plan (Constant)

The illustrated Table 15 model summary output results demonstrate that project management plan and implementation of low-cost housing construction projects have an identifiable pattern of linear association relationship as a unit increase in implementation of low-cost housing construction projects can be predicted by 48.5%-point increase in project management plan, while the other 51.5% is attributable to other factors other than project management plan. And whereas drawing a project plan is an important process of integration management influencing the implementation of low-cost housing construction projects, the other factors and processes should also be given an equal weight and consideration in order to achieve effective implementation of low-cost housing construction projects

### 4.6.3 Analysis of Regression ANOVA Between Project Management Plan and Implementation of Low-cost Housing Construction Projects

Regression ANOVA output as computed to demonstrate the degree, effect, strength and relationship exhibited between project management plan and implementation of low-cost HCPs has been laid out in output Table 16;

**Table 16: Analysis of Regression ANOVA Between Project Management Plan and Implementation of Low-cost Housing Construction Projects**

| Model | | Sum of Squares | Df | Mean Squares | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 153.716 | 1 | 153.716 | 135.795 | 0.000[b] |
| | Residual | 163.003 | 144 | 1.132 | | |
| | Total | 316.719 | 145 | | | |

Criterion Variable: in Implementation of low-cost HCPs
Predictor: (Constant) Project Management Plan

The illustrated Table 16 regression ANOVA output results demonstrate that project management plan is statistically significant relationship in predicting implementation of low-cost housing construction projects because the value P<0.000 compared to the alpha significant level α=0.05 is less and qualifies to be significant and F=135.795 which is positive suggesting a positive association. Therefore, project management plan is significant and positively influence the Implementation of low-cost housing construction projects. Project management plan as a process of integration management should be drawn with expertise and professionalism as possible in order to enhance implementation of low-cost housing construction projects.

### 4.6.4 Regression Coefficient Between Project Management Plan and Implementation of low Cost Housing Construction Projects

Regression coefficients output as computed to demonstrate the degree, significant, strength and relationship exhibited between project management plan and implementation of low-cost HCPs has been laid out in output Table 17;

**Table 17: Analysis of Regression Coefficients Between Project Management Plan and Implementation of Low-cost Housing Construction Projects**

| Model 1 | Unstandardized coefficients | | standardized coefficients | T | Sig. |
|---|---|---|---|---|---|
| | B | Std. Err | Beta | | |
| 1(Constant) | 0.570 | 0.240 | | 2.377 | 0.019 |
| Project management plan | 0.722 | 0.062 | 0.697 | 11.653 | 0.000 |

Criterion Variable: in Implementation of low-cost housing construction projects

The illustrated Table 17 regression coefficient output results demonstrate that project management plan is statistically significant in predicting implementation of low-cost housing construction projects because the value P<0.000 compared to the alpha significant level $\alpha$=0.05 is less and subsequently significant. Project management plan as illustrated going by the given evidence is a significant document that influences implementation of low-cost housing construction projects. This is further because of consistency in patterns, facts trends and linear associations levels between the predictor and the criterion variables as established between project management plan and implementation of low-cost HCPs. Therefore, project management plan should be present and consistently used as a guide in all the processes of implementation of low-cost housing construction projects.

### 4.6.5 Hypothesis 2 Testing

**H$_0$2:** There is no significant relationship between project management plan and implementation of low-cost housing construction projects. With $\alpha$=0.05being the priori significant level and P>0.05being subsequently the value where null hypothesis is accepted for when no significant relationship exists for project management plan and implementation of low-cost housing construction projects. Whereas when P< 0.05, subsequently null hypothesis in not accepted for no evidence is sufficient enough to back up the values and demonstrate a significant relationship is established between project management plan and implementation of low-cost housing construction projects

Therefore, hypothesis test using t-test scores was undertaken to determine if a significant degree of identifiable associations exists between project management plan and implementation of low-cost HCPs where analysis of ANOVA regression computed as guided by the null hypothesis formulated and tested being H$_0$2: $\beta_2 = 0$. On the other hand, alternative hypothesis correspondingly being H$_0$2: $\beta_2 \neq 0$. Thus, with the values for P<0.000 and which is less than priori set significant level of 0.05, we do not accept null hypothesis as stated and subsequently retain the corresponding alternative hypothesis.

