



The Role of Communication Channels on Implementation of Housing Construction Projects in Nairobi County, Kenya

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Abstract

The implementation of housing projects should aim to get construction work completed within stipulated time and within the costs estimated. The frequencies of stalled construction projects, the government dismantling some illegally constructed buildings, collapsing buildings and the disturbing death toll that accompanies these events, have become significant issues in Kenya. The purpose of the study was to examine the roles that communication channels have on implementation of housing construction in Nairobi City County Government, Kenya. The study used both descriptive and inferential statistics for the analysis technique. Target population was 256 participants (professionals engaged in design, approval and construction of public housing projects within Nairobi.) It was evident that the model: Overall Project Implementation = $6.311 + 0.00319$ (Channels of Communication) is a significant predictor of overall project implementation. After conducting data analysis, the results of the hypothesis were found to be significant: Channels of communication are key to the execution of construction projects. The results of the regression analysis show that improving the means of communication channels by a unit increases the overall project completion by 0.00319. The study concluded that in the implementation of construction projects, channels of communication is of significant impact.

Keywords: Communication channels, implementation, housing construction projects and Nairobi county

INTRODUCTION

The implementation of housing projects should aim to get construction work completed within stipulated time and within the costs estimated. The frequencies of stalled construction projects, the government dismantling illegally constructed buildings, collapsing buildings and the disturbing death toll that accompanies these events, have become significant issues in Kenya. The same is experienced in different countries across the world. According to a study by Assaf and Al-Hejji (2009), in Saudi Arabia, only 30% of projects were finished on schedule, and the total time that most projects overran, was between 10% and 30%, with a further 30% not being executed according to the desired requirements. In Nigeria, the country's construction industry has suffered many setbacks in terms of completion of the projects at the stipulated period and within the predetermined sum and quality (Kasimu & Usman, 2013). Research has come up with several reasons that have been attributed to short falls in the implementation of construction projects. One of them is a study by El-Razek et al., (2008) who discovered that the reasons that triggered poor or staggered execution of housing projects in Egypt were delayed payments, planning problems, and poor communication. Further, Malaysian researchers Sambasivan and Soon (2007) described poor project

architecture, poor site management, and poor planning as factors affecting the successful execution of most government housing projects.

A World Bank study of 2013 on procurement in Ghana and the Government of Ghana, found that there was a clear depiction of low performance within the building sector. This resulted in a low tendency to meet the client's expectations. This finding created a gap in this area of research, encouraging researchers working in the building industry to turn their attention to the impacts of variables such as improved profitability, willingness to obtain credit, health and safety. However, the report pointed out that very little or similar work has been done on social factors such as project communication and how it affects the construction industry in Ghana. (World Bank report 2013).

In a project environment, it is exemplary for people to communicate with each other to enable the execution of planned tasks with certainty right through the project life cycle (Nangoli & Ahimbisibwe, 2012). Effective project communication relates to how project information is availed in the right format, at the right time, and with the right impact to the project stakeholders (Priyadharshini & Satheesh, 2015). Research has revealed that projects involve unique coordinated activities and resources during implementation, which calls for a project manager's unique skills in communication, in order to lead and control unique sets of activities and resources for the project to attain its set quality performance goals (Hwang & Ng, 2013). The project managers' ability to coordinate activities efficiently would assist them in handling personnel and tasks. Project coordination has become one of the most sought-after qualities as a method of maintaining appropriate knowledge improvements, with a clear goal of increasing the efficacy and awareness of project qualities and impacts (Nangoli, 2010; Ramsing, 2009).

Communication is necessary in project settings and effective communication indicates that knowledge is exchanged efficiently. If coordination is successful, project information will be available at the right time and in the right format, which will have a positive influence to project stakeholders (Katerega & Sebunya, 2017). Communication requires the installation of machinery, either downward communication (from superior to subordinate), horizontal communication (between colleagues), or upward communication (from sub-ordinates to superior) (Affare, 2012; Chmielecki, 2015). A project manager's major responsibility should be executing decision making and building efficient mutual relationships among a diverse group of project stakeholders (Grosseohlme, 2014). (Reeta and Neerja, 2012) argued that the core difference between very successful projects and less successful projects is in the ability of project manager's development of interpersonal skills. According to their findings, effective communication is essential for achieving high-quality project success. These scholars contend that effective communication ensures that project team gather, disseminate, store, and ultimately dispose project knowledge in a timely and acceptable manner. The communication process involves several elements like the stimulus, source/sender, the message, the medium/channel, the recipient and finally the feedback. According to Kwofie, Figar and Adinyira (2014), the sender sends a message to the recipient through a medium or channel. Effective communication requires selecting an appropriate communication channel to send your message (Wrench, Thomas-Maddox, Richmond, & McCroskey, 2008).

