FACTORS INFLUENCING QUALITY OF RESIDENTIAL BUILDING CONSTRUCTION PROJECTS; A CASE OF KASARANI CONSTITUENCY IN NAIROBI COUNTY, KENYA

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ABSTRACT

In the last few decades, the building construction industry has experienced challenges of quality which are complex and different. The building construction industry in Kenya has been associated with disruptions in quality therefore causing cost and time problems. Many of the quality challenges are a product of inadequate planning. In Kenya, there have been reports of poor administration of residential building construction projects, a superfluous surge in project usage lacking organization and budgetary arrangements, and exorbitant project management. The collapse of residential buildings has been reported severally, especially in the capital city of Nairobi. The purpose of the study was to assess the factors influencing quality of residential building construction projects in Kasarani Constituency of Nairobi County. The following specific objectives guided the research; to assess the influence of construction equipment, project funding, project management, and modern technology on quality of residential building construction projects in Kasarani Constituency of Nairobi County. The study adopted a descriptive research design targeting practitioners in the residential building construction industry including architects, structural engineers, civil engineers, mechanical engineers, electrical engineers, land surveyors, quantity surveyors, construction project managers and private developers. The sample size was 385 respondents, and the non-probability sampling technique was used in the study. Data collection in the study was done by administering questionnaires and carrying out interviews. Descriptive statistics, such as frequency, means, percentage and standard deviation, were used to interpret the data. A regression analysis was conducted in order to show how construction equipment, project funding, project management and modern technology influence quality of residential building construction projects in Kasarani Consituency of Nairobi County. The key finding of the study was that there was a positive and significant correlation between construction equipment ($r=0.695$, p-value <0.05); project funding ($r=0.831$, p-value <0.05); project management ($r=0.776$, p-value <0.05) as well as modern technology ($r=0.743$, p-value <0.05) on quality of residential building construction projects in Kasarani constituency of Nairobi County. This implied that the nature of construction equipment, the level of project funding and project management as well as the level of application of modern technology were positive determinants of quality of residential building construction projects in Kasarani constituency of Nairobi County. The recommendations are that the right construction equipment should be used in the construction of residential buildings. Competent project managers should be engaged to manage the residential building construction projects. The clients and contractors should have enough cash flow to execute projects. Appropriate technologies such as Building Information Modelling should be adopted quickly in the residential building construction sector to minimize errors, and improve quality of works.

Key words: **Construction Equipment, Project Funding, Project Management, Modern Technology, Quality of**

Residential Building Construction Projects.

INTRODUCTION

The conceptual changes in the building industry have popularized the issue of quality. Consequently, quality and quality systems subject has increasingly received scholarly attention globally (Oke, Aigbavboa and Dlamini, 2017). In any industry, the end product should meet certain set standards, and be satisfactory to the client. The need for achievement of excellence in the building industry can thus not be overemphasized. The management of quality in the building industry is, therefore, an important area that is highly researched from many perspectives including total quality control, cost of quality, and quality performance management systems, and best practice among others. All these efforts have resulted in improved ways of looking at the building industry's quality management.

Courtesy of competitiveness in the building industry, attention on the excellence in performance of construction projects has increasingly become important. In light of this, it has become imperative to establish quality factors in the construction industry. Project managers must thus have means of ascertaining and controlling quality in their projects.

Naoum (2016) established that the factors influencing building construction projects include; site layout, designs, subcontractors involved, nature of contract, material used, nature of labour, equipment used, site personnel, and execution of the project. Compliance with codes and regulations, owner specifications, design phase and procedures, scheduling requirements, expense requirements and constructability are the elements that influence quality of building construction projects (Abas, Khattak, Hussain, Maqsood and Ahmad, 2015).

From the different studies, it is clear that quality is an intangible term and more so in the construction industry. Construction projects involve multidisciplinary teams with each discipline having a different definition of success and failure depending upon individual goals and objectives. Consequently, the definition of quality as a first step is important for assessment in different projects. Quality is considered in terms of compliance to timelines and client satisfaction in the study that is under investigation. Success or failure of construction projects is contributed by many factors. The factors influencing the success of residential construction projects is examined when it comes to the development of tools that are critical in controlling project price and scheduling in the building construction industry (William and Dettmer, 2017).

