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RESEARCH ARTICLE

LEADERSHIP SKILLS AND EXECUTION OF FIBRE OPTIC INFRASTRUCTURE IN NAIROBI COUNTY, KENYA

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ABSTRACT

The main purpose of this study was to investigate influence of leadership skills on execution of fibre optic infrastructure implemented by mobile telecommunication and internet service providers in Nairobi County, Kenya. The objective of the study wasto determine how leadership skills influence execution of fibre optic infrastructure. The research design that guided this study was cross-sectional survey. The study adopted mixed methods research and pragmatism paradigm approach. A self-administered structured questionnaire was used to collect quantitative data while interview schedule and document review guide were used to collect qualitative data. Prior to data collection, preliminary testing of research instruments was done using content analysis and test retest principle to respectively ascertain validity and reliability. Census was used to select 187 respondents from a target population of 187 functional staff in fibre optic infrastructure departments of mobile telecommunication and internet service companies through stratified and purposive sampling. The study used summary statistics to analyze descriptive data. Inferential statistical analysis were performed using simple regression and hypothesis tested for significance using F tests. To ensure validity of statistical investigation, tests of statistical assumptions were performed prior to data analysis. With R2 = 0451, $\beta = 0.626$, p-value = $0.000 < 0.05$, the nullhypothesis, which stated that Leadership skills have no significant influence on execution of fibre optic infrastructure(H01), was rejected and conclusion made that leadership skills have a significant positive influence on execution of fibre optic infrastructure. It was recommended that mobile telecommunication and internet service companies should consider leadership skills when recruiting project leaders. It was also recommended that the companies should develop training programs to improve leadership skills of the current project leaders. The study further recommended that the companies should develop coaching and mentoring programs. This study was delimited to consider the influence of leadership skills on execution of fibre optic infrastructure in Nairobi County, Kenya. It was therefore suggested that more studies should be conducted on other factors that may influence execution of fibre optic infrastructure in Kenya. The study also recommended that additional and comparable studies should be conducted in other counties in Kenya.

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INTRODUCTION

Project planning and management focuses on organization as well as 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 of project leaders who can manage 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, Ahmed and Zulqarnain, 2015). Leadership skills help Project Managers empower teams and other 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). Therefore, leadership skills are vital in defining project vision, scope and managing stakeholders throughout the project life cycle. 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 huge amount of data and increased voice traffic (Ernst and Young, 2015). One of the innovations to beat this new development in 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, Enriquez, Guvendi&

Sandoval, 2011), and therefore a major building block in telecommunication infrastructure (Ezeh, Ogbuehi, Eleke and Diala, 2013; Massa, 2013). Fibre optic are flexible, long, transparent, thin strands of glass or plastic about a diameter slightly thinner than human hair (Torlak, 2013). Light signal from fibre optic cables do not cause interference among other fibre cables in same channel. Optical fibre is therefore, suited for transmission of digital information, useful 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 weather as well as in safety and land access. Similarly, Deloitte (2016) notes that logistics in procurement, staff mobilization, equipment and materials transport to sites also present significant challenges in fibre optic network. Furthermore, fibre construction happen in communities for short periods and therefore a complex program of proactive community engagement with operators, constructors, government agencies, environment groups and property owners is essential part of meeting schedules and budget (Huawei, 2016).

Leadership skills approach is the theory that informedthis study. Skills propose what leaders are able to accomplish. The skills methodology suggests that skills, knowledge, and abilities are necessary for effectiveness of a leader. In the current study, the researcher focused on skills approach by Katz (1974). Katz (1974) noted that the foundation of leadership is on three skills: technical, human, and conceptual. Under current study, human and conceptual skills relate to the independent variable, leadership skills whose indicators are visionary, team building, communication, planning, delegation, problem solving and decision-making, coaching and training.
In Malaysia, Zakaria, Mohamed, Ahzahar and Hashim (2015) concluded that leadership skills of a project manager positively contribute to success of projects and that acquisition of such skills is through training and learning. Likewise, findings of Riaz, Tahir and Noor (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, Gesche and Medcof, 2010; Neuhauser, 2012; Law and Martin, 2016). Delegation is therefore an important leadership skill (Law and Martin, 2016).Carey, Philippon and Cummings (2013) showed importance of coaching as a leadership skill. Effective coaches may possibly develop trustful relationships with their employees that foster learning and professional growth(Von, Nonaka and Rechsteiner, 2014).