There's a severe housing deficit in Kenya that develops annually in urban areas such as Nairobi County. As per the Ministry of Housing, the shortage is assessed to be more than 156,000 units on an annual premise compared to population growth and urban

relocation. The growth of housing construction in the urban areas is slower with slightly above 50,000 units constructed annually. The gap is filled by growth in slum dwellings and poor-quality traditional housing (Walley, 2011). Affordable housing is a big undertaking that the Kenyan government is currently implementing. A vast number of projects have kicked off and scheduled to be finished within the stipulated time frame of five years (2018-2022) across various counties. Project management will be crucial to ensuring these houses are delivered on schedule, in the desired condition and within the allocated budget. However, the challenges experienced in the sector may cause deficiency on the project output, which will in turn hinder the government from achieving its intended objective of adding an additional 500,000 affordable homes in the country over a period of five years. (Kieti, Rukwaro and Olima, 2020). In Nairobi county, the government planned to construct 2000 units in Makongeni estate, 11000 units in Kibera, Marigoini and Kiambui slums and 16000 units in Jeevanjee estate (GOK, 2016). According to a Business Daily report published on January 17th, 2020, the number of stalled ventures in Kenya is growing due to inadequate funding and legal cases in court. These litigation cases are majorly by tenants who accused the government of not adequately consulting and preparing them for relocation, they also expressed dissatisfaction on the terms and conditions attached to the vacation notices that were issued to them. These mentioned challenges clearly portray communication gaps during the initiation period of the project. According to the Ministry of Transport and Infrastructure Development (MTID) research on collapsing buildings, lack of adequate oversight and inadequate maintenance practices are to blame for poor building construction (Githenya & Ngugi, 2014). Kioko (2014) stated that building accidents arise as a result of the use of substandard materials, bad workmanship, defective design methodology, noncompliance with methodology, lack of oversight, poor assessment and control, structural deficiencies and unauthorized modifications.

Several Kenyan researchers have conducted research on construction projects across the country. Njogu (2011), conducted his research in Karatina Municipality, Central Province, investigated the factors that affect the success of informal laborers in the construction industry. Munyoki (2014) investigated the factors that influence the execution of construction projects in Nairobi County, Kenya. Wanjau (2015) investigated the factors that influence the completion of construction projects in Kenya. However, little research has been conducted on the "softer" factors, such as communication channels and its effect on the construction projects.

Since there is a significant number of people participating in large building projects at the execution period, coordination becomes difficult because knowledge must be passed on from project planners to engineers to construction staff. Any failure of coordination along this chain will have devastating implications for overall project execution, resulting in significant delays and a rise in overall project costs. The communication process involves several elements like the stimulus, source/sender, the message, the medium/channel, the recipient and finally the feedback. According to Kwofie, Figar and Adinyira (2014), the sender sends a message to the recipient through a channel. Any communication that occurs in an organization is characterized by a channel for instance face to face conversation, memos, printouts, emails and schemes depending on the content and messaging and the aim of the message which the sender wants to relay to the target audience. This study aimed to determine how project communication channels influences the execution of housing development projects in Nairobi County, Kenya.

In this light, the study investigated the effects of project communication channels on the implementation of housing constructions in Nairobi County. The study will help the

Nairobi County government and other organizations, such as the National Construction Authority, develop clearer strategies for governing the construction industry and ensuring good performance in building construction projects. The project will also recommend ways in which knowledge accessibility and availability can help necessitate timely services. It will also encourage openness in how affordable housing project managers should perform their operations, by use of proper channels of communication which will in turn, contribute to the development of stakeholder trust, team spirit and transparency. Furthermore, the study provides reference resources for prospective researchers in the field of project management and communication, and will help them in future research topics and studies.

LITERATURE REVIEW

Project Communication

Different phases of construction projects entail different experts sharing information that is interpreted to meet the objective of the final project. Information in form of drawings, specifications and construction methods is communicated from one expert to another. This communication requires an efficient channel of communication to ensure that it is not misinterpreted. Project communication is the transmission of data, information and knowledge between two or several stakeholders (Sambasvan & Soon, 2007) and plays a key role in project success (Ye, Zia & Skitmore, 2014). Project's success occurs when faster decision-making tools and techniques are needed in a normal operation and include resources provided by the company in which the project is operated (Sambasvan & Soon, 2007). Efficient project communication is achieved when meaning of information sent conforms to interpretations of information received (Musyinaka, 2015); the meaning intended by the transmitter should conform to the interpretation made by the receiver. The objective of performing efficient communication is to minimize waste activities without jeopardizing the understanding and clarity of information. Effective communication occurs when information and mutual understanding pass between the sender and receiver, thus conveying meaning and possibly producing an appropriate or desired reaction (Wrench, Thomas-Maddox, Richmond, & McCroskey, 2008). This can be achieved by using the efficient channels of communication that conforms to the information being relayed. (Muhamedi and Ariffin, 2017) Communication channels are important elements of administration activity in the organization. They provide abilities of power and control to superiors as well as satisfaction and performance to subordinates.