Across the globe, the construction industry has had a mix of success and failures courtesy of an array of influencing factors. A research by Sinesilassie et.al, (2018), examining the factors that affect performance of local building projects in the Middle East revealed that quality in the construction industry is influenced by material costs, availability of resources, the average delay due to closure resulting in material shortage, staff expertise and credentials, the project manager's leadership skills, as well as the standard of machinery, and raw materials used in

the project. According to Burgess and Stern (2020), the quality process in the construction industry is positively influenced by factors such as commitment by the management. Commitment by management ensures continuous improvement in quality. Equipping of personnel with appropriate skills positively influences the quality process.

In Africa, a study done in Egypt by Willar, Coffey and Trigunarsyah (2015) observed that compromise in quality in the building industry has devastating effects and as such project managers need to take specific action to ensure project quality. Among the actions they suggested include, coming up with appropriate goals and objectives, setting up a good administrative structure, establishing public relations practices, obtaining professional and technical staff, ensuring a pleasant working atmosphere and adequate technological resources and encouraging workers to advance their careers.

In Kenya, in the last few decades, the building industry has grown exponentially. The industry has developed to become one of Kenya's most important sectors, contributing significantly to the country's growth. The construction industry in Kenya has been frequented by sporadic disruptions and delays leading to cost and time overruns. These interferences are the origin of possible hazards; which present studies researching on how to control these hazards include: technological, economic, building, legal, financial resource and commercial levels (Gaba, 2019).

Funding the construction industry is done with an intention of gaining paybacks from the ventures. The building industry is recognized as a material depleting and time-consuming industry. This is due to its uncertainty and instability, which is brought about by a wide range of desires, requirements, and tastes. No investor will put money into a project with unknown costs or schedules. A study done by Holden (2018) established that time, expense, and the construction industry are inextricably linked. The study further shows that construction programmes have a start and end date, use money, and must meet certain conditions in order to satisfy the beneficiaries. Additionally, contracts are often dependent on the expense and time required to complete a job.

In context, there are no studies which have been conducted and little information is provided in relation to quality residential building construction projects and factors such as construction equipment, project funding, project management and modern technology. Consequently, this research will be carried out to fill in the knowledge gaps by investigating the factors influencing quality of residential building construction projects; a case of Kasarani Constituency in Nairobi County.

Problem Statement

The population in urban areas is estimated to rise to around 2.5 billion people by the year 2050 with Africa and Asia expected to have 90% of this growth (World Bank, 2021). Currently, the lack of affordable housing is approximated to be at 350 million households in the cities. By 2025, it is projected to grow by at least 30% to 440 households with 1.6 billion

people (King et al., 2017). As a result, many cities are encouraging its residents to move to urban periphery in order to solve this problem. At this end, this approach itself is a problem on its own since it cuts off people from economic opportunities and social networks. Consequently, contractors are in a rush to complete construction development projects with residential buildings playing the center-stage (Carter, 2018). The requirement for accomplishing quality projects in building development is essential. Quality is a fundamental component of manageability and consumer loyalty. Activities such as production, procurement of building materials or the supply of construction facilities has guaranteed the survival of construction firms (DFID, 2020). To achieve success and productivity, construction firms aim to increase the efficiency of their goods in the market. In building projects, project management's role is to execute successful projects that meet the agreed-upon targets and bring value to the project. The literature indicates that the management process of the project is aimed at achieving effective projects in general (Demirkesen and Ozorhon, 2017). In the design of buildings, quality control has become exceedingly important (Bui, 2018). If quality is properly controlled, the success of the project rates and the viability of the organizational can also increase (Leng, 2018).