### 4.7 Knowledge Integration and Implementation of Low-Cost Housing Construction Projects

This study's theme of objective three assessed influence of knowledge integration on Implementation of low-cost HCPs. The resulting figures are enlisted in Table 18;

**Table 18: Descriptive statistics analysis on knowledge integration and Implementation Of Low-cost Housing Construction Projects**

| Item | Statements on Knowledge integration | Strongly Agree (5) | Agree (4) | Neutral (3) | Disagree (2) | Strongly Disagree (1) | Mean | SD |
|------|-------------------------------------|--------------------|-----------|-------------|--------------|-----------------------|------|-----|
| D1 | The project organization implement knowledge capture | 35(23.97%) | 29(19.86%) | 18(12.33%) | 35(23.97%) | 29(19.86%) | 3.04 | 1.485 |
| D2 | The project organization implement knowledge management system during project implementation | 24(16.44%) | 54(36.99%) | 26(17.81%) | 31(21.23%) | 11(7.53%) | 3.34 | 1.199 |
| D3 | Knowledge generated during the project cycle is shared to relevant teams | 37(25.34%) | 39(26.71%) | 10(6.85%) | 42(28.77%) | 18(12.33%) | 3.24 | 1.421 |
| D4 | The project organization maintains a clear knowledge transfer procedures. | 34(23.29%) | 41(28.08%) | 15(10.27%) | 36(24.66%) | 20(13.70%) | 3.23 | 1.403 |
| D5 | The knowledge generated during project implementation is integrated and reused in future projects | 36(24.66%) | 40(27.40%) | 27(18.49%) | 34(23.29%) | 9(6.16%) | 3.41 | 1.258 |
| | **Composite Mean and S.D** | | | | | | **3.25** | **1.353** |

The descriptive statistical analysis results as outlined in Table 18 demonstrates that knowledge integration can be described by a composites mean =3.25 and composite S.D=1.353. This is interpreted to mean knowledge integration is influenced positively by statements D2, and D5, because they have means greater than composite mean of the variable. Consequently, D1, D3 and D4, negatively influenced the variable because their means were less than composite mean for the variable. Thus the negative and positive effects of the statement contributed variedly to knowledge integration

Item D1 sought to establish if the project organization implement knowledge capture. The response distribution of the 146 respondents demonstrate that 35(23.97%) strongly-agreed, 29(19.86%) agreed, 18(12.33%) neutral, 35(23.97%) disagreed and 29(19.86%) strongly-disagreed. This item's mean therefore stood at 3.04 mean and 1.485 S.D, The responses registered suggest that marginally majority supported that the project organization implement knowledge capture

Item D2 sought to investigate if the project organization implement knowledge management system during project implementation. The response distribution of the 146 respondents demonstrate that, 24(16.44%) strongly-agreed, 54(36.99%) agreed, 26(17.81%) neutral, 31(21.23%) disagreed and 11(7.53%) disagreed strongly. The x̄ recorded stood at 3.34 and 1.199 S.D. The acceptance rating of the statement points towards project organization implement knowledge management system during project implementation to some agreeable level.

Item D3 sought to investigate if knowledge generated during the project cycle is shared to relevant teams. The response distribution of the 146 respondents demonstrate that; 37(25.34%) strongly-agreed, 39(26.71%) agreed, 10(6.85%) neutral, 42(28.77%) disagreed and 18(12.33%) disagreed strongly. The x̄ recorded stood at 3.24 and 1.421 S.D and their composites 3.25 mean and 1.353 S.D respectively. The acceptability rating suggest knowledge generated during the project cycle is shared to relevant teams for better project outcomes

Item D4 sought to investigate if the project organization maintains a clear knowledge transfer procedures.
The response distribution of the 146 respondents demonstrate that; 34(23.29%) strongly-agreed, 34(23.29%) agreed, 15(10.27%) neutral, 36(24.66%) disagreed and 20(13.70%) disagreed strongly. The x̄ recorded stood at 3.23 and 1.403 S.D. The results demonstrate the project organization maintains a clear knowledge transfer procedures as supported by marginal majority

Item D5 sought to investigate if the knowledge generated during project implementation is integrated and reused in future projects. The response distribution of the 146 respondents demonstrate that; 36(24.66%) strongly-agreed, 40(27.40%) agreed, 27(18.49%) neutral, 34(23.29%) disagreed and 9(6.16%) disagreed strongly. The x̄ recorded stood at 3.41 and 1.258 S.D. The outlined responses suggest the knowledge generated during project implementation is integrated and reused in future projects to some degree of acceptance by the majority

For the qualitative data the study collected on knowledge integration and implementation of low-cost housing construction projects provide that;

> "*Knowledge integration is not taken seriously as the documentation and dissemination process is never given the seriousness it deserves and thus important knowledge is either lost or discarded without being put to proper use*". KII4

### 4.7.1 Analysis of Correlation Between Knowledge integration and Implementation of Low Cost Housing Construction Projects