In United States, Campbell (2015) showed that communication in an organization should be vertical, up and down flow, horizontal, diagonal, with different stakeholders including the employees. Kouzes (2012) postulated that leadership skills are essential in good project management and have a greater influence on the overall project process. Similarly, according to Sears, Sears and Clough (2016) leadership skills are important in ensuring effective stakeholders management in the execution of projects. In Iran, investigating the effect of transformational leadership on success of results of the listed companies showed that Transformational leadership increases staff motivation, which in turn leads to an increase in commitment and productivity and hence success of the 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. Archer, Verster and Zulch (2010) in South Africa sought to describe the importance of people and leadership skills in construction industry and concluded that leadership is an important skill and project managers should continuously develop as leaders and constantly improve their skills. In Uganda, Rukundo (2011) showed that most organizations neglected training of staff and leaders leading to poor performance of projects. He also highlighted that lack of training and incompetence of leaders and employees and poor negotiation skills led to unrealistic schedules, plans and budgets right from the initiation of projects. In Kenya, Moenga and Moronge (2016) findings showed that human resource capacitywas positively correlated to effective utilization of ICT infrastructure. In a similar study, using descriptive survey design, Wanjiku and Keraro (2015) findings showed that human resource management practicesinfluence performance of ICT projects in Kenya. However, these studies did not factor in aspect of leadership skills and execution of fibre optic infrastructure. Fibre optic infrastructure is significant to economic growth. It is therefore essential to ensure effective, efficient and sustainable execution of fibre optic infrastructural projects. The need for leadership skills to guarantee effective leadership is acceptable among professionals in project planning and management. Studies in areas of leadership notwithstanding, the extent to which leadership skills influence execution of fibre optic infrastructure is not clear. The issue is that projects continue to fail because of ineffective leadership. However, empirical evidence suggest that leadership skills may well 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 influence of leadership skills on execution of fibre optic infrastructure and interaction among the variables. It is against this background that this study was carried out to fill the knowledge gap with reference toexecution of fibre optic infrastructure in Nairobi County, Kenya.

MATERIALS AND METHODS

The study adopted the pragmatism research paradigm approach, with cross-sectional survey design. Target population was 187 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 were 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 study sample comprised the entire target population of 187 respondents, with target organizations arranged in strata. The researcher used a raffle containing eight names of the target organizations to choose organization from where survey started among the eight organizations. The researcher used first raffle to start survey. The study used qualitative and quantitative data with questionnaire, interview schedule and document review guide as data collection instruments. The questionnaire had Visual analogue scale with a range of 0 to 10 and 5 point 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 principle 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 were performed using simple regression and the hypothesis tested for significance using F tests. Prior to the main data analysis, statistical investigation involving tests for statistical assumptions of linearity, normality, homoscedasticity, multicollinearity and autocorrelation were performed.

in their organizations. The results were as shown in Table 1. The functional staff agreed, with a mean of 4.069 and a standard deviation of 0.889, that project leaders understand the job and know resources and skills that are relevant to the organizations' projects. They also agreed, with a mean of 4.058 and a standard deviation of 0.922, that their companies have visionary leadership with right set of leadership skills that ensured effective stakeholder management and correction, as well as completion of defined and documented scope. The respondents further agreed, with a mean of 4.046 and a standard deviation of 0.953, that their companies ensured project team members were involved throughout the project life cycle. With a mean of 4.000 and a standard deviation of 1.002, the functional staff agreed, that their firms have motivated teams to go an extra mile to deliver projects in time. They also agreed, that project team members are empowered to make decisions, and have a certain level of delegated authority and responsibility as shown by a mean of 4.000 and a standard deviation of 0.865. Moreover, with a mean of 3.848 and a standard deviation of 1.020, the functional staff agreed, that project leaders in their firms communicated to each other to let the teams know when they were performing well and not just when they were performing poorly.