Yap, Chow and Shavarebi (2019), stated that most quality problems reported in projects under construction are the product of inexperienced planners and builders, as well as inadequate planning. Project management, issues with technology, site-related challenges, ineffective procedures, equipment cost overruns, completion time, safety and health, environment, customer satisfaction, and communication were defined as factors that influence the quality of building construction projects. A report by The Standish Group (2015) shows that cost overruns ranged from 51% to 100% on 29.6% of the projects investigated. 35.5% of projects have gone over budget by 101% to 200%, and 39.1 % of projects have changed from the original schedule by 75% to 99%. For all businesses, the average rise from the initial estimate cost is 189% to 222%. More than a quarter of projects are finished with just 25% to 49% of the characteristics and intent stated at the start. In Kenya, there have been reports of poor administration undertakings, a superfluous surge in project usage, lacking organization and budgetary arrangements, and exorbitant project management (Arrow and McGrath, 2019). Kenya has a huge housing shortfall, which is developing each year and is progressively passive in urban zones and especially Nairobi County. As per the Ministry of Housing statistics, the present yearly housing shortfall is assessed to be more than 156,000 units every year given the population development and urban relocation (KNBS, 2020). The speed of building is still restricted to slightly above 50,000 units built annually and the remaining part is filled by growth in slum existence and poor-quality traditional housing (Blake, 2018). Recent research has been done on factors influencing construction schemes, however, the lack of consistent studies, scarcity data, information and lacuna in studies present a clear problem on the quality of residential construction projects. Therefore, this research will address this deficiency in the body of knowledge by studying the factors influencing quality of residential building construction projects in Kasarani Constituency of Nairobi County.

Objectives of the Study

The following objectives guided the study:

i. To assess the influence of construction equipment on quality of residential building construction projects in Kasarani Constituency of Nairobi County.
ii. To assess the influence of project funding on quality of residential building construction projects in Kasarani Constituency of Nairobi County.
iii. To assess the influence of project management on quality of residential building construction projects in Kasarani Constituency of Nairobi County.
iv. To assess the influence of modern technology on quality of residential building construction projects in Kasarani Constituency of Nairobi County.

THEORETICAL REVIEW

Resource Dependency Theory

In 1978, Pfeffer and Salancik introduced the Resource Dependency Theory. Its main point was that the involvement of external support has a significant impact on an organization's development (Omran, Abdalrahman and Pakir, 2020). This approach implies that the organization's capacity in terms of finance and resources is a vital determinant of the mission and project performance. According to advocates of the theory, like Mohammed (2019) it is critical for an organization to possess enough capital for the execution of a project or the achievement of established goals. Finances, qualified human capital, supplies, and infrastructure are among the resources defined by the researcher as critical to the achievement of organizational goals. However, opponents of the hypothesis, such as Tabishl and Jha (2018) contend that certain organizations have flourished without funding therefore calling for other factors like instillation of the appropriate strategies, the effectiveness of the management and the organizational culture. Despite the fact that such critiques are warranted in light of the theory's general proposition, it is crucial to remember that providing the requisite tools must be balanced with other enablers such as a positive working environment and a sound plan.

The resource dependency theory is relevant to this study since it provides the theory in knowing the capability of an organization like the builder to carry out his/her quality work, therefore, building projects become disturbed by the presence of inadequate project funding. The usefulness of supplies and tools, as well as the expertise of human resources, are critical factors in the building project's progress. A Contractors experience is usually taken into account when assessing his or her ability to handle construction projects. Experienced contractors are required to have valuable tools that can help minimize the time it takes to complete building construction projects. The theory can be useful in explaining the project funding variables and its influence on the quality of residential building construction projects. It can also explain the effect of project efficiency in projects.

Stakeholder Theory

According to Edward Freeman (1983) an organization has got several parties that inflame its own operations. The theory itself was disclosed by Edward Freeman. Other people who support this theory like Arkin and Skitmore (2008) remark that it's important to involve the organization's stakeholders and consider their interests. Putting into consideration the concerns of the stakeholders guarantees a successful project. The theory considers the different types of organizational stakeholders and their input. Stakeholder approach is a management instrument. The attribute elements and authenticity of cases characterize an association's stakeholders.

Power in addition to desperation ought to be gone in order for the chiefs to serve the lawful as well as the good interests of honest to goodness shareholders (Oyewobi et al., 2018). According to the stakeholder theory, open division can be defined as being intricate settings having numerous stakeholders that regularly possess various, ambiguous and separating objectives. In any case, no critical proof has been found that completely keeps the exchange of working thoughts, strategies and theory from the private area to general society segment. Still, the probability of effective results of such exchanges is thought to be identified with the level of acclimation to fit the attributes of the objective setting.