The linear associations and predictability levels between knowledge integration and implementation of low-cost housing construction projects was determined through correlation analysis as computed where the values of "r" which shows the strength and association direction of the linear relationships and the value of "P" which shows the degree of significance the predictor and criterion variables have as laid out in output Table 19 indicates that;

**Table 19: Analysis of Correlation Between Knowledge integration and Implementation of low-cost housing construction projects**

| Variable | | Knowledge integration | Implementation of low-cost housing construction projects |
|---|---|---|---|
| **Knowledge integration** | Pearson' Correlation | 1 | 0.613** |
| | Sig. (2-tailed) | | 0.000 |
| | n | 146 | 146 |
| **Implementation of low-cost housing construction projects** | Pearson' Correlation | 0.613** | 1 |
| | Sig. (2-tailed) | 0.000 | |
| | n | 146 | 146 |

**\*\* Correlation, at 0.05 level of significance for a two-tailed test**

The tabulated results in Table 19 results illustrates that knowledge integration and implementation of low-cost housing construction projects are linked by an association of a strong significant positive correlation (r=0.619; P<0.000). This association as it exists confirms that knowledge integration is by far and large an important process in the implementation low-cost housing projects as it informs project decision making process through facts and imperially supported informed actions by project proponents, managers and stakeholders. The findings corroborate Olaisen and Revang (2018) and Jia, Ma, Wu, Wu, and Jiang (2021) findings by confirming that through knowledge integration; people are able exchange and incorporate specialized knowledge to generate existing insights for enhanced implementation of projects.

### 4.7.2 Analysis of Model Summary Between Knowledge Integration and Implementation of Low-cost Housing Construction Projects

Model summary regression output as computed to demonstrate the degree, effect, strength and relationship exhibited between knowledge integration and implementation of low-cost housing construction projects has been laid out in output Table 20;

**Table 20: Analysis of Model Summary Between Knowledge integration and Implementation of low-cost housing construction projects**

| Model | R | R-Square | Adjusted R- Square | Standard Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.613[a] | 0.376 | 0.372 | 1.171 |

Predictor: Knowledge integration (Constant)

The illustrated Table 20 model summary output results demonstrate that knowledge integration and implementation of low-cost housing construction projects have an identifiable pattern of linear association relationship as a unit increase in implementation of low-cost housing construction projects can be predicted by 37.6%-point increase in knowledge integration, while the other 62.4% is attributable to other factors other than knowledge integration. And whereas creating knowledge integration system is an important process of integration management influencing the implementation of low-cost housing construction projects, the other factors and processes that are also responsible to the 62.4% influence in implementation of low-cost housing construction projects should be treated with critical importance them deserve.

### 4.7.3 Analysis of Regression ANOVA Between Knowledge Integration and Implementation of Low-cost Housing Construction Projects

Regression ANOVA output as computed to demonstrate the degree, effect, strength and relationship exhibited between knowledge integration and implementation of low-cost housing construction projects has been laid out in output Table 21;

**Table 21: Regression ANOVA Between Knowledge Integration and Implementation of Low Cost Housing Construction Projects**

| Model | | Sum of Squares | Df | Mean Squares | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 119.144 | 1 | 119.144 | 86.836 | 0.000[b] |
| | Residual | 197.576 | 144 | 1.372 | | |
| | Total | 316.719 | 145 | | | |

a. Predictors: (Constant), Knowledge integration
b. Criterion Variable: in Implementation of low-cost HCPs

The illustrated Table 21 regression ANOVA output results demonstrate that knowledge integration is statistically significant relationship in predicting implementation of low-cost housing construction projects because the value P<0.000 compared to the alpha significant level α=0.05 is less and qualifies to be significant and F=86.836 which is positive suggesting a positive association. Therefore, knowledge integration is significant and positively influence the implementation of low-cost housing construction projects. Knowledge integration as a process of integration management should thus be properly and professionally executed through management information systems in

project execution for enhanced access to information in implementation of low-cost housing construction projects.

### 4.7.4 Analysis of Regression Coefficients Between Knowledge integration and Implementation of low-cost housing construction projects

Regression coefficients output as computed to demonstrate the degree, significant, strength and relationship exhibited between knowledge integration and implementation of low-cost housing construction projects has been laid out in output Table 22;

**Table 22: Regression Coefficients Between Knowledge Integration and Implementation of Low-cost Housing Construction Projects**

| Model 1 | Unstandardized coefficients | | standardized coefficients | T | Sig. |
|---|---|---|---|---|---|
| | B | Std. Err | Beta | | |
| 1(Constant) | 1.004 | 0.252 | | 3.986 | 0.000 |
| Knowledge integration | 0.630 | 0.068 | 0.613 | 9.319 | 0.000 |

Predictors: (Constant), Knowledge integration

The illustrated Table 22 regression coefficient output results demonstrate that knowledge integration is statistically significant in predicting implementation of low-cost housing construction projects because the value P<0.000 compared to the alpha significant level $\alpha=0.05$ is less and subsequently significant. Knowledge integration as illustrated going by the given evidence is a significant process and outcome that influences implementation of low-cost housing construction projects. Further, this is so because of consistency in patterns, facts trends and linear associations levels between the predictor and the criterion variables as established between knowledge integration and implementation of low-cost housing construction projects. Therefore, knowledge integration should be incorporated and consistently be used to inform all the processes of implementation of low-cost housing construction projects.

