

Leadership Skills, Stakeholder Management and Execution of Fibre Optic Infrastructure

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Abstract: The main purpose of this study was to investigate how leadership skills and stakeholder management acting together to influence the execution of fibre optic infrastructure. The study adopted the pragmatism research paradigm, with a cross-sectional survey design. Census was used to select 187 respondents from a target population of 187 functional members of staff in fibre optic infrastructure departments of two mobile telecommunication and four internet service companies in Nairobi County, Kenya. A self-administered structured questionnaire was used to collect quantitative data while an interview guide and document review guide were used to collect qualitative data. Inferential statistical analysis was performed using multiple regression. It was demonstrated that leadership skills and stakeholder management act together to have a significant positive influence on the execution of fibre optic infrastructure. Therefore, there is a need for companies to ensure that stakeholders are involved in all phases of a project from inception to closure. Mobile telecommunication and internet service providing companies should also develop training programs to improve the leadership skills of project leaders and make use of conflict management strategies and communication skills to ensure appropriate management of change. It was suggested that similar and comparable studies should be conducted in other countries across the world.

Keywords: Leadership skills, stakeholder management, execution, fibre optic infrastructure, information communication technology.

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1. Introduction

Project planning and management focus on the organization as well as the management of complex arrays of activities that deliver a project such as fibre optic infrastructure (Morris, 1994). In projects, things often do not go according to plans and this can cause conflict among stakeholders. Therefore, there is a real need for project leaders who can manage project tasks as well as people (Qing and Dekker, 2014). Recommended leadership skills include but not limited to: communication, planning, coaching, conflict resolution, team building, delegation, problem-solving and decision-making, coaching and training (Awan et al., 2015). Leadership skills help project managers to empower teams and stakeholders, list down all stakeholders, assess their interest in the project, use influence and communication skills to convey and sell project vision to stakeholders, shape expectations and

affirm successful execution of projects (Qing and Dekker, 2014).

Leadership skills are, therefore, vital in defining project vision, scope and managing stakeholders throughout the project life cycle. In fibre optic infrastructure, governments, operators, constructors and equipment vendors are the main stakeholders that take major responsibilities (Huawei, 2016). Consequently, the need to strike a balance to see that fibre optic infrastructure has the right response from stakeholders is important to policymakers. However, with multiple stakeholders, the successful execution of fibre optic infrastructure is a challenge (Ilavarasan and Srinivasan, 2014). The inability of project players to address fears of stakeholders in projects also result in myriad project disappointments world over (Bourne and Walker, 2005).

Telecommunication and internet service enterprise has drastically evolved in the last 10 years across the globe.

Consequently, customers, and business enterprises with smart devices consume a huge amount of data and increased voice traffic (EY, 2015). One of the innovations to beat this new development in the telecommunication industry is the emergence of fibre optic telecommunication network. Optical fibre is the globally preferred technology to supply high-speed broadband to end-users (Beardsley et al., 2011), and therefore is a major building block in telecommunication infrastructure (Ezeh et al., 2013; Massa, 2013). Torlak (2013) defined optic fibre as flexible, long, transparent thin strands of glass or plastic about a diameter slightly thinner than a human hair. The light signal from fibre optic cables does not cause interference among other fibre cables in the same channel. Optical fibre is, therefore, suitable for transmission of digital information, in computer and telecommunication networks (Sankara, 2014; Massa, 2013).

Nevertheless, fibre optic network involves construction challenges far beyond those associated with traditional construction projects on a contained and easily controlled site (Crocker, 2012). Crocker (2012) also noted that fibre optic construction involves huge risks from the weather as well as in safety and land access. Similarly, Deloitte (2016) noted that logistics in procurement, staff mobilization, equipment and materials transport to sites also present significant challenges in fibre optic network. Furthermore, fibre construction happens in communities for short periods and therefore a complex program of proactive community engagement with operators, constructors, government agencies, environmental groups and property owners is an essential part of meeting schedules and budget (Huawei, 2016).