The theory critical to the comprehension of the interests of key stakeholders bearing in mind the desired goal which is to move a project with least disturbance. Stakeholder examination is helpful in identifying important project's stakeholder and recognizing their particular advantages in the project with relation to quality of works. The stakeholder investigation along these lines appears like a suitable solution for the multifaceted nature-related difficulties of the adjusted scorecard as a vital administration apparatus. Wyatt and Baird (2018) attribute the growth of corporate social responsibility to stakeholder theory, it recommends an association's survival and the achievement to be perceived by accomplishment of non-financial goals in light of a legitimate concern for their stakeholders.
The management of any firm takes into account every stakeholder aggregate in either of the three diverse ways, to be specific; regularizing, instrumental and unmistakable. The perspective of standardizing recommends that the firm should consider the interests of the stakeholders as a whole and not just of the clients or stockholders. According to the above perspective, a firm should outline the structure of a complete CSR activity in a manner which offers consistency to the entire stakeholder group. The key perspective supports a firm's concentration in enhancing monetary execution holding on the fact that financial achievement is the main goal in organizations. To make this real, Proposals are for the firms to establish accentuation on just the CSR characteristics that particularly enhance financial management.
The distinct perspective recommends that an organizations conduct can be anticipated by the shareholders, their qualities and relative impact, and stakeholder theory determines the degree to which a partnership treats its stakeholders properly, and in this manner is connected to corporate social obligations (Kartam, 2018). The study is appropriate to the stakeholder theory as it helps to appreciate that project management is important in identifying and engaging various stakeholders such as contractors and other parties that should be taken into

consideration while undertaking construction projects in order to attain quality of works. Project managers should, for that matter, be in a position to adjust their operational mode to be in agreement with the stakeholders' needs and to ensure the accomplishment of the overall objectives.

Technology Acceptance Model

The study will also be anchored on Davis Fred's Technology Acceptance Model (TAM) of 1986. The consequences of the characteristics of the system on the user acceptance is examined by this model among others. To determine whether or not to employ technology in the work place, one uses data in a structural way. Three main factors were identified by Arditi and Günaydın (2016), influencing acceptance of technology. The factors are related to understanding of the technology and its effectiveness. Kartam (2018) started with the TRA which he adopted for instituting the connection between how people understand the ease of using technology and the perceived usefulness of the technology, and the intentions to give explanations of adopting the technology.

The level at which a technology is perceived to be of more benefit than the previously used technology is what is referred to as relative advantage. The relative advantage leads to improved status, better efficiency and financial benefits. Previous research has created the positive presence relationship between relative advantage and rate of adoption. According to the research, users tend to adopt a new technology if they find it to be more usefulness and advantageous than the old one.

The Technology Acceptance Model is specifically designed to predict users' adoption of information technology and its application in the workplace., TAM model deals with expectations rather than actual use by relying on mindset explanations of purpose to use a given device or service. It is suggested that when a prospective adopter is faced with a new technology, perception determines how they can use it (Mohammed, 2019). Yuan et al., (2018) advocated for the Theory of Reasoned Action (TRA). This was an addition to the TAM. The theory stressed that human behaviour stems from their intentions and behavioral intentions (BI). Behavioural Intentions is a type of cognitive function that has two facets: attitude and subjective standards. According to the Theory of Reasoned Action, a salient conviction determines both the mindset and subjective norm portion of individual conduct.

Primarily, this Technology is useful to assess the intention of the users, and to accept or reject the usage of a specific technology. This model best explains the reasoning behind an employee accepting or declining a particular technology on the basis of how the employee perceives it useful as well as its ease of use as explained by the TAM.