With an increase in project organizations and complexities, the objectives of projects also increase, which makes project communication among the teams harder (Remidez & Jones, 2012). Hence, there is need for project team members with different professions to communicate effectively despite their different background of knowledge. Efficient communication requires the information to be transmitted faster before it loses its meaning. Inefficient communication, on the other hand, includes waste activities that have no value for the customer at the end (Remidez & Jones, 2012). Waste activities can only be controlled or done away with if there is an effective communication channel (Kwofie, Figar & Adinyira, 2014) without jeopardizing the understanding and clarity of information. Reeta & Neeja, (2012) reported that for project success to be achieved, project communication is one important tool. Musyinka (2015) stated that poor communication can have a negative impact on project performance, which in turn may affect the project outcome. Project communication, among other tools within projects, aims to spearhead the achievement of the project objectives (Kwofie, Figar & Adinyira, 2014). Greater project success is achieved and accomplished when the wastes in project communication are eliminated.

Communication Channels and Project implementation

In the communication process, several elements are involved, such as the stimulus, the source, sender, message and the medium, recipient and feedback. Researchers Kwofie, Figar and Adinyira (2014) reported that the recipient receives a message from the sender through a channel or medium. Communication channels may include; face-to-face conversations, video conferencing, audio conferencing, emails, written letters and memos, chats and messaging, blogs, written documents, spreadsheets among others. The medium depends on the content that the message contains and the aim of the message that the sender would like to pass to the stakeholders. In the building industry, the channels of communication are effective depending on the sender and recipient of the message. The project manager will have to analyze and come up with the right channels for the different team members in the construction project to ensure effective interpretation of information.

According to Reeta and Neerja (2012), the use of open communication forms is important because they foster and enhance creativity, new ideas as well as innovation. The authors went ahead to state that employees who work in organizations where communication is efficient often work towards making improvements in their companies and can easily identify new innovations that will help in increasing the company's success. In organizations where the leaders are open minded, employees are often at free will because their ideas are recognized and appreciated and can be used to better the company. In addition, if the leaders are responsive to their ideas, chances are the employees will want to freely share challenges that may hinder their input at work. According to Hwang & Ng, (2013), there are three types of communication channels namely; formal, informal and unofficial which the project manager can use efficiently for the good of the project. Formal communication involves flow of information on predefined and controlled channels. It follows a hierarchical top-down (leaders to subordinates) structure and chain of command. Informal channels are unstructured and not predefined, they are unofficial but are used by team members for social needs. Unofficial communication channels are also known as the organization's grapevine, this is where rumors and gossip circulate. A project manager needs to be aware of these channels and the type of information flowing in them. What the team is discussing on rumors and gossips may provide important information that may affect the implementation of the project. Communication can also be categorized as tradition and modern. Traditional communication channels include telephone, letters, faxes, business reports, presentations, and face-to-face meetings. Modern communication channels include the Internet, e-mail, instant messaging, teleconferencing and video conferencing Zizka, (2014).

In a construction project, channels of communication should be promptly specified so that the channel and information being passed conforms. This can be achieved by structuring how project team move information around. Effective communication strategies can enhance the working environment and ultimately remove any barriers that may hinder the implementation of quality construction projects. It will also address any existing gaps or risks encountered during project implementation and promote accountability among team members.

Theoretical Review

The study was built upon the Project Management Theory and the Implementation Theory with regards to project management and implementation, which has a link with quality in the projects. Communication theories that are relevant to the focus of the

study were also used. These include Diffusion Theory and Groupthink Theory which build up on the significance of proper and effective communication.

Project Management Theory

According to the project management theory initiated by Koskela and Howell (2002b), the most common thing in all major projects all over the globe is planning, organizing, coordinating and controlling of both human and material resources, with a sole purpose of realizing the project outcome. Construction industry is organized on a project basis. In the traditional management approach, the project coordinator performs the role of project manager but with limited capacity since the decisions are made by the client. The traditional management structure is as represented in figure 1.

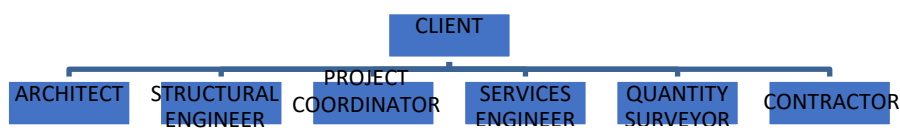


Figure 1: Traditional Management Structure: (Ekundayo et al., 2013)

However, with the development of project management as a profession in the 1950s, it was determined that project management is an independent and efficient way to achieve project goals and objectives (Koskela et al, 2002). Project management is defined as application of knowledge, skills, tools and techniques to project activities to achieve the project requirements. This is accomplished through the application and monitoring of project management processes which include initiating, planning, executing, monitoring and controlling as well as closing (Lewis, 2007, p.4).