Table 1. Leadership Skills from Likert scale data

	1	2	3	4	5	Mean	Std. Dev.
The company has visionary leadership with right set of leadership skills that ensures effective stakeholders management, correction and complete scope is defined and documented	2.3	3.5	15.1	44.2	34.9	4.058	0.922
My company has motivated teams that go an extra mile to deliver projects in time	1.2	7.0	22.1	30.2	39.5	4.000	1.002
My company ensures project team members are involved throughout the project	1.2	5.8	18.6	36.0	38.4	4.046	0.953
Project leaders in my company use communication to let the teams know when they are performing well and not just when they are performing badly	2.3	9.3	18.6	40.7	29.1	3.848	1.020
Project leaders in my company frequently plan milestones to help project team feel they are making progress	3.5	10.5	22.1	41.9	22.1	3.686	1.040
Project leaders understand the job and know resources and skills relevant to the project	1.2	7.0	8.1	51.2	32.6	4.069	0.889
Project team members are empowered to make decisions and have a certain level of delegated authority and responsibility	0.0	5.8	19.8	43.0	31.4	4.000	0.865
In my company project leaders are empowered to firmly say no and are ready to justify the reasons behind the decision no matter how senior or important the person is	4.7	12.8	25.6	38.4	18.6	3.534	1.078
Project leaders coach and train other project team members	2.3	9.3	15.1	50.0	23.3	3.825	0.969
Training is available in my company to equip project team members with relevant skills	8.1	16.3	23.3	26.7	25.6	3.453	1.258
Average						3.8519	0.9996

Table 2. Leadership skills from Visual analogue scale

Scale	Frequency	Percent
2.00	4	2.3
3.00	8	4.7
4.00	4	2.3
5.00	14	8.1
6.00	18	10.5
7.00	34	19.8
8.00	48	27.9
9.00	22	12.8
10.00	20	11.6
Total	172	100.0

FINDINGS

The objective of this study was to determine how leadership skills influence execution of fibre optic infrastructure. Leadership skills considered in this study include: visionary, team building, communication, planning, delegation, decision making, problem solving, coaching and training.

Descriptive Analysis of Leadership Skills from Likert scale data: The functional staff in fibre optic infrastructure departments of two mobile telecommunication and four internet service companies were requested to indicate their level of agreement with various statements on leadership skills

With a mean of 3.825 and a standard deviation of 0.969, the functional staff also agreed, that project leaders coached and trained other project team members. They further agreed, that project leaders in their companies, frequently plan milestones to help project teams feel, that they were making progress as shown by a mean of 3.686 and a standard deviation of 1.040. Furthermore, the functional staff also agreed, that their companies' project leaders were empowered to say no, and were ready to justify reasons behind the decision, no matter how senior or important the person was as shown by a mean of 3.534 and a standard deviation of 1.078. However, the employees were neutral on the statement indicating, that training was available in their companies to equip project team

members with relevant skills, as shown by a mean of 3.453 and a standard deviation of 1.258.