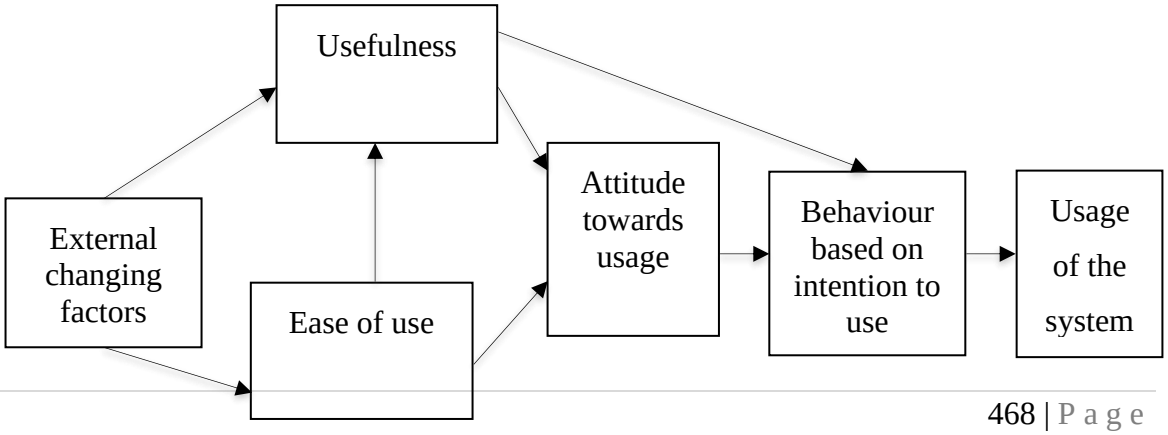

Figure 1: Technology Acceptance Model

A potential consumer of technology believes that technology consumption will require less energy. This is what is perceived as the ease of use. The Technology Acceptance Model will help in explaining and predicting the behavioral patterns of the users and the effect of new technologies on the building design and the efficiency of construction projects. The theory points out that the user's mood, intentions and understanding of the system, directly or indirectly affects the application of a modern technology system.

RESEARCH METHODOLOGY

Research Design

The plan, framework, blueprint and the strategy used to set up requirements for obtaining answers to study questions, data collection and data analysis is used to describe the research design. Simply is like a "glue" which sticks together the elements of a research project (Akhtar, 2016). Descriptive research design was employed in this research which described demographic characteristics of the population. The mean, frequencies standard deviation and frequencies were provided and inferential statistics by establishing how predictor variables and the outcome variables were related. This was centered on the outcomes of data processing; it assists in describing the interaction between the dependent and independent variables using a descriptive approach. Therefore, the researcher adopted descriptive research design because it allows a researcher to gather and analyse data using both quantitative and qualitative techniques (Keman, 2020).

Target Population

A target population can be defined as a specified community of individuals or a set of things, households, firms and services which are to be studied (Wambugu, 2013). The study was carried out in Kasarani Constituency of Nairobi County. The target population was practitioners in the construction industry. They included; Quantity Surveyors, Architects, Structural Engineers, Civil Engineers, Electrical Engineers, Mechanical Engineers, Land Surveyors and Construction Project Managers. Developers also formed a part of the targeted group. The sample size was 385 respondents. The primary objective of choosing this population was to collect recent and historical evidence from people who have participated in the execution of building programmes and are therefore thought to have firsthand familiarity with execution of residential building construction projects.

Sample size and sampling procedures

The sampling is described as sampling unit, sampling frame, and sampling size. Sampling procedures are the approaches a researcher adopt in selecting the elements of the population that will participate in the study (Parveen et al., 2017). The study adapted probability sampling design and random sampling techniques. The sampling procedure was also driven by the data of the licensed building industry workers who made up the population. To reflect the whole population, a certain number of subjects were chosen from a characterized

population. Sample size is an absolute size of the selected participants who are included in the study and its findings are used in generalization of the entire population.

The researcher's interpretation and its relevant application in data information realization required for the study was also put into considerations. The population sampled was selected in Kasarani constituency of Nairobi County. The Yamane's formula of 1967 was useful in computing the sample involved in the study.

$$n = \frac{N}{1 + Ne^2}$$

Where: N = Population size as per the study, n = sampled size, e = Margin error expected out of the study set at ±5%

In this case, the Sample size will therefore be

$$\frac{10547}{1+10547(0.05)^2} = \frac{10547}{1+10547(0.0025)} = \frac{10547}{1+26.3675} = \frac{10547}{27.3675}$$

= = 385 respondents which is 3.65% of the total population

Therefore, the study sampling matrix is illustrated in Table 1.