Project management allows for extensive planning and coordination, which also enables work to be organized across the various functional groups that work together. This results in improved coordination and communication among employees and managers. Fig. 2 shows the structure in project management.

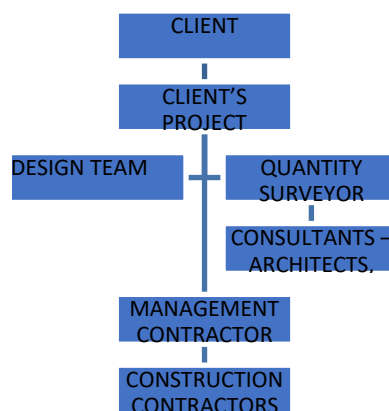


Figure 2: Project Management Structure (Ekundayo et al., 2013)

Project management has a significance effect on the implementation of construction projects. Data obtained from the National Construction Authority indicates low number of building projects that have complied with construction regulations within Nairobi county compared to the number of ongoing construction projects. This possesses potential danger as most projects are being implemented without compliance (National Construction Authority, 2019). The Authority is responsible for quality assurance during project execution. During inspection, NCA requires 7 key tasks to be performed by any individual doing construction in Kenya which include: Register your project with NCA, have a registered contractor on site, have accredited workers on site, acquire all necessary approvals from the respective county government, Erection of hoarding on site, ensure all safety signs are installed and visible and Erection of a site board that has all the necessary construction details (National Construction Act 2011) Project management encompasses levels of management that are responsible for successful project completion. Therefore, communication is a critical aspect that ensures all parties can relate effectively in different phases of the project. Given that project management works with time frames and schedules, timely completion of work and to the required specifications determines the success of the project.

Implementation Theory

According to the Implementation theory by Maskin and Sj'strom (2002), the implementation problem is the problem of designing a mechanism (game form) such that the equilibrium outcomes satisfies a criterion of social optimality embodied in a social choice rule. If a mechanism has the property that, in each possible state of the world, the set of equilibrium outcomes equals the set of optimal outcomes identified by the social choice rule, then the social choice rule is said to be implemented by this mechanism.

In this theory, the problem of implementation lies with coming up with an equilibrium outcome which may be socially optimum for all members of such a society. Therefore, proper implementation can be accomplished with a smaller set of possible states/outcomes of the situation, Hayek (1945). This means that in instances of project management, the project manager can have a greater chance of properly implementing the project successfully, if he/she is aware of the actions or strategies of those directly under them. In this case, understanding how managers are planning on carrying out their activities ensures that the project manager can align the activities of the project to ensure effective implementation.

Communication Theories

Communication theories are diverse and numerous in the field of social sciences. However, in this study, the focus was on the theories that are relevant to the focus of the study with regards to project management and implementation. The theories include: Groupthink Theory and Diffusion Theory.

Groupthink Theory

Groupthink theory states that when team members work together too well, letting their desire to conform, interfere with their ability to make sound decisions. In this theory, created by Irving Janis (1972), the focus is on a large group of people who are involved in a singular project. Project managers have to ensure that all the members in the group have the same goals and are aiming for the same objective. Additionally, the team members must acknowledge that the project goals supersedes their individual needs and personal differences. This is difficult to achieve in most cases, since finding cohesion, especially in very large projects that include several line managers, becomes difficult (Aronson et al.,2003). This theory was chosen for this study because it covers

issues that become present when there is a large group of people undertaking a similar task that has a singular expected outcome. By understanding how individuals are most likely to behave in this type of situation, then it is possible to come up with possible solutions.

Diffusion Theory

Everett Rodgers (1962) came up with this theory, which describes how new ideas, technologies, products or processes can spread through communication among members of a group/society through different communication channels. It originated in communication to explain how, over time, an idea or product gains momentum and spreads through a specific population or social system, Rogers (2003). Communication channels, interpersonal networks and social modeling were particularly powerful elements in the change process. Across broader cultural and disciplinary contexts, Rogers identified general patterns and similarities in the change process, Lamorte (2019). The problem with large projects is that sudden changes may have huge implications for the individual parts of the project. Therefore, during planning it is important to know the people in the group and how they adapt to such changes. While a number of people may be comfortable adjusting to conform to new requirements, some may be unable to cope and work efficiently as before, LaMorte (2018).

There are five established adopter categories and these are: Innovators who want to be first to try innovation, Early adopters who enjoy leadership roles and embrace change, The early majority who need to see evidence that the innovation works but embrace it and the late majority who are skeptical but will embrace it after the innovation has been tried by the majority and laggards who are bound by tradition and very conservative, very skeptical of change and are the hardest group to bring on board. A project manager has to properly plan to ensure that there are minimal changes throughout the duration of the project and, at the same time, be well versed to enable him/her make transitions as smooth as possible for most team members. This theory is significant to this study because it can explain how changes in project deliverables or timelines may affect the individuals involved in the project. This could ultimately affect the entire project in the long run.