### 4.7.5 Hypothesis 3 Testing

**$H_03$:** There is no significant relationship between knowledge integration and implementation of low-cost housing construction projects. With $\alpha=0.05$ being the priori significant level and P>0.05being subsequently the value where null hypothesis is accepted for when no significant relationship exists for knowledge integration and implementation of low-cost housing construction projects. Whereas

when P< 0.05, subsequently null hypothesis in not accepted for no evidence is sufficient enough to back up the values and demonstrate a significant relationship is established between knowledge integration and implementation of low-cost housing construction projects

Therefore, hypothesis test using t-test scores was undertaken to determine if a significant degree of identifiable associations exists between knowledge integration and implementation of low-cost housing construction projects where analysis of ANOVA regression computed as guided by the null hypothesis formulated and tested being $H_03: \beta_3 = 0$. On the other hand, alternative hypothesis correspondingly being $H_03: \beta_3 \neq 0$. Thus, with the values for P<0.000 and which is less than priori set significant level of 0.05, we do not accept null hypothesis as stated and subsequently retain the corresponding alternative hypothesis.

## 4.8 Integration Change Management and Implementation Of Low-Cost Housing Construction Projects

The study's objective four sought to reveal the influence of integration change management on Implementation of low-cost HCPs. The results of descriptive statistics on integration change management and Implementation of low-cost HCPs are presented in Table 23;

**Table 23: Integration change management and implementation of low-cost housing construction projects**

| Item | statements on Integration change management | Strongly Agree (5) | Agree (4) | Neutral (3) | Disagree (2) | Strongly Disagree (1) | Mean | SD |
|---|---|---|---|---|---|---|---|---|
| E1 | There is proper scope for baselines to inform changes | 39(26.71%) | 36(24.66%) | 23(15.75%) | 26(17.81%) | 22(15.07%) | 3.30 | 1.421 |
| E2 | change request is used to alter procedures | 24(16.44%) | 47(32.19%) | 27(18.49%) | 35(23.97%) | 13(8.90%) | 3.23 | 1.238 |
| E3 | There is availability of change control tools to inform project implementation | 33(22.60%) | 50(34.25%) | 8(5.48%) | 42(28.77%) | 13(8.90%) | 3.33 | 1.340 |
| E4 | Cost benefit analysis is carried before integrating any change | 38(26.03%) | 46(31.51%) | 18(12.33%) | 33(22.60%) | 11(7.53%) | 3.46 | 1.298 |
| E5 | Management keeps change logs | 28(19.18%) | 33(22.60%) | 43(29.45%) | 32(21.92%) | 10(6.85%) | 3.25 | 1.197 |
| **Composite Mean and Composite S.D** | | | | | | | **3.31** | **1.299** |

The descriptive statistical analysis results as outlined in Table 23 demonstrates that integration change management can be described by a composites mean =3.31 and composite S.D=1.353. This is interpreted to mean integration change management is influenced positively by statements E3, and E4, because they have means greater than composite mean of the variable. Consequently, E1, E2 and E5, negatively influenced the variable because their means were less than composite mean for the variable. Thus the negative and positive effects of the statement contributed variedly to the integration change management.

Item E1 sought to examine if there is proper scope for baselines to inform changes. The response distribution of the 146 respondents demonstrate that; 39(26.71%) were in strong agreement, 36(24.66%) agreed, 23(15.75%) neutral, 26(17.81%) Disagreed and 22(15.07%) disagreed strongly. The statement's mean score was 3.30 and 1.421 S.D. The statement suggest that majority contend that there is proper scope for baselines to inform changes

Item E2 sought to examine if change request is used to alter procedures. The response distribution of the 146 respondents demonstrate that; Strongly-agreed 24(16.44%) Agreed, 47(32.19%) Neutral, 27(18.49%) Disagreed 35(23.97%) and 13(8.90%) disagreed strongly-. The item's mean stood at 3.23 and 1.238 S.D. The results of the simple majority points toward the fact that change request is actually used to alter procedures.