Table 1: Sampling Matrix of the Study

Population Description	Target Population	Registering body	Sample Size (3.65%)
Architects	1,308	BORAQS/AAK	48
Quantity surveyors	687	BORAQS	25
Engineers	6,330	EBK/IEK	230
Land surveyors	206	ISK	8
Property developers	16	KPDA	1
Construction project managers	2,000	BORAQS/ICPMK	73
Total	**10,547**		**385**

Source, NCA 2020

Out of the 385 participants the study picked two interviewees from each of the category. Therefore those who participated in questionnaires were 374 and there were 11 key informants. All the participants were picked randomly.

Data collection instruments

Primary data was gathered using questionnaires from the respondents. Questionnaires were designed to elicit information on demographic information and the specific questions which included; influence of construction equipment, project funding, project management and modern technology on quality of residential building construction projects in Kasarani Constituency of Nairobi County. Questionnaires were mainly used to collect quantitative data and they were administered to Quantity Surveys, Architects, Engineers, Property Developers, Construction Project Managers and Land Surveyors. Structured interview schedule was conducted to the Key Informants (KI). An interview schedule was suitable to obtain insights

and in-depth information that questionnaire failed to capture. Secondary data was obtained from brochures, journals, periodicals, websites, and other relevant sources that are available.

Piloting of Research Instruments

A pilot study is a pretest that is conducted before the actual study. The pilot study was done in the neighbouring Constituency of Roysambu. The collected pilot data was excluded from the actual study. The reliability and validity of research instruments was pretested by pilot testing. Pilot test was done on 10 respondents who were not part of Kasarani Constituency. Random sampling was used in order to form the pilot group. This was due to the fact that in this system, each unit was chosen. A pre-trial finding was not included in the actual study. A pilot study in a research plays a significant role by providing the researcher with valuable information that enable the researcher to evaluate data, rethink analysis methods, clarify, redefine, restructure and even remove vague items in the study (Doody and Doody, 2015).

Validity of the Instruments

According to Surucu, Lutfi & Maslakci, Ahmet & Sesen, Harun, (2020), validity is an essential factor used in research in order to yield beneficial results. The degree to which a test instrument accurately tests what it claims to measure is known as validity. Whiston (2016) describes validity as when a research instrument obtains data appropriate to achieve the intended purpose. Validity is concerned with whether the research instruments measure the quality or behaviour that it is supposed to measure. Additionally, validity determines whether the research instrument expresses the scale that is suitable to its function and measures its desired results. It examines the accuracy and significance of inferences drawn from research findings. Research instruments were authenticated by a panel of experts in the study's area. To determine the internal validity and determine if it was appropriate for use as an instrument to achieve the research's goals and objectives. The panel ensured that the items properly reflected topics that addressed all applicable aspects under requested to determine the internal relevance and whether or not it was appropriate for use. The panel ensured that the objects denoted ideas which tackled all applicable issues being investigated in an adequate way. Face validity, material validity and construct validity tests were performed on the instrument based on previous studies.

Reliability of the Instruments

Reliability is an essential factor in a research process since it enables a study to yield beneficial outcomes (Sururu, 2020). The degree to which a test instrument produces stable outcomes under similar conditions and after repeated trials with the same participants is known as reliability. The reliability of the measuring procedure is said to be higher if consistent outcomes are gotten by the common participants in the similar repetitive measurement. If tools used in research is stable and consistent, and hence, accurate and predictable, this means it is consistent. The testing instrument's dependability was investigated using an inter-item reliability measure. Various elements were used to gauge every idea present in the questionnaire. It involved a series of similar questions that were

used to assess how far one definition was linked to another. To assess reliability, the Cronbach's coefficient test was used. A Cronbach's alpha value of 0.5 to 0.7 was considered suitable as an indicator of the instrument's internal reliability. A score of more than 0.7 was considered sufficient evidence of internal accuracy. Cronbach's formula

$$\hat{\alpha} = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k} p_i(1-p_i)}{\hat{\sigma}_X^2}\right).$$

Where a is the number of elements and is the Cronbach's coefficient. The proportion of respondents who answer a study question in a certain way is known as pi. The results of Cronbach's alpha test were obtained by questionnaires with different respondents. As illustrated in Table 2.