Conceptual Framework

The Conceptual Framework is a concise description accompanied by a graphical or visual depiction of the major concepts of the study and the hypothesized relationships and linkages among them (Mugenda & Mugenda, 2012). It assumes that project communication channels influence the implementation of housing construction projects (dependent variable). This is as illustrated in Figure 3.

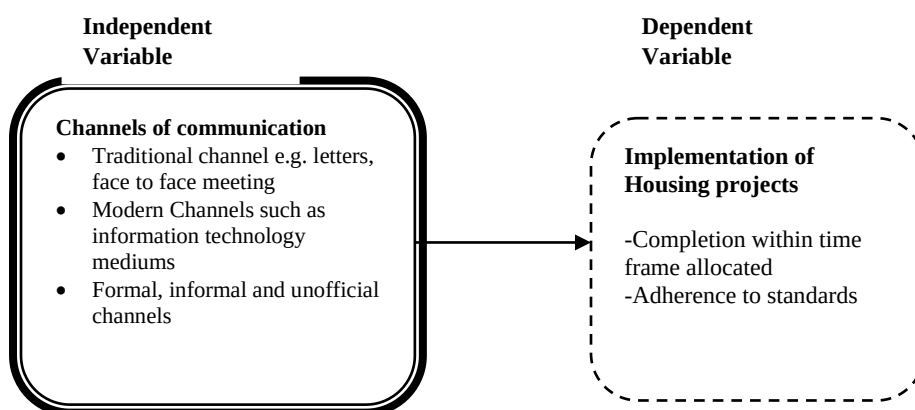


Figure 3: Conceptual Framework

METHODOLOGY

The study area was Nairobi County in which majority of construction projects in Kenya are ongoing. Its status as the capital city of Kenya also made it ideal for the study since it hosts major government offices and headquarters of major organizations that are key to this study.

This study targeted respondents from the Nairobi City County Government, those from the Building Inspection Unit. Questionnaires were distributed to the officers from the building Inspection Unit. Additionally, licensed architectural and quantity surveyor firms and building contractors operating in Nairobi were part of the population. The study also targeted senior registration officers from the National Construction Authority (NCA) which is a regulator of the construction industry, as well as those from the National Environmental Management Authority (NEMA) who spearhead environmental protection. Members of the Board of Registration of Architects and Quantity Surveyors (BORAQS) were also targeted in the study.

A Stratified random sampling technique was used to draw the sample. This method was to assist in improving the presentation of each stratum (groups) within the population, as well as ensuring that the strata are not over-represented. Owing to practical difficulties with responses from large survey groups, a meaningful survey sample size was determined. Taro Yamane formula was used to get a sample size of 252 from a total population of 681 at a confidence interval of 95%; By using the different proportions of the selected categories, the sample size was computed for all the categories.

Table 1: Sample Size Distribution

Category	Population(N)	Proportion (%)	Sample(n)
Architectural firms	94	13.80	38
Quantity Surveyors	63	9.25	25
Building Contractors	436	64.02	176
NCA Officers	18	2.64	7
NEMA Officers	25	3.67	10
Nairobi County Govt. Officers	35	5.14	14
BORAQS Officers	10	1.45	5
TOTAL	681	100	252

The study adopted a primary method of data collection in which the quantitative data supported the reviewed literature. These included descriptive statistics, correlation and association. This was critical to enable the comparison and analysis of the different types of information collected from the respondents under the different sections of the questionnaire. From this data, it was then possible to perform scoring and compare the levels with which the respondents agreed or disagreed with statements. This was then presented using descriptive statistics.

The study ensured validity of research instruments by using simple language free from jargon that was understood by the respondents. The research adopted content validity which refers to the extent to which a measuring instrument provides adequate coverage of the topic under study. The study thus used a threshold of 0.78 to check the validity and appropriateness of the sample of items under measure. In order to test the reliability of the instruments, internal consistency techniques were applied using Cronbach's Alpha. The alpha value ranges between 0 and 1 with reliability increasing with the increase in value. A Coefficient of 0.6-0.7 is commonly recommended measure to indicate an acceptable reliability. Therefore, a value of 0.7 or higher indicates good reliability hence this study was based at a threshold of 0.7. The researcher ensured that all the necessary ethical standards and regulations were adhered to during the duration of the study. Data collected was analyzed using quantitative method. Quantitative data was entered, cleaned and analyzed using Statistical Software, SPSS version 25. Inferential statistics as well as descriptive statistics were used to analyze the data and results were presented in cross tabulation, frequency distribution and charts.