Item E3 sought to examine if there is availability of change control tools to inform project implementation. The responses distribution of the 146 respondents demonstrate that; strongly-agreed 33(22.60%) agreed, 50(34.25%) neutral, 8(5.48%) disagreed 42(28.77%) and 13(8.90%) disagreed strongly-. The item's mean stood at 3.33 and 1.340 S.D. The recorded scores show that there is availability of change control tools to inform project implementation process

Item E4 sought to examine if the cost benefit analysis is carried before integrating any change. The responses distribution of the 146 respondents demonstrate that; 38(26.03%) were in strong agreement 46(31.51%) agreed, 18(12.33%) neutral, 33(22.60%) disagreed and 11(7.53%) disagreed strongly-. The item's mean stood at 3.46 and 1.298 S.D. The recorded responses indicate that the majority confirmed that the cost benefit analysis is carried before integrating any change

Item E5 sought to examine if management keeps change logs. The response distribution of the 146 respondents demonstrate that; 28(19.18%) strongly-agreed, 33(22.60%) agreed, 43(29.45%) neutral, 32(21.92%) disagreed and 10(6.85%) disagreed strongly-. The aggregated mean ($\bar{x}$) the item scored

3.25 and 1.197 S.D. The response weight distribution shows that management keeps change logs to some good level of action

For the qualitative data the study collected on integration change management and implementation of low-cost housing construction projects provide that;

"*Change integration management is majorly informed by M&E results and if there is weak M&E framework, then change integration management is very difficult to implement because of lack of imperial data and information*". KII5

### 4.8.1 Analysis of Correlation Between Integration Change Management and Implementation of Low-cost Housing Construction Projects

The linear associations and predictability levels between integration change management and implementation of low-cost housing construction projects was determined through correlation analysis as computed where the values of "r" which shows the strength and association direction of the linear relationships and the value of "P" which shows the degree of significance the predictor and criterion variables have as laid out in output Table 24 indicates that;

**Table 24: Analysis of Correlation Between Integration Change Management and Implementation of Low-cost Housing Construction Projects**

| Variable | | Integration change management | Implementation of low-cost housing construction projects |
|---|---|---|---|
| **Integration change management** | Pearson' Correlation | 1 | 0.528** |
| | Sig. (2-tailed) | | 0.000 |
| | n | 146 | 146 |
| **Implementation of low-cost housing construction projects** | Pearson' Correlation | 0.528** | 1 |
| | Sig. (2-tailed) | 0.000 | |
| | n | 146 | 146 |
| **** Correlation at 0.05 level of significance for a two-tailed test** | | | |

The tabulated results in Table 24 results illustrates that integration change management and implementation of low-cost housing construction projects are linked by an association of a fairly strong significant positive correlation (r=0.528; P<0.000). This association as it exists confirms that integration change management is a critical process in the implementation low-cost housing projects as it incorporates the necessary changes as generated and informed by M&E process for better project

outcome. The findings validate Zhao et al., (2009), and Halou, Samin, and Ahmad (2019) whose findings similarly indicated that if changes are not resolved through a formalised change management process they may turn into a significant source of contractual disputes, that ultimately results in project failure

**4.8.2 Analysis Model Summary Between Integration Change Management and Implementation of Low-cost Housing Construction Projects**

Model summary regression output as computed to demonstrate the degree, effect, strength and relationship exhibited between integration change management and implementation of low-cost housing construction projects has been laid out in output Table 25;

**Table 25: Analysis of Model Summary Between Integration Change Management and Implementation of Low-cost Housing Construction Projects**

| Model | R | R-Square | Adjusted R- Square | Standard Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.528[a] | 0.279 | 0.274 | 1.259 |

Predictor: Integration change management (Constant)

The illustrated Table 25 model summary output results demonstrate that integration change management and implementation of low-cost housing construction projects have an identifiable pattern of linear association relationship as a unit increase in implementation of low-cost housing construction projects can be predicted by 27.9%-point increase in integration change management, while the other 72.1% is attributable to other factors other than integration change management. And whereas implementing integration change management during project execution is an important process of integration management influencing the implementation of low-cost housing construction projects, the other factors and processes that are also responsible to the 72.1% influence in implementation of low-cost housing construction projects should be looked into and deservedly given as much weight as their importance level of influence.