Table 2: Cronbach's Alpha Values

Values	Reliability
< 0 .5	Not reliable
0.5 to 0 .7	Mode
> 0.7	Good

Source: Nunally (1978)

Data collection procedure

The researcher acquired a permit from the National Commission for Science, Technoolgy and Innovation (NACOSTI). Later, the instruments were administered to the respondents. The targeted population included literate people who could read and understand questions provided in the questionnaires. Hard copies of the questionnaires were handed to respondents. The drop and pick method was used whereby questionnaires were administered to the research participants and they were picked after two weeks to give the respondents ample time to respond to questions and to increase data accuracy. The researcher booked interviews with key informants and the interview took twenty minutes (20) to one hour (1). The collected data was analyzed to make meaningful inferences to the study.

Data Analysis Techniques

The research was quantitative in nature. Data analysis involves examining data with the aim of making any useful analysis, to make deductions and inferences of the study goals and plans. Data analysis involves coding, arranging data, removing errors and processing data. Therefore, quantitative and qualitative data obtained from research instruments were cleaned, coded in a computer and analysis done using Statistical Package for Social Sciences version 21. To present quantitative data in various ways, the researcher used statistical figures such as percentages, frequencies, means, and standard deviation. Popular patterns, narrative structure, and content analysis was used to interpret the qualitative results. Data analysis, according to Kothari (2014), is the method of assigning numerical values to observations or products, with the unit of measurement defined by the laws used to assign the quantities. Analysis of correlation were used to demonstrate the connection between construction equipment, project

funding, project management and modern technologies on the quality of residential building construction projects in Kasarani Constituency of Nairobi County.

RESEARCH FINDINGS

The study utilized Pearson's Correlation Analysis to evaluate the association between the study's independent variables (construction equipment, project funding, project management and modern technology) and the study's dependent variable (quality of residential building construction projects) in Kasarani Constituency of Nairobi County at 5% significance level. The correlation analysis results are as illustrated in Table 3.

Table 3 Correlation matrix

	Quality of residential building construction projects	Construction equipment	Project funding	Project management	Modern technology
Quality of residential construction projects (r) (p) Sig. (2 tailed)	1.000				
Construction equipment (r) (p) (2 tailed)	0.695* 0.016	1.000			
Project funding (r) (p) (2 tailed)	0.831* 0.000	0.113 0.509	1.000		
Project management (r) (p) Sig. (2 tailed)	0.776* 0.000	0.068 0.424	0.228 0.121	1.000	
Modern technology (r) (p) Sig. (2 tailed)	0.743* 0.009	0.090 0.631	0.175 0.149	0.106 0.327	1.000

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

Results of the Pearson's correlation coefficients depicted that there was a positive and significant correlation between construction equipment (r=0.695, p-value <0.05); project funding (r=0.831, p-value <0.05); project management (r=0.776, p-value <0.05), modern technology (r=0.743, p-value <0.05) and quality of residential building construction projects in Kasarani Constituency of Nairobi County. This implied that the nature of construction equipment, the level of project funding and project management as well as the level of application of modern technology positively influenced quality of residential building construction projects in Kasarani Constituency of Nairobi County. As such the quality of residential building construction projects in Kasarani Constituency of Nairobi County would be enhanced by improvements made in the areas of construction equipment, project funding, project management and use of modern technology.

Construction Equipment

The study assessed the influence of construction equipment on quality of residential building construction projects in Kasarani Constituency of Nairobi County and found that it greatly influences the quality of building construction projects. The study found that the cost of hiring or purchasing construction equipment determined what respondents adopted at the construction site. According to the findings, most of the respondents indicated that proper

construction equipment affected residential building in Kasarani Constituency to a very great extent and that respondents agreed on construction equipment statements to a great extent. These findings concur with the study findings by Arditi and Gunaydin (2016) who claimed that construction equipment is vital component of new construction, reflecting the company's construction force and possessing a significant result on the project's success and performance. The standard of management guarantees that the type and production characteristics of construction equipment corresponds to the site's needs. The contractor should choose appropriate construction machinery and equipment by taking into account technological advances, rationality of economics, applications of production, dependable performance and the security, as well as the project's pertinence and durability. The performance parameters should be adjusted to meet the construction standards and quality controls.

Project Funding

The study assessed the influence of project funding on the quality of residential building construction projects in Kasarani Constituency of Nairobi County and found that it greatly influences the quality of building construction projects. This correlates with Gimeno (2018) who reported that a successful project should be allocated adequate funds to finance its completion and guarantee good quality works. It was also found that contractor's cash flow greatly influences quality of residential building construction projects. This is in line with Mohammed and Isah (2012) who stated that contractor's cash flow significantly influences quality of building construction projects. Project funding is a key factor that decides whether or not a project is successful.