In order to analyze the relationship between the independent variable and the dependent variable, the study adopted multiple regression analysis based at a 5% level of significance. Regression was used based on the formula below:

$$y = \alpha_0 + \alpha_1 X_1 + \dots + \alpha_k X_k$$

Where,

Dependent variable

Constant

k^{th} term. Each term can be a single predictor, a polynomial term, or an interaction term. The k^{th} term for this model is a single predictor variable forming bases for variation in the dependent variable.

estimate of k^{th} regression coefficient

The study findings were presented by the use of tables, figures, charts and graphs.

RESULTS

Demographic Information

Demographic information presents information related to gender, geographical location, marital status, education etc. The need to analyze the demographic information was to assess the distribution of respondent and to compare the difference between the analysis with the demographic information.

Profession

Figure 4 provides the distribution of respondent by the area of specialization. The results showed that 58% of the respondents were engineers, 19% architects, 20% of contractors and quantity surveyors and 3% building surveyors. The involvement of the respondents with various professional background brought about different levels of expertise as required in a construction project.

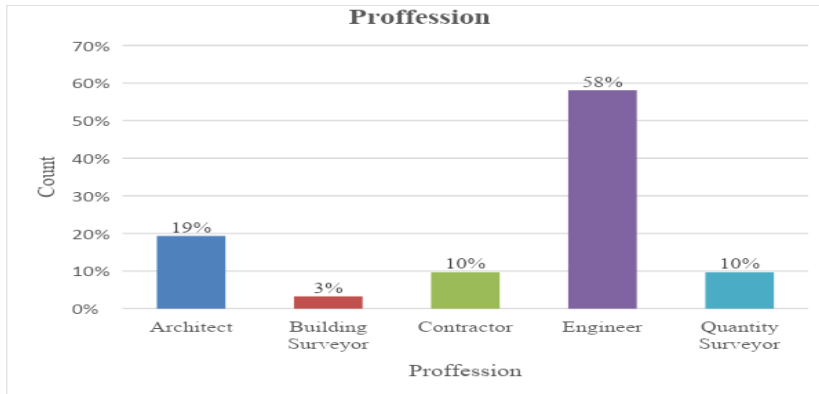


Figure 4: Distribution of respondent by profession

Experience

Figure 5 shows the distribution of respondent by the years of experience. The results showed that 42% of the respondents had experience ranging from 6 to 10 years. Respondents with less than five years' experience were 35%. A respondent with experience between 11 to 15 years was 13% while 10% of the respondent were above the experience of 15 years.

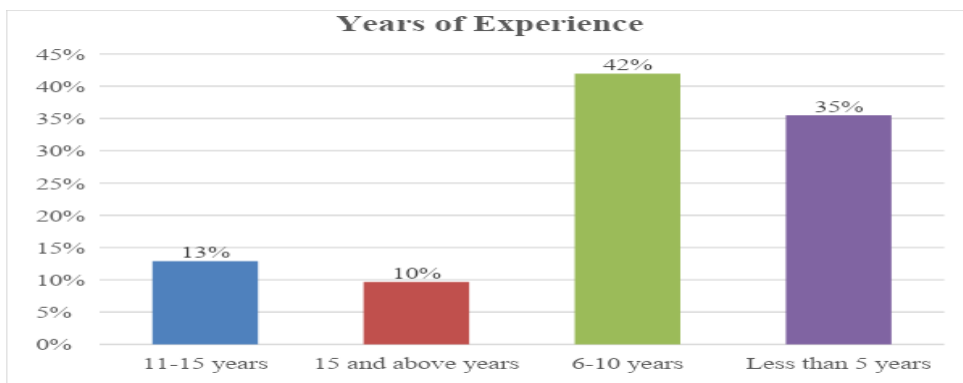


Figure 5: Distribution of respondent by year of experience

Education

Figure 6 provides the distribution of respondent by the level of education. Out of a 100 respondent, 65% were University undergraduates, while 32% had a master's degree. The respondent with the doctorate degree was 3%.

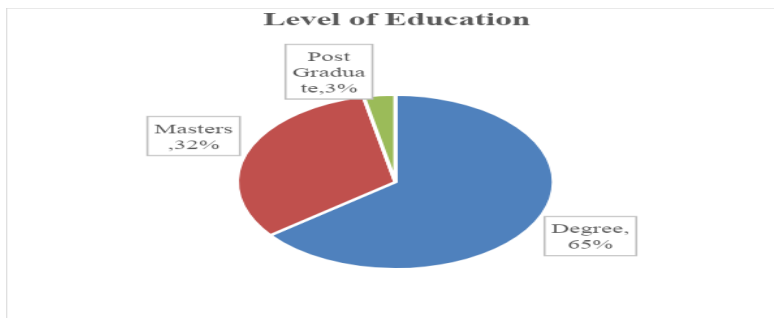


Figure 6: Distribution of respondent by the level of education

Age

Figure 7 provides the distribution of respondent by age group. Most of the respondents (68%) were between the age group 18-35 years, while 32% were above 35 years. This illustrates how construction industry is dominated by generally young people.