### 4.8.3 Analysis of Regression ANOVA Between Integration Change Management and Implementation of low-cost housing construction projects

Regression ANOVA output as computed to demonstrate the degree, effect, strength and relationship exhibited between integration change management and implementation of low-cost housing construction projects has been laid out in output Table 26;

**Table 26: Analysis of Regression ANOVA Between Integration Change Management and Implementation of Low-cost Housing Construction Projects**

| Model | | Sum of Squares | Df | Mean Squares | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 55.326 | 1 | 88.326 | 55.689 | 0.000[b] |
| | Residual | 228.393 | 144 | 1.586 | | |
| | Total | 316.719 | 145 | | | |

a. Dependent Variable: Implementation of low-cost housing construction projects
b. Predictors: (Constant), Integration change management

The illustrated Table 26 regression ANOVA output results demonstrate that integration change management is statistically significant relationship in predicting implementation of low-cost housing construction projects because the value P<0.000 compared to the alpha significant level $\alpha=0.05$ is less and qualifies to be significant and F=55.689 which is positive suggesting a positive association. Therefore, integration change management is significant and positively influence the implementation of low-cost housing construction projects. Integration change management as a process of integration management should thus be expertly and professionally done throughout project management cycle for enhanced implementation of low-cost housing construction projects.

### 4.8.4 Analysis of Regression Coefficients Between Integration change management and Implementation of low-cost housing construction projects

Regression coefficients output as computed to demonstrate the degree, significant, strength and relationship exhibited between integration project charter and implementation of low-cost housing construction projects has been laid out in output Table 27;

**Table 27: Regression Coefficient Between Integration change Management and Implementation of Low-cost Housing Construction Projects**

| Model 1 | Unstandardized coefficients | | Standardized coefficients | T | Sig. |
|---|---|---|---|---|---|
| | B | Std. Err | Beta | | |
| 1(Constant) | 1.314 | 0.270 | | 4.869 | 0.000 |
| **Integration change management** | 0.555 | 0.074 | 0.528 | 7.463 | 0.000 |

a. Dependent Variable: Implementation of low-cost housing construction projects

b. The illustrated Table 22 regression coefficient output results demonstrate that knowledge integration is statistically significant in predicting implementation of low-cost housing construction projects because the value P<0.000 compared to the alpha significant level $\alpha$=0.05 is less and subsequently significant. Integration change management as illustrated going by the given evidence is a significant process and outcome that influences implementation of low-cost housing construction projects. Further this is so because of consistency in patterns, facts trends and linear associations levels between the predictor and the criterion variables as established between integration change management and implementation of low-cost housing construction projects. Therefore, integration change management should be incorporated and consistently be used to inform all the processes of implementation of low-cost housing construction projects.

### 4.8.5 Hypothesis 4 Testing

**H$_0$4:** There is no significant relationship between integration change management and implementation of low-cost housing construction projects. With $\alpha$=0.05being the priori significant level and P>0.05being subsequently the value where null hypothesis is accepted for when no significant relationship exists for integration change management and implementation of low-cost housing construction projects. Whereas when P< 0.05, subsequently null hypothesis in not accepted for no evidence is sufficient enough to back up the values and demonstrate a significant relationship is established between integration change management and implementation of low-cost housing construction projects

Therefore, hypothesis test using t-test scores was undertaken to determine if a significant degree of identifiable associations exists between integration change management and implementation of low-cost housing construction projects where analysis of ANOVA regression computed as guided by the null hypothesis formulated and tested being H$_0$4: $\beta_4 = 0$. On the other hand, alternative hypothesis

correspondingly being $H_04$: $\beta_4 \neq 0$. Thus, with the values for P<0.000 and which is less than priori set significant level of 0.05, we do not accept null hypothesis as stated and subsequently retain the corresponding alternative hypothesis.

## CHAPTER FIVE

## SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Introduction

Chapter five provides a concise summary of the key findings related to the influence of the project charter, project management plan, knowledge integration, and integration change management on the implementation of low-cost housing construction projects in Nairobi City County, Kenya. Additionally, the chapter presents recommendations, conclusions, the study's contribution to the existing body of knowledge, and suggestions for future research.

### 5.2 Summary of the Study's Key Findings

The primary objective of this study was to examine the impact of integration management on the implementation of low-cost housing construction projects in Nairobi City County. The study aimed to achieve the following specific objectives: firstly, to determine the influence of the project charter on the implementation of low-cost housing projects in Nairobi City County; secondly, to establish the influence of the project management plan on the implementation of low-cost housing projects in Nairobi City County; thirdly, to assess the influence of knowledge integration on the implementation of low-cost housing projects in Nairobi City County; and finally, to investigate the influence of integration change management on the implementation of low-cost housing projects in Nairobi City County.