In the United States, Sears et al. (2016) directly linked the successful implementation of projects to the joint influence of leadership skills and stakeholders management. Sankara (2014) postulated that the execution of projects including fibre optic infrastructure requires project leaders to have relevant leadership skills to be able to define and manage key stakeholders. Similarly, Eikenberry (2016) opined that the leadership skills of a project manager enable stakeholders to take part in the process of scope definition for the successful execution of projects including fibre optic infrastructure. In Iran, investigating the effect of transformational leadership on the success of listed companies, results showed that transformational leadership increases staff motivation, which in turn leads to an increase in commitment and productivity and hence the success of projects (Sayrani and Ataolahi, 2015). In Australia, Fageha and Aibinu (2014) argued that communication skills are required for leaders in managing projects to achieve project goals.

In Tianjin Binhai New Area, China, Wei et al. (2016) illustrated how the combination of multicriteria decision analysis and a group decision-making technique can be used to arrive at solutions that are mutually acceptable to multiple stakeholders when selecting sustainable transport projects. The results showed that multicriteria decision analysis and a group decision-making technique can enable transportation managers achieve acceptable solutions to complex project-prioritization problems by understanding the different needs and concerns of diverse stakeholders. In 2016, Wei et al., also investigated the potential influences of stakeholder characteristics as well as project environments on conflicts and consensuses in stakeholders' overall preferences about sustainable transport projects in

China. The results showed that discrepancies of opinion about transport-project sustainability criteria prevail among stakeholder-group types in every region studied, due to these types' different needs and concerns. The findings also suggested that special attention should be given to cases in which multiple stakeholder groups assign the same priorities to certain criteria, as those criteria are likely to represent the most serious issues affecting all stakeholders in a given project environment including fibre optic infrastructure (Wei et al., 2016).

In Malaysia, it was revealed that while a leader should come up with road plans with the aim of successfully completing a project, it was necessary to work together with other stakeholders to accomplish the project on time (Zakaria et al., 2015). In addition, Zakaria et al. (2015) noted that stakeholders' interests and influence on a project may change during execution and skilled leaders must demonstrate the ability to manage the change in an effort to achieve project success. Findings of Ahmed et al. (2013) in Pakistan showed that project managers with essential qualities, leadership competencies and management skills ensure effective accomplishment of business and project results. The main challenges facing execution of projects include poor teamwork due to lack of empowerment and delegation of authority (Hauschildt et al., 2010; Neuhauser, 2012; Law and Martin, 2014).

In South Africa, Steyn (2014) showed that a leader with communication skills is able to pass information, resolve conflicts and interact with employees comfortably, which in turn influences the execution of projects. Archer et al. (2010) sought to describe the importance of people and leadership skills in the construction industry and concluded that leadership is an important skill and project managers should continuously develop as leaders and constantly improve their skills. In Namibia, it was found out that most projects fail because leaders do not visit and discuss with stakeholders on previous project experiences when developing strategies and plans to streamline new projects (Kawana, 2016).

To guarantee project sustainability, Kobusingye et al. (2017) in Rwanda noted that stakeholders should be involved in all the phases of a project including the planning phase that covers vision and goals development. Bashir (2010) in Uganda, argued that stakeholder identification and analysis is the first step to the management of identifying and resolving conflicts in a project. In Kenya, Kariungi (2014) showed that the ability to formulate project scope determines the success of a project and supervision of the stakeholders. Satisfaction of the stakeholders is key to the improvement and relevance of the project, which eventually translates to its success. Likewise, Moenga and Moronge (2016) findings in Kenya showed that stakeholder participation is a significant factor in the utilization of ICT infrastructure. In addition, the study revealed that human resource capacity, implementation strategy and government policy are positively correlated to the effective utilization of information communication technology (ICT) infrastructure (Moenga and Moronge, 2016).