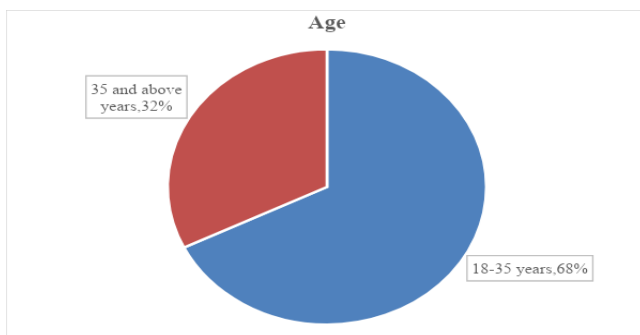


Figure 7: Distribution of respondent by Age

Descriptive Statistics

Table 2: Descriptive Statistics

Statistics	Channels of Communication	Overall Implementation	Project
Mean	3.14375	3.471875	
Standard Error	0.16782152	0.237478113	
Median	3.2	3.9	
Mode	4	3.9	
Standard Deviation	0.949341877	1.343379075	
Sample Variance	0.90125	1.804667339	
Kurtosis	0.248133002	-0.575040548	
Skewness	-0.639259438	-0.708395631	
Range	4	4.5	
Minimum	1	0.5	
Maximum	5	5	

Note: Table 2 provides the descriptive statistics' table offers the measure of central tendency and variation for all the continuous variables in the study. The computation of the mean for all the five variables was facilitated by data transformations in which average of all the elements under the variables were computed.

Table 3: Channels of Communication

Channels of Communication	<u>Measure of Extent</u>				
	Great Extent	Neutral	Small Extent	Very Great Extent)	Very Small Extent
Print channels	31%	19%	28%	9%	13%
Electronic channels	34%	13%	22%	13%	19%
Face-to-face channels	13%	9%	34%	6%	6%
Social Media channels	31%	22%	13%	9%	25%

Note: Table 3 provides the measures of extent for all the element under the aspect of communication channels.

Under channels of communication 31% felts that print channels had a great extent best channel of communication.

For the electronic channel 34% felt the channel had great extent delivering information. Social media was ranked to have a great extent of communicating by 31% respondent. The mean score for the channels of communication is 3.14 and a standard deviation 0.95($M=3.14$, $SD=0.95$). The findings imply that electronic media as a channel of communication has a greater impact on project implementation. The results align with Berg, (2017) findings on their study on the impact of the choice of communication tool on communication efficiency. The results of the study proved how the traditional channels had decreased in terms of efficiency. However, although electronic media has emerged as an efficient means of communication, there exist safety issues in this platform. The findings presented in this section align with Berg, (2017) findings as electronic and social media forms the key components of channels of communication.

Inferential Statistics

Correlation Analysis

Correlation analysis is a technique used to measure the strength and direction of relationship (Wherry, 2015). The technique was adopted in order to show whether there is relationship between overall project implementation and channels of communication. The results of the correlation analysis shows positive relation between overall project implementation and channels of communication, $r(158) = .475$, $p = .033$.

Table 4: Correlation analysis between overall project implementation and channels of communication

Correlations		Channels of Communication	Overall Project Implementation
Overall Project Implementation	Pearson	.475	1
	Correlation Sig. (2-tailed)	.033	
	N	158	158

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

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

Regression Analysis

Regression analysis is a statistical technique that is used to establish whether a relationship exists between dependent and independent variables (Chatterjee & Hadi, 2015). The report generates values of the coefficient of determination from which an

explanation variation of dependent variable is assessed. The coefficient of determination in regression analysis explains the proportion of change in the dependent variable that is caused by the independent variable. The technique further produces a model in which the coefficients are provided to explain the relationship.

The study adopted the use of multiple regression analysis. The purpose of using regression analysis is to establish the impact of the independent variable on the dependent variable (Murugan et al., 2011). The dependent variable in the study was the overall project completion while the independent variable was the channels of communication.

Table 5: Model Summary for the predictor variables

Model Summary	
Multiple R	0.46061
R Square	0.212162
Adjusted R Square	0.174645
Standard Error	0.72761
Observations	158

Note: The table provides the results of the coefficient of determination. The R square for the model is 0.21

Table 6: Analysis of Variance (ANOVA)

	d f	S S	M S	F	Significan ce F
Regression	3	8.763412	2.921137232	11.73356	0.018288
Residual	155	47.18128	1.685045564		
Total	158	55.94469			

Note: The table provides the results of the Analysis of Variance. The results of the analysis show that the model is significant, $F(3,158) = 11.73$ $P = 0.018288$

Table 7: Coefficients

	Coefficients	Standard Error	t Stat	P-value
Intercept	6.309646662	1.289414	4.893419974	3.71E-05
Channels of Communication	0.003191107	0.286934	-0.01112141	0.009912

Note: The table provides the results of the coefficient and the p-values for the predictor variable. The independent variable is a good predictor of project implementation as their p-value is less than the significance level.