Descriptive Analysis of Leadership Skills from Visual analogue scale data: The respondents were asked to rate the extent to which leadership skills have been applied in their companies in steering company projects towards their intended goals using a scale of 0 to 10, where 0 represented least application and 10 represented most application. The results were as shown in Table 2. From the findings, 27.9% of the respondents gave application of leadership skills in steering company projects towards their intended goals a rating of 8, and 19.8% gave it a rating of 7. 12.8% gave it a rating of 9, 11.6% gave it a rating of 10, 10.5% gave it a rating of 6, 8.1% gave it a rating of 5, 4.7% gave it a rating of 3, 2.3% gave it a rating of 4 and the same percent (2.3%) gave it a rating of 2. These findings showed that the performance of mobile telecommunication and internet service providers in the application of leadership skills in steering company projects towards their intended goals were rated as 8 on the visual analogue scaleby 52.32% of respondents. The key informants indicated that project manager's leadership skills influence execution of fibre optic infrastructure. In addition, they specified that leadership skills required for effective execution of fibre optic infrastructure include people management skills, project management skills and financial management skills. The key informants also showed that the companies in mobile and internet service industry had no leadership framework and philosophy.

Inferential Analysis of Leadership Skills and Execution of Fibre Optic Infrastructure: Simple regression analysis was used to determine how leadership skills influence execution of fibre optic infrastructure.

The null hypothesis stated that

$H_0$1: Leadership skills have no significant influence on execution of fibre optic infrastructure

The R^2 shows variation in the dependent variable that can be explained by the independent variable (Bryman, 2012). The R^2 in Table 3 for the relationship between leadership skills and execution of fibre optic infrastructure was 0.451. This showed that 45.1% of the execution of fibre optic infrastructure may well be explained by leadership skills.

Table 3. Model Summary for Leadership Skills

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.672	.451	.448	1.34320

The analysis of variance is used in regression analysis to assess whether the model is a good fit for data analysis (Bryman, 2012). The F-calculated (139.835) in Table 4 was greater than the F-critical (3.94) and the p-value (0.000) was less than the significance level of (0.05), inferring that the model was a good fit for the data analysis. This showed that the model may well be used in predicting the influence of leadership skills on execution of fibre optic infrastructure.

Table 4. ANOVA for Leadership Skills

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	252.288	1	252.288	139.835	.000[b]
	Residual	306.712	170	1.804		
	Total	559.000	171			

The regression model for the hypothesized relationship was as follows:

Y=2.965+ 0.626X

The results indicated that leadership skills had a positive and significant influence on execution of fibre optic infrastructure by mobile telecommunication and internet service providers in Nairobi County, as shown by a regression coefficient of 0.626 (p-value=0.000) in Table 5. The p-value (0.000) was less than the significance level (0.05) and hence the null hypothesis was rejected and the alternative hypothesis accepted. This inferred that leadership skills have a significant influence on execution of fibre optic infrastructure.

Table 5. Coefficients for Leadership Skills and Execution of Fibre Optic Infrastructure

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.965	.397		7.469	.000
	Leadership skills	.626	.053	.672	11.825	.000

DISCUSSION

In any organization, leadership skills are important in influencing members of staff positively and giving them moral support to contribute in effectiveness and success of the organization. The study found out that leadership skills have a significant influence on execution of fibre optic infrastructure. These findings agree with those of Kouzes (2012) that leadership skills are essential in good project management and have a greater influence on the overall project process. Recommended dimensions of leadership skills for this study were: visionary, team building, communication, delegation, planning, decision-making, problem solving, coaching, and training (Awan, Ahmed and Zulqarnain, 2015). The study established that project leaders understand the job and know resources and skills that are relevant to the organizations' project. In addition, visionary leadership with right set of leadership skills ensures effective stakeholder management and correction as well as definition and documentation of complete scope. These findings agree with the argument by Sears, Sears and Clough (2016) that leadership skills are important in ensuring effective stakeholders management in the execution of projects. The study also found out that project leaders in their companies frequently plan milestones to help project team feel they were making progress. In addition, project leaders were empowered to say no and were ready to justify the reasons behind the decision no matter how senior or important the person was. However, training was moderately available in mobile telecommunication and internet service providing companies to equip project team members with relevant skillscontrary to the assertion by Zakaria *et al*., (2015) that managers should come up with programs to train their employees continuously to acquaint them with leadership skills, which are important in ensuring successful completion of projects. The study also established that companies ensured project team members were involved throughout their projects. These findings agree with the assertion of Law and Martin (2016) that project team members should be involved in all the phases of a project to develop ownership and commitment. The study also revealed that motivated teams go an extra mile to