Fibre optic infrastructure involves a complex stakeholder management framework across a wide range of groups requiring constant engagement to provide management oversight through formal reporting, audit and assurance mechanisms to ensure successful execution (Crocker, 2012). Despite advanced project management

methodologies, many projects including fibre optic infrastructure in Kenya and indeed across the world continue to fail, delivered beyond projected timelines, budget and scope for a number of reasons including inadequate leadership skills and poor stakeholder management. The need for skilled leaders and thorough stakeholder management is therefore acceptable among professionals in project planning and management.

Studies in leadership skills and stakeholder management notwithstanding, the combined influence of leadership skills and stakeholder management on the execution of fibre optic infrastructure is not clear. The issue is that projects remain unsuccessful because of ineffective leadership and poor stakeholder management. However, empirical evidence suggests that effective leadership and stakeholder management may possibly contribute to overcoming challenges faced by projects including fibre optic infrastructure. Even with previous studies focusing on ICT infrastructure and construction projects in general, none has focused on the combined influence of leadership skills and stakeholder management on the execution of fibre optic infrastructure and interaction among the variables. This study was, therefore, carried out to fill this knowledge gap with reference to the execution of fibre optic infrastructure.

The objective of the study was to establish how leadership skills and stakeholder management jointly influence the execution of fibre optic infrastructure. The research question was: *Does a relationship exist between leadership skills, stakeholder management and execution of fibre optic infrastructure?* Leadership skills and stakeholder management were independent variables while execution of fibre optic infrastructure was the dependent variable. The target population comprised of functional members of staff in fibre optic infrastructure departments of mobile telecommunication and internet service companies that own and deploy fibre optic infrastructure with their headquarters in Nairobi County, Kenya. It is hoped that findings of this study will be valuable to academicians, policymakers and other researchers as they add to the current literature in project management, telecommunication industry and in particular fibre optic infrastructure.

2. Methodology

This study was anchored on leadership skills and stakeholder theories. Skills propose what leaders are able to accomplish. The skills theory suggests that skills, knowledge, and abilities are necessary for the effectiveness of a leader. In the current study, the researcher focused on the skills approach by Katz (1974). Katz (1974) noted that the foundation of leadership is on three skills: technical, human, and conceptual. Under the current study, human and conceptual skills relate to the independent variable, leadership skills. The indicators of leadership skills are visionary, team building, communication, planning, delegation, problem-solving and decision-making, coaching and training.

Patton (2008) postulated that the purpose of stakeholder theory is to enable managers to identify, analyze, and know stakeholders and purposefully manage them. As applied in this study, stakeholder theory relates to the independent variable, stakeholder management whose indicators are stakeholder list with areas of interest, stakeholder analysis, dynamics of stakeholders in the

project life cycle, stakeholder's reaction to project decisions and stakeholder's engagement through the project life cycle. Execution of fibre optic infrastructure whose indicators are the timeline, cost savings, quality standards, stakeholder satisfaction, learnt lesson reports, project benefits, handover documents and project team commitment was the dependent variable. This study was therefore, also anchored on the conceptual framework that execution of fibre optic infrastructure may well be predicted by leadership skills and stakeholder management.

The study adopted the pragmatism research paradigm, with a cross-sectional survey design. The target population was 187 comprising of functional members of staff in fibre optic infrastructure departments of two mobile telecommunication organizations, four internet service providers and two policy-making and regularity authorities. The functional staff was distributed as follows: Telkom Ltd – 25, Safaricom PLC – 45, Liquid Telecom – 30, Jamii Telecom – 25, Access Kenya – 30, Wananchi Group – 30, ICT Authority – 1 and Communication Authority – 1. Size of the study sample comprised the entire target population of 187 respondents.

The study used qualitative and quantitative data with a questionnaire, interview schedule and document review guide as data collection instruments. The questionnaire had a visual analogue scale with a range of 0 to 10 and 5 points grouped Likert scale. On the Likert scale, 5 represented strongly agree, 4 represented agree, 3 represented neutral, 2 represented disagree while 1 represented strongly disagree. The visual analogue scale measured the opinion ratings on an interval scale (Dexter and Chestnut, 1995). Prior to data collection, preliminary testing of research instruments was done through content analysis and test-retest principles to verify validity and reliability respectively. Census was used to select 187 respondents from a target population of 187 functional staff in mobile telecommunication and internet service companies through stratified and purposive sampling.