The model summary table provides the values of coefficient of determination (R squared) and adjusted R. The model has one predictor variable; hence, coefficient of determination should apply. The coefficient of determination is 0.21 ($R^2 = 0.21$). The value signifies that the model accounts for or explains 21% of the variability in Project Implementation. The remaining 79% of the variability in performance is unexplained and other factors not in the model might explain such variability. Such factors could be as a result of funding of construction projects, availability of skilled labor, availability of quality machinery etc. From the ANOVA table, it is evident that the model is a significant predictor of overall project implementation with; ($F(3,158) = 11.73$ $P = 0.018288$). The p-value is less than 0.05; hence we reject the null hypothesis that states that there is no relationship between overall project implementation and the predictor variables channels of communication. Therefore, channels of communication

have a significant impact on the overall project implementation. The coefficient table provides the coefficient of the predictor variable. Given the coefficient, the model is as follows.

Overall Project Implementation = $6.311 + 0.00319 (\text{Channels of Communication})$

Channels of Communication and implementation of housing construction projects

Channels of communication are key to the implementation of construction projects. The results of the regression analysis showed that improving the means of communication channels by a unit increases the overall project completion by 0.00319. Under channels of communication, 31% felt that print channels had a great extent best channel of communication. For the electronic channel, 34% felt the channel had great extent delivering information. Social media was ranked to have a great extent of communicating by 31% respondent. The mean score for the channels of communication is 3.14 and a standard deviation of 0.95 ($M=3.14$, $SD=0.95$).

Facilitating qualities of printing channels such as memos, notices, letters, brochures, newsletters, reports, policy manuals, annual reports and posters and use of better electronic channels would further improve the quality of communications, which in turn facilitate quicker completion of projects. Elements under electronic channels such as email and voice mail, Intranets, blogs, podcasts, chat rooms, business TV, video conferencing, instant messaging systems and wikis would provide a better communication channel during project execution. Improving additional factors such as Face-to-face and social media channels provides an avenue for quicker completion of projects.

Channels of Communication on implementation of Housing Construction Projects

Statistics indicate that channels of communication are key to the execution of construction projects. The results showed that improving the means of communication channels increases the quality of overall project implementation. The change can be attained through facilitating the use of printing channels such as memos, notices, letters, brochures, newsletters, reports, policy manuals, annual reports and posters and the use of better electronic channels. This would further improve the quality of communications, which in turn facilitate quicker completion of projects. Elements under electronic channels such as email and voice mail, Intranets, blogs, podcasts, chat rooms, business TV, video conferencing, instant messaging systems and wikis would provide a better communication channel during project execution. Improving additional factors such as Face-to-face and social media channels will provide an avenue for quicker completion of projects.

CONCLUSION

The purpose of the study was to examine the roles that communication channels have on implementation of housing construction projects in Nairobi County, Kenya. The objective of the study was to establish how project communication channels affect implementation of public housing construction projects within Nairobi County. From the findings of the study, the hypothesis was rejected. It is evident that the research questions and objective was addressed. The mentioned independent variable was found to significantly affect project implementation. The results of the regression analysis provided the degree of influence the independent variable has on the dependent variable (project implementation). Conclusively, there is overwhelming evidence to show that communication channels have a significant effect on the implementation of housing construction projects.

RECOMMENDATIONS

Based on the research findings, it is recommended that key participants in the construction projects should use effective channels of communication to co-ordinate, plan and schedule the work. Channels of communication ensures control, motivation, information sharing and emotional expression. The study recommends that key project managers should use channels of communication in the execution of construction projects. The results of the regression analysis showed that improving the communication channels increases the overall project quality. The change can be attained by using the right communication channels specific to the information being communicated, and facilitating the use of printing channels such as memos, notices, letters, brochures, newsletters, reports, policy manuals, annual reports and posters and the use of electronic channels. These would improve the quality of communication within the team, which would in turn facilitate quicker and quality completion of construction projects. Elements under electronic channels such as email and voice mail, Intranets, blogs, podcasts, chat rooms, business TV, video conferencing, instant messaging systems and wikis would provide a better communication channel during project execution. Improving additional factors such as Face-to-face and social media channels provides an avenue for quicker completion of projects.

The study recommends further studies on the impact of modern digital communication channels on construction project implementation. With the changing environment and advances in information technology, there's an intense change in how business communication is conducted. Modern communication increasingly utilizes digital media. The study also suggests that further research should target other counties for purpose of comparison.

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