Project Management

The study assessed the influence of project management on quality of residential building construction in Kasarani constituency of Nairobi County and found that it greatly influences quality of residential building construction projects. Majority of those interviewed indicated that project management influenced quality of residential building construction projects in Kasarani Constituency and project management factors influenced construction quality to a great extent. These findings concurs with the study finding of Larsson, Eriksson and Pesämaa, (2018) who concluded that project management and the efficiency of building design programmes have a significant positive connection. Adoption of the practices of project management allows efficient completion of a project as intended with cost minimization and in a way that meets the customer needs. Project management had a substantial influence on the building project's efficiency.

Modern Technology

The study assessed the influence of modern technology on quality of residential building construction in Kasarani constituency of Nairobi County and found that it greatly influences quality of residential building construction projects. A positive and significant correlation was also established between modern technology and quality of residential construction

projects in Kasarani constituency, Nairobi County, implying that the quality of residential construction projects in Kasarani constituency, Nairobi County would be enhanced by wider/greater application of modern technology. These findings concur with the study findings by Ayudhya (2018) who explored the present condition of modern technology that exists within building industry and announced some effective methods too. The research outlined the merits of incorporating technology into the construction processes to enhance efficiency and quality. As per the study the motivating factors behind adoption of technology were; output, which increased corporate competitiveness and efficiency; globalization, to resolve competition; strict scheduling; and regional and organizational proximity issues, as well as construction industry idiosyncrasies; i.e., orientation of the industry's project, the structural organization and temporary as well as short-relationships of short terms businesses. The aforementioned itemized that technology should propel the organization to achieve its set quality goals.

Conclusion

The research was conducted in order to study the factors influencing quality of residential building construction projects in Kasarani Constituency of Nairobi County. The following conclusions are made from the study;

On the influence of construction equipment on quality of residential building construction projects, it was found that the study has a positive and significant influence on quality of residential building construction projects in Kasarani Constituency of Nairobi County. It was deduced that equipment breakdown, shortage of equipment, equipment operation skills, and cost of equipment influenced quality of residential building construction projects. The findings observe that proper and new construction machinery had an important and beneficial impact on the quality of residential building construction projects.

The findings show that project funding greatly and positively influences quality of residential building construction projects in Kasarani Constituency of Nairobi County. It was found that adequacy of finances, source of finances, and contractor's cash flow greatly influence quality of residential building construction projects.

It is concluded that project management had a substantial influence on quality of residential building construction projects. The study's findings revealed that the present condition of building management of projects in Kasarani Constituency needed to be improved as there were challenges in relation to project management implementation that needed to be addressed such as quality control, monitoring and evaluation and resource flow.

It is also concluded that modern technologies had an influence on quality of residential building construction projects. The findings conclude that technology facilitates collaboration and synchronization of job procedures thus creating a constructive effect on quality of works and satisfaction of the clients. Lastly, the findings show that adoption of Building

Information Modelling (BIM) helps in reducing errors and omissions in construction. It enables project teams to create effective design strategies.

Recommendations

The following recommendations based on the research findings was made;

i. The contractors and designers should strictly follow the required standards of materials for construction of residential buildings construction projects. This will ensure that the management competence is put into consideration by encouraging those in management to embrace risk management practices such as risk identification, quantification, monitoring and mitigation to help prevent risks and improve quality and safety.
ii. It recommended that clients and project developers should increase their sources of funds during project formulation and initiation and so as to ensure that the project is not cash strapped during implementation of the project. The contractors should be well evaluated before contract award to ensure that they do not have cash flow problems. The contractors should also provide performance security insurances and deposits prior to project execution in order to cushion the client from risks.
iii. Competent and experienced project managers should be engaged in order to ensure that the right project managers lead project implementation. The programme of works should be formulated and accompanied by good supervision to ensure that standards and best practices are followed to the letter so as to ensure good quality residential buildings.
iv. A culture of quality should be encouraged on the residential building construction industry so that deliberate efforts and synergies are made to deliver high quality projects.

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