Data analysis proceeded in three steps: data preparation, data analysis and reporting. Mixed methods of data analysis were adopted in this study incorporating descriptive, inferential and content analysis. The instruments were assembled, sorted and prepared for analysis after completion of data collection exercise and quantitative data coded and analyzed using descriptive and inferential statistics. The study used summary statistics to analyze descriptive data. Inferential statistical analysis was performed using multiple regression. Prior to the main data analysis, a statistical investigation involving tests for statistical assumptions of linearity, normality, homoscedasticity, multicollinearity and autocorrelation was performed.

3. Findings

The objective of this study was to establish how leadership skills and stakeholder management jointly influence the execution of fibre optic infrastructure. The study's research question was: *What is the relationship between leadership skills, stakeholder management and execution of fibre optic infrastructure?* Multiple regression analysis was used to determine the joint influence of leadership skills and stakeholder management on the execution of fibre optic infrastructure.

The null hypothesis stated that:

H01. Leadership skills and stakeholder management acting together do not have a significant influence on the execution of fibre optic infrastructure

R^2 shows variation in the dependent variable that can be explained by the independent variable (Bryman, 2012). The R^2 for the relationship between independent variables and the dependent variable was 0.574 as shown in Table 1. This implied that leadership skills and stakeholder management may well jointly explain 57.4% of the execution of fibre optic infrastructure.

The analysis of variance is used in regression analysis to assess whether the model is a good fit for data analysis (Bryman, 2012). According to the findings, the F-calculated (114.016) in Table 2 was greater than F-critical (3.09) and the p-value (0.000) was less than a significant level of (0.05), which showed that the model was a good fit for the data. This inferred that the model may well be used in predicting the joint influence of leadership skills and stakeholder management on the execution of fibre optic infrastructure among mobile telecommunication and internet service providers.

Multiple regression model was as follows:

$$Y = 2.027 + 0.379X_1 + 0.385X_2 \quad (1)$$

The results in Table 3 showed that leadership skills had a significant influence on the execution of fibre optic infrastructure as shown by a regression coefficient of 0.379 (p-value<0.001). Similarly, stakeholder management had a significant influence on the execution of fibre optic infrastructure as shown by a regression coefficient of 0.385 (p-value<0.001). Since the p-values<0.001 in both independent variables were less than the significance level (0.05) the null hypothesis was rejected and the alternative hypothesis indicating that Leadership skills and stakeholder management acting together had a significant influence on the execution of fibre optic infrastructure accepted.

4. Discussion

The construction of fibre optic infrastructure needs proper management, executed with the involvement of stakeholders in the implementation process and its

completion. Therefore, the construction of fibre optic infrastructure also requires a competent manager, and a qualified leader who can perform his duties effectively.

The study found out that leadership skills and stakeholder management acting together have a significant influence on the execution of fibre optic infrastructure. The findings agree with those of Sears et al. (2016) who, in their study, directly linked the successful implementation of projects to the joint influence of leadership skills and stakeholder management. In their study, Wei et al. (2016) showed that discrepancies of opinion about transport-project sustainability criteria prevail among stakeholder-group types, as a result of different needs, concerns and as such, special attention should be given to cases in which multiple stakeholder groups assign the same priorities to certain criteria, as those criteria are likely to represent the most serious issues affecting all stakeholders in a given project environment including fibre optic infrastructure. The findings also concur with the argument by Sankara (2014) that the execution of projects including fibre optic infrastructure requires project leaders to have relevant leadership skills to be able to define and manage key stakeholders. In addition, the findings also agree with the assertion by Kawana (2016) that most projects fail because leaders do not visit and discuss with stakeholders on previous project experiences when developing strategies and plans to streamline new projects.