### 5.2.1 Project Charter and Implementation of Low-cost Housing Construction Projects

To achieve the desired goal as set in objective one, the study sought to determine influence of project charter on implementation of low-cost housing HCPs in Nairobi City County, Kenya. A significant strong positive correlation was established between project charter and implementation of low-cost HCPs (r=0.711; P<0.000). composite mean ($\bar{x}$) and S.D 3.64; 1.284

### 5.2.2 Project Management Plan and Implementation of Low-cost Housing Construction Projects

To achieve the desired goal as set in objective two, the study sought to establish influence of project management plan on implementation of HCPs in Nairobi City County. A significant strong positive correlation was established between project management plan on implementation of low-cost housing construction projects (r=0.697; P<0.000). composite mean ($\bar{x}$) and S.D 3.40; 1.336

### 5.2.3 Knowledge Integration and Implementation of Low-cost Housing Construction Projects

To achieve the desired goal as set in objective three, the study sought to assess influence of knowledge integration on implementation of low-cost housing construction projects in Nairobi City County, Kenya. A significant strong positive correlation was established knowledge integration and implementation of low-cost HCPs (r=0.613; P<0.000). composite mean and S.D 3.25; 1.353

### 5.2.4 Integration Change Management and Implementation of Low-cost Housing Construction Projects

To achieve the desired goal as set in objective four, the study sought to investigate influence of integration change management on implementation of low-cost housing construction projects in Nairobi City County, Kenya. A significant moderately strong positive correlation was established between integration change management and implementation of HCPs (r=0.528; P<0.000). composite mean ($\bar{x}$) and S.D 3.31; 1.299

### 5.2.5 Implementation of Low-cost Housing Construction Projects

The study had sought to determine implementation levels of low-cost housing construction projects. The study thus established that implementation of low-cost HCPs is not demonstrating good progress as respectively demonstrated by composite mean ($\bar{x}$) and S.D of 2.65 and 1.322 .

### 5.3 Conclusions

The findings of the study informed the following conclusions being arrived at;

Project charter significantly and positively influences implementation of low-cost housing construction projects. Project management plan significantly and positively influences implementation of implementation of low-cost HCPs. knowledge integration positively and significantly influences implementation of low-cost HCPs. The study also concluded that integration change management positively and significantly influences implementation of low-cost housing construction projects. Lastly, the study concluded that there is staggering progress in implementation of low-cost HCPs as some projects have either stalled or have taken too long way beyond the scheduled completion time.

### 5.4 Recommendations

For the policy formulation and implementation practice the study recommends that;

i.    Project charter should be well displayed at the projects sites and should act as a guide in implementation of low-cost HCPs

**ii.**   Project management plan should serve as a reference in all project activities so that precedence is maintained and followed to the latter in implementation of low-cost housing construction projects

iii.   Knowledge integration should be comprehensively done so that all project stakeholders become privy to all important project information during implementation of low-cost HCPs

iv.   Integration change management should be effectively implemented so as not to interfere and distort key project processes in implementation of low-cost HCPs

## 5.5 Suggestions for Further Research

i.    The study hereby suggests for action that similar studies be undertaken in other counties around Nairobi and major cities in Kenya to determine how integration management influences implementation of HCPs

ii.   The study also suggests that similar studies be conducted to establish how integration management influence implementation of other projects other than HCPs

## 5.6 Contribution to the Body of Knowledge

The study's contribution to the body of knowledge can be outlined as follows;

| Research Objective | Contributions to the Body of Knowledge |
| --- | --- |
| To determine influence of project charter on implementation of low-cost housing construction projects in Nairobi City County | Implementation of low-cost housing construction projects is strongly, positively, and significantly influenced by the predictor Project charter and thus validated previous studies |
| To establish influence of project management plan on implementation of low-cost housing construction projects in Nairobi City County | Implementation of low-cost housing construction projects is strongly, positively, and significantly influenced by the predictor project management plan and thus validated previous studies |
| To assess influence of knowledge integration on implementation of low-cost housing construction projects in Nairobi City County | Implementation of low-cost housing construction projects is strongly, positively, and significantly influenced by the predictor knowledge integration and thus validated previous studies |
| To investigate influence of integration change management on implementation of low-cost housing construction projects in Nairobi City County | Implementation of low-cost housing construction projects is strongly, positively, and significantly influenced by the predictor integration change management and thus validated previous studies |

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# APPENDICES

## Appendix I: Questionnaire

This questionnaire has four sections that will take you a few minutes to accomplish. Please respond appropriately to the offered item. This is an empirical question, and all information collected from participants will be kept entirely private.