deliver projects in time. Employee motivation is one of the components of transformation leadership as postulated bySayrani and Ataolahi (2015) who argued that transformational leadership increases staff motivation, which in turn leads to an increase in commitment and productivity and hence success of the projects.

Fageha and Aibinu (2014) argued that communication skills are required for leaders in managing projects to achieve project goals. This was corroborated by the findings that project leaders in mobile telecommunication and internet service companies communicated to each other to let the teams know when they were performing well and not just when they were performing poorly. These findings also concur with those of Campbell (2015) who showed that communication in an organization should be vertical, up and down flow, horizontal, diagonal, with different stakeholders including the employees. Hauschildt *et al.* (2010) argued that one of the main challenges facing execution of projects was poor teamwork due to lack of empowerment and delegation of authority. However, the study found out that project team members in the mobile telecommunication and internet service companies were empowered to make decisions and had a certain level of delegated authority and responsibility. These findings agree with the argument byLaw and Martin (2016) that delegation was an important principle in an organization but require monitoring for good results. However, Neuhauser (2012) postulated that poor performance of projects was often because of managers who had to manage the technical part of the project that included making a plan, working schedules, preparing budgets, carrying out statistical analysis and monitoring of the whole project instead of delegating some functions to other team members. Effective coaches could develop trustful relationships with their employees that foster learning and professional growth (Carey, Philippon and Cummings, 2013). The study revealed that project leaders coached and trained other project team members. These findings are in agreement with those of Von, Nonaka and Rechsteiner (2014) that coaching involves equipping employees with tools, knowledge, and skills they require to nurture their skills to perform well. These findings also agree with assertion by Rukundo (2011) that most organizations were neglecting training of staff and leaders leading to poor performance of projects. Rukundo (2011) also highlighted that lack of training and incompetence of leaders and employees and poor negotiation skills led to unrealistic schedules, plans and budgets right from the initiation of those projects.

Conclusion

The objective of this study was to determine how leadership skills influence execution of fibre optic infrastructure. The inferential statistics and key informant interviews showed that leadership skills have a significant positive influence on execution of fibre optic infrastructure. It was concluded that leadership skills significantly influence execution of fibre optic infrastructure. The study was anchored on leadership skills approach theory, which argues that skills, knowledge, and abilities are required in order for a leader to be effective. The findings of this study supported this argument by indicating that leadership skills such as visionary, team building, communication, planning, delegation, decision making, problem solving, coaching and training are significant in ensuring effective execution of fibre optic infrastructure. In addition, the study found out that leadership skills are significant in ensuring that project stakeholders are motivated and inspired.

Recommendations

The study found that leadership skills influence execution of fibre optic infrastructure. This inferred that mobile telecommunication and internet service providing companies should ensure that project leaders have skills such as visionary, team building, communication, planning, delegation, decision making and problem solving, coaching and training. It was recommended that companies should put into consideration leadership skills when recruiting project leaders. It was also recommended thatcompanies should develop training programs to improve leadership skills of their project leaders. The study also highlighted the significance of coaching and training skills among leaders. Coaching helps in improving skills and confidence of employees in making decisions. It was recommended that mobile telecommunication and internet service providing companies should develop coaching and mentoring programs. The study was delimited to Nairobi County, which is the capital city of Kenya. However, fibre optic infrastructure projects have also been implemented in other counties in Kenya. Different counties in the country experience different levels of stakeholders' involvement depending on other factors such as literacy level. It was recommended that similar and comparable studies should be conducted in other counties in Kenya.

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