Likewise, the findings validate the argument by Eikenberry (2016) that the leadership skills of a project manager enable stakeholders to take part in the process of scope definition for the successful execution of projects. Moreover, the findings are in line with those of Kariungi (2014) who, in his study, showed that the ability to formulate project scope determines the success of a project and supervision of stakeholders. Satisfaction of the stakeholders is key to improvement and relevance of the project, which eventually translates to its success. The findings of the study also validate the argument by Wei et al. (2016) that transportation managers can achieve an acceptable solution to a complex project-prioritization problem by understanding the different needs and concerns of diverse stakeholders.

Table 1. Model summary for stakeholder management (X_2) and leadership skills (X_1)

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.758	0.574	0.569	1.18657

Table 2. ANOVA for leadership skills, stakeholder management and execution of fibre optic infrastructure (Y)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	321.057	2	160.529	114.016	0.000 ^b
	Residual	237.943	169	1.408		
	Total	559.000	171			

Table 3. Coefficient for leadership skills, stakeholder management and execution of fibre optic infrastructure

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.027	0.375		5.397	0.000
	Leadership skills	0.379	0.059	0.407	6.476	0.000
	Stakeholder management	0.385	0.055	0.439	6.989	0.000

Steyn (2014) showed that a leader with communication skills is able to pass information, resolve conflicts and interact with employees comfortably, which in turn influences the execution of projects. Similarly, the findings agree with the assertion by Zakaria *et al.* (2015) who, in their study, revealed that while a leader should come up with road plans with the aim of successfully completing a project, it was necessary to work together with other stakeholders to accomplish the project on time. In addition, stakeholders' interests and influence on a project may change during execution and skilled leaders must demonstrate the ability to manage the change in an effort to achieve project success (Zakaria *et al.*, 2015).

5. Conclusion

The objective of the study was to establish how leadership skills and stakeholder management jointly influence the execution of fibre optic infrastructure. Results from the inferential statistical analysis indicated that leadership skills and stakeholder management acting together has a significant positive influence on the execution of fibre optic infrastructure.

The study was anchored on the leadership skills theory which argues that skills, knowledge, and abilities are required in order for a leader to be effective. The findings of the study supported this argument by indicating that leadership skills such as visionary, team building, communication, planning, delegation, decision making and problem-solving and coaching and training are important in ensuring effective execution of fibre optic infrastructure. In addition, the study found out that leadership skills are important in ensuring that the followers are motivated and inspired.

The study was also anchored on stakeholder theory that highlights the responsibility of project leaders to the stakeholders. The theory insists on the identification of stakeholders and their interests, which is the first step in stakeholder management and involvement. This is supported by the findings of this study, which indicated that the companies were carefully identifying and listing stakeholders and their interests. In addition, this study found out that resolving conflicts among stakeholders is one of the most effective ways of ensuring project success.

6. Recommendations

The study found out that leadership skills and stakeholder management acting together influence the execution of fibre optic infrastructure. The study, therefore, recommended that companies should ensure stakeholders are involved in all phases of a project from inception. In addition, it was recommended that mobile telecommunication and internet service providing companies should develop training programs to improve the leadership skills of project leaders.

The execution of fibre optic infrastructure involves change and stakeholders can decide to make changes in their interests thus changing project scope during implementation. The study, therefore, recommended that mobile telecommunication and internet service providing companies should make use of conflict management and communication skills to ensure appropriate management of change.

The study was delimited to Nairobi County, Kenya. However, fibre optic infrastructure projects have also been

implemented in other countries across the world. Different countries experience different levels of stakeholders' involvement depending on other factors such as literacy level, level of development, ethnicities and cultures. Therefore, similar and comparable studies should be conducted in other countries.

The importance of studying how the execution of fibre optic infrastructure is influenced by leadership skills and stakeholder management acting together is further emphasized by the need of involving key stakeholders throughout the project life cycle and having a competent project leader with requisite skills to effectively manage the project and project stakeholders.

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