## <u>SECTION A: RESPONDENT BASIC INFORMATION</u>

| Characteristics | Tick |
|---|---|
| **Respondents' Gender** | |
| Male | |
| Female | |
| **Age of Respondents in Years** | **Tick** |
| 25 and below | |
| 26***35 | |
| 36*** 45 | |
| 46***55 | |
| Above 55 | |
| **Respondents'  Highest Academic  Qualification** | **Tick** |
| Certificate | |
| Diploma | |
| Bachelor's Degree | |
| Masters | |
| Ph.D | |
| **Duration Worked in Construction Projects (Years)** | **Tick** |
| Less than 2 | |
| 2-5 | |
| 6-98 | |
| Above 10 | |

## SECTION B: PROJECT CHARTER

Please proceed by ticking the suitable option at the intersection of the statement on knowledge integration and your agreement levels with each of the disclosures below on 5-1 descending order scale

| ITEM-B | Statements | 5 | 4 | 3 | 2 | 1 |
|--------|-----------|---|---|---|---|---|
| 1 | Stakeholder are clearly identified by the project charter | | | | | |
| 2 | There is clarity in project deliverables in the charter | | | | | |
| 3 | There is clarity of project scope in the charter | | | | | |
| 4 | Project budget estimates in the charter is well captured | | | | | |
| 5 | The overall project schedule is well elaborated in the charter | | | | | |

## SECTION C: PROJECT MANAGEMENT PLAN

Please proceed by ticking the suitable option at the intersection of the statement on knowledge integration and your agreement levels with each of the disclosures below on 5-1 descending order scale

| Item C | Statements | 5 | 4 | 3 | 2 | 1 |
|--------|-----------|---|---|---|---|---|
| 1 | There is clear project timelines for all project phases | | | | | |
| 2 | Project milestones are well defined | | | | | |
| 3 | There is clear sequence of events that incrementally built up until your project is complete | | | | | |
| 4 | There is clear project implementation metrics for all project phases | | | | | |
| 5 | There is clear risk management plan | | | | | |

## SECTION D: KNOWLEDGE INTEGRATION

Please proceed by ticking the suitable option at the intersection of the statement on knowledge integration and your agreement levels with each of the disclosures below on 5-1 descending order scale

| Item- D | Statements | 5 | 4 | 3 | 2 | 1 |
|---------|-----------|---|---|---|---|---|
| 1 | The project organization implement knowledge capture | | | | | |
| 2 | The project organization knowledge management system during project implementation | | | | | |
| 3 | Knowledge generated during the project cycle is shared to relevant teams | | | | | |
| 4 | The project organization maintains a clear knowledge transfer procedures. | | | | | |
| 5 | The knowledge generated during project implementation is integrated and reused in future projects | | | | | |

## SECTION E: INTEGRATION CHANGE MANAGEMENT

Please proceed by ticking the suitable option at the intersection of the statement on knowledge integration and your agreement levels with each of the disclosures below on 5-1 descending order scale

| Item- E | Statements | 5 | 4 | 3 | 2 | 1 |
|---------|-----------|---|---|---|---|---|
| 1 | There is proper scope for baselines to inform changes | | | | | |
| 2 | change request is used to alter procedures | | | | | |
| 3 | There is availability of change control tools to inform project implementation | | | | | |
| 4 | Cost benefit analysis is carried before integrating any change | | | | | |
| 5 | Management keeps change logs | | | | | |

**SECTION F: IMPLEMENTATION OF LOW-COST HOUSING CONSTRUCTION PROJECTS**

Please proceed by ticking the suitable option at the intersection of the statement on knowledge integration and your agreement levels with each of the disclosures below on 5-1 descending order scale

| Item-F | Statements | 5 | 4 | 3 | 2 | 1 |
|--------|-----------|---|---|---|---|---|
| 1 | Numerous housing units have been achieved through low cost construction of housing initiative | | | | | |
| 2 | The completed housing have all been occupied | | | | | |
| 3 | The house rental cost for low-cost housing are low | | | | | |
| 4 | The low-cost housing construction projects firms offer flexible house purchase plans | | | | | |
| 5 | The low-cost housing units constructed are generally affordable to majority of city dwellers | | | | | |

**Appendix II: Interview schedule**

This interview contains questions on the integration management and implementation of LCHCPs in Nairobi City County, which will take you a few minutes to complete. The interview will take maximum of 30 minutes.

1. In your own opinion, how has development of project charter enhanced the success in implementation of LCHCPs in Nairobi City County

   Explain

2. In your own opinion, how has project management plan enhanced the success implementation of LCHCPs in Nairobi City County

   Explain

3. In your own opinion, how has knowledge integration enhanced the success of implementation of LCHCPs in Nairobi City County

   Explain

4. In your own opinion, how has integration change management enhanced the success of implementation of LCHCPs in Nairobi City County
   Explain

5. In your own opinion, how has implementation of LCHCPs in Nairobi City County

   Explain

# Appendix III: Permit for Research

**REPUBLIC OF KENYA**

**NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY & INNOVATION**

Ref No:  **285587**

Date of Issue: **25/April/2